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Poltekkes Kemenkes Surabaya

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Welcome Message from the ICoHPS General Chair

In the name of Allah, the Most Beneficent and the Most Merciful. May peace, mercy, and blessings of Allah be upon you.

On behalf of the technical program committee, we warmly welcome you to 2021 **4th International Conference of Health Polytechnic Surabaya (ICoHPS)** in Surabaya, Indonesia with the theme "Empowering the Health Professionals and Community in Mitigating the Impacts of Covid-19 Pandemic".

The committee has organized exciting technical programs for The 2nd International Conference on Electronics, Biomedical Engineering, and Health Informatics (ICEBEHI), The 1st International Conference on Nursing and Public Health (ICoNPH), The 1st International Conference on Midwifery (ICoMid), The 1st International Conference on Medical Laboratory Technology (ICoMLT), The 1st International Conference on Environmental Health (ICoEH), The 1st International Conference on Nutrition (ICoN), The 1st International Conference on Dental and Oral Health (ICoDOH), is the annual international conference organized by Poltekkes Kemenkes Surabaya, Indonesia and co-organized by Muhammadiyah University of Surabaya, Health Academy Rustida Banyuwangi. Stikes Mitra Adiguna Palembang, Poltekkes Kemenkes Sorong, Poltekkes Kemenkes Ternate, Poltekkes Kemenkes Manado, Poltekkes Kemenkes Semarang, Poltekkes Kemenkes Banjarmasin, Poltekkes Kemenkes Medan, Poltekkes Kemenkes Aceh, Poltekkes Kemenkes Kaltim, Poltekkes Kemenkes Denpasar, Poltekkes Kemenkes Tasikmalaya, Poltekkes Kemenkes Palangkaraya, Poltekkes Kemenkes Palembang, and Isabela State University Philippines. As an annual international conference, 4th ICoHP provides an excellent platform to share innovative ideas and experiences, exchange information, and explore collaboration among researchers, engineers, practitioners and scholars in the field of health science, and medical engineering.

The Purpose of the conference are:

Knowledge, practice and experience sharing among experts to mitigate the impacts of Covid-19 Pandemic.

Achieve workable and applicable approaches to dealing with Covid-19 Pandemic

Improving public awareness about Covid-19 resilience Pandemic

Develop networking among experts and audiences from different disciplines to anticipate the new wave of Covid-19 Pandemic

Create collaboration among scholars to conduct research on the topic of Covid-19

The forms of activities are:

International Conference which will be attended by four keynote speakers from 4 countries namely Australia, Philippines, Thailand, Malaysia

International standard call for papers with International proceeding outputs, International journal and DIKTI Accredited journal.

All submitted papers throughout went through a rigorous review process and each paper was evaluated. Besides those regular sessions, 4th ICoHPS 2021 also features world-class keynote/plenary speeches and distinguished invited speakers that reflect the current research and development trends in the aforementioned fields. We are deeply indebted to all seven technical program committee members as well as our reviewers, who volunteered a considerable amount of their time and expertise to ensure a fair, rigorous, and timely review process. Many thanks should be given to our keynote and invited speakers who will share their experience in this conference. Last but not least, our sincere gratitude should be given to all authors for submitting their work to 4th ICoHPS 2021, which has allowed us to assemble a high quality technical program.

Welcome to 4th ICoHPS 2021 and hope you will enjoy this virtual conference.

With best regards,
Dr. Siti Nur Kholifah
General Chair



Welcome To Health Polytechnic of the Ministry of Health, Surabaya



drg. Bambang Hadi Sugito, M.Kes
Director
Health Polytechnic of the Ministry of Health, Surabaya
Assalamu'alaikumWr. Wb.

Praise Allah SWT for bestowing His mercy and blessings, and with His permission we held the The 4th International Conference of Health Polytechnic Surabaya (ICoHPS) in 2021 which is part of a series to commemorate the LUSTRUM IV 2021, Ministry of Health Surabaya Polytechnic.

The Covid-19 pandemic situation requires partnerships of various parties and the preparedness of supporting human resources. Health professionals on the frontline need updating on knowledge, skills and awareness to fight against Covid-19.

From some of the explanations regarding the Covid 19, the PoltekkesKemenkes Surabaya will hold 4th International Conference of Health Polytechnic Surabaya (ICoHPS) with the theme "**Empowering the Health Professionals and Community in Mitigating the Impacts of Covid-19 Pandemic**". This Conference will bring all scholars, scientists, epidemiologists, medical doctors, nurses, allied health professionals, and even politicians to share their expertise to attain a workable approach to dealing with the Covid-19." on 6 – 7 October 2021, Implementation of Activities in a virtual conference.

The conference consists of seven conferences in accordance with scientific families, including: Electromedical Engineering, Nursing, Midwifery, Medical Laboratory Technology, Dental Nursing, Environmental Health. The name of the International Conference (IC) under the umbrella of 4th ICoHPS consist:

1. The 2nd International Conference on Electronics, Biomedical Engineering, and Health Informatics(ICEBEHI)
2. The 1st International Conference on Nursing and Public Health (ICoNPH)
3. The 1st International Conference on Midwifery (ICoMid)
4. The 1st International Conference on Medical Laboratory Technology (ICoMLT)
5. The 1st International Conference on Environmental Health (ICoEH)
6. The 1st International Conference on Nutrition (ICoN)
7. The 1st International Conference on Dental and Oral Health (ICoDOH)

Finally, I would like to congratulate and say thanks to the Co Host consisting of 12 Poltekkes in Indonesia, Muhammadiyah University of Surabaya, Health Academy Rustida Banyuwangi. Stikes Mitra Adiguna Palembang..and all participant from other institution participating in the 4th International Conference of Health Polytechnic Surabaya (ICoHPS).

May God the Almighty facilitate our work. That is the delivery of my welcome.
Thank you.

WassalamualaikumWr. Wb



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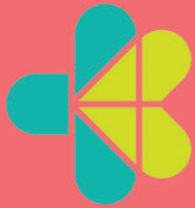
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Relationship of Family Support with Quality of Life among Breast Cancer Patients in Surabaya

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ABSTRACT

Breast cancer is the first gynecology cancer that cause mortality dan morbidity among women in Indonesia. Breast cancer has impacts on physical health, psychological status, social relationships, independence and spirituality. Those will have negative impact on the quality of life among breast cancer patients. Family support is very important to overcoming the negative impacts of breast cancer. This study aims was to determine the relationship between family support and quality of life among breast cancer patients in Surabaya. Quantitative design with a cross-sectional approach was used. The sample was 44 breast cancer women. Family Support Scale (FSS) and Quality of life a Breast Cancer Patient (QOL-BC) questionnaires were used to collect the data. The results showed that the majority of breast cancer patients who had family support was in the good category (88.6%) while the majority of the quality of life in breast cancer patients was in the good category (59.1%). The results of the Spearman Rank test showed there is a relationship between family support and quality of life (p value 0.029). Therefore, family involvement during caring of breast cancer patients should be sought to improve the patient's quality of life.

Keywords: Breast cancer, family support, quality of life, women.

INTRODUCTION

Breast cancer is a gynecological cancer that causes the highest mortality and morbidity from gynecological cancer in women in Indonesia. According to the findings of the Health Organization International Agency for Research Center (IARC) the global death rate from cancer increased to 8.2 million in 2012 and around 43,500 deaths from breast cancer each year, making this disease the second largest cause of death after lung cancer in women in United States of America (1). In Indonesia, the highest incidence rate for women is breast cancer, which is 42.1 per 100,000 (Kementerian Kesehatan Republik Indonesia, 2019). The incidence of breast cancer in East Java Province in 2019, the number of those examined and found lumps was 1,243 women (0.5%) (2). The incidence of breast cancer in the city of Surabaya in 2018 the number of women who were examined and found lumps were 262 women (1.93%). Breast cancer has a negative impact on physical health, psychological status, social relationships, independence and spirituality of patients. This disease makes sufferers have psychological problems such as fear and worry about a decrease in physical condition and even death (3). Based on research conducted by Irawan, et al., (2017) found that cancer patients experience physical changes due to treatment and the course of the disease that results in feelings of shame. Di Giacomo dkk (2016) found that breast cancer sufferers often experience depression, anxiety, anger, bad mood, social withdrawal, isolation and aggressiveness. In addition, treatment and therapy in breast cancer patients cause changes both physically and psychologically (4). Tsitsis & Lavdaniti (2014) found that cancer patients undergoing treatment would experience side effects such as fatigue, anemia, skin reactions, and psychological stress such as depression, anxiety, and others (5). These problems are long term and affect their quality of life (6). Quality of life is an individual's perception of their position in life in the context of the culture and value system in which they live in relation to their goals, expectations, standards and concerns (7). There are several factors that influence the quality of life of breast cancer patients, such as family support and the surrounding environment. Efforts made by both breast cancer patients themselves and their families are solely to maintain their quality of life (5).

Families have an important role in caring for sick family members. Treatment will be successful if there is family participation. In accordance with the theory put forward by Friedman (2010) that negative family support

will affect the health of clients, especially those related to chronic diseases. According to Kroenke, et al (2013) cancer patients have a high dependence on the surrounding environment, especially their families (5). The family is an important part in the process of treating breast cancer patients because the culture of the family says that disease is one of the factors that affect the quality of life of breast cancer patients. Kaakinen (2010) states that someone who is bound by marriage, has blood ties, lives in one house, communicates and interacts with each other, and has their respective roles is said to be family (5). Efforts from families to seek information about treatment and therapy for breast cancer patients become positive coping for families and become family efforts to provide support for patients while caring for patients. Friedman said that family support is an attitude of action and acceptance of the family towards its family members (8). Family support consists of assessment support, instrumental support, informational support and emotional support. The family plays a role in providing assessment support by guiding, supporting and assessing the situation that occurs by solving problems together. The family also plays a role in providing instrumental support such as providing services to patients, providing financial and material assistance. In addition, the efforts made by the family to overcome existing problems are to seek information to overcome these problems. This support is called informational support. Emotional support provided by the family, namely the family provides a comfortable place so that patients have good coping (8). Therefore, family support is needed in helping family members recover. Families help patients to get a quality life. Quality of life is a condition in which patients who experience the disease they suffer can still feel comfortable physically, psychologically, socially, and spiritually and are optimally able to use their lives for the happiness of themselves and others (9). Therefore, efforts to provide support for cancer patients are very important to improve the quality of life of individuals. Based on the description above, the researchers are interested in conducting research on "The Relationship of Family Support with Quality of Life in Breast Cancer Patients at Kalijudan Public Health Center, girlfriend Keling Public Health Center, Mulyorejo Public Health Center".

METHODS

The research design used in this research was non-experimental using correlation analytic. 44 breast cancer patients were selected using a proportionate random sampling technique. The inclusion criteria for the research sample included respondents who were willing to participate in the study and breast cancer patients who were accompanied by their families or lived with their families. Meanwhile, the exclusion criteria in this study included breast cancer patients who had limited or impaired verbal communication, refused to be respondents, had complications from other diseases, and lived alone. The instruments were Family Support Scale (FSS) and Quality of life a Breast Cancer Patient (QOL-BC) questionnaires. The questions contained in the questionnaire consist of 20 questions and answers using a Likert scale with the criteria: no (0), a little (1), some (2) and a lot (3). The results of the reliability test of the Family Support Scale (FSS) questionnaire conducted by Uddin & Bhuiyan (2019) obtained an Alfa Cronbach value of 0.94, which means that the questionnaire is reliable to use. A study reported said that the Family Support Scale (FSS) questionnaire is reliable for use in developing countries (10). The dependent variable, namely the quality of life was measured using the The Quality of life a Breast Cancer Patient (QOL-BC) questionnaire. This questionnaire is specially designed to be used in cancer patients. It consists of 46 question items covering physical health, psychological dimensions, social dimensions, and spiritual dimensions. This questionnaire uses a Likert scale from 0-10, where 0 is the worst result and 10 is the best result. There are several items that are reversed, meaning that if the patient answers or circles the number 3 in question number 10, the score is recorded as 7 ($10-3 = 7$). Question items whose assessments are reversed are numbers 1-7, 9, 10, 17-29, 31, 33-39 & 43. Filling the questionnaire is by reading the questions and the client is asked to make a decision whether the client agrees with the question or not. After that, the patient circled the answer he felt was appropriate for his situation (11). The results of the reliability test carried out by nurses and also midwives at dr.Sardjito Hospital Yogyakarta obtained the Cronbach Alfa value. The lowest value is the physical dimension (0.63), while the highest value is the psychological dimension (0.88). The value of Cronbach's Alfa overall quality of life was obtained (0.93). A questionnaire is said to be reliable if the Cronbach's Alpha value is > 0.70 . Although the Cronbach's Alpha value on the physical and social dimensions is < 0.70 , the overall score on the quality of life is > 0.70 , meaning that the instrument is reliable (12). The data in the study were analyzed using the Spearman rank test.

RESULTS

Table1 Distribution of Respondents Characteristics (n=44)

Characteristics	n (%)
Ages (Year)	
Early Adulthood (26 – 35)	2 (4,5%)
Late Adulthood (36 – 45)	14 (31,8%)
Early Elderly (46 – 55)	13 (29,5%)
Late Elderly (56 – 65)	14 (31,8%)
Seniors (> 65)	1 (2,3 %)
Religion	
Islam	42 (95,5%)
Christian	1 (2,3%)
Catholic	1 (2,3%)
Health Care Centre Area	
Mulyorejo	24 (54,5%)
Kalijudan	9 (20,5%)
Pacar Keling	11 (25,0%)
Ethnic group	
Javaness	44 (100%)
Length of ill	
0-5 tahun	32 (72,7%)
6-10 tahun	11 (25,0%)
>10 tahun	1 (2,3%)
Education Background	
Elementary school	28 (63,6%)
Junior high school	8 (18,2%)
Senior High School	5 (11,4%)
Bachelor	3 (6,8%)
Occupation	
House Wife	36 (81,8%)
Trader/Entrepreneur	5 (11,4%)
Employee	2 (4,5%)
Retired	1 (2,3%)
Income (a month)	
No income	35 (79,5%)
Less than 1,000,000	4 (9,1%)
1,000,001 – 2,000,000	3 (6,8%)
2,000,001 – 3,000,000	2 (4,5%)
Married Status	
Married	42 (95,5%)
Single/Widow	2 (4,5%)
Family Support	
Moderate	5 (11,4%)
Good	39 (88,6%)
Quality of life	
low	1(2,3%)
Moderate	17 (38,6%)
High	26 (59,1%)

n (%) = Jumlah responden (persentase); M = Mean; SD = Standar Deviasi

Based on table 1 above, it shows that the majority of the characteristics of breast cancer patients in this study were in late adulthood (31.8%), late elderly (31.8), female (100%), Javanese (100%), Muslim (95%). 5%), married (95.5%), respondents came from Mulyorejo Health Center (54.5%), elementary school (63.6%), housewives (81.8%), no income (79.5 %). Most of the respondents' length of illness was 0-5 years (72.7%), the level of family support was mostly good (88.6%) and the level of quality of life was mostly good (59.1%).

Table 2 Indicators of Family Support and Quality of Life in Breast Cancer Patients (n=44)

Family Support indicators	Mean±SD
Instrumental Support	14,95±2,332
Rating Support	12,93±2,073
Emotional Support	13,82±1,483
Informational Support	10,30±1,579
Quality of life indicators	Mean±SD
Quality of Life Indicator	Mean±SD
Dimensions of Physical Health	51,32± 10,450
Psychological Dimension	146,59±25,805
Social Dimension	56,61±14,580
Spiritual Dimension	59,05±7,533

Based on table 2 of 44 breast cancer respondents, it was found that the most widely given family support was instrumental support with a mean and standard deviation (14.95 ± 2.332). The highest quality of life of breast cancer patients was found in the psychological dimension with the mean and standard deviation (146.59 ± 25.805). Based on the results of statistical tests using Spearman rank, the p value/sig (2-tailed) was $0.029 < (\alpha) 0.05$. This means that there is a positive relationship between family support and quality of life in breast cancer patients at Kalijudan, Mulyorejo, and Girlfriend Health Centers. The higher the social support, the higher the quality of life of breast cancer patients.

DISCUSSION

Family support is an attitude, deed, and also acceptance from the outside towards sick family members. Family support is a relationship in the form of attitudes, actions and acceptance of the family as well as supporting and providing assistance to family members (8). Family support consists of informational support, assessment support, instrumental support, and emotional support (Friedman, 2010). Nauli (2014) said that family support can be obtained from people who are close to the patient such as parents, husband, wife, children, or relatives. The support provided can be in the form of information, physical activity, or material that is able to provide a sense of comfort, being loved, cared for, and loved by the family (13). Instrumental support is support given to patients in the form of services, financial and material assistance. Families provide assistance to family members who are sick in carrying out daily activities including things needed as well as assisting in religious activities. Families also provide services to sick family members in the form of care and treatment as well as preparing medicine needs. This study found that breast cancer patients get a lot of instrumental support from their families. The form of instrumental support provided by the family can provide what the patient needs, including money for treatment. Papastavrou & Tsangari (2009) found that economic ability affects the treatment process where someone with a low economy causes irregularities in the treatment process (14). Furthermore, informational support is the lowest support received by respondents. Respondents in this study received little information from their families. The lack of information provided by the family to the sick family member is probably due to the family's lack of knowledge about the illness experienced by the sick family member. Another reason is because the respondent's family is busy so they don't have much time with sick family members. However, this does not have much effect on respondents because low informational support and high instrumental support lead to good family support for sick family members. Low informational support does not necessarily result in poor family support because sick family members still get other support from the family such as instrumental support, emotional support, and assessment support. Research conducted by Finfgeld and Connet (2005) found that cancer patients need more instrumental support (15). This is because with instrumental support, the mental quality of cancer patients will be better. Providing valid information to competent families about breast cancer and also its treatment needs to be done to increase the informational support provided. If the family itself does not really understand about breast cancer, the family can seek information from health workers or cadres who are competent in their fields. In addition, families should also provide a lot of free time with sick family members. Good family support will affect the health of patients with chronic diseases such as breast cancer. All indicators of family support are also important in supporting the improvement of the condition of breast cancer patients. However, even though there is one indicator that is low, it does not mean that the family support provided to the patient is bad. This is because with family support from other domains, it will certainly affect the physical and psychological health of breast cancer patients.

Physical and psychological health is a domain in measuring a person's quality of life. In breast cancer patients, a good quality of life will be in line with their improved health status. If the health status is good, the physical function and ability will also function optimally. Patients with a good quality of life will have a high desire to recover so that they can improve their health. On the other hand, if the quality of life is poor, the desire

to heal also decreases (16). A good quality of life is indicated by patients undergoing regular treatment so that they are most likely to recover. So that patients can return to their activities to meet their needs without depending on others anymore. Patients can be independent both emotionally, socially and physically so that their quality of life becomes better (17). Several previous studies have results that are in line with this study, namely there is a positive relationship between family support and the quality of life of breast cancer patients (17–20). The higher the family support, the higher the quality of life of breast cancer patients and vice versa. If you find poor family support, you will risk 14,000 times the quality of life of cancer patients will deteriorate. If the family support provided is good, the quality of life of cancer patients will also get better (17). On the other hand, if the family support provided is poor, the quality of life of breast cancer patients will also be bad (18). Family support is very helpful for someone, especially for breast cancer patients in dealing with their problems. If family support is given well, it will lead to high motivation and self-confidence in breast cancer patients (21). Family support also affects health and well-being. Good family support will improve the quality of life (13). Good family support will result in decreased mortality, increased recovery rates, increased cognitive and physical function, and emotional health (21). This good quality of life can be seen from regular treatment, high desire to recover, improving cognitive and physical function, and improving emotional health. Most of the respondents in this study had a good quality of life. This is because respondents get good support from the people closest to them. Family support can improve the health and well-being of breast cancer patients and can make them more confident.

CONCLUSION

Breast cancer causes physical, psychological and spiritual changes for the sufferer. These conditions affect the quality of life and form of positive relationships. Good family support can improve the quality of life of breast cancer patients. Health workers have an important role in increasing family participation in caring for breast cancer patients, namely by providing information about the importance of family support and information related to the disease process and its treatment.

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Empowering Mother on Prevention and Intervention of Stunting on Magetan Regency

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ABSTRACT

The condition of failure to grow babies, toddlers due to chronic malnutrition so that children are too short for their age is called stunting. The aim of research is to Empower Mothers in Preventing and Intervening Stunting. The first phase developed a model of maternal empowerment in preventing and intervening stunting using a cross sectional design. Phase II, implementation model uses a Quasi Experimental Non Randomized Pre Post Control Group Design. The population of this study were all mothers of children under five in Posyandu A, B, C. The sample of the study was some mothers of children who met the inclusion and exclusion criteria. The sampling technique uses multistage random sampling, which starts with grouping samples based on the area or population location, then stratification and sampling using simple random sampling technique. The analyzed by SEM with PLS. The results of the study of mothers who had good characteristics increased mother's knowledge of preventing and intervening with stunting 0.423 times ($p=0.000$). Mothers who have good knowledge increase maternal commitment by 0.230 ($p=0.004$), mothers who have good commitment reduce stunting by 0.448 ($p=0.000$). Mothers who have good knowledge increase family support 0.236 ($p=0.040$). Families that have good family support reduce stunting by 0.257 ($p=0.011$). New findings of the Model of Empowerment of Mothers in Factors and intervening Stunting where the most influential on maternal commitment, maternal characteristics and family support. The benefit of the research is to provide understanding of mothers in preventing and intervening with stunting.

Keywords: Mother Empowerment, Prevention, Intervention, Stunting

INTRODUCTION

The condition of failure to thrive in infants, toddlers due to chronic malnutrition in the first 1000 days of life so that children are too short for their age is called stunting. Malnutrition occurs since the baby is in the womb and after the baby is born, but only appears after the child is 2 years old (de Onis & Branca, 2016). Toddlers are stunted if their z-score (PB/U) or (TB/U) $<-2SD$ and $<-3SD$ (Nahar et al., 2020). The aim of research is to Empower Mothers in Preventing and Intervening Stunting.

Phase I research aims to develop a model of maternal empowerment in the prevention and treatment of stunting using a survey and a cross sectional approach. Phase II, Implementation of the model that has been compiled using a Quasi Experimental research design. The result of this research is that mother's commitment is the most influential factor besides the mother's characteristics and family support.

Different from research Vollmer et al., (2017) by using the Demographic and Health Survey using linear probabilities results that father's education is as important as mother's education to reduce stunting in children. In addition to mother's education, father's education must also be taken into account because father's education also has an indirect contribution to stunting in children.

Study Beal (2018) stated that exclusive breastfeeding for the first 6 months is a very important determinant of child stunting. Meanwhile, the results of the 2016 Saadah study explain that apart from the mother's commitment, the mother's income factor has an important impact on the child's growth and development (Saadah & Yulianto, 2017).

The decline in the stunting rate in Indonesia was only 4% from 1992-2013, so the 1000 day HPK movement was established in an effort to improve the nutritional status of children under five (Mairo & Jeniawaty, 2020) Mother's ability (social support, psychological health, decision making, and empowerment) with child feeding practices affect the child's nutritional status (Ickes et al., 2018).

The results of this study are also in line with research Barir et al., (2019) carried out using the method An analytical observational study with a case control design with a sample of 200 children aged 2-3 years showed that stunting

was directly and negatively affected by birth length 48 cm, birth weight 2500 g, exclusive breastfeeding, and timely complementary feeding. Indirectly influenced by family income, maternal age, attitude, maternal height >150 cm, occupation, education, and knowledge.

The short-term impact of stunting causes an increase in the incidence of morbidity and mortality, suboptimal cognitive, motor, and verbal growth and development in children, and an increase in health costs, the long-term impact of suboptimal posture in adulthood, increased risk of obesity and other diseases, decreased reproductive health, less than optimal learning capacity and performance at school, suboptimal productivity and work capacity. Stunting children tend to be susceptible to infectious diseases so that they are at risk of experiencing a decrease in the quality of learning at school and are at risk of often not attending school. Stunting children had poor motor skills ($P = 0.006$ for fine motor; $P < 0.001$ for gross motor) compared to their non-skinny peers in accordance with the purpose of our research, namely Empowering Mothers in Preventing and Intervening Stunting.

METHODS

Phase I of this study used a survey or observational study with the aim of developing a model of maternal empowerment in the prevention and treatment of stunting with a cross sectional approach. The second stage of the research is the implementation of the model using a Quasi Experimental research design with the Nonrandomized Control Group Pretest Posttest Design. The result of this research is that mother's commitment is the most influential factor besides the mother's characteristics and family support.

The population of this study were all mothers of children under five in Posyandu A, B and C. The sample of the study was some mothers of children under five in Posyandu A, B and C who met the inclusion and exclusion criteria. The sampling technique uses multistage random sampling, which starts with grouping samples based on the area or population location, then stratification and sampling using simple random sampling technique.

The instruments used were questionnaires and Z-Score sheets. Questionnaire to measure mother's knowledge variable, family support, nutritional status, mother's commitment, child's physical health, outdoor environment and home environment and Z-Score sheet to measure stunting variable (Supariasa et al., 2014). Independent t test was used to see the difference between the intervention group and the control group.

RESULTS

Characteristics of Research Subjects

The table below describes the variables of age, education, socio-economic, occupation and knowledge of the mother, nutritional status of children, physical health of children, home environment, environment outside the home, mother's commitment and family support that contribute to preventing and handling with stunting.

Table 1. Distribution of maternal age, mother's education, socio-economic, maternal work, maternal knowledge, children's physical health, children's nutritional status, home environment, outside environment, mother's commitment, and family support

Variable	Indicator	Frequency	Percentage
X11. Mother's age	< 20 Years	0	0%
	20 - 35 Years	109	73.3%
	> 35 Years	41	26, 7%
X12. Mother's Education	Primary School	7	5.2%
	Junior High School	61	40.4%
	Senior High School	64	42.2%
	College	18	12.4%
X13. Socio-Economic	Total expenses	52	35.3%
	Family food expenses	98	64.7%
X14. Mother's Job	Civil servant	4	2.5%
	Private	61	41%
	Farmer	38	24.8%
	Housewife	47	31.7%
X21. Mother's knowledge about early detection of stunting	Low	25	16.8%
	High	125	83.2%
X22. Mother's knowledge about stunting prevention	Low	22	14.9%
	High	128	85.1%

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X12. Mother's Education	Primary School	7	5.2%
	Junior High School	61	40.4%
	Senior High School	64	42.2%
	College	18	12.4%
X23. Mother's knowledge about stunting	Low	24	16.1%
	High	126	83.9%
X31. Children's physical health	Once	50	33.3%
	Never	100	66.7%
X41. Child nutritional status	Sufficient	72	48%
	Insufficient	78	52%
X51. Live with both parents	Living with both parents	107	71.3%
X52. Live with one parent	Living with mom	43	28.7%
	Living with dad	0	0
	Living with grandma	0	0
X51. Eating habits of friends in the neighborhood	Less nutritious	41	27.3%
	Nutritious	109	72.7%
Y11. Mother's role	Weak	37	24.7%
	Strong	113	75.3%
Y21. Husband's support	Weak	19	12.7%
	Strong	131	87.3%
Y31. Child body size	Normal	131	87.3%
	Stunting	19	12.7%

Based on Table 1, the majority of mothers were 20-35 years old, were senior high school graduates, were housewives, have good knowledge, the nutritional status of children is also good, the prevention and treatment of stunting is good, the children's physical health is good, the environment is good, having healthy/good home, having good outdoor environment, having very high maternal commitment, having high family support and the having children who are not stunted.

a. Convergent Validity Test

Based on the measurement model using reflective indicators, it can be seen from the correlation between the item/indicator scores and the structural scores, the individual indicators are considered reliable if they have a correlation value above 0.70.

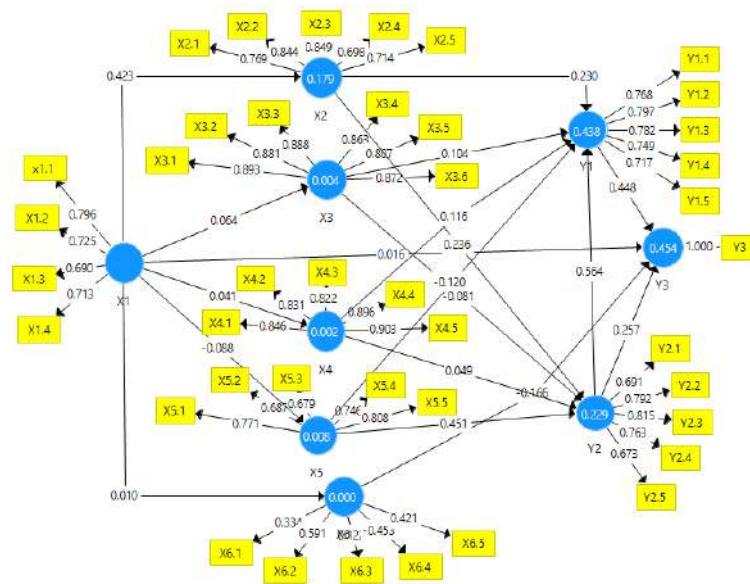


Figure 1.T-test results of the influence of indicators on the constructs for the measurement model

Based on Figure 1 above, the loading factor of each item can be seen in table 1 below:

Based on the table below, it is explained that among all indicators and variables, only 1 has an invalid value, namely the environmental variable outside the home.

Table 2. The factor loading value of the mother's empowerment model in the prevention and intervening of stunting in children

No	Construct	Indicator	Construct Loading Value	Convergen t validity test results
1	X1. Mother Characteristics	X.1.1 Maternal age	0.796	Valid
		X.1.2 Mother's education	0.725	Valid
		X.1.3 Socio-Economic	0.690	Valid
		X.1.4 Mother's Work	0.713	Valid
2	X2. Mother's knowledge about early detection, prevention, and handling of stunting	X.2.1 Early detection of stunting	0.769	Valid
		X.2.2 Prevention of stunting	0.844	Valid
		X.2.3 Handling stunting	0.849	Valid
3	X3. Children's Physical Health	X.3.1 Children Physical Health	0.893	Valid
4	X4. Nutritional status	X.4.1 Children Nutritional Status	0.846	Valid
5	X5. Houseenvironment	X.5.1 Living with both parents	0.771	Valid
		X.5.2 Living with one parent	0.687	Valid
6	X6. Outdoor environment	X.6.1 His friend's environmental habits	0	Invalid
7	Y1. Mother's commitment	Y.1.1 Mother's role	0.768	Valid
8	Y2. Family support	Y.2.1 Husband's support	0.691	Valid
9	Y3. Stunting	Y.3. Stunting	1,000	Valid

Based on Table 2, the mother's age, education, socioeconomic and occupation, knowledge, child's nutritional status, prevention and treatment of stunting, child's physical health, home environment, mother's commitment, and family support have valid values, while the house environment had an invalid value.

Value of Effect of Exogenous Constructs to Endogenous Constructs

In the table below, it is explained that the influence of family support variable on children's nutritional status is indirectly influenced by maternal characteristics.

Table 3. Direct, indirect, total effects in the path diagram

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STD EV)	P Values	Information
X1 -> X2	0.423	0.426	0.047	8.947	0.000	Significant
X1 -> X3	0.064	0.07	0.094	0.681	0.496	Not Significant
X1 -> X4	0.041	0.044	0.089	0.459	0.647	Not Significant
X1 -> X5	-0.088	-0.091	0.098	0.896	0.370	Not Significant
X1 -> X6	0.010	0.008	0.189	0.054	0.957	Not Significant
X1 -> Y1	0.151	0.151	0.063	2.406	0.016	Significant
X1 -> Y2	0.057	0.060	0.070	0.815	0.416	Not Significant
X1 -> Y3	0.097	0.099	0.069	1.395	0.164	Not Significant
X2 -> Y1	0.363	0.360	0.125	2,894	0.004	Significant
X2 -> Y2	0.236	0.241	0.114	2,063	0.040	Significant
X2 -> Y3	0.223	0.219	0.087	2,564	0.011	Significant
X3 -> Y1	0.058	0.055	0.075	0.769	0.442	Not Significant
X3 -> Y2	-0.081	-0.077	0.074	1.091	0.276	Not Significant
X3 -> Y3	0.005	0.000	0.052	0.098	0.922	Not Significant
X4 -> Y1	0.144	0.154	0.061	2,352	0.019	Significant
X4 -> Y2	0.049	0.060	0.072	0.675	0.500	Not Significant
X4 -> Y3	0.077	0.085	0.046	1,689	0.092	Not Significant
X5 -> Y1	0.135	0.150	0.085	1,590	0.112	Not Significant
X5 -> Y2	0.451	0.455	0.091	4.973	0.000	Significant
X5 -> Y3	0.176	0.193	0.068	2,578	0.010	Significant
X6 -> Y3	-0.166	-0.018	0.142	1.170	0.243	Not Significant
Y1 -> Y3	0.448	0.422	0.120	3,742	0.000	Significant
Y2 -> Y1	0.564	0.583	0.104	5.428	0.000	Significant
Y2 -> Y3	0.510	0.535	0.095	5.338	0.000	Significant

The results from table 3 show that the magnitude of the direct influence coefficient of X1 on Y2 (0.057) is smaller than the indirect effect of Y2 on Y1 (0.564) with a statistical t value of > 1.96, meaning that the mediating variable can have an indirect effect between the independent variables and the dependent variable (Willi, 2015). This shows that Y1 variable mediates or becomes an intervening variable in the effect of Y2 on Y3.

Research Findings

The new findings of this study are the establishment of a Model for Early Detection, Prevention and Intervening of Stunting in Children, where maternal commitment is the most influential factor in reducing stunting, followed by maternal characteristics and family support.

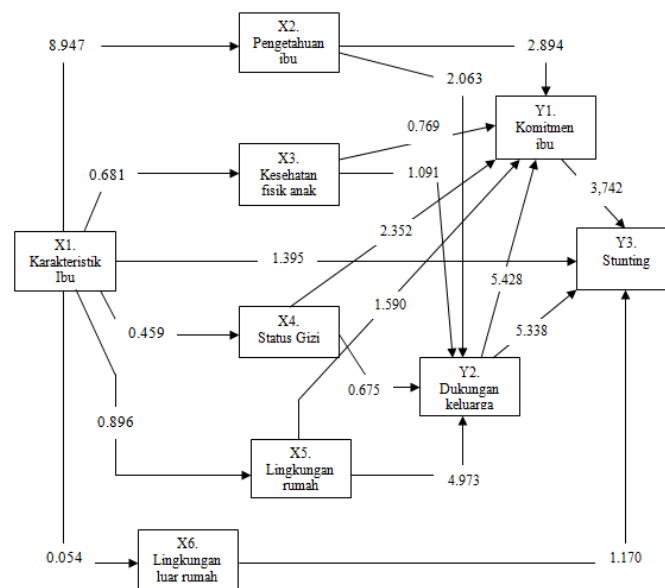


Figure 2 New Findings in the form of a Model of Mother Empowerment in Prevention and Intervening of Stunting in Children Based on the HPM Theory (Lailis Model)

The new finding in this study is the production of a Lailis Model for Stunting Prevention and Intervention based on HPM Theory, which is a Maternal Empowerment Model on Early Detection, Prevention and Intervention of Stunting which was built through various channels, both direct and indirect from all existing factors. In this case, maternal commitment factor (Commitment to a Plan of Action) is the most influential factor in the intervention of stunting, followed by maternal characteristics (Personal Factors) and family support factors (Interpersonal Influences).

DISCUSSION

Effect of Mother's Characteristics (age, mother's education, socioeconomic, and mother's occupation) on Stunting in Children.

The results of this study stated that the majority of mothers aged between 20-35 years old which is categorized as early adulthood. Maternal characteristic factor has a significant direct effect on the stunting factor.

In addition, maternal characteristics also have a significant indirect effect on stunting, which is through mother's knowledge, children physical health, children nutritional status, home environment, outside environment, mother's commitment and family support regarding early detection, prevention and intervening of stunting. The results of this study found that there was a strong influence between maternal commitment and the incidence of stunting t -statistic (3.742) > t -table 1.96. This is in line with research conducted by Roba et al., (2021) stating that maternal education, mother occupation and maternal age have a significant effect on stunting. This research is also supported by research (Mistry et al., 2019) which stated that maternal education was identified as an important predictor of stunting. In addition, research conducted by Fadare et al., (2019) also emphasized that higher maternal education significantly reduced child stunting, and a person's age affects knowledge, in this case, the older a person is, the more likely his knowledge and experience will increase.

Study conducted by Dompas et al. (2019) further explained that productive age is the age at which a person reaches a level of maturity in terms of productivity in the form of rational and motor. Mothers aged 19-35 years old are mothers in the productive age group, where they already have maturity in terms of rational and motor skills so that they have sufficient maturity. The maturity of the mother causes the ability to take care of their child well, so it is expected that the growth and development of her child is also good.

This research was actually planned to be conducted offline, however, due to pandemic, it was carried out offline and online. Therefore, it took time to change the questionnaire using the Google form which affected on the increased time for conducting research.

The Effect of Mother's Knowledge on Early Detection, Prevention and Handling of Stunting in Children

The results of this study stated that most of the mother's knowledge about early detection, prevention and intervention of stunting in children was high. However, after being given in-depth questions, some mothers were still reluctant to carry out the things they already know, so they need motivation/trigger from health workers/cadres to carry out early detection, prevention and treatment of stunting in children. The results of the study are also in accordance with the research carried out by Suleman et al., (2021) which explained that there was a significant effect of health promotion on knowledge and attitudes with stunting prevention measures.

The Influence of Children's Physical Health as Factors Affecting Stunting in Children

The results of this study obtained that the majority of children have never been sick. This does not mean that the child has never been sick at all. The child might have been sick but it was mild and treated immediately so that it did not interfere with the child's growth and development. The child's physical health factor had a significant indirect effect on the stunting factor.

This is in line with research done by Borji et al., (2018) which claimed that infectious diseases can reduce food intake, interfere with nutrient absorption, cause direct loss of nutrients, and increase metabolic needs so that it affects Child Development. It is different from the research conducted by Rah et al., (2020) which obtained that there was no relationship between anemia in children and the incidence of stunting in children.

The Influence of Children's Nutritional Status as Factors Affecting Stunting in Children

The results of this study explained that the nutritional status of the majority of children is sufficient which is between adequate and less nutritional status, the comparison is almost balanced. The nutritional status of children had a significant indirect effect on the stunting factor. The level of education had an influence on health, one of which is nutritional status. Individuals who have a higher education level are more likely to know a healthy lifestyle and how to keep the body in shape as reflected in the application of a healthy lifestyle such as consuming nutritious food.

This study supports the results of research on feeding patterns in children influenced by physiological, psychological, social and cultural factors. These factors determine what food choices will be consumed, how much and who will consume and when the food may or may not be consumed (Singh et al., 2019). This is in line with the previous research (Debela et al., 2021) which explained that improving child nutrition and empowering women are two important and closely related development goals. If the mother works and has an income, the mother will provide more nutritious food than mothers who do not have their own income. In addition, research conducted by (Sarker et al., 2020) also supports the results of this study where it was explained that an increase in economic activity improved the nutritional status of children which then lead to decreased inequality.

The Influence of the Home Environment as a Factor That Affects Stunting in Children

The results of this study explained that most children live with both parents but this does not guarantee that children always get full attention from both parents because of the business of both parents. The house environment factor is significant to the stunting factor. This research is supported by research previously done by Orth (2018) which explains that the home environment affects children in various ways, including affecting on how a child develops and learns from his environment. This research is also in line with Nguyen et al., (2018) that providing a house environment that stimulates the growth and development of children is very important to ensure that children's development runs optimally.

The Influence of the Outdoor Environment as a Factor that Affects Stunting in Children

The results of this study stated that most children had received nutritious food but if judged from the quality and quantity according to the age of the child, it was still lacking because children followed and imitated their friends. This supports research which stated that environmental factors outside the house related to stunting are eating habits with peers. Environmental factor outside the house is not significant to the incidence of stunting (Bueno et al., 2018).

The Effect of Mother's Commitment to Early Detection, Prevention, and Handling of Stunting in Children

The results of this study indicated that the mother's commitment to make efforts so that her child does not experience stunting is mostly very strong but the motivation to implement is still not optimal. The maternal commitment factor has a significant direct effect on the stunting factor. It is proven that most of the mothers have a strong commitment to be able to carry out early detection, prevention and intervention of stunting in children.

The results of this study are in line with Setiadi et al., (2020) which states that the role of parents in general includes the role of the father and the role of the mother. The role of the mother is as a housekeeper, caregiver and educator of children, protector of the family as well as the breadwinner of the family and as a member of the community of certain social groups, while the role of the father is as the head of the family, has a role as breadwinner, educator, protector or protector, giving a sense of security for each family member and also as a member of a particular social group community.

Effect of Family Support on Early Detection, Prevention, and Handling of Stunting in Children

The results of this study stated that strong family support for mothers in carrying out early detection, prevention and treatment of stunting in children had a direct significant effect on the stunting factor. This is in line with Kang & Kim's research (2019) which stated that family support/husband support is very meaningful for mothers in

carrying out early detection, prevention and handling of stunting. In this case, family support can be in the form of moral and material support.

CONCLUSION

The aim of the research was to develop a model for maternal empowerment in preventing and intervening stunting in children through stunting early detection training. The new findings are the formation of a Model for Early Detection, Prevention and Intervention of Stunting in Children, where maternal commitment is the most influential factor in reducing stunting, followed by maternal characteristics and family support.

Mother's characteristics (Personal Factors) make important contributions and influence mothers in taking attitudes and actions for Early Detection, Prevention and Intervention of Stunting. Furthermore, mother's knowledge is an important factor and makes a big contribution in addition to the strong family support to carry out Early Detection, Prevention and Intervention Stunting. Physical health of children and family support who understand the importance of early detection, prevention and treatment of stunting in children encourage mothers to have a high commitment to implement it. The nutritional status of children and family support who understand the importance of early detection, prevention and intervention of stunting in children encourage mothers to have a high commitment to implement it. In addition, house environment and family support who understand the importance of early detection, Prevention and Intervention of Stunting in children encourages mothers to have a high commitment to implement it. Although the outside environment (Perceived Barrier) is a factor that does not contribute to the incidence of stunting in children, this factor should not be ignored because children tend to follow the habits of their friends. Mother's commitment (Commitment to a Plan of Action) is also strong due to the self-advancement factor felt by the mother (Self Efficacy) so that the mother takes action (Activity Related Affect) on Early Detection, Prevention and Intervention of Stunting because the mother feels the benefits of her actions. On the other hand, family support is also very needed by mothers in realizing their commitment to carry out Early Detection, Prevention and Intervention of Stunting.

Based on the results of this study, it is expected that in the future, the Health Office can facilitate in making policies related to Early Detection, Prevention and Intervention of Stunting at the Magetan District Health Center by using the existing models and using modules that have been recommended to be used as a reference for midwives in carrying out Early Detection, Stunting Prevention and Intervention.

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INTERVENTIONS TO REDUCING STIGMA TOWARD COVID-19: RAPID REVIEW AND PRACTICAL RECOMMENDATION

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ABSTRACT

Stigma toward covid-19 was a barrier to handing and treating of covid-19 cases. Need intervention to reducing impact of stigma toward covid-19. The aim of rapid review was to develop recommendation for interventions to reduce stigma toward covid-19, through revieweign evidence related to covid-19, or other high infectious disease outbreak, or stigmatized condition (mental illness) from systematic reviews, primary studies, and recommendation from additional materials. Methods. Rapid review from database searches Proquest, PubMed, ScienceDirect, and google scholar with entering keyword: intervention; reducie; stigma; covid-19. Inclusion criteria of the articles were: 1) systematic review or primary intervention studies (<10 years), 2) primary studies related to intervention to reduce stigma toward covid-19, or other infectious disease outbreak, or stigmatized condition (mental illness). Data were extracted on stigma condition, stigma target, population, intervention, and result. These data were summarised and presented into table and narrative overview. Result: the searches identified a total of 5.549 articles, from which we found 9 systematic reviews, and 1 primary studies. Recommendation to reduce stigma toward covid-19 were focused on : 1) target group, 2) stigma target, 3) intervention, and strategy for implementation. Conclusions: the effectiveness of stigma intervention toward covid-19 could be reach optimally by choosing the right interventions based on stigma condition, stigma target, outcome of interventions, and supporting of essensial elements, like individu, community/ society, and government to reducing impact of stigma toward covid-19.

Keywords: intervention; reduce; stigma; covid-19

INTRODUCTION

SARS-CoV-2 (Covid-19) was to be outbreak since it was first found in China at October 2019 and declaring by WHO as global pandemic at 11 March 2020 in order to the spreading of the virus around 114 countries in the world (WHO, 2020). Covid-19 was acute respiratory syndrome that was manifested with mild, moderate and severe symptome that caused by SARS-CoV-2 virus through contact with respiratory tractus (WHO, 2020). Meanwhile, the first case of covid-19 in north America, oseania, and Europe was found at january 2020 (Sohrabi et al., 2020). Up to 6 July 2021, total cases of positive confirmatory of covid-19 globally was 183.934.913 cases with 3.985.022 deaths (WHO, 2021). Meanwhile, total confirmatory cases of covid-19 in Indonesia till 6 July 2021 was 2.345.018 cases with 61.868 deaths (WHO, 2021).

Emergency condition related to the spreading of covid-19 worldwide made psychologice response like confusing, anxiety, and fear of community that could be social stigma and discrimination especially with people who were infected by the virus (CDC, 2020). Social Stigma could be defined as a characteristic or attribute that was manifested with negative responses or unexpected impact of person or people with that character (Goffman, 2009). other terminology, defined social stigma as integrated of four components of stigma: anticipated, perceived, experienced, and internalized stigma (Kane et al., 2019). Stigma toward covid-19 could be manifested as anticipated stigma if person avoid testing of covid-19, perceived stigma if the infected people or their family felt judged by others, experienced stigma if infected people were excluded, isolated, and discriminated by community, and internalized stigma if infected people of covid-19 felt shame and self rejection. Meanwhile, discrimination toward infected people by covid-19 was defined as behavioural responses of prejudice in termn of social process that enable domination of people or group, that gave devalue the stigmatized (Phelan et al., 2008). Previous study reported that society did stigma and discriminating toward infected people by covid-19 virus and vulnerable group who close contacted with them (health worker and their family) (Sulistiadi et al., 2020; Sigh & Subedi, 2020). Stigma toward covid-19 was manifested with afraid to contact with people were infected with the virus (Ramaci et al., 2020), and discriminating to stigmatized people through forbidding the infected people leave from their home, forbidding them join with social activities, and forbidding them entering to work (Abuhammad et al., 2020). Stigma toward covid-19 had to be more harmful than covid-19 virus (Ren et al., 2020). Social stigma was also as a barrier to covid-19 responses to community (Mahmud & Islam, 2020). It was proved that the society or individu were not willing to visit the hospital in order to afraid to be positive covid-19 diagnosis, health worker was prevented to access the health status of community, this condition could make difficult to report of covid-19

incidents. So that the covid-19 cases in the communities can not be managed and treated optimally (Shigemura et al., 2020).

Need to be strategy to reducing impact of stigma toward covid-19 among society. In this context, the aim of the rapid review was to review the literature related to strategy for recommendation or intervention to reducing stigma toward covid-19 among society.

METHODS

Rapid review from database searches Proquest, PubMed, ScienceDirect, and google scholar with entering keyword: intervention; reduce; stigma; covid-19. Inclusion criteria of the articles were: 1) systematic review or primary intervention studies (<10 years), 2) primary studies related to intervention to reduce stigma toward covid-19, or other infectious disease outbreak, or stigmatized condition (mental illness). Data were extracted on stigma condition, stigma target, population, intervention, and result. These data were summarised and presented into table and narrative overview.

The outcome of interest was changes in stigma (any type; e.g. anticipated stigma, public stigma, self-stigma, structural stigma, stigma-by-association, perceived stigma), or changes in outcomes of components of stigma (knowledge, attitudes, behaviours). The target populations were: people experiencing stigma (e.g. people who are confirmed or suspected to have the condition, or who have recovered; people associated with the condition due to their work [e.g. healthcare workers], association with someone who is unwell [e.g. caregivers, family members]); or people who can act on stigma (e.g. general public, policy makers, people associated with the condition, or who have experience of the illness).

RESULTS

The searches identified a total of 5.549 records, reflecting 24 records of potentially relevant systematic reviews and 11 primary studies. From these, 9 systematic reviews were selected as evidence for this review, and 1 primary studies met the criteria. [Figure 1](#) provides an overview of the article selection process.

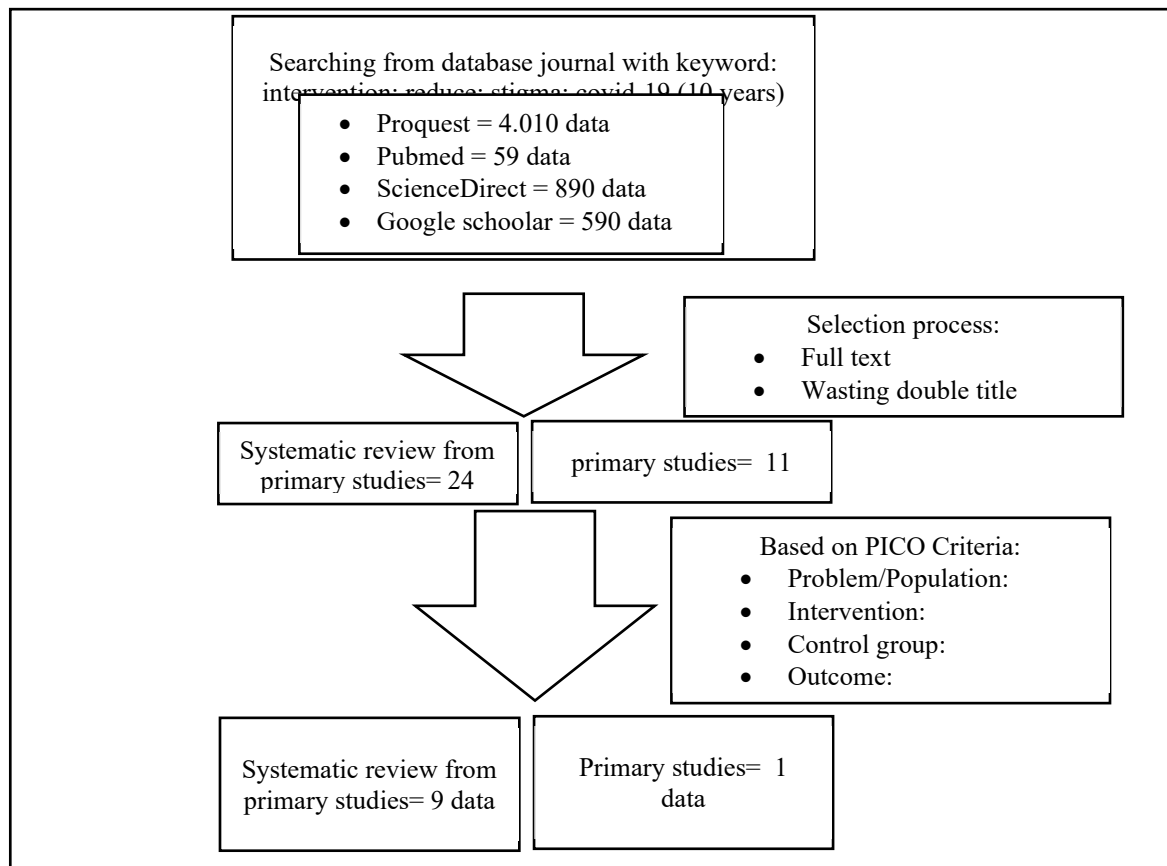


Figure 1. Data Selection Process From Journal Database

The characteristics of the systematic reviews and primary studies providing evidence for this review are presented in Table 1. These reviews reported on the effectiveness of anti-stigma interventions in relation to HIV/AIDS (Andersson et al., 2019; Feyissa et al., 2019; Ma et al., 2019), mental illness (Clement et al., 2013; Hanisch et al.,

2016; Mascayano et al., 2020; Mills et al., 2020; Morgan et al., 2018; Vaghee et al., 2015), and related to tuberculosis (Sommerland et al., 2017).

In terms of stigma, most reviews focused on general stigma in relation to the condition (Clement et al., 2013; Hanisch et al., 2016; Mascayano et al., 2020; Feyissa et al., 2019; Mascayano et al., 2020), but self-stigma (Andersson et al., 2019; Ma et al., 2019; Mills et al., 2015; Vaghee et al., 2015). Some reviews focused on stigma in specific target groups or settings; namely affected persons and their families (Andersson et al., 2019; Ma et al., 2019; Mills et al., 2015; Morgan et al., 2018; Vaghee et al., 2015), healthcare workers (Feyissa et al., 2019; Mascayano et al., 2020; Sommerland et al., 2017). No evidence (i.e., systematic reviews or primary intervention studies) was identified for stigma-reduction directly in relation to COVID-19). Most reviews included evidence from studies using a broad range of quantitative designs (generally this included randomised-control trials or RCTs) (Andersson et al., 2019; Clement et al., 2013; Hanisch et al., 2016; Feyissa et al., 2019; Hanich et al., 2016; Ma et al., 2019; Mascayano et al., 2020; Morgan et al., 2018; Sommerland et al., 2017), one focused on RCTs specifically (Vaghee et al., 2015).

Table 1. Description of reviewing process from selected articles

Author	Stigmatised condition	Stigma target	Population	Intervention	Result
Andersson et al. (2019)	HIV/AIDS	Self stigma/internalized stigma Perceived stigma	People with HIV/AIDS	Group-based behavioural interventions, Patient-centered mental health programmes, Community support initiative	From 27 selected primary studies report that: three interventions were effective to reduce stigma on people with HIV/AIDS
Clement et al. (2013)	Mental illness	Public stigma	General public	Mass media intervention	From 5 selected primary studies reported that mass media intervention may reduce prejudice to people with mental illness at immediate, short, and medium term
Feyissa et al. (2019)	HIV/AIDS	HIV related Stigma in healthcare setting	Healthcare workers	Training popular opinion leaders Professionally assisted peer group interventions Modular interactive training Participatory self-guided assessment and interventions Contact strategy combined with information giving and empowerment	N=14 studies. Reported these interventions were effective to reduce avoidance intent and prejudicial attitudes, and reducing stigma in healthcare setting
Hanich et al. (2016)	Mental illness	Public stigma	Employee in workplace	Anti-stigma intervention at the workplace	N=16 studies. This intervention was effective to reduce stigma of employee toward people with mental illness through enhance

						knowledge, attitude, and behaviour
Ma et al. (2019)	HIV/AIDS	Self stigma Perceived stigma	People living with HIV/AIDS and their families	Psycho-education Support for treatment adherence Pscoterapy Narrative intervention Community participation		N=23 studies. The combining therapies were Effective to reduce self stigma of people with HIV/AIDS and their families
Mascayano et al. (2020)	Mental illness	Public stigma toward people with mental illness	Community setting (healthcare providers, community members, and relative	Including culture programs		=18 studies. This intervention was effective to reduce stigma toward people with mental illness through improving knowledge and attitude
Mills et al. (2015)	Mental illness	Self stigma	People with mental illness	Self-help intervention		N=8 studies. This intervention was effective reduce self stigma and help-seeking, especially in depression
Morgan et. al (2018)	people with severe mental illness	Public stigma	General public, family of people with severe mental illness	Contact educational intervention dan		N=62 studies. These combine intervention were effective to reduce stigma toward people with severe mental illness (contact intervention showed positive impact on reduction of stigmatising atitudes, while educational intervention effected to stigmatising attitude and desire for social distance)
Sommerland et al. (2017)	Tuberculosis	Public stigma and anticipated stigma	General public, caregivers (healthcare workers)	Knowledge-shaping and attitude-changing interventions		=7 studies. These interventions were effective to reduce stigma toward patients with tuberculosis, through enhancing knowledge, attitude and behaviors (home visit and support group)

Vaghee et al. (2015)	Mental illness (schizophrenia)	Self stigma and perceived stigma	Family care givers of patients with mental illness	Psychoeducation	N=60 family caregivers of patients with schizophrenia, intervention (n=30), control (n=30). Psychoeducation was effective to reduce stigma toward people with mental illness among family caregivers (p=0,01).
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Focuses the recommendation for intervention to reduce stigma toward covid-19 were based on: 1) target group (People were infected by the covid-19 virus, family members of infected people, healthcare worker, vulnerable group, and community/ public), 2) stigma target (public stigma, self stigma, perceived stigma), 3) intervention (based on : 3.1) optimize individual capacities (psycho-education, support for treatment adherence, psychoterapy, narrative intervention, and Knowledge-shaping and attitude-changing interventions, 3.2) optimize family supported (family based intervention, family psycho-education), 3.3) optimize public intervention (community participation, community supported intervention, mass media intervention, and culture program), 3.4) optimize healthcare worker capacities (training popular opinion leaders, professionally assisted peer group interventions, modular interactive training, participatory self-guided assessment and interventions, contact strategy combined with information giving and empowerment), 3.5) optimize vulnerable group (anti-stigma intervention at the workplace), 4) strategy for implementation: have to considering aspects: 4.1) approaching methods (person, family, community/group), 4.2) choosing right intervention based on stigma experienced, 4.3) optimize internal and external supports.

Table 2. Recommendation for reducing stigma toward covid-19

Target group	Stigma target	Intervention	Strategy for implementation
People were infected by covid-19 virus	Self stigma Perceived stigma	Psycho-education Support for treatment adherence Psychoterapy Narrative intervention Community participation	Identify stigma experienced of person/ people were infected by the virus Using personal approach to get patient attention Choose the right intervention based on stigma of person experienced Optimize social support (family, community)
Family members of infected people	Self stigma Perceived stigma	Psycho-education intervention Family-based intervention Community supported intervention	Identify stigma experienced of family members of infected people (knowledge, attitude, and behaviour) Identify the sources of family supporting Identify attention of family members to change stigma experienced Applying the right intervention to reduce stigma based on internal factors and external factors
Healthcare worker	Public stigma	Training popular opinion leaders Professionally assisted peer group interventions Modular interactive training Participatory self-guided assessment and interventions	Identify stigma, discrimination, and abusing behavior toward healthworker in healthcare setting Identify impact of stigma toward healthworker and people who closed contact with them (family members, partners) Make sure to giving life insurance to protect them of working risk

		Contact strategy combined with information giving and empowerment	The intervention must be focused on reducing stigma, and abusing behaviour to health worker
Vulnerable group (in workplace)	Public stigma Self stigma	Anti-stigma intervention at the workplace	Identify people were experiencing stigma in workplace Identify causing of stigma among people in workplace Conduct social restriction and implementing of health protocols Doing intervention at the similar group (experiencing stigma)
Community/society	Public stigma	Mass media intervention culture programs Knowledge-shaping and attitude-changing interventions	Identify the causing of stigma toward covid-19 (by assessing knowledge, attitude, and behavior) Identify attention to reduce stigma Optimize combine intervention to get the effective result

DISCUSSION

The review showed that the stigma experienced by people or communities were categorised on self stigma, perceived stigma, and experienced, and internalized stigma. The result was consisted with stigma concepted reported by Kane et al. 2019 that social stigma that was happened in the community that consisted of anticipated, perceived, experienced, and internalized stigma. Required stigma intervention have to focused on target group, stigma target, intervention, and strategy for implementation. The result was consisted with previous reviews by Gronholm et al. 2021 that focused stigma intervention toward covid-19 have to considering aspects were language/words used in relation to COVID-19 and affected people, media/journalistic practices, public health interventions, targeted, public health interventions for key groups and, involving communities and key stakeholders to apply intervention. Prasad et al. 2020 recommended that intervention to reduce stigma toward covid-19 have considering reliable sources of information to reduce stigma, gaining information about what people know about covid-19, and online psychoeducation to stigma reduction strategy.

Intervention to reduce stigma toward covid-19 have to based on population target, stigma target, and outcome of intervention. If want to reduce stigma on individu/person, have to choosing intervention based on changing of knowledge, attitude and behaviour of person (psychoeducation, treatment adherence, narrative intervention, and knowledge- attitude changing intervention). Javed et al. 2021 recommended that intervention to reduce stigma toward covid-19 would be worked effectively if enabling factors (Cultural, socio-economic and religious factors of person to change health seeking behavior, attitudes of the individuals and health practitioners and mental health systems.

Addressing stigma requires comprehensive and inclusive mental health policies and legislations; sustainable and culturally-adapted awareness programs; capacity building of mental health workforce through task-shifting and interprofessional approaches; and improved access to mental health services by integration with primary healthcare and utilizing existing pathways of care.

CONCLUSION

The effectiveness of stigma intervention toward covid-19 could be reach optimally by choosing the right interventions based on stigma condition, stigma target, outcome of interventions, and supporting of essential elements, like individu, community/ society, and government to reducing impact of stigma toward covid-19. To implementing of intervention have to Identify stigma experienced of person/ people were infected by the virus, using personal approach to get patient attention, choosing the right intervention based on stigma of person experienced, and optimizing social support (family, community, and government).

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Literature Review
**The Effect Of Progressive Muscle Relaxation On Random Blood Sugar Levels In
Diabetes Mellitus Type 2**

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ABSTRACT

Background: Non-communicable diseases are a public health problem in Indonesia and occupy the top ten diseases that cause death and the most cases, one of which is diabetes mellitus. Diabetics can experience various long-term complications if their diabetes is not managed properly. One of the non-pharmacological therapies for people with diabetes mellitus is progressive muscle relaxation. **Purpose:** This literature review aims to determine the effect of progressive muscle relaxation on random blood sugar levels in diabetes mellitus type 2. **Methodology:** This study uses the literature review method, in searching for articles using the database Google Scholar, Garuda Portal, and Research Gate. **Results:** Based on the literature search, 8 journals were found that match criteria. The results of the analysis show that there is an effect of progressive muscle relaxation on random blood sugar levels in diabetes mellitus type 2. **Discussion:** Routine muscle tension and relaxation can increase glucose transport into cell membranes and make glucose levels more effective so that levels can approach normal or stable. **Conclusion:** It's important for people with diabetes mellitus to control their blood sugar levels, one of which is by progressive muscle relaxation. This therapy is a companion to pharmacological / medical therapy (complementary therapy).

Keywords: Progressive Muscle Relaxation, Random Blood Sugar, Diabetes Mellitus Type 2

INTRODUCTION

Non-communicable diseases are a public health problem in Indonesia, occupying the top ten diseases that cause death and the most cases, one of which is diabetes mellitus (Dewi et.al, 2020). Diabetes mellitus is often referred to as the "silent killer". The threat of complications of diabetes mellitus continues to overshadow people's lives. Around 12-20% of the world's population is estimated to have this disease and every 10 seconds in the world, someone dies due to complications (Nurrahmani, 2015). Continuously high blood sugar levels result in damage to blood vessels, nerves, and other internal structures. Diabetics can experience various long-term complications if their diabetes is not managed properly (Sari, 2020)

The main results of the 2018 Basic Health Research (Riskesdas) in Indonesia show that the prevalence of diabetes mellitus based on measurement results in the population aged 15 years according to the Perkeni consensus has increased, from 6.9% in 2013 to 10.9% in 2018 (Ministry of Health, 2018). According to the results of the Basic Health Research (Riskesdas) in the province of East Java in 2018, it was stated that the prevalence of diabetes mellitus based on a doctor's diagnosis in the population aged 15 years in East Java had increased, from 2.1% in 2013 to 2.6% in 2018, and in the city of Surabaya, there was an increase, from 4.4% in 2013 to 4.8% in 2018 (Ministry of Health, 2018).

Diabetes is a chronic (chronic) disease in the form of a metabolic disorder characterized by blood sugar levels that exceed normal limits. Type 2 diabetes mellitus is diabetes caused by an increase in blood sugar due to a decrease in low insulin secretion by the pancreas gland. (Ministry of Health, 2020). When too much sugar stays in the bloodstream for a long time, it can affect the blood vessels, nerves, eyes, kidneys, and cardiovascular system. Complications include heart attacks and strokes, severe foot infections (causing gangrene, may result in amputation), end-stage renal failure and sexual dysfunction (P2PTM, 2019).

Non-pharmacological therapy is often an option for people with diabetes mellitus because this non-pharmacological therapy is easy to do, does not cost a fortune, and does not result in fatal effects or worsen the disease state (Sukarmiasih, 2019). One of the non-pharmacological therapies for people with diabetes mellitus is progressive muscle relaxation. In a relaxed state, the brain will get optimal oxygen supply. This condition will

help achieve stable work of the adrenal glands to produce sedative hormones which will have an impact on reducing stress. If stress conditions can be controlled, blood sugar will also decrease (Hidayati, 2018). Based on the explanation that has been put forward, the authors are interested in reviewing some related literature on the effect of progressive muscle relaxation on random blood sugar levels in patients with type 2 diabetes mellitus.

METHODS

This research method uses qualitative research methods with a literature review on the effect of progressive muscle relaxation on random blood sugar levels in patients with type 2 diabetes mellitus. The secondary data source obtained is in the form of reputable journal articles both nationally and internationally with predetermined themes (Nursalam, 2020). The search was conducted using three databases, namely Google Scholar, Portal Garuda, Research Gate. Search articles or journals using keywords and boolean operators (AND, OR NOT or AND NOT) and adjusted to Medical Subject Heading (MeSH) with the following keywords: "Progressive Muscle Relaxation", "Progressive Muscle Relaxation", "Blood glucose", "Blood sugar", "Blood glucose", "Diabetes", "Diabetes Mellitus Type 2". The strategy used to search for journal articles using PICOST, with the following inclusion criteria, Population: The study is aimed at people with type 2 diabetes mellitus, Intervention: Research intervention with progressive muscle relaxation therapy to reduce random blood sugar levels, Comparison: There is a control group and an intervention group or there is a pre-post test design, Output : Random blood sugar levels during type 2 diabetes mellitus, Study : Quasi Experimental, Time : Publication published from 2016-2020, Language : The languages used are Indonesian and English. After conducting a full-text search, checking for duplication and eliminating duplicate journals, conducting inclusion screening, eliminating exclusion journals and conducting a feasibility test.

RESULTS

Table 1. Study Characteristics

No	Databases	Total
1.	<i>Google Scholar</i>	6
2.	Portal Garuda	1
3.	<i>Research Gate</i>	1
Total		8
No	Publication Year	Total
1.	2016	1
2.	2017	2
3.	2018	2
4.	2019	1
5.	2020	2
Total		8
No	Research Design	Total
1.	<i>Quasy Experimental Design</i>	8
Total		8
No	Languange	Total
1.	Indonesian	5
2.	English	3
Total		8

Table 2. Characteristics of Respondents

Author/Year	Characteristics of Respondents			
	Number of Respondents	Gender		Age
		M	F	
Meilani, et al / 2020	24	6	18	15-64
Simanjuntak, et al / 2017	30	-	-	46-79
Sari, et al / 2020	10	-	-	-
Junaidin / 2018	9	2	7	55-60
Jannah et al / 2019	30	15	15	30-60
Akbar et al / 2018	30	4	11	49-51
Antoni / 2017	66	-	-	-
Avianti et al / 2016	48	8	40	38-70 41-70
Total	247	35	91	15-79

Table 3. Duration and Frequency of Progressive Muscle Relaxation Intervention

Author/Year	Duration and Frequency
Meilani, et al / 2020	25 minutes
Simanjuntak, et al / 2017	15-20 minutes 3 times a day for one week
Sari, et al / 2020	15-20 minutes 3 times a day for one week
Junaidin / 2018	three days with the frequency of exercise twice a day and the duration of each session \pm 15 minutes and the measurement of blood glucose levels was carried out in three sessions, namely at 08.00, 12.00, and 17.00 both before and after the intervention
Jannah et al / 2019	15 minutes
Akbar et al / 2018	3 times on three consecutive days with a duration of 25-30 minutes
Antoni / 2017	not listed
Avianti et al / 2016	three days in a row 6 times every morning and evening

Table 4. Effect of Progressive Muscle Relaxation on Random Blood Sugar Levels in Patients with Type 2 Diabetes Mellitus

Author/Year	Intervention Group		Control Group		P Value
	Pre Test	Post Test	Pre Test	Post Test	
Meilani, et al / 2020	240,5	195,0	209,5	210,9	0,000
Simanjuntak, et al / 2017	213,43	180,43	-	-	0,001
Sari, et al / 2020	245,34	170,83	-	-	0,000
Junaidin / 2018	233	157,6	231,25	212	0,000
	242,8	173,4	245	227,75	
	233	157,6	235	211,25	
Jannah et al / 2019	313	276,87	-	-	0,000
Akbar et al / 2018	292,07	211,60	294,13	230,33	0,000
Antoni / 2017	218,27	171,61	217,48	202,58	0,001
Avianti et al / 2016	262,00	183,87	151,41	180	0,000

DISCUSSION

Based on the results of the analysis of 8 research articles, it showed that patients with type 2 diabetes mellitus were more female, namely 91 people compared to 35 men. This is in accordance with the theory which states that women are more at risk of suffering from type 2 diabetes mellitus than men. Women are more at risk of developing diabetes because physically women have a greater chance of increasing their body mass index. Monthly cycle syndrome (premenstrual syndrome), post-menopause which makes the distribution of body fat easily accumulate due to the hormonal process so that women are at risk of suffering from type 2 diabetes mellitus (Irawan, 2010). The average age of the respondents in the 8 research articles is the age range of 15-79 years. The main results of the 2018 Basic Health Research (Riskesdas) in Indonesia show that the prevalence of diabetes mellitus based on measurement results in the population aged 15 years according to the Perkeni consensus has increased, from 6.9% in 2013 to 10.9% in 2018. The highest cases of diabetes mellitus based on doctor's diagnosis occurred at the age of 55-64 years, which was 6.3% (Ministry of Health, 2018). This is in line with research conducted by Chaidir (2017) which states that diabetes mellitus at the age of 55-59 years is the beginning of entering the elderly where the elderly have begun to experience a decrease in the work of the pancreas when producing insulin and this causes an increase in blood sugar levels.

Based on the results of the analysis of 8 articles found differences in the duration and frequency of implementation of the intervention. In Meilani et al's study (2020) the intervention was given for 25 minutes. In the study of Simanjuntak et al (2017) the intervention was given for 15-20 minutes 3 times a day for one week. In the study of Sari et al (2020) the intervention was given for 15-20 minutes 3 times a day for one week. In Junaidin's research (2018) the intervention was given for three days with a frequency of exercise twice a day and the duration of each session of \pm 15 minutes and measurement of blood glucose levels was carried out in three sessions, namely 08.00, 12.00, and 17.00 both before and after the intervention. In the study of Jannah et al (2019) the intervention was given for 15 minutes. In the study of Akbar et al (2018) the intervention was given 3 times on three consecutive days with a duration of 25-30 minutes. In Antoni's research (2017) the duration of the intervention was not included. In the study of Avianti et al (2016) the intervention was given for three consecutive days 6 times every

morning and afternoon. Based on the research above, although there are differences in the duration and frequency of the intervention, it still shows significant changes in random blood sugar levels in patients with type 2 diabetes mellitus after Progressive Muscle Relaxation.

This is in line with research conducted by Isnaini et al (2017), by doing progressive muscle relaxation therapy regularly for 3 days with a duration of 15 minutes can increase muscle activity and increase glucose metabolism in the body and increase insulin secretion by the pancreas. Research by Herlambang et al (2019), by doing PMR exercises 2 times for 3 consecutive days can significantly reduce stress and blood sugar levels in type 2 DM patients.

Progressive muscle relaxation therapy carried out with the right procedures and routinely will get optimal results and benefits so that it can control the stability of blood sugar levels. In addition, it is also necessary to conduct future research to see the effectiveness of progressive muscle relaxation therapy on blood sugar levels by differentiating the duration and frequency of therapy based on previous research.

Based on the results of the analysis of 8 articles, the research of Simanjuntak et al (2017), Sari et al (2020), and Jannah et al (2019) used the same analytical test, namely the T dependent test. In the research of Akbar et al (2018) and Antoni (2017) using the same analytical test, namely the dependent T test and the Independent T test. In the research of Meilani et al (2020) using the Independent T test analysis test. In the research of Avianti et al (2016) using the Wilcoxon-Mann Whitney Test analysis test. Of the 8 research articles above, the most widely used analytical test is the dependent T test. Dependent sample t-test or paired sample t-test is a type of statistical test that aims to compare the average of two groups in pairs. Paired samples can be interpreted as a sample with the same subject but experiencing two different measurements, namely measurements before and after the treatment is given (Miftakhul'Ulum et al, 2016)

Based on the results of the analysis of 8 articles, all articles use the same research method namely quasi-experimental. In the research of Simanjuntak et al (2017), Sari et al (2020), and Jannah et al (2019) applying a one group pre-post test design approach. In the research of Meilani et al (2020), Junaidin (2018), Akbar et al (2018), Antoni (2017), and Avianti (2016) applied a pre-post test approach with control group design. The control group is the group that is not given or subject to treatment. The control group works as a comparison to find out the differences that may appear between the experimental group and the control group (Soesilo, 2018). Therefore, it is better if the control group is included in the study as a comparison.

Based on the analysis of 8 research articles, it was found that patients with type 2 diabetes mellitus experienced a significant decrease in random blood sugar levels after a progressive muscle relaxation intervention. Meilani et al's research (2020) showed that the average blood sugar level before and after progressive muscle relaxation in the intervention group was 240.5 mg/dl and 195.0 mg/dl then in the control group was 209.5 mg/dl. dl and 10.9 mg/dl with a p value of 0.000. Research by Simanjuntak, et al (2017) showed that the average blood sugar levels before and after progressive muscle relaxation were 213.43 mg/dl and 180.43 mg/dl with a p value of 0.001. Sari's research, et al (2020) showed that the average blood sugar before and before progressive muscle relaxation was 245.34 mg/dl and 170.83 mg/dl with p value = 0.000. Junaidin's research (2018) shows that there are differences in the average KGD both at 08.00, 12.00, and 17.00 before and after progressive muscle relaxation exercises, namely a decrease in blood glucose levels. Research by Jannah, et al (2019) showed that the average value of blood sugar levels before and after progressive muscle relaxation was 313 mg/dl and 276.87 mg/dl with a p value of 0.000. Research by Akbar, et al (2018) showed that the average pretest and posttest blood glucose levels in the intervention group were 292.07 mg/dl and 211.60 mg/dl, then the control group was 294.13 mg/dl and 230.33 mg/dl. etc. Paired t-test in the intervention group showed a p-value of 0.000 and the independent t-test in the control group showed a p-value = 0.015. Antoni's research (2017) showed that the average pretest and posttest blood glucose levels in the intervention group were 218.27 mg/dl and 171.61 mg/dl then the control group was 217.48 mg/dl and 202.58 mg/dl with a value of p. 0.001. Avianti's research, et al (2016) showed that the average KGD of the treatment group before and after progressive muscle relaxation was 262.00 mg/dl and 183.87 mg/dl then the control group was 151.41 and 180 mg/dl with values p = 0.000.

This is in line with research conducted by Hasaini (2015) which states that progressive muscle relaxation exercises can be done as a physical exercise for DM patients. This exercise is done to get relaxation by tensing and relaxing muscles. By routinely tensing and stretching the muscles, this has an impact on the transport of glucose into the cell membrane, this makes the use of glucose levels more effective so that levels can be close to normal or stable. Blood sugar levels in DM patients are related to the stress they face. Stress activates the neuroendocrine system and sympathetic nervous system through the pituitary-adrenal hypothalamus, causing hormones such as epinephrine, cortisol, glucagon, ACT, corticosteroids, and thyroid that can affect blood glucose levels in diabetics. Progressive Muscle Relaxation is a non-pharmacological therapy, the benefits of Progressive Muscle Relaxation will be seen if it is done regularly. That way, a person will find it easier to think and a relaxed state will be achieved more quickly. In a relaxed state, the brain will get optimal oxygen supply. Oxygen that meets all areas of the brain will circulate along with the heart to distribute to all organs of the body. This condition will help achieve the stability of adrenal work to produce calming hormones which will have an impact on reducing stress. This is

contrary to the impact of stress itself where under stress conditions the blood sugar in DM patients will increase. If stress conditions can be controlled, blood sugar will also decrease (Hidayati, 2018).

Type 2 diabetes mellitus is diabetes caused by an increase in blood sugar due to a decrease in low insulin secretion by the pancreas gland. The management and management of DM are 4 pillars of DM management: education, medical nutrition therapy, physical exercise and pharmacological intervention. Physical exercise is one of them with relaxation such as progressive muscle relaxation. This non-pharmacological therapy is often an option for people with diabetes mellitus because it easy to do, does not cost a fortune, does not result in fatal effects or worsen the disease state and can be used as a companion to pharmacological/medical therapy (complementary therapy). Continuously high blood sugar levels result in damage to blood vessels, nerves, and other internal structures. Diabetics can experience various long-term complications if their diabetes is not managed properly. Therefore, it is important for people with diabetes mellitus to control their blood sugar levels, one of which can be done, one of which is progressive muscle relaxation, relaxation therapy by tightening and relaxing the muscles in one part of the body at a time to provide a feeling of physical relaxation. This results in increased glucose transport into cell membranes. This increase makes the use of glucose levels more effective so that levels can be close to normal or stable. In addition, this relaxed condition helps achieve the stability of the work of the adrenals to produce calming hormones which will have an impact on reducing stress and blood sugar levels. It is hoped that people with diabetes mellitus can increase their knowledge about progressive muscle relaxation, not only for health workers. In addition, family support is one of the factors that affect the regularity of blood sugar control. It is hoped that the caring family can help carry out this progressive muscle relaxation therapy.

CONCLUSION

Based on the 8 research articles that have been presented in the results and discussion, it shows that there is an effect of Progressive Muscle Relaxation on random blood sugar levels in patients with type 2 diabetes mellitus. Type 2 diabetes mellitus is diabetes caused by an increase in sugar due to a decrease in low insulin secretion by the glands. pancreas . Continuously high blood sugar levels damage blood vessels, nerves, and other internal structures. Diabetics can experience various long-term complications if their diabetes is not managed properly. Therefore, it is important for people with diabetes mellitus to control their blood sugar levels, one of which can be done by progressive muscle relaxation.

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The Effect of Negative Pressure Wound Therapy (NPWT) on Diabetic Ulcer Wound Healing (Literature Review)

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ABSTRACT

Diabetes mellitus is a problem that constantly occurs in Indonesia and the world until now. Various complications arise if not treated and controlled properly such as diabetic ulcers. The main goal of diabetic ulcer treatment is to achieve healing as quickly as possible. Many wound care techniques are currently developing along with technological developments, one of which is Negative Pressure Wound Therapy/NPWT. This study was conducted to determine the effect of NPWT intervention on diabetic ulcer healing specifically. Scopus, Pubmed, Sage, ProQuest were used to find articles that matched the inclusion and exclusion criteria, then reviewed. There was an effect of giving NPWT as evidenced by a decrease in the wound area, leukocyte count, and Ang2 levels, an increase in the number of EPCs with a significant value of $p < 0.05$). The use of NPWT attracts excess exudate by applying negative pressure to the wound so that the wound fluid is reduced and the wound heals faster. NPWT is safe to use on diabetic ulcers, especially to help reduce exudate, wound area, and depth, accelerate healing time, increase the number of growth factors in wound tissue regeneration. Further research is needed to prove other clinical benefits of using NPWT.

Keywords: Negative Pressure Wound Therapy (NPWT), Diabetic Ulcer, Wound Healing

INTRODUCTION

Until now, diabetes mellitus is a problem that often occurs in Indonesia and the world. Various complications can arise as a result of not being treated and controlled properly. Diabetic foot ulcers are one of the chronic complications of diabetes mellitus in the form of ulcerations affecting the lower limbs, with or without infection, which can cause damage to the underlying tissue (International Diabetes Federation, 2017). Diabetic ulcers are chronic wounds that are difficult to heal because they require patience in long-term treatment. Effective wound care is one part of a holistic approach that is needed optimally in treating diabetic ulcer patients.

According to the World Health Organization (WHO) in 2016, approximately 8.5% (422 million) of the world's adult population had diabetes, 25% (105.5 million) of that number would develop diabetic ulcers (Armstrong et al, 2017). More than 4.8 million adults in the UK have diabetes and 25% or around 1.2 million of these diabetics will develop diabetic foot ulcers (Armstrong et al, 2017; Diabetes UK, 2020). There were 7,545 amputations among diabetics in the UK between 2015 and 2018. It is known that 84% or approximately 6337 lower extremity amputations were due to complications of foot ulcers (Public Health England, 2019).

It takes a long time and comprehensive multidisciplinary treatment for diabetic ulcer healing. If the wound is not immediately treated and treated properly, it will have many impacts starting from infection, worsening ulceration, gangrene, resulting in increased treatment costs and is the main cause of amputation. The main focus of diabetic ulcer intervention is to prevent and avoid lower extremity amputation, so that maximum care and therapy are needed to treat diabetic ulcers. One of the interventions applied is to perform good and effective wound care for diabetic ulcer healing. Treatment of diabetic ulcers has the main goal of achieving healing as soon as possible and as an effort to prevent recurrence after healing is achieved.

Quite a lot of wound care techniques are now constantly evolving along with technological developments. The therapy that is currently very popular and has received much attention from researchers is negative pressure wound therapy (NPWT or what is often referred to as a vacuum wound (Vacuum Assisted Closure/VAC). Negative Pressure Wound Therapy (NPWT) or known as negative pressure wound care is the application of negative pressure to the wound of 50-175 mmHg either continuously or intermittently (Kartika, 2016). NPWT is a wound management therapy commonly called wound vacuum is a non-invasive method by applying negative pressure to the closed space of the wound so that the excess wound fluid can be reduced and clean the bacteria that cause infection.

The basic mechanism of how NPWT work is to attract fluid in the form of blood which is certainly toxic, irritant in the tissue area around the wound, and also changes the local microcellular environment to achieve faster and maximum wound healing. The NPWT consists of a pump, suction hose, sterile dressing (granufoam), and a canister (liquid container bottle). The NPWT pump functions to maintain negative pressure wound therapy (NPWT) on the wound surface around -125 mmHg. In addition to keeping the humidity of the wound and around the wound with the use of granufoam, this NPWT therapy can stimulate tissue growth and absorb excess fluid exudate. The exudate is controlled by the dressing through a combination of absorption and moisture. Many empirical pieces of evidence have been shown by scientists worldwide that negative pressure wound therapy (NPWT) has greater efficiency in wound healing. Therefore, the authors are interested in conducting a literature review on the effect of the negative pressure wound therapy (NPWT) method in healing wounds, especially in diabetic ulcers.

METHODS

This research is research using the literature review method. This type of literature review research is trying to find theoretical references that are relevant to the case or problem to be raised. The type of research design used in this literature review is causal which is intended to examine the effect of negative pressure wound therapy on healing diabetic ulcers. This type of research uses quasi-experimental, qualitative research, cross-sectional studies, and randomized control trials methods.

Search Strategy

The search in this literature review uses both nursing and health research databases, using four databases with high and medium quality criteria, namely Scopus, Pubmed, Sage, and ProQuest. Researchers set the literature from the last 5 years in 2016-2020. The literature search was carried out in August-September 2020. The strategy used to search for articles was using PICOS. The found articles were then identified based on the inclusion and exclusion criteria.

Search selection

Inclusion criteria included a population of diabetic patients with foot ulcers. The sample of this study is more than 15 respondents. The research was conducted on humans. The intervention used was applying the Negative Pressure Wound Therapy (NPWT) technique. The study design and publication type use quasi-experimental studies, qualitative research, cross-sectional studies, and randomized control and trials which are published in 2016-2020 and the language used are English.

Data identification/ Data extraction

Search articles or journals using keywords and boolean operators (AND, OR NOT or AND NOT) which are used to expand or specify the search, making it easier to determine the articles or journals used when doing the research. Keywords in this literature review are adjusted to Medical Subject Heading (MeSH). The keywords used are Effectiveness OR Effectiveness OR Efficacy AND Negative Pressure Wound Therapy OR Vacuum-Assisted Closure OR Topical Negative Pressure AND Wound OR Wounds AND Diabetic ulcer OR Foot ulcer OR Feet ulcer AND Healing OR Healings OR Dressing.

Table 1. Keyword Search Strategy in Database

<i>Effectivity</i>	<i>Negative Pressure Wound Therapy</i>	<i>Wound</i>	<i>Diabetic ulcer</i>	<i>Healing</i>
<i>OR</i>	<i>OR</i>	<i>OR</i>	<i>OR</i>	<i>OR</i>
<i>Effectiveness</i>	<i>Vacuum-Assisted Closure</i>	<i>Wounds</i>	<i>Foot ulcer</i>	<i>Healings</i>
<i>OR</i>	<i>OR</i>		<i>OR</i>	<i>OR</i>
<i>Efficacy</i>	<i>Topical Pressure</i>	<i>Negative</i>	<i>Feet ulcer</i>	<i>Dressing</i>

Based on the results of a literature search through publications in four databases and using keywords that have been adapted to MeSH, the researchers found 720 articles that matched these keywords. The search results that have been obtained are then checked for duplication, it was found that 4 similar articles were removed and the remaining 716 articles. The researcher then conducted a screening based on the title (n = 57), abstract (n = 20), and full text (n = 15) which was adjusted to the theme of the literature review. The assessment was conducted based on the feasibility of the inclusion and exclusion criteria obtained as many as 15 articles that can be used in the literature review.

After the selection based on the inclusion and exclusion criteria is then extracted in the form of a PRISMA checklist table as follows:

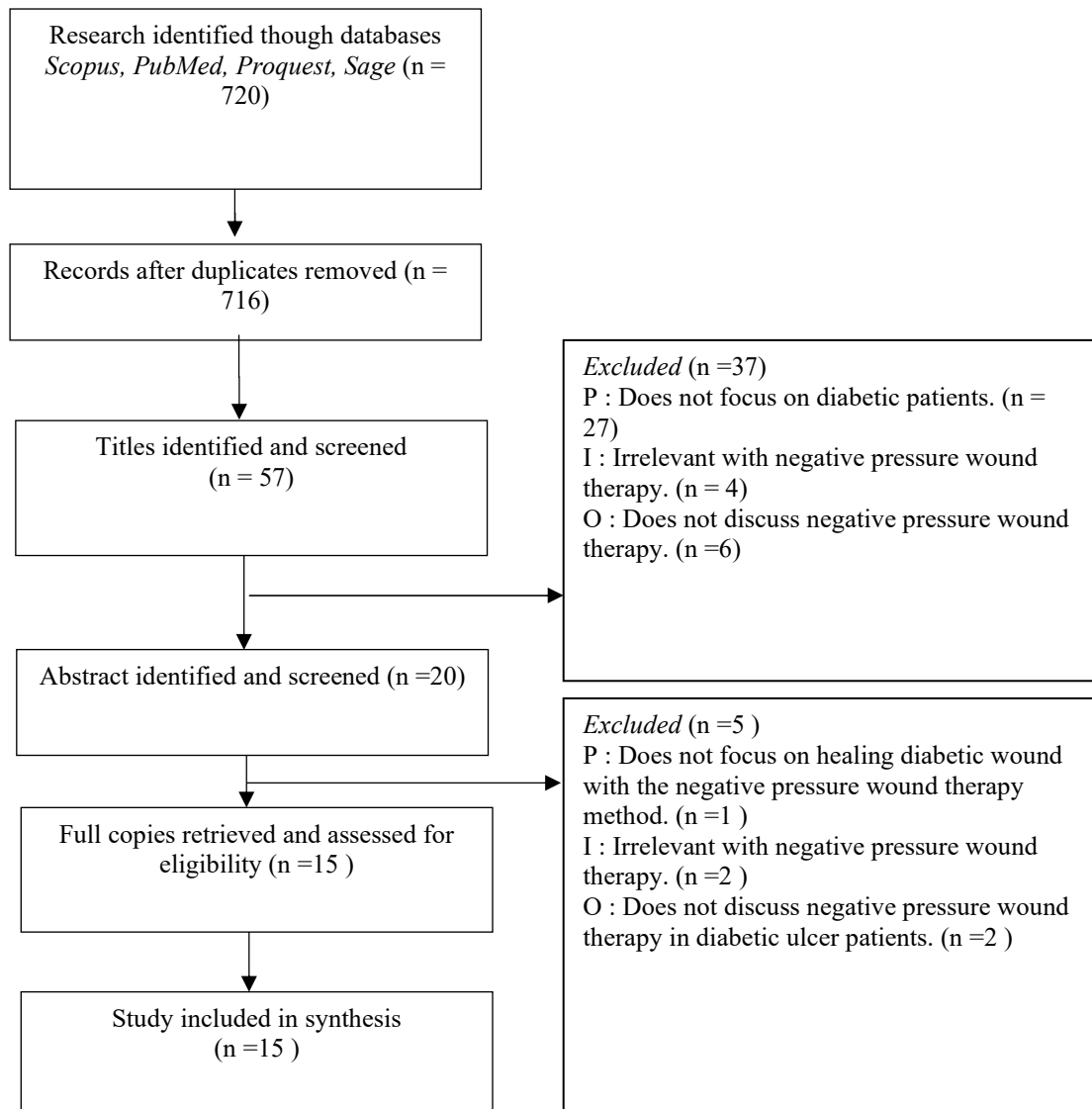


Figure 1. Flowchart of Literature Review Based on PRISMA 2009 (Polit and Beck, 2013)

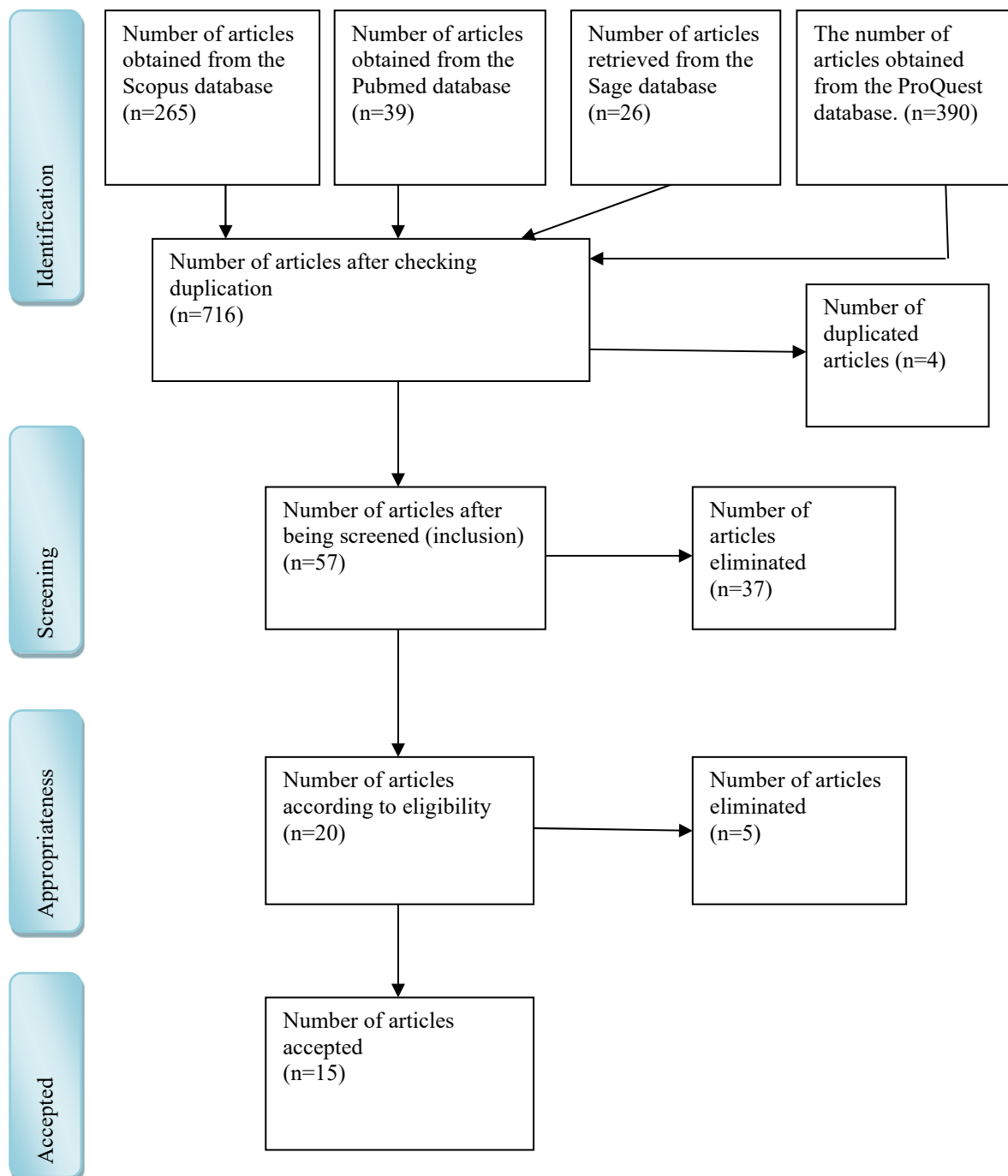


Figure 2. PRISMA Diagram

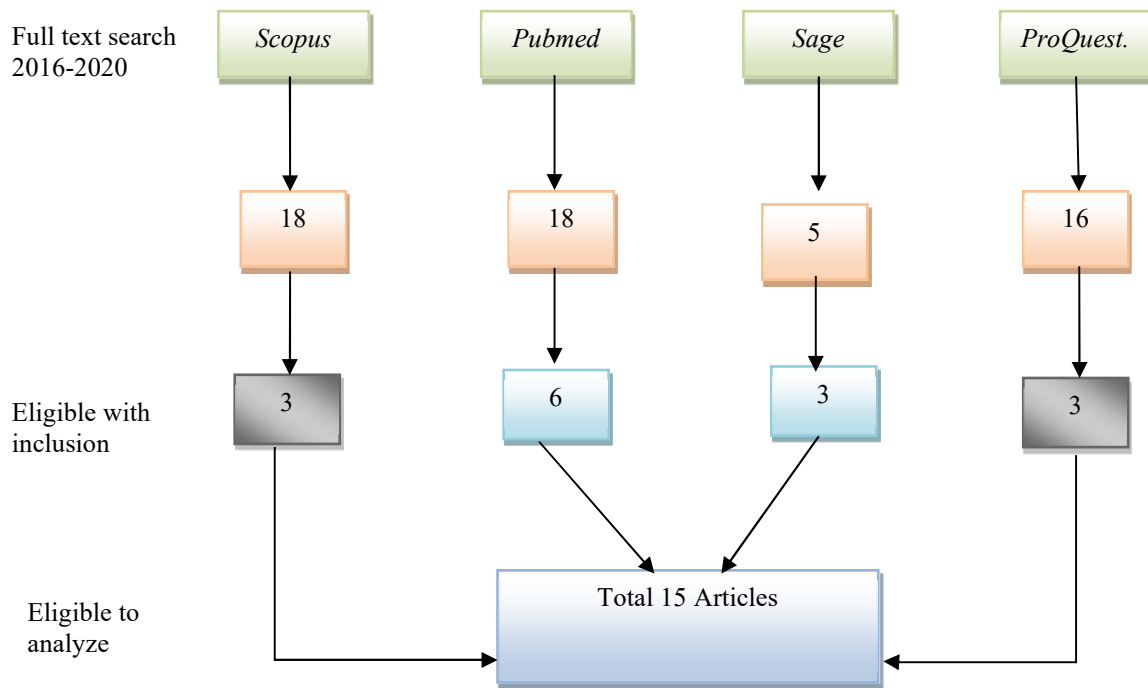


Figure 3. Article Selection Scheme Based on Inclusion and Exclusion Criteria

RESULTS

Table 1. Intervention Characteristics

Author/Year	Respondent Age	Number of Respondents	Material	P Value
Borys et al /2019	67,5- 69,0 years old	25 patient	- NPWT -Conventional therapy	0,028
Kirsner et al /2019	60,4-62,5 years old	115 patient	-s-NPWT -t-NPWT	0.018
Hohendorff et al /2019	62 - 70 years old	49 patient	- NPWT -Standar Therapy (ST)	0,02
Hu et al /2019	51-69 years old	70 patient	- VAC therapy -VAC and photon therapy	<0.0001
Seidel et al /2020	>18 years old	181 patient	- Terapi NPWT - Moist wound standard care	0.004
Mu et al /2019	±55,7 years old	56 patient	-NPWT	<0,01
Yang et al /2017	50 - 70 years old	20 patient	-Vacuum-Assisted Closure (VAC) -Moist wound therapy	<0,01
Lavery et al /2020	>21 years old	150 patient	-Traditional NPWT -NPWT with simultaneous irrigation (NPWT-I)	0,53
Chiang et al /2017	41-83 years old	22 patient	-Topical Negative Pressure (TNP) -Topical dressing	0,03
Wang, et al/ 2019	55-56 years old	13 patient	-NPWT after debridement	0,001

			- Gauze bandage after debridement	
Chattinnakorn et al /2020	18 -70 years old	27 patient	NPWT	<0,001
Gonzalez et al /2017	18 - 80 years old.	72 patient	- <i>Vacuum-Assisted Device with debridement</i> -Debridement and regular wound cleaning	<0,05
Borys et al /2018	64-65 years old	53 patient	- NPWT - Standar Therapy	0.0001
Singh et al /2020	Not listed	86 patient	-Conventional VAC -Indigenous Low VAC - VAC TPOT	p> 0,05
Ludwig-Slomczynska et al /2019	64,9-68,3 years old	23 patient	-NPWT - Standar Therapy	FDR (<i>False Discovery Rate</i>)= 0.05

Based on the 15 articles obtained, the majority of respondents are aged 50-60 years on average and are multi-regional. The gender characteristics of the respondents are almost the same between men and women. Most of the respondents on each article are more than 25 people. Based on the results of the 15 articles found, an analysis related to the use of NPWT was applied to diabetic ulcer patients with a certain time span, and measurements of the wound area and wound depth using a measuring instrument that has been established. It was shown that NPWT has a significant effect on healing diabetic ulcers as indicated by significant results of each article is $P < 0.05$, which means that there is an effect of NPWT treatment on diabetic ulcer wound healing.

DISCUSSION

1. Wound Healing before NPWT Intervention in Diabetic Ulcer Patients

Before NPWT, there were quite a lot of wound care techniques, one of which was conventional wound care methods which had the principle of maintaining moisture, warmth, and preventing trauma. However, the use of NaCl in this conventional wound care method is less able to maintain moisture because NaCl is volatile so that the gauze becomes dry. The dryness of the gauze causes the gauze to easily stick to the wound and this condition causes re-trauma to occur easily. Due to the lack of gauze in maintaining moisture, the wound healing process takes a long time. From the 15 journals obtained, before NPWT was performed, the wound had different characteristics. Before NPWT therapy, the number of leukocytes in diabetic ulcers tends to be high. One of the parameters measured in determining the response to tissue infection in wounds is high leukocyte levels (Gonzalez et al., 2017). Increased levels of white blood cells (leukocytes) occur due to the inflammatory process of diabetic ulcers. Increased production of leukocytes occurs when the body is trying to fight the infection process. Leukocytes are one of the components in the blood that detect the presence of infection, including in wounds. The area of the wound and the depth of the ulcer are severe causing peripheral vascular disruption to wound healing which will be hampered. The depth and area of the wound in diabetic ulcer patients vary depending on the severity and grade of the wound. A wound is said to be completely healed if the wound has returned to its normal anatomical structure, tissue function, and appearance within an appropriate period of time (T Velnar in Primadina et al., 2019). Damage to nerves and blood vessels due to uncontrolled blood sugar levels in diabetic patients triggers the occurrence of diabetic ulcers which are characterized by wounds, especially on the legs with a certain area and depth.

The number of EPCs in diabetic ulcer patients was still low before NPWT treatment. The amount of EPC is one of the indicators used to assess the rate of wound healing in diabetic ulcer patients. EPC (Endothelial Progenitor Cell) plays a role in accelerate wound healing. EPC plays a role in the process of angiogenesis and neovascularization (Lalezari et al., 2017). Tissue vascularization in diabetic ulcers tends to be disrupted, thus affecting the length of wound healing. A wound is said to be healed if there is a complete re-epithelialization and neurovascularization process, namely the process of forming epithelial tissue to cover the entire wound surface and the process of forming new blood vessels.

Likewise, levels of angiopoietin (Ang2) tended to be high before NPWT treatment. Angiopoietin levels also play a role in the process of angiogenesis or the formation of new blood vessels. Angiopoietin is an angiogenic factor needed for the maturation of blood vessels and can increase the process of angiogenesis (Xie et al., 2020).

The tissue where the formation of new blood vessels occurs usually looks red (erythema) due to the formation of capillaries in that area. Under physiological conditions, Angiopoietin 2 (Ang2) levels are low, Ang2 levels are elevated associated with chronic complications. As in diabetic ulcers, Ang2 levels tend to be higher. In the wound healing process, an increase in Ang2 in the absence of Vascular Endothelial Growth Factor (VEGF) is associated with impaired wound healing.

2. Wound Healing after NPWT Intervention in Diabetic Ulcer Patients

Based on the results of the literature review that has been carried out by researchers in general, it is explained that the use of NPWT has succeeded in influencing the healing of diabetic ulcers. This is proven from the results of the analysis of the fifteen articles which showed that after being given the NPWT intervention and measurements were made using various instruments to assess the condition of the wound, the results showed that there was an improvement in the wound area, wound depth, inflammatory response, pain score, and tissue granulation acceleration. A study conducted by (Singh et al., 2020) showed a significant reduction in wound size, infection control in all three groups receiving NPWT. There was no statistically significant difference in the wound area and depth reduction between the three treatment groups ($P > 0.05$). In line with research conducted by (Wang et al., 2019) showing that NPWT plays a role in reducing wound infection and accelerating diabetic wound healing. The number of neutrophils was much smaller in the NPWT group compared to the control group with a P-value = 0.001.

A study conducted by (Gonzalez et al., 2017) showed that the number of leukocytes decreased on the 10th day of NPWT administration. A decrease in leukocytes indicates a reduction in both tissue and local infection of the wound. This NPWT/VAC technique controls the tissue inflammatory response by reducing interstitial fluid, increasing angiogenesis, reducing bacterial growth by isolating the wound from the environment and increasing the rate of granulation tissue in response to mechanical forces (Morykwas in Gonzalez et al, 2017). Leukocytes that are in normal limits indicate that the infection process is reduced in diabetic ulcers. The decrease in leukocyte levels within normal limits proves that after NPWT treatment, there is an effect on the healing of diabetic ulcers.

Research conducted by (Mu et al., 2019) showed an effect on healing diabetic ulcers with NPWT intervention ($p < 0.01$) with ($\alpha < 0.05$). The number of circulating EPCs increased significantly in the NPWT group. Granulation tissue growth was significantly higher in the NPWT group. NPWT given for 1 week can significantly increase the number of EPCs (Endothelial Progenitor Cells) in peripheral blood in diabetic patients with mild ischemic foot ulcers ($P = 0.05$).

The use of NPWT can significantly increase the number of EPCs in peripheral blood in diabetic patients with diabetic ulcers. NPWT results in an increase in a number of growth factors associated with the angiogenesis process through VEGF stimulation and an increase in the number of endothelial progenitor cells (EPC) as a linking mechanism between the Vascular Endothelial Growth Factor (VEGF) pathway and angiogenesis (Lalezari et al., 2017).). The increase in the number of EPCs indicates an increase in endothelial function in both tissues and blood vessels in diabetic ulcers towards cell regeneration and wound healing.

Research conducted by (Hohendorff et al., 2019) stated that after NPWT treatment, the decrease in Angiopoietin 2 (Ang2) levels was more significant with $p = 0.01$. A decrease in Ang2 indicates better wound healing. The role of angiopoietin 2 (Ang2) in the process of angiogenesis depends on VEGF. In the presence of VEGF, Ang2 acts as a proangiogenic, whereas when VEGF is inhibited, Ang2 acts as an antiangiogenic (Hohendorff et al., 2019). The process of angiogenesis in diabetic ulcers is not the same as the process of wound angiogenesis in general, it is caused by a decrease in growth factors, one of which is VEGF in diabetic ulcers. Increased levels of VEGF during the normal wound healing process will stimulate the formation of neoangiogenesis directly. Angiopoietin is associated with inflammatory markers as well as leukocytes (white blood cells). The use of NPWT has benefits on angiopoietin levels. The mechanism of action of NPWT is to reduce exudate fluid and infectious materials such as bacteria by sucking them continuously, thereby reducing the humidity of the wound environment.

Research conducted by (Chattinnakorn et al., 2020) showed that the pain score of patients who were given cold air on NPWT was slightly reduced than those who used sterile room temperature on the NPWT tube (4 vs 5.67) with $P < 0.003$. The pain scores of patients given cold air on the NPWT tube were significantly worse than those on the NPWT tube (4 vs 6.59) with $P < 0.001$. This shows that presenting sterile cold water to the NPWT tube before dressing change can reduce pain scores than using nothing or using only room temperature sterile water.

Temperatures below 13.6°C can reduce the speed of conduction of nerve impulses which reduces pain relief (Bugaj in Chattinnakorn, 2020). Low temperatures can reduce the speed of conduction of nerve impulses resulting in reduced pain relief. The decrease in tissue temperature also acts in the peripheral nervous system by

reducing the speed of transmission in the nerves and thereby increasing the pain threshold and pain tolerance along the same nerve.

3. The Effect of NPWT Intervention on Diabetic Ulcer Healing

Based on the analysis of fifteen journals in general, it is explained that there is an effect of NPWT intervention on improving the condition of diabetic ulcers, including wound surface area, wound depth, acceleration of wound healing time, and an increase in several wound healing factors. From 15 journals that were obtained and analyzed, the average administration of NPWT affected healing diabetic ulcers. The effect of NPWT on wound healing is that it can decrease and reduce the area of the wound and accelerate wound closure.

Based on the results of 4 articles ((Borys et al., 2019), (Borys et al., 2018), (Kirsner et al., 2019), (Chiang et al., 2017)) which were found to be related to a reduction of wound area and wound depth Diabetic ulcer patients after receiving NPWT showed the same results with the significance of each article $P > 0.05$, which means that it indicates that the NPWT intervention affects healing diabetic ulcers characterized by the development and healing of wounds with a reduction in wound dimensions (area, depth, and volume).

Likewise with research conducted by (Hu et al., 2018) showed that there was a change in wound surface area in the experimental group receiving VAC ($p < 0.0001$, $\alpha < 0.05$). The area and depth of the wound were also reduced and improved after the application of NPWT in the combined group of ulcer patients who received NPWT treatment combined with photon therapy also experienced changes in the wound surface area. Photon Therapy is a clinical application of the use of electromagnetic energy which has a wavelength of 100-10,000 nanometers. Light energy is transmitted through space as a wave that has a collection of energy called photons (Satria Nugraha et al., 2019). The nature of photons is collimation (travel in one direction without divergence), coherence (all waves converge in a phase with monochromaticity (single wavelength)). This causes the photon beam to directly reach the mitochondria of the cell membrane, nucleus, and cytosol to increase the metabolic function of the cell which aims to normalize cell function, dry wounds, and accelerate wound healing. NPWT works on wound healing in several ways, one of which is by promoting contraction of the wound margins to facilitate closure and encourage the formation of granulation tissue (Kartika, 2016). Combination therapy (a combination of VAC with photon therapy) accelerates wound healing but does not affect long-term efficacy. VAC therapy combined with photon therapy is effective and safe in the treatment of diabetic ulcers.

In addition to affecting the surface area of the wound, NPWT also affects wound healing time. This is evidenced by a study conducted by (Seidel et al., 2020) the effect of using NPWT on diabetic wound healing by showing wound closure time in patients treated with NPWT was shorter than the Standard Moist Wound Care (SMWC) intervention ($p = 0.004$) with ($\alpha = 0.05$). Likewise, research conducted by (Lavery et al., 2020) showing that NPWT shortens wound healing. The study stated that NPWT-I/NPWT with simultaneous irrigation took 50.7 days to heal. Meanwhile, conventional NPWT takes 56.3 days to heal ($p = 0.53$ with $\alpha = 0.05$). The average wound healing time in simultaneous irrigation NPWT was faster than conventional NPWT. Simultaneous NPWT irrigation used 0.1% polyhexanide betaine as simultaneous irrigation at a speed of 30 cc/hour.

In principle, the irrigation period can be repeated as often as desired. The period of administration of the solution (saline, antiseptic, or antibiotic) is approximately 10–30 seconds. The dwelling periods depend on the time it takes for the solution to become effective, usually 20 minutes. The suction period is 2 to 3 hours. Mechanically, irrigation will help remove foreign objects and reduce the concentration/inoculates of bacteria in the tissue by up to 80% (Wiguna & Putra, 2020). There was no significant difference between conventional NPWT and simultaneous irrigation NPWT. Both simultaneous irrigation NPWT and conventional NPWT have the same goal which is reducing exudate in diabetic ulcers. NPWT irrigation technique and conventional NPWT both only clean the wound and attract exudate. The addition of simultaneous irrigation did not change the clinical outcome of patients with diabetic ulcers which was superior to the use of conventional NPWT. The most commonly used pressure on the NPWT is 125 mmHg. Low pressures of less than 125 mmHg may be ineffective, whereas high pressures of more than 125 mmHg may be painful and harm the microcirculation. An initial pressure application of 125 mmHg was used in the first few days due to a large amount of initial exudate. The determination of the pressurization mode can be applied in continuous or intermittent mode. Negative pressure is most often applied in continuous mode. Intermittent mode involves switching on and off repeatedly (usually 5 minutes to 2 minutes).

Indications of NPWT with intermittent suction may be useful for wound healing in the formation of new granulation tissue but in the intermittent suction mode, it can result in higher pain occurrence in treated patients. The intermittent mode results in mechanical stimulation on the base of the wound and greater stimulation of blood circulation, oxygenation, and angiogenesis, and possibly a lower risk of ischemic damage. It is suggested that the therapy can be applied in continuous mode for the first 24 hours and if the above effect is desired, the intermittent mode can be applied. Recommendations for starting and stopping the use of NPWT (Apelqvist et al., 2017) are the use of NPWT for exudate management starting immediately after debridement and discontinuing as soon as possible until wound closure is achieved and exudate reduction in the direction of wound drainage. The NPWT dressing is changed every 2-4 days.

Hospitals are the best places to treat patients with NPWT because they provide the best conditions for application, including rooms, sterile procedures, optional anesthesia, rapid availability of analgesics, and trained staff, and continuous patient observation. On initial application of NPWT, the patient and bandage should be monitored closely for at least 24 hours to ensure that possible bleeding and other complications are detected. Aside from the hospital, the NPWT application can also be done at home as long as the patient's condition allows them for home care treatment.

NPWT also showed a local increase in the number of growth factors such as EPC and TGF- β . Research conducted by (Mu et al., 2019) showed that the number of EPCs after NPWT treatment increased by 85.3×10^{-6} cells from the original 34.1×10^{-6} cells. In line with the research conducted by (Yang et al., 2017) showed an increase in the optical density of TGF- β 1 on day 7 of $0.30 \mu\text{m}$ from the original optical density of TGF-1 on day 0 of $0.26 \mu\text{m}$. TGF- β is involved in tissue regeneration. TGF- β also stimulates endothelial cells to form capillary loops, which is commonly referred to as the process of angiogenesis (Primadina et al., 2019). Compression of small blood vessels by negative pressure on NPWT will stimulate the growth of new blood vessels (angiogenesis). TGF- β and EPC are important growth factors and promoters in wound healing. Diabetic ulcers are chronic wounds that cause tissue hypoxia. Growth factors such as TGF- β and EPC are produced in response to tissue hypoxia which will play a role in the process of angiogenesis. NPWT is involved in gene-level expression changes. In line with the research conducted by (Ludwig-Slomczynska et al., 2019) showed that the wound area was much better in the NPWT group (FDR = 0.05). NPWT also induces gene expression during wound healing. The molecular mechanism that shows the effect of NPWT use down to the gene level is still unclear, but several proliferative genes were found after NPWT use. NPWT aids wound healing by removing excess exudate and influencing the inflammatory phase of cells. It is plausible when the exudate is taken out from the wound could promote the complex regulation of cell interactions and progression of the wound to the healing phase. Therefore, several proliferative genes were found after treatment with NPWT.

CONCLUSION

Before NPWT intervention, diabetic ulcers had different characteristics including high leukocytes, the depth of the wound, appearance of large wound areas, presence of exudate, low number of EPC (Endothelial Progenitor Cells), and length of time for wound closure. After NPWT treatment, the development of wound healing in a better direction was marked by a decrease in the number of leukocytes, a reduction in the depth and area of the wound, an increase in wound closure time, and an increase in the number of EPCs (Endothelial Progenitor Cells) which play a role in the angiogenesis process neurovascularization. NPWT affects healing diabetic ulcers, especially helping to reduce exudate, reducing wound surface area and wound depth, accelerating wound healing time, reducing wound infection, increasing the number of several growth factors in accelerating wound tissue regeneration. Suggestions for health workers and services are expected to increase the knowledge and skills of nurses in the use of NPWT to treat diabetic ulcer patients. For people with diabetes to further improve their health by consulting and seeking treatment in health care settings to get more up-to-date treatment, such as using NPWT for diabetic wound care to accelerate the ulcer healing process. For further researchers, can continue this literature review study more deeply with variables that do not exist in this literature review.

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THE APPLICATION OF ERGONOMIC EXERCISES IN ELDERLY WITH SLEEP DISORDERS (INSOMNIA) AT HARAPAN KITA NURSING HOME PALEMBANG IN 2021

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ABSTRACT

In the elderly, the quality of sleep at night has decreased to around 70-80%, which is slightly more effective than adults. Sleep disorders experienced by the elderly are caused by several factors including stress or anxiety, depression, chronic disorders, side effects of medication, poor diet, caffeine, nicotine, and lack of physical activity or exercise. Gymnastics for the elderly consist of various types and one of them is ergonomic exercise. This study aims to determine the application of ergonomic exercise in the elderly with sleep disorders (insomnia) at the Harapan Kita Nursing Home in Palembang in 2021. The design of this study is a qualitative study. There were 3 sources of data or informants, consisting of 2 nurses and 1 general practitioner as key informants, and also used secondary data such as journal articles, books, and others. The results of this study were that the application of ergonomic exercise was seen from all the informants theoretically already had sufficient knowledge about the concept of insomnia and ergonomic exercise. Most of the nurses already know the stages of ergonomic exercise and it has been going well, although the results have not been maximized, this is because the standard operating procedures for the stages that are made are not socialized regularly. Few of the nurses have sufficient information about the benefits of ergonomic exercise but it is necessary to have regular training on ergonomic exercise at the Harapan Kita Nursing Home in Palembang. It is hoped that counseling for the elderly who experience insomnia will want to follow the given ergonomic exercise so that insomnia in the elderly does not occur again. The more routine ergonomic exercise activities, the greater the opportunity to reduce the number of elderly who experience insomnia.

Keywords: Ergonomic exercise, Elderly, Insomnia

INTRODUCTION

According to the World Health Organization (2014), the elderly is someone who enters the age of 60 years or more. According to WHO data, in the Southeast Asian region, the elderly population is 8% or around 142 million people. In 2050 it is estimated that the elderly population will increase 3 times from this year. In 2000 the number of elderly people was around 5.300.000 (7.4%) of the total population, while in 2010 the number of elderly people was 24.000.000 (9.77%) of the total population, and in 2020 it is estimated that the number of elderly people reached 28,000,000 (11,34%) of the total population (Ambarwati dkk, 2018). The elderly population in Indonesia is quite high and has various health problems, one of which is insomnia, a condition where individuals are unable to get adequate sleep, both in quality and quantity so that the individual only sleeps briefly or has difficulty sleeping (Ramadhanti A dkk, 2019). Insomnia often occurs in the elderly which is a sleep disorder, if not handled properly it will affect the physically and psychologically elderly. Some of these factors can affect the sleep patterns of the elderly, commonly known as sleep disorders. According to epidemiological surveys, up to 40-50% of individuals over 60 years of age indicate that they are dissatisfied with sleep or have difficulty sleeping, between 12 and 25% complain of chronic insomnia (Borneo et al., 2016).

Luckman (1997) in Sincihu et al. (2018) states that in the elderly there is a decrease in weight, fluid content, and cerebral blood flow, an increase in ventricular size and thickening of the brain cortex, and in the spinal cord there is a decrease in reaction and a slowing of the sympathetic that results in a decrease in sleep patterns. The elderly who live alone have a sense of fear and anxiety that is exacerbated at night so that they cannot sleep, supported by a decrease in sleep patterns. Causes of insomnia in the elderly can be divided into four groups: (1) physical illnesses or symptoms, such as long-term bladder or prostate pain, joint diseases such as arthritis or bursitis, and gastroesophageal reflux; (2) environmental/behavioral factors, including diet/nutrition; (3) the use of drugs, such as caffeine, alcohol, or prescription drugs for chronic illness; and (4) mental illness or symptoms, such as anxiety,

depression, loss of personal identity, or otherwise poor health status (Dewi & Ardani, 2013). According to Jaime (2007) in Prasetyo et al. (2020) The correlation between the benefits of rest and sleep on physical health in the elderly is often underestimated or ignored. Rest and sleep perform a function of recovery both physiologically and psychologically. Physiologically sleep rests one's organs, stores energy, maintains biological rhythms, and improves mental state. While psychologically, sleep can reduce tension and increase feelings of well-being. This maintenance function is very important for the elderly who need a lot of time to adjust to changes.

According to Aziz (2014) in Widiani et al (2020) states that treatments that can be used to treat insomnia include pharmacological therapy and non-pharmacological therapy. Pharmacological therapy can be done by giving sleeping pills, but long-term use can interfere with sleep quality and cause more serious problems such as drug dependence, decreased metabolism in the elderly, decreased kidney function, and caused cognitive function impairment. According to Asmadi (2009), in avoiding things that cause disturbed sleep, one can also perform muscle release techniques, exercise, or exercise every day, one of which is doing elderly gymnastics (Oktaviani, 2018).

According to Sagiran (2012) in Andrian et al (2019) there are many ways to improve and maintain the fitness, freshness and physical flexibility of the elderly, such as doing housework, gardening, walking, swimming, and gymnastics, one of the exercises that can be done is ergonomic exercise as a daily exercise or at least 2-3 times a week. Ergonomic exercise is an exercise with movements adopted from prayer movements so that it is relatively easy for the elderly to follow. Ergonomic exercise is a fundamental exercise whose movements are following the composition and physiological functions of the body. The body naturally maintains its homeostasis (order and balance) so that it remains in fitness. These movements also allow the body to be able to control, ward off several diseases and functional disorders so that the body remains healthy. Ergonomic exercise is inspired by prayer movements and resembles prayer movements. According to Osama (2019) in Winda (2020) prayer can be suggested as a warm-up exercise and light intensity exercise that provides benefits in terms of the cardiovascular system, musculoskeletal system, posture and body composition.

According to Lubantobing (2004) in Sinciuhu et al. (2018) that research progress on this sleep problem has been very slow. Only about the last 40 years have experts begun to explore sleep problems and their disorders. Based on the results of a preliminary study by researchers at the Harapan Kita Elderly Social Institution in Palembang. The results of a survey conducted on 15 elderly people found that 13 elderly people had sleep disorders which were characterized by less than 6 hours, with these conditions the elderly complained that they often felt tired during the day, lacked enthusiasm, and had difficulty concentrating. In addition, 6 out of 13 elderly stated that their sleep was disturbed due to joint pain, 3 people stated that their sleep was disturbed because of many thoughts (stress) and 4 other people felt anxious about their condition so that the elderly often woke up at night and had difficulty going back to sleep. Ergonomic exercise has been regularly scheduled at the Harapan Kita Elderly Social Institution in Palembang, but its implementation has not been maximized. This underlies the author to research further on research on "The Application of Ergonomic exercise in Elderly With Sleep Disorders (Insomnia) at the Harapan Kita Nursing Home in Palembang in 2021".

METHODS

In conducting this study, the authors used a qualitative research design that aims to understand and explore more deeply the application of ergonomic exercise for the elderly with sleep disorders (insomnia) at the Harapan Kita Nursing Home in Palembang in 2021. In this study, qualitative research methods were used to examine the condition of natural objects, where the researcher is the key instrument. The technique of collecting data is triangulation (combined), the data analysis is inductive and the research results emphasize meaning rather than generalization. In this case, data were obtained from in-depth interviews, observations, review of survey documents, and various other data.

In this study, primary data were obtained through in-depth interviews and participatory observations conducted by researchers to two nurses and in-depth interviews with one general practitioner. Secondary data were obtained from data on the number of residents of nursing homes, special references consisting of literature, reading orientation by reviewing literature related to the topic of applying ergonomic exercise in the elderly. In this study, the sample collection technique by using non-probability using purposive sampling, namely determining and selecting sources based on the characteristics or special characteristics possessed by the sample. The data analysis technique in this study is inductive, which is an analysis based on the data obtained. Subsequently developed into a hypothesis. Based on the hypothesis formulated from the data, whether the hypothesis is accepted or rejected based on the data collected. If based on data that can be collected repeatedly using triangulation techniques, it turns out that the hypothesis is accepted, then the hypothesis develops into a theory.

RESULTS

Informants in this study consisted of 3 people (2 nurses, 1 key informant a doctor). The general description of the informants is as follows:

Table 1. Characteristics of Informants by Age, Education and Length of Work

No	Name	Age	Education	Length of Work
1	Ny."MP"	38 y.o	Doctor	8 years
2	Tn."MA"	36 y.o	S1 Nursing	6 years
3	Ny."PC"	31 y.o	D III nursing	4 years

Table 2. Information obtained from Informants

No	Variable	Informasi yang diperoleh	Informan
1	Definition and causes of insomnia	1. What is insomnia? 2. What are the causes of insomnia?	Doctor and nurse
2	Ergonomic exercise stages	1. What is ergonomic exercise? 2. Can ergonomic exercise treat insomnia? 3. What are the ergonomic exercises? 4. Are ergonomic exercise movements in accordance with standard operating procedures?	Doctor and nurse
3	The benefits of ergonomic exercise	1. What are the benefits of roomy ergonomic exercise? 2. What are the benefits of ergonomic exercise with gratitude? 3. What are the benefits of sitting ergonomic exercise? 4. What are the benefits of prostration ergonomics? 5. What are the benefits of ergonomic exercise lying down?	Doctor and nurse

DISCUSSION

In this study, several questions were asked related to the application of ergonomic exercise with each question consisting of 3 outline questions according to the desired indicator.

Based on the results of interviews with informants for indicators of the concept of insomnia, it is known that nurses already have sufficient knowledge about the concept of insomnia as a sleep problem, namely the occurrence of sleep disturbances experienced by a person so that it interferes with their physical health, for example, will be sleepy during activities. This is supported by the results of the interview as follows: "Insomnia is a sleep disorder experienced by a person at night, normally a person sleeps 6-8 hours" (Mr. MA). Another informant also expressed the same thing as follows: "Insomnia is a sleep disorder experienced by a person for example already falling asleep then waking up again and finding it difficult to fall asleep again, usually people who experience insomnia get tired easily, sleepy during the day" (Mrs. PC). This is following the statement of key informants who said that insomnia is a condition of a person who has difficulty sleeping or experiences sleep disturbances caused by stress, lifestyle, and lack of activity.

This is following the statement of Lopez (2011) in Mawitjere et al. (2017) that insomnia is difficulty initiating and maintaining sleep, about sleep disorders in adolescents. People who experience insomnia have less sleep quality and quantity so that when they wake up, insomniacs feel unrefreshed and still sleepy. According to Wibowo (2009) in Mulia (2017) states that insomnia is difficulty in initiating and maintaining sleep so that it cannot meet adequate sleep in quality and quantity, usually someone who experiences insomnia will have more difficulty starting sleep, often wakes up during sleep to wake up early and has difficulty going back to sleep.

This study is in line with the results of research by Patel, Steinberg, & Patel (2018) in Hartono et al (2019) which states that insomnia is a sleep disorder characterized by difficulty initiating or maintaining sleep which causes symptoms of difficulty concentrating and mood disturbances during the day. From all the statements that have been submitted by the informants, the researcher argues that nurses already have sufficient knowledge about the concept of insomnia, which is a sleep disorder characterized by the occurrence of sleep disturbances experienced by a person so that it interferes with physical health, for example, will be sleepy during activities. The causes of insomnia include an unhealthy lifestyle, unhealthy eating patterns, lack of activity, mental disorders such as stress. As for the results of interviews with informants for indicators of the cause of insomnia, it is known that nurses already have sufficient knowledge about the causes of insomnia. This is obtained from the interpretation based on

information obtained from all informants stating that the cause of insomnia can be due to stress, lack of activity, unhealthy lifestyle, and eating patterns. This research is in line with the results of a research according to Islamiyah (2014) in Safitri R A dan Supriyanti (2020) namely, psychological factors, psychiatric problems, physical pain, environmental factors, lifestyle and excessive napping.

This is also in accordance with the statement of Rafknowldege (2014) in Pertiwi B et al. (2021) which states that depression or stress can cause excessive worry and anxiety that can consistently disrupt sleep. In addition to causing insomnia, depression can also cause the desire to sleep all the time, because you want to get away from the problems that are happening. Depression can cause insomnia and insomnia can cause depression. From all the statements that have been submitted by the informants, the researcher argues that nurses already have sufficient knowledge about the causes of insomnia, including unhealthy lifestyles, unhealthy eating patterns, lack of activity, mental disorders such as stress.

The results of interviews with informants for indicators of understanding ergonomic exercise are known that nurses already have sufficient knowledge about the meaning of ergonomic exercise. The interpretation of all informants stated that ergonomic exercise is an exercise whose movements imitate prayer movements and ergonomic exercise can treat insomnia that occurs in a person. This is following the research of Sagiran (2012) in Gandari et al. (2019) which states that ergonomic exercise is a gymnastic technique to restore or correct the position and flexibility of the nervous system and blood flow. Ergonomic exercise is also useful for maximizing oxygen supply to the brain, opening the intelligence system, sweat system, body heating system, combustion system (uric acid, cholesterol, blood sugar, lactic acid, oxalate crystals), rheumatic pain. The movements contained in ergonomic exercise are very effective, efficient, and logical movements because the series of movements are a series of prayer movements that have been carried out by humans from the past until now.

This is also following the statement of Sagiran (2012) in Andari et al. (2020) Ergonomic exercise is one of the practical and effective methods in maintaining one's body health. Movement in ergonomic exercise is a series of movements that are similar to prayer movements because the movements in ergonomic exercise are inspired by prayer movements that have been carried out by Muslims from the past until now. From all the statements that have been submitted by the informants, the researcher believes that the method of implementing ergonomic exercise in the Harapan Kita Nursing Home in Palembang has been running, although the results are not optimal, this is because the standard operating procedures and stages of ergonomic exercise that have been made have not been socialized properly and regularly.

The results of interviews with informants for indicators of the impact of ergonomic exercise can overcome insomnia, it is known that nurses already have sufficient knowledge about the impact of ergonomic exercise. The results of the interpretation of all informants stated that ergonomic exercise is exercise whose movements imitate prayer movements, ergonomic exercises can overcome insomnia that occurs in someone, especially the elderly if done regularly. The results of this study are in line with Oktaviani's research (2018) who argues that with increasing age, the need for sleep decreases in maintaining sleep and cannot control the nervous system in blood flow, so the elderly need to exercise regularly to reduce the reduced need for sleep. Another benefit of ergonomic exercise is that it can reduce high blood pressure, even though we know that the higher the age, the higher the chance of a person suffering from hypertension (high blood pressure). Many studies have explored the correlation between ergonomic exercise and hypertension. In one study, it was stated that exercise with ergonomic movements can have a significant effect on reducing blood pressure in the elderly (Dewiyani et al., 2019).

This is also in line with Indiani's research (2020) which shows that physical exercise ergonomics, aerobics, walking shows that it can overcome sleep disorders in the elderly and can improve sleep quality. However, aquatic physical exercise is more beneficial for sleep initiation and yoga practice is more shown to increase sleep stability. Physical exercise needs to be done regularly by paying attention to the type of physical exercise that will be used which is safe and effective for the elderly. From all the statements that have been submitted by the informants, the researcher believes that ergonomic exercise can reduce the risk of insomnia in the elderly if it is carried out regularly. The results of this study are also in line with the results of Sugandika & Nahariani's study (2017) that ergonomic exercise is effective in reducing the level of insomnia. This is because the elderly who take part in ergonomic exercise will discharge negative energy from the body which can improve blood flow and oxygen intake to the brain which at the same time will stimulate the serotonin hormone which functions to facilitate sleep so that the elderly will be easy to fall asleep. And it can also improve REM and NREM sleep cycles and patterns so that insomnia levels can be lowered.

The results of interviews and observations to informants for indicators of the stages of implementing ergonomic exercise are known that nurses have understood the stages of ergonomic exercise exercises and are by standard operating procedures for ergonomic exercises. The interpretation of all informants stated that ergonomic exercise is gymnastics whose movements imitate prayer movements. Ergonomic exercise consists of 5 core movements, namely broad chest, submissive gratitude, sitting mighty, prostration of gratitude, and lying down. This research is in line with the research of Sagiran (2012) in Andari et al. (2020) about reducing blood pressure in the elderly

with ergonomic exercise which states that this ergonomic exercise is under the composition and physiology of the human body. Ergonomic exercise movements consist of one (1) opening movement, namely standing perfectly, and five (5) fundamental movements, namely broad chest, grateful submission, sitting strong, sitting burning, and lying down.

This is also following the statement of Wratsongko (2008) in Wijayanti et al. (2019) that ergonomic exercise consists of effective, efficient, and logical movements that are by the rules of body creation that are inspired by prayer movements and are safe for the elderly to do for 15 to 20 minutes so that it is easy for the elderly to apply this gymnastic movement. From all the statements that have been submitted by the informants, the researcher argues that the method of implementing ergonomic exercise in the Harapan Kita Nursing Home in Palembang has been running even though the results are not optimal, this is because the standard operating procedures and stages of ergonomic exercise that have been made have not been properly socialized and periodically.

The results of interviews and observations to informants for indicators of the benefits of ergonomic exercise are known that nurses have known and understood the benefits of ergonomic exercise. The interpretation of all informants stated that the benefits of all ergonomic exercise movements are beneficial for improving body shape, smoothing the function of body organs, spine, and circulation of oxygen to the brain as well as relaxing the spinal cord which can improve sleep quality in the elderly. This is in line with Syahrini's research (2017) about the effect of ergonomic exercise on systolic blood pressure in the elderly with hypertension at the Tresna Werdha Budi Mulya 3 Margaguna Social Home, South Jakarta that the benefits of ergonomic exercise are relaxing the spinal cord because the spinal structure is 'relatively' close to a straight position where the anatomical curves are segmental spinal cord (followed by the spinal cord) causes the strain/pull on the spinal nerve fibers to decrease, thus providing an opportunity to relax and being able to reorganize the optimal function of the innervated organs. Within 2 weeks of physiological ergonomics, exercise can accelerate blood flow and increase oxygen intake to the brain which makes it easier for the elderly to fall asleep which at the same time can improve REM and NREM sleep cycles and patterns besides the success of ergonomic exercise provided by researchers is also influenced by the elderly who cooperatively in participating in ergonomic exercise guided by nurses so that the level of insomnia can be reduced (Sugandika & Nahariani, 2017).

The results of this study are also in line with Oktaviani's research (2018) that after being given ergonomic exercise therapy, respondents experienced changes, that respondents could form optimal body resistance if done regularly. The quality of sleep after ergonomic exercise is included in the category of good sleep quality, therefore ergonomic exercise is one of the techniques to improve sleep quality.

This is in line with Fathoni's et al. research (2018) that the presence of exercise that is done together is a factor that affects the level of distress in the elderly. A fresh body can produce a relaxed mind and away from negativity so that it can motivate the elderly to do therapy, especially with non-pharmacological therapy. Ergonomic exercise is easier for the elderly to do when they have free time at home. From all the statements that have been submitted by the informants, the researcher believes that nurses at the Harapan Kita Nursing Home in Palembang have sufficient information about the benefits of ergonomic exercise but there is a need for regular training on ergonomic exercise at the Harapan Kita Nursing Home in Palembang.

CONCLUSION

All informants theoretically already have sufficient knowledge about the concept of insomnia and ergonomic exercise. Most of the nurses already know the stages of ergonomic exercise and it has been going well even though the results have not been maximized, this is because the standard operating procedures of the stages that are made are not socialized regularly. The success of ergonomic exercise guided by nurses is also influenced by the cooperative elderly in participating in ergonomic exercise so that the level of insomnia can be reduced. The more routine ergonomic exercise activities, the greater the opportunity to reduce the number of elderly who experience insomnia. Some nurses have sufficient information about the benefits of ergonomic exercise but there is a need for regular training on ergonomic exercise at the Harapan Kita Nursing Home in Palembang.

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Medication Adherence With Blood Pressure Of Hypertension Clients At Baureno Public Health Center

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ABSTRACT

Hypertension still increasing due to non-adherence to taking medication which results in uncontrolled blood pressure so that there is a risk of complications. Thus study aims to determine the relationship between Medication adherence and blood pressure. The type of research used correlational research with a cross sectional approach. The population in this study were hypertension clients of Prolanis participants in Baureno Public Health Center, Bojonegoro at April 2021 with a sample size of 45 clients selected through purposive sampling. Inclusion criteria were hypertensive clients who received antihypertensive medication, hypertension clients who were PROLANIS participants, and permanent residence. While the exclusion criteria for this study were hypertension clients who had other chronic diseases. The variables were medication adherence and blood pressure. The research instrument used a modified Morisky Medication Adherence Scale 8 (MMAS 8) questionnaire and a sphygmomanometer. The data obtained were processed using Spearman Rho correlation analysis. The results of this study obtained that most hypertension clients (51.1%) had high adherence and most of them (68.9%) had blood pressure in the prehypertension range. The results of the analysis showed a significant relationship between Medication adherence and blood pressure ($p=0.001$). The higher the adherence to taking Medication, the more stable the blood pressure. It is expected that hypertension clients can improve adherence in taking Medication because with high Medication adherence it can control blood pressure and prevent complications.

Keywords: Medication adherence, blood pressure, hypertension

INTRODUCTION

Hypertension is widely known as a cardiovascular disease and is one of the main causes of premature death in the world. Hypertension can be established where the systolic pressure is above 140 mmHg and the diastolic pressure is above 90 mmHg (Poter & Perry, 2010). The incidence of hypertension is still increasing due to one of the factors related to the client's non-adherence in taking medication. This non-adherence results in uncontrolled blood pressure so that there is a high risk of complications (Ningsih et al., 2014).

Based on Basic Health Research (RISKESDAS) at 2018, the province of East Java was ranked sixth with a prevalence of hypertension sufferers of around 35%. According to data from the Bojonegoro Health Office, in 2018 the number of people aged >18 years who experienced hypertension was 120,473 (21.63%) (Dinas Kesehatan Bojonegoro, 2018). Hypertension ranks first for the most chronic diseases in the working area of the Baureno Health Center, Bojonegoro. The data accumulated at the Baureno Health Center contained 4019 patients with hypertension in 2020.

The results of an initial study with five hypertension clients in the working area of the Baureno Health Center found that three respondents did not comply with taking antihypertension Medications. The reason of three clients that not being obedient to taking medication was because the respondents felt healthy and thought that when taking medical Medications regularly they would be addicted. From three respondents, it was found that two respondents had blood pressure of 120/80 mmHg and 130/85 mmHg and one respondent had blood pressure of 145 /90 mmHg.

Hypertension is a lifelong disease that cannot be cured permanently so many patients are bored and do not comply with treatment. An increase in blood pressure in the long term can cause damage to the kidneys, heart and brain if not detected early and receive adequate treatment. Treatment of hypertension is influenced by adherence to medication and lifestyle modifications such as running a diet, doing physical activity, not smoking, and reducing stress (Harijianto, Rudijianto, & N., 2015). Adherence with medication in hypertension clients is very important because taking antihypertension Medications regularly can control blood pressure in hypertension clients, so that in the long term the risk of damage to organs such as the heart, kidneys, and brain can be reduced.

One of the efforts to control blood pressure so that complications of hypertension do not occur, it is necessary to get used to taking medication regularly from the dose, time, period, and method of taking medication. So this study aims to determine the relationship between medication adherence and blood pressure.

METHODS

This research was a type of correlational research with cross sectional study. Sampling using purposive sampling technique with a sample of 45 respondents. Inclusion criteria were hypertensive clients who received antihypertensive medication, hypertension clients who were PROLANIS participants, and permanent residence. While the exclusion criteria for this study were hypertension clients who had other chronic diseases. The study was conducted in the BaurenoPublic Health Center, Bojonegoro at April 2021. The variables of this study were medication adherence and blood pressure. The medication adherence variable was categorized into three, namely high adherence, moderate adherence, and low adherence. While the blood pressure variable was categorized into four, namely normal, prehypertension, grade 1 hypertension, grade 2 hypertension. The research instrument used a modified Morisky Medication Adherence Scale 8 (MMAS 8) questionnaire and a sphygmomanometer. Data collection has been carried out face-to-face by complying with the health protocol. started by filling out a questionnaire that was given 10-15 minutes then followed by checking blood pressure. The research questionnaire has been tested for validity and reliability before being used. This data were analyzed using the Spearman rho test. This research is non-coercive and guarantees the confidentiality of the respondent's identity. Research ethics has been carried out at the Ethics Commission of the Health Polytechnic Surabaya with Number EA/458KRPK-Poltekkes_Sby/V/2021 and was declared ethically fit according to 7 WHO standards.

RESULTS

Demographic characteristics

Demographic characteristics Hypertension clients at the Baureno Health Center are mostly 51-60 years old (62.2%), most are female (73.3%), most have elementary school education (53.3%), and almost half are housewives (46.7%). Complete data can be seen in table 1

Table 1. Frequency Distribution of Demographic Characteristics of Hypertension Clients

Characteristics	Category	Frequency	Percentage(%)
Age	41-50 years old	15	33.3
	51-60 years old	28	62.2
	> 60 years old	2	4.4
Gender	Male	12	26.7
	Female	33	73.3
Education	Elementary school	24	53,3
	Junior High School	7	15,6
	Senior High School	10	22,2
	University	4	8,9
Job	Housewife	21	46.7
	Farmer	10	22.2
	Swasta	8	17.8
	Labor	4	8.9
	Civil Servant	2	4.4
	Total	45	100,0

Distribution of Disease Characteristics of Hypertension Clients

The characteristics of hypertension clients at the Baureno Health Center mostly have no hereditary history of hypertension (71.1%), most of them have been diagnosed with hypertension since 2-4 years (64.4%), and most of the Medications taken Amlodipine 5 mg (53.3%)). Complete data can be seen in table 2.

Characteristics	Category	Frequency	Percentage (%)
Hypertension history	Parent	12	26.7
	Grandmother	1	2.2
	Nothing	32	71.1
	< 2 years	6	13,3

Long of diagnosed hypertension	2-4 years	29	64,4
	> 4 years	10	22,2
Medicine	Amlodipine 5 mg	24	53,3
	Amlodipine 10 mg	12	25,7
	Captopril 25 mg	9	20,0
	Total	45	100,0

Table 2. Frequency Distribution of Disease Characteristics of Hypertension Clients

Medication Adherence

The results showed that of the 45 respondents, a small proportion had low adherence (15.6%) and most had high adherence (51.1%). Complete data can be seen in table 3

Table 3. Frequency Distribution of Medication Adherence

Medication Adherence	Frequency	Percentage (%)
Low adherence	7	15,6
Moderate adherence	15	33,3
High adherence	23	51,1
Total	45	100,0

Blood Pressure

The results showed that of the 45 hypertension clients, most had blood pressure in the prehypertension range (68.9%) and a small portion (2. 2%) hypertension grade 2. Complete data can be seen in table 4

Table 4. Frequency Distribution of Blood Pressure

Blood Pressure	Frequency	Percentage (%)
Normal	5	11,1
Prehypertension	31	68,9
Hypertension Grade 1	8	17,8
Hypertension Grade 2	1	2,2
Total	45	100,0

Correlation Medication Adherence with Blood Pressure

There were 23 clients with high adherence had blood pressure almost entirely (78.3%) in the prehypertension range. Based on the results of the spearman rho statistical test, p value = 0.001, it means there is a relationship between medication adherence and blood pressure. Complete data can be seen in table 5.

Table 5. Cross tabulation between Medication Adherence with Blood Pressure

Medication Adherence	Blood Pressure								Total	
	Normal		Pre Hypertension		Hypertensi on Grade 1		Hypertension grade 2			
	f	%	f	%	f	%	f	%	f	%
Low adherence	0	0,0	3	42,9	3	42,9	1	14,2	7	100,0
Moderate adherence	1	6,7	10	66,7	4	26,6	0	0,0	15	100,0
High adherence	4	17,4	18	78,3	1	4,3	0	0,0	23	100,0
Total	5	11,1	31	68,9	8	17,8	1	2,2	45	100,0
r = -0.466; p = 0.001; α = 0.05										

DISCUSSION

Medicine Adherence

Most of them had high adherence. The results of this study are in line with the research of Nurmalita, Annisa, & Pramono (2019) which showed that most hypertension clients had high adherence. Adherence is an action taken by a patient to take medication or repeat medication prescriptions on time that involves communication between patients and health workers (Fauzi&Nishaa, 2018). According to Nurjanah, Astrid, & Kusumaningsih (2021) the factors that influence the level of adherence are demographic factors such as age and education. Education is a factor that affects knowledge, the higher the knowledge, the better the adherence. However, low education does not hinder a person's ability to acquire knowledge. Information factors from extension workers and the media can also affect a person's knowledge. This is supported research by Rasajati, Raharjo, & Nigrum (2016) which shows

that there is no relationship between education and medication adherence. Respondents with high and low education both want to recover from their illness so that the level of education does not affect adherence to treatment.

Age can also affect adherence because a person's age can make changes in physical and psychological aspects. The psychological aspect of a person's level of thinking will be more mature and mature, but in the elderly, the thinking process will experience a decline. This will affect adherence to taking medication in the elderly so that family support is needed.

According to Muhadi (2019), there are several classes of antihypertension drugs, namely ACE inhibitors, ARBs, B-blockers, CCBs, and diuretics. Based on the results of the study, it showed that hypertension clients were taking antihypertension drugs of the ACE Inhibitor (Captopril) and CCB (Amlodipine) groups. The mechanism of action of Captopril is to inhibit the conversion of angiotensin I to angiotensin II. This CCB class of antihypertension drugs works to relax the heart and smooth muscles by inhibiting the entry of calcium into arterial blood vessel cells causing dilation of coronary arteries and peripheral arteries so that blood pressure becomes stable.

There are also hypertension clients, some of whom have low adherence. This is in line with Anwar&Masnina's (2019) research which states that a small proportion of hypertension clients have low levels of adherence. The low level of adherence in taking antihypertension drugs occurs because of the low understanding of the patient in understanding the purpose of therapy and the patient setting his own medication schedule that is not as recommended by health workers. In addition, the side effects of this hypertension drug are also a cause of client discomfort in the treatment of hypertension

Sources of information are very important in helping to improve adherence where patients know the influence of the importance of taking medication for blood pressure control. Hypertension clients have a high level of adherence because it is supported by the Prolanis activity where hypertension patients are given health education about the disease and are given a schedule to take medicine once a month. Efforts are made to continue health education to support adherence to taking medication so that it can control blood pressure.

Blood Pressure

Blood pressure is mostly prehypertension. This study is in line with the results of Anwar & Masnina's (2019) study which showed that most people with hypertension had blood pressure in the prehypertension range. Hypertension is a medical condition in which blood pressure is above normal limits. A person's blood pressure is not constant and can be influenced by several factors. According to Hastuti (2019), a person's blood pressure is influenced by several factors such as gender, this study shows that the most of hypertension clients are women. This is because the average woman will experience an increase in high blood pressure or hypertension after menopause, namely age over 45 years. Women who have not menopause are protected by the hormone estrogen which plays a role in increasing levels of High Density Lipoprotein (HDL). However, after menopause the hormone estrogen is not able to produce HDL in large quantities so that the process of atherosclerosis occurs due to increased levels of LDL cholesterol (Low Density Lipoprotein).

According to Hastuti (2019), a person's blood pressure is also influenced by age. Individuals aged 45 years or more have a risk of suffering from hypertension. With age, there is a degenerative process, namely a decrease in the elasticity of the blood vessel walls, so that arterial pressure is higher. However, it is possible that hypertension can also be experienced at a young age. Several factors can affect hypertension at a young age such as heredity and lifestyle (Aripin, Sawitri, & Adiputra, 2015).

The rise and fall of blood pressure is influenced by a healthy lifestyle, for example by physical activity. In the research of Harahap, Rochadi, & Sarumpaet (2017), it is explained that physical activity affects blood pressure. People who rarely do activities tend to have a higher heart rate. This causes the heart muscle to work harder with each contraction. The harder the heart muscle pumps blood, the greater the blood pressure imposed on the artery walls so that peripheral resistance causes blood pressure to increase. This study shows that most of the hypertension clients work both inside and outside the building. This will make the hypertension client expend energy so that blood pressure does not increase.

The results of this study indicate that most hypertension clients have prehypertension blood pressure. This does not mean changing the status of the hypertension client, recovering and not experiencing hypertension anymore. Blood pressure Hypertension clients are in the prehypertension range because clients routinely take medication as shown in the data presented in table 3. Sustained hypertension can interfere with the function of other body organs. The need for attention to hypertension will later be a factor to reduce the mortality rate and the severity of cardiovascular disease. It is expected to continue to carry out routine blood pressure control and compliance in carrying out hypertension treatment and a healthy lifestyle.

Correlation Medication Adherence with Blood Pressure

Based on the results of spearman's rho analysis, it was stated that there was a significant relationship between the level of medication adherence and blood pressure in hypertensive clients in the work area of the BaurenoBojonegoro Health Center. These results indicate that the relationship between the medication adherence and blood pressure is quite strong, the higher the compliance, the controlled the blood pressure.

Hypertension is a disease that cannot be cured but can be controlled or controlled by taking antihypertensive drugs for life. Adherence to taking medication for hypertension is very important because it can control or control blood pressure. The results of this study are in line with Efendi, Tiahesara, & Azana (2018) which showed that there was a relationship between medication adherence and blood pressure and the strength of the relationship was sufficient.

Non-adherence in taking hypertension medication can trigger a rebound, meaning that blood pressure that has fallen when treated can suddenly spike higher when the drug is stopped. The risk of cardiovascular complications and death increases in patients who do not adhere to consistent therapy. Consistency in adherence is a key factor in controlling blood pressure which will ultimately affect clinical outcomes. The impact of low adherence is a major contributor to hypertension with uncontrolled blood pressure. Low adherence is a failure to initiate pharmacotherapy, to take medication as often as prescribed and to persist on long-term therapy is recognized as a contributing factor to poor blood pressure control (Rikmasari, Rendowati, & Putri, 2020).

Adherence to taking medication greatly supports the success of hypertension treatment. It is hoped that health workers can still become educators and facilitators by scheduling routine drug taking, carrying out routine supervision through Prolanis activities every month, and providing health education in stages. This is can support the client to continue to have high adherence in taking medication so as to produce stable blood pressure.

CONCLUSION

Most hypertension clients had high adherence and most had blood pressure in the prehypertension range. In the Spearman Rho test it was stated that there was a relationship between medication adherence and blood pressure in hypertensive clients, the higher the compliance, the lower the blood pressure.

Hypertensive clients are expected to maintain or improve adherence to taking antihypertensive drugs in order to control blood pressure so that the risk of complications can be reduced. Health workers can become educators and facilitators by carrying out routine supervision and providing health education in stages. Future researchers are expected to be able to use it as a source of data for further research based on other factors, different variables, with a larger number of samples.

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Nutritional Status with the Incidence of Acute Respiratory Infection in Toddlers at Kalirungkut Public Health Center Surabaya

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ABSTRACT

Acute respiratory infection is one of the causes of death in children under five. Factors that can increase the incidence of infection in toddlers is nutritional status. This study was aims to determine the relationship between nutritional status and the incidence of acute respiratory infection in children. Study used analytical design through cross-sectional approach. The sampling in this study were children who were grouped based on the nutritional status of weight by age in Kalirungkut Public Health Center, Surabaya obtained 50 children. The variables of this study were nutritional status and the incidence of respiratory infection. The instrument used in this study was a questionnaire, data were processed using chi square correlation analysis. The results of this study was a indicate that under-five children with very low body weight almost half (40%) rarely experience ARI and most (60%) often experience infection. The results of the analysis showed that there was a significant relationship between nutritional status and the incidence of infection in children. To reduce the frequency of infection occurrences in toddlers, it is hoped that parents can fulfill the nutritional adequacy of toddlers to maintain the toddler's immune system so that they do not cause other diseases due to complications of infection.

Keywords: Nutritional Status, Acute Respiratory Infection, Toddlers

INTRODUCTION

Lack of fulfillment of nutritional needs in toddlers will cause nutritional problems such as malnutrition (Gunawan, et al., 2011) . The result of poor nutrition is a decrease in the body's resistance so that children are susceptible to infectious diseases. One of the infectious diseases due to malnutrition is acute respiratory infection. Acute respiratory infection is one of the causes of morbidity and mortality of infectious diseases in the world. Acute respiratory infection is a disease that often occurs in children in the age group of 1-4 years (Kemenkes RI, 2013). The Prevalence of nutritional status based on weight by age in toddlers aged 0-59 months who experienced malnutrition in 2018 in the East Java region was 3.3% and 2.57% in the Surabaya area. Meanwhile, children under five who experienced malnutrition in 2018 in the East Java region were 13.4% and 14.2% in the Surabaya area (Kemenkes RI, 2018). The magnitude of the prevalence of malnutrition in children under five can increase the risk of infection. According to the World Health Organization (WHO) in 2017, pneumonia accounted for 15% of all deaths of children under the age of 5 years, one of which could occur due to inaccuracies in handling acute respiratory infection in infants, with a mortality rate of 808,694 children in the world. Based on the Basic Health Research (RISKESDAS) in 2018 in the East Java region, the prevalence of acute respiratory infection in children under five was 12.9% and 31.40% in the Surabaya city area (Kemenkes RI, 2018).

At this stage of development, toddlers experience a golden period which is a critical period that occurs once in a child's life. In this period the child is in the process of forming himself so that adequate nutrition plays an important role in the child's growth and development process (Wauran, 2016). Poor nutritional status will affect the body's response in the formation of antibodies and lymphocytes to the presence of germs. This requires adequate protein and carbohydrates so that in children with malnutrition the production of antibodies and lymphocytes is inhibited (Nadila et al., 2016). Children with less nutrition will be more susceptible to acute respiratory infection due to lack of immune system (Maryunani, 2010).

One of the efforts to prevent the incidence of acute respiratory infection is immunization. The other main way is to maintain the immune system through healthy lifestyle behaviors, including a balanced diet and adequate rest (Mardiah, et al., 2017). So, This study was aims to determine the relationship between nutritional status and the incidence of acute respiratory infection in children.

METHODS

This type of research is correlational analytic with cross sectional study. Sampling using simple random sampling technique with a sample size of 50 respondents. The study was conducted in the working area of the Kalirungkut Public Health Center Surabaya in April 2021. The variables of this study were nutritional status which was

categorized into very low weight, low weight, normal weight and overweight risk and the incidence of acute respiratory infection which was categorized into rarely, often and very often. The instrument used in this study was a questionnaire containing the condition of nutritional status and the frequency of occurrence of acute respiratory infection in children under five. Data were analyzed using Chi Square to determine the relationship between variables. This research is non-coercive and ensures the confidentiality of the respondent's identity. Research ethics has been carried out at the Surabaya Health Polytechnic Ethics Commission with Number EA/513/KEPK-Poltekkes_Sby/V/2021.

RESULTS

Demographic Characteristics of Mothers and Toddlers

Based on the characteristics of toddlers, it was found that most (58%) of the toddlers were male, most (62%) of the toddlers were in preschool and it was found that almost all (94%) toddlers did not experience prematurity. Based on the demographic data obtained, almost half (44%) of mothers under five have higher education and a small proportion (8%) of elementary school education, almost half (46%) are housewife and a small part (6%) work as laborers. Complete data can be seen in table 1.

Table 1. Demographic characteristics and children under five at Kalirungkut Public Health Center Surabaya

No	Characteristics	Category	Frequency	Persentase
1	Gender	Man	29	58
		Woman	21	42
2	Age	1-3 years old (Toddler)	19	38
		3-5 years old (Preschool)	31	62
3	History of prematurity	Premature	3	6
		Non-premature	47	94
4	Mother's Education	Elementary School	4	8
		Junior High School	5	10
		Senior High School	19	38
		College	22	44
5	Mother's Job	Housewife	23	46
		private employees	8	16
		entrepreneur	16	32
		Labor	3	6

based on ARI disease

The characteristics of toddlers who have a history of acute respiratory infection disease obtained are mostly (52%) have mild symptoms and most (54%) parents treat the symptoms of acute respiratory infection under five by buying drugs at pharmacies. Complete data can be seen in table 2.

Table 2. History of ARI in children under five at Kalirungkut Public Health Center Surabaya

No	Characteristics	Category	Frequency	Persentase
1	History of ARI Symptoms	Mild	26	52
		Moderate	21	42
		Severe	3	6
2	Place of treatment when infection	Public health center	12	24
		Private health services	11	22
		Self medication	27	54

Nutritional Status

The results showed that of the 50 children, most (52%) had normal weight and a small proportion (10%) had very low weight. Complete data can be seen in table 3.

Table 3. Characteristics of nutritional status in toddlers

Category	Nutritional Status	Frequency	Persentase
	Very Low Weight	5	10
	Low weight	9	18

Category Nutritional Status	Frequency	Persentase
Normal weight	26	52
Risk of overweight	10	20
Total	50	100

Acute respiratory infection incident

The results showed that from 50 children, almost all (78%) children under five experienced acute respiratory infection less often and a small portion (22%) often experienced acute respiratory infection. Complete data can be seen in table 4.

Table 4. Characteristics of the incidence of infection in toddlers

ARI incident category	Frequency	Persentase
Rarely	39	78
Often	11	22
Very often	0	0
Total	50	100

Relationship between Nutritional Status and the Incidence of acute respiratory infection in Toddlers

Most toddlers with very low weight (60%) often experience acute respiratory infection. Most children with low weight (55,6%) rarely experience acute respiratory infection. Almost all toddlers with normal weight (92.3%) rarely experience acute respiratory infection, while almost all children at risk of obesity (80%) rarely experience acute respiratory infection. Based on the results of the chi Square statistical test, p value = 0.023, because $p < 0.05$, H_a is accepted and H_o is rejected, which means that there is a relationship between nutritional status and the incidence of acute respiratory infection. Complete data can be seen in table 5.

Table 5. Cross tabulation of nutritional status with the incidence of infection in children under five

nutritional status	Incident of acute respiratory infection						Total	
	Rarely		Often		Very often			
	F	%	F	%	F	%	F	%
Very Low Weight	2	40	3	60	0	0	5	100
Low weight	5	55,6	4	44,4	0	0	9	100
Normal weight	24	92,3	2	7,7	0	0	26	100
Risk of overweight	8	80	2	20	0	0	10	100
Total	39	78	11	22	0	0	50	100
r: -0,336; p: 0,023; α: 0,05								

DISCUSSION

Nutritional Status

most of children are of normal weight and some are very underweight. This study is in line with the research of Widyawati, et al. at 2020, in that study most of them had normal weight.

Nutritional status is the state of the body as a result of food consumption and use of nutrients. Nutritional status is a reflection of the size of the fulfillment of nutritional needs (Rahmi, et al., 2017). According to Hanim (2020), the factors that can affect the nutritional status of children are the mother's level of knowledge, children feeding patterns and children feeding problems. In this study, almost half of the mothers of children under five had higher education and a small proportion had elementary education. Knowledge of mothers of children under five is one of the factors that can affect the nutritional status of children under five. Mothers with higher education usually have good knowledge about toddler nutrition, so that children are in good nutritional status (Permatasari, et al., 2020). However, it is possible that mothers who have higher education also have children with malnutrition, which can be caused by the lack of application of information about toddler nutrition in everyday life (Hanim, 2020). This is in line with Hanim's research (2020), which shows that a small percentage (11.3%) of highly educated mothers of children under five have underweight toddlers.

Mother's occupation is also one of the determinants of children's nutritional status. Paying attention and providing good nutritional intake for toddlers requires more time for parents, especially a mother to be together with toddlers, if the mother takes 6-7 hours to work outside the home it will reduce the time together with her child. This condition can affect the fulfillment of nutritional intake in the child (Fauzia, et al., 2019).

In addition, nutritional status is also influenced by a history of prematurity. Prematurity is one of the risk factors for the incidence of LBW. Low birth weight will affect the development of children in the future. Children with low birth weight tend to be underweight children and will find it difficult to catch up with the child's growth. This will result in impaired child development. Both motor development and cognitive development (Fajriana & Buanasita, 2018).

The results of the study in the working area of the Kalirungkut Public Health Center Surabaya showed that most of the children had normal weight. This shows that mothers of children under five in the Kalirungkut Public Health Center Surabaya are aware of the importance of adequate nutritional intake for the development and growth of children. The good nutritional status of children under five in the Kalirungkut Health Center working area is supported by the awareness of parents of children regarding the regular visits to the posyandu and the role of health workers and cadres in providing information about the importance of nutritional adequacy for the development and growth of toddlers. Efforts are made to improve the nutritional status of children to maintain the child's immune system so that they are at low risk of infection.

Incident of Acute respiratory infection

Based on the results of data analysis on children in the working area of the Kalirungkut Public Health Center Surabaya, it shows that almost all toddlers who experience of acute respiratory infection and a small portion often experience of acute respiratory infection. Acute respiratory infection is an infection that can attack the alveoli tissue in the lungs and has symptoms such as cough, runny nose, shortness of breath and is categorized as an acute infectious disease (Nasution, 2020). The incidence of acute respiratory infection can be influenced by several factors, one of which is age.

Based on the results of this study, a small proportion of children under five often suffer from acute respiratory infection. The incidence of acute respiratory infection in toddlers is due to the natural immune system not being optimal. The immune system in a person's body plays a very important role in fighting bacteria and viruses that enter a person's body. In a weak body condition will increase a person's risk of infection. This condition often occurs in children. Whereas in adults, natural immunity has occurred which is more optimal due to the experience of previous infections (Nasution, 2020).

Another factor in the incidence of acute respiratory infections in children is parental education. The lower the parental education, the degree of acute respiratory infection suffered by the child is getting worse. On the other hand, the higher the education level of the parents, the lighter the degree of acute respiratory infection suffered by the child. Knowledge is very closely related to education where it is expected that someone with higher education will have wider knowledge. However, it should be emphasized that a person with low education does not mean absolutely low knowledge. Increased knowledge is not absolutely obtained from formal education, but can also be obtained in non-formal education (Maramis, et al., 2013)

The results of the study in the work area of the Kalirungkut Public Health Center Surabaya showed that some toddlers often suffered from acute respiratory infection. The incidence of acute respiratory infection that continues and is not treated immediately can cause more serious illness due to complications of acute respiratory infection such as acute otitis media, rhinosinusitis and others. Therefore, the need for attention regarding the incidence of acute respiratory infection in children under five will be a factor to reduce the infant mortality rate. In addition, it is expected to meet the nutritional needs of toddlers to improve the immune system so that toddlers rarely suffer from acute respiratory infection.

Relationship between nutritional status and incidence of acute respiratory infection in toddlers

Based on the results of the analysis using the chi square test, it was stated that there was a significant relationship between nutritional status and the incidence of acute respiratory infection in children under five in the working area of Kalirungkut Public Health Center Surabaya, which was indicated by a p value = 0.023 or less than 0.05. The value of r or the strength of the relationship between nutritional status and the incidence of acute respiratory infection is -0.336. These results indicate that the relationship between the two variables is quite strong and has a negative value, which means that increasing the nutritional status of children under five, the lower the incidence of acute respiratory infection.

Acute respiratory infection is an acute infectious disease that attacks one or more parts of the respiratory tract from the nose (upper respiratory tract) to the alveoli (lower respiratory tract) including tissues such as sinuses, cavities, middle ear and pleura. One of the factors in the incidence of acute respiratory infection is nutritional status. Toddlers with a lack of protein will cause a decrease in body resistance and the virulence of pathogens so that they will be susceptible to disease and disrupt the body's balance (Nasution, 2020).

The results of this study are in line with the research of Lorensa (2017) which showed that there was a relationship between nutritional status and the incidence of acute respiratory infection in children under five with p value = 0.000. Overall, the results of this study indicate that toddlers who are underweight are less likely to suffer from

acute respiratory infection more often than toddlers who have normal weight by age. This shows that nutritional status affects the incidence of acute respiratory infection in children under five.

Nutrition is an important component that must be met as a support for toddler growth and development. Fulfillment of adequate nutrition will increase the immune system or body defense so that it can reduce the risk of toddlers suffering from infectious diseases such as acute respiratory infection.

CONCLUSION

The status of children under five in the working area of Kalirungkut Public Health Center based on weight by age found that a small proportion of them have very low weight, low weight, risk of overweight and most have normal weight.

Toddlers in the working area of the Kalirungkut Public Health Center Surabaya, most of them less often experience of acute respiratory acute and a small portion often experience acute respiratory infection. In the chi square correlation test, it was stated that there was a relationship between nutritional status and the incidence of acute respiratory infection in children under five in the working area of Kalirungkut Public Health Center Surabaya.

Parents of toddlers are expected to be able to meet the nutritional needs of toddlers to maintain the body's defense system to avoid the incidence of acute respiratory infection in toddlers so as not to cause other diseases due to complications from the incidence of ARI. Health workers are expected to be educators and facilitators on an ongoing basis to parents of toddlers about the importance of fulfilling toddler nutrition.

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**THE EFFECTIVENESS OF EXCELLENT SERVICE IN THE ELDERLY AS AN
EFFORT TO IMPROVE SERVICE**

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ABSTRACT

In an organization, excellent service is related to the services carried out by the organization to provide a sense of satisfaction and trust to its customers. Excellent service means maximum service, or the best service, and is a key factor in the company's success. The purpose of this study was to determine the effectiveness of excellent service for the elderly to improve services at the Harapan Kita Elderly Social Institution in Palembang in 2021. The design of this study was qualitative research. The social situation in this study is the elderly who live in the Harapan Kita Elderly Social Institution in Palembang, amounting to 60 people. The number of informants is 3 elderly and 1 trusted informant, namely nursing home. Collecting data using in-depth interviews with informants. Qualitative data analysis is inductive, which is an analysis based on the data obtained. Subsequently developed into a hypothesis. The results obtained were that promotive efforts in nursing homes were not optimal so they still needed to be improved, preventive efforts in nursing homes were good enough but still needed to be improved, curative efforts in nursing homes were good, and rehabilitative efforts in nursing homes were good. It is hoped that the social institution can improve health services which include promotive, preventive, curative, and rehabilitative efforts to achieve a decent quality of life and welfare for the elderly so that they can enjoy their old age peacefully physically and mentally.

Keywords: Excellent Service, Elderly

INTRODUCTION

Elderly is a term given to people who are getting older. The Indonesian Ministry of Health classifies the elderly into three groups, namely: the early elderly group (55-64 years), a group that has just entered the elderly, the elderly group (65 years and over), a high-risk elderly group, namely the elderly who are more than 70 years old. Many people think that old age is no longer beneficial, some even think that old age is often perceived negatively, as a burden on family and society. While socially the elderly are a separate social group (Laelly, 2017).

The government is the main provider of public services, one of which is health services which have the main goal of creating health for the community. Health services organized by the government are expected to be the main reference for the community when experiencing health problems. Health services by the government are aimed at various community targets such as families including pregnant women and toddlers, suffering from diseases, mental/psychiatric problems, and the elderly. One of the targets of health services in the elderly is the term for the final stage of the process of getting older (Jannah, 2016).

With the health policy for the elderly, the government must provide facilities and infrastructure, medical personnel, and supporting facilities so that the plan can be implemented properly. This will certainly have an impact on health services for the elderly in a more optimal manner and obtain health services by what is desired by the community, especially the elderly. Health services for the elderly that is carried out optimally are expected to be able to realize the welfare of the elderly, considering that the health of the elderly is currently rarely considered (Jannah, 2016).

Werdha's Social Welfare Institution is a technical implementation unit in the field of fostering social welfare for the elderly that provides social welfare services for the elderly in the form of providing shelter, life insurance such as clothing, health care, filling leisure time including recreation, social mental and religious guidance so that they can enjoy their old age covered inner and outer peace (Kholifah, 2016).

Excellent service means maximum service, or the best service, and is a key factor in the company's success. In this case, excellent service must be carried out continuously under any circumstances. Because the current company is essentially providing services that must grow and develop to survive serving the Indonesian people by the company's short-term and long-term goals (Rangkuti in Indah, 2019).

The results of Jannah's research (2016) with the title of excellent service at the Posyandu for the elderly in the Village Health Hut (Ponkesdes) Karangdinoyo Sumberrejo Bojonegoro Village. The results of this study indicate that the service process has been going well, although there are still obstacles. This is known through the A4 concept of excellent service, the Attitude concept in the integrated service post for the elderly at Ponkesdes Karangdinoyo has provided good, friendly, polite and courteous service, the Attention concept in the integrated service post for the elderly at Ponkesdes Karangdinoyo, in the form of always paying attention to elderly health by providing direction on a healthy life, and maintaining a good and regular diet, the concept of action is the form of action given by employees or nurses at the integrated service post for the elderly at Ponkesdes Karangdinoyo in the form of always providing good service for the elderly and always improving attitudes. From the activities carried out, the Anticipation Concept in the integrated service post for the elderly at Ponkesdes Karangdinoyo, in the form of when the elderly feel severe pain and the employee or nurse is unable to handle it, they can directly go to the doctor at the community health center or at the hospital and the employee or the Ponkesdes nurse will immediately provide a referral for this action.

Meanwhile, the results of Hadjam's (2001) research on the effectiveness of excellent service as an effort to improve services in hospitals. The result of the research is that the Excellent Service Training is effective enough to improve the quality of excellent service to nurses in hospitals. This can be seen from the quality of excellent service to nurses after receiving excellent service training, which is higher than the quality of excellent service to nurses before receiving training.

This is also supported by research by Indah et al (2019) with research on the Effectiveness of Excellent Service for the Poly Section at the Pondok Aren Health Center Tangerang by always providing good service for the elderly and always improving the attitude of the activities carried out and if the elderly feel severe pain so that employees or the Ponkesdes nurse is unable to handle it, then you can directly check with the doctor at the Puskesmas or Hospital and the Ponkesdes will immediately provide a referral for this action.

Based on the description above, the authors are interested in examining the effectiveness of excellent service for the elderly as an effort to improve services at the Harapan Kita Elderly Social Institution in Palembang in 2021.

METHODS

The approach in this research is qualitative. The focus of this research is on the effectiveness of excellent service to the elderly as an effort to improve services. In this case, data were obtained from in-depth interviews, observations, review of survey documents, and various other data. In this study, primary data were obtained through interviews conducted by researchers to the elderly who had lived in the nursing home for at least 5 years. Secondary data were obtained from data for nursing home residents, special references consisting of literature, reading orientation by reviewing literature related to the topic of excellent service. This documentation study is to obtain secondary data to support the research conducted. In this study, the sample collection technique was using non-probability by purposive sampling, namely determining and selecting resource persons based on the characteristics or special characteristics possessed by the sample, while in this study the informants were three elderly people who received excellent service, namely Mrs "K", age 64 years old, junior high school education; Mrs "S" is 66 years old, junior high school education, and Mrs "F", 68 years old, elementary school education. Data analysis techniques in this study were carried out during data collection and after data collection was completed within a certain period. Data or information that has been obtained, noted or recorded using a radio cassette and made a transcript, then transferred into a matrix and in the data matrix grouped according to the purpose of the study.

RESULTS

Based on the results, the researchers found that there was excellent service for the elderly as an effort to improve services. The characteristics of the informants are as follows:

Table 1. Characteristics of Informants by Age, Education, Length of Stay

Initial	Age	Education	Length of stay
Ny "K"	64 y.o	Junior high school	5 years
Ny "S"	66 y.o	Junior high school	7 years
Ny "F"	68 y.o	Elementary school	10 years

Based on the answers to the questions regarding the promotive efforts of all informants, it was found that the promotive efforts in the nursing home were not optimal so they still needed to be improved. Meanwhile, the question regarding the preventive measures of all informants in the nursing home is good enough but still needs to be improved.

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For answers to questions regarding the curative efforts of all informants, data was obtained that the curative efforts at the orphanage were good. Meanwhile, regarding the rehabilitation efforts of all informants, data obtained that the rehabilitation efforts at the orphanage were good.

DISCUSSION

Excellent service is a concern for customers by providing the best service to facilitate the convenience of customer needs to achieve satisfaction. Of course, it requires a requirement that every service provider has professional competence quality. Therefore, excellent service plays an important role in an organization and can provide a positive image for the organization (Indah et al, 2019).

In this study, several questions were asked related to promotive, preventive, curative, and rehabilitative with each effort consisting of five questions according to the desired indicators.

Based on the results of interviews with informants for indicators of promotive efforts, it is known that improving the health status of the elderly living in nursing homes, is done by adjusting their diet, conducting regular checks. The elderly in the nursing home also received counseling about nutrition. The elderly in the nursing home receive spiritual showers once a week on Fridays. The elderly are invited to go for recreation but not regularly, and if there is the information submitted by the health officer, they will call the elderly to the nursing home hall. This is following the statement of a trusted informant who said that to improve the health status of the elderly, the nursing home staff regularly checks health, maintains diet, and maintains cleanliness. Counseling about nutrition is usually done by students who practice at the nursing home. Meanwhile, to fill spiritual activities, the nursing home usually invites ustadz to lecture and read the Qur'an. The elderly who live in the nursing home are usually invited to take a vacation once a year to the park, to the famous mosque in the city of Palembang. To provide the latest information, health workers will conduct health education such as about the coronavirus, officers provide health education about the coronavirus, and ask the elderly to be vigilant.

Based on the answers to the questions regarding the promotive efforts of all the informants above, the researcher concludes that the promotive efforts in nursing homes are not optimal so they still need to be improved.

This is following Kholifah's (2016) theory, promotive is an effort to excite the spirit of life and improve the health status of the elderly so that they remain useful, both for themselves, their families, and the community. The activities are in the form of health counseling and training for nursing home staff on the following matters: Nutrition and diet issues, basic health care, emergency case nursing, recognizing cases of mental disorders, sports, communication techniques, spiritual guidance for the elderly, recreation, competitions among the elderly. within or between nursing homes, dissemination of information about the health of the elderly in nursing homes and the wider community through various media.

According to Indah et al (2019), excellent service is a concern for customers by providing the best service to facilitate the convenience of customer needs as an effort to achieve satisfaction, of course, requires a requirement that every service provider who has professional competence quality, therefore, excellent service plays a very important role important in an organization and can provide a positive image for the organization. This research is in line with the results of Laelly's research (2017) about the excellent service of the Elderly Posyandu at the Jagir Health Center in Surabaya. The results of the study found that in the Integrated Healthcare Center for the elderly there was already a clear explanation, that was written on every table, there was registration, recording, examination, and counseling. The rules that apply are assessed as appropriate, consistent, and consistent using 4 tables. The rights and obligations of the service provider and recipient have been fulfilled.

Based on the results, theories, and related research, researchers assume that promotive efforts are one part of existing health services in nursing homes to improve health services to stimulate the spirit of life and improve the health status of the elderly. improve the spirit and standard of living of the elderly in the nursing home.

Based on research conducted on informants for indicators of preventive efforts, it is known that informants are given information about diseases and are limited in access to travel to reduce the risk of disease. The elderly in the nursing home still do sports independently. The elderly are routinely checked by health workers. When bored, the elderly can go out and walk around the nursing home. While health checks are carried out every day.

Based on the answers to the questions regarding the preventive efforts of all the informants above, the researcher concludes that the preventive efforts in nursing homes are good enough but still need to be improved.

This is following the theory of Kholifah (2016), preventive efforts are efforts to prevent the possibility of diseases caused by the aging process and its complications. The activities are periodic checkups that can be carried out at the home by health workers who come to the nursing home periodically or using the elderly KMS, screening for diseases in the elderly, both by health workers at the health center and nursing home workers who have been trained in health care for the elderly, health monitoring by oneself with the help of the nursing home staff using personal notebooks, exercising regularly according to their respective abilities and conditions, managing the diet and food of the elderly residents of the nursing home according to their respective health conditions, increasing piety to God Almighty, developing His hobby is to be able to fill time and stay productive, to do reality orientation, namely an effort to introduce the surrounding environment so that the elderly can be better able to make relationships and restrictions on time, place, and people optimally.

The results of this study are in line with the results of Jannah's research (2016) on excellent service at the integrated service post for the elderly in the Health hut of Karangdinoyo Village, Sumberrejo, Bojonegoro. The results of the study indicate that Excellent Service in the service process has been running well, although there are still obstacles. This is known through the A4 concept of excellent service, the Attitude concept in the integrated service post for the elderly at Ponkesdes Karangdinoyo has provided good, friendly, polite, and courteous service, the Attention concept in the integrated service post for the elderly at Ponkesdes Karangdinoyo, in the form of always paying attention to the health of the elderly. by providing direction on a healthy life, and maintaining a good and regular diet, the concept of action is a form of action given by employees or nurses at the integrated service post for the elderly at Ponkesdes Karangdinoyo by always providing good service for the elderly and always improving the attitude of the activities carried out. implemented, the Anticipation concept in the Posyandu service for the elderly at Ponkesdes Karangdinoyo, in the form of if the elderly feel severe pain so that the Ponkesdes are unable to handle it, they can directly check with the doctor at the Puskesmas or Hospital and the Ponkesdes will immediately provide advice refer to the action.

Based on the results, theories, and related research, researchers assume that prevention is one part of health services in nursing homes to prevent diseases caused by the aging process and its complications. The better the preventive efforts provided, the more excellent health services will be to prevent diseases in the elderly.

Based on the results of research conducted on informants for indicators of curative efforts, it is known that if the elderly are sick they will be given medicine and if they are still sick they will be taken to a community health center or hospital. If the elderly are sick they will be given medicine and if they are still sick they will be taken to the Public health center or hospital. The family will be responsible for all costs of care and treatment of the client from the first day of illness. Health workers routinely check the health of the elderly, especially those with hypertension. And if the elderly are sick, they will be given medicine. If they have not recovered, they will be taken to the Public health center.

Based on the answers to the questions regarding the curative efforts of all the informants above, the researcher concluded that the curative efforts at the nursing home were good.

This is following Kholifah's (2016) theory, curative is an effort to treat the elderly by health workers or trained nursing home staff as needed. This activity can be in the form of basic health services at the nursing home by health workers or nursing home officers who have been trained through the guidance and supervision of health workers/health centers, mental health care, dental and oral health care, eye health care, health care through activities at the Puskesmas, referrals to hospital, specialist doctor, or health professional as needed.

The results of Jannah's research (2016) with the title of excellent service at the integrated service post for the elderly in the Karangdinoyo Sumberrejo Village Health hut, Bojonegoro, show that Excellent Service in the service process has been going well, although there are still obstacles. This is known through the A4 concept of excellent service, the Attitude concept in the integrated service post for the elderly at Ponkesdes Karangdinoyo has provided good, friendly, polite, and courteous service, the Attention concept in the integrated service post for the elderly at Ponkesdes Karangdinoyo, in the form of always paying attention to the health of the elderly. by providing direction on a healthy life, and maintaining a good and regular diet, the concept of action is the form of action given by employees or nurses at the integrated service post for the elderly at Ponkesdes Karangdinoyo in the form of always providing good service for the elderly and always improving the attitude of the activities that are carried out. implemented, the Anticipation concept in the integrated service post for the elderly at Ponkesdes Karangdinoyo, in the form of if the elderly feel severe pain so that the Ponkesdes are unable to handle it, they can directly check with the doctor at the Puskesmas or Hospital and the Ponkesdes will provide a direct reference for the action.

Based on the results of research, theories, and related research, researchers assume that curative treatment is an effort for the elderly by health workers or trained nursing home staff as needed, the curative efforts provided at the nursing home are good. Officers are always ready to carry out examinations and treatment for the elderly who are in the nursing home if they are sick.

Based on the results of research conducted on informants for indicators of rehabilitation efforts, it is known that the elderly are invited to exercise and maintain their diet. Usually the elderly tell stories and jokes, sing

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and walk around the nursing home. Older people who like to sing will be invited to sing and give money. The nursing home environment is cleaned every day by working together. The elderly are maintained their diet and maintain personal and environmental hygiene and maintain activities so that they are not excessive. Based on the answers to the questions regarding the rehabilitation efforts of all the informants above, the researcher concluded that the rehabilitation efforts at the nursing home were good.

The results of this study are in accordance with the theory of Kholifah (2016), rehabilitation is a recovery effort to maintain optimal organ function. This activity can be in the form of physical, mental, and vocational rehabilitation. This activity is carried out by trained health workers and nursing homes.

Excellent service means maximum service, or the best service, and is a key factor in the company's success. In this case, excellent service must be carried out continuously under any circumstances. Because the current company is essentially providing services that must grow and develop in order to survive serving the Indonesian people in accordance with the company's short-term and long-term goals (Rangkuti in Indah (2019)).

This research is in line with the results of Khesia's (2018) research on the analysis of the quality of health services at the Rowosari Health Center, Tembalang District, Semarang, which shows that the Rowosari Health Center has provided good health services to its community. In addition, Rowosari Health Center still has obstacles in providing services that stem from awareness factors, lack of awareness of officers to arrive on time, system procedures and regulations factors including many patients who do not carry complete requirements, organizational factors, there is overlapping work for dental clinic nurses. , and the factor of service facilities with the lack of seats in the patient waiting room

Based on the results, theories, and related research, researchers assume that rehabilitation is a recovery effort to maintain optimal organ function, this has been done maximally by officers to provide maximum service to help restore and maintain organ function in the elderly.

CONCLUSION

Excellent service for the elderly as an effort to improve services at the Harapan Kita Elderly Social Institution in Palembang in 2021 seen from promotive, preventive, curative, and rehabilitative aspects. In the implementation of excellent service for promotive efforts in nursing homes, it is not optimal so it still needs to be improved. Meanwhile, preventive efforts in nursing homes are good enough but still need to be improved. The curative efforts at the nursing home have been good and the rehabilitative efforts at the nursing home have been good. By improving health services that include promotive, preventive, curative, and rehabilitative, it is possible to achieve a decent quality of life and well-being for the elderly, so that they can enjoy their old age with peace of mind and heart.

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The Impact of Therapy Foot Exercise And Foot SPA on Foot Sensitivity in Patients with Diabetes Mellitus: A Literature Review

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ABSTRACT

Diabetes mellitus is a chronic disease which if not controlled properly will cause various complications, one of which is diabetic neuropathy. One way to prevent it can be doing activities and exercises such as foot gymnastics and foot SPA. To determine the impact of foot exercise and foot SPA on the sensitivity of the feet of patients with diabetes mellitus. This study uses a literature review method using the Google Scholar, PubMed, ProQuest, and Garuda Portal databases. Based on a literature search, 14 journals according to the criteria showed that there was an impact of foot exercise and foot SPA on foot sensitivity in patients with diabetes mellitus. Foot gymnastics and foot SPA which are done regularly can help increase the sensitivity of the feet. The feet will get an adequate supply of oxygen so that complaints such as tingling, numbness which is a symptom of diabetic neuropathy decrease so that the sensitivity of the feet increases. Foot exercise and foot SPA have a good impact on foot sensitivity in diabetes mellitus patients. Thus minimizing the occurrence of diabetic neuropathy and diabetic foot ulcers.

Keywords: Foot exercise, foot SPA, foot sensitivity, foot sensation, diabetic neuropathy, diabetes mellitus

INTRODUCTION

Diabetes mellitus is a chronic disease that cannot be cured but by controlling it. If not controlled will cause various complications. The most frequent complication is diabetic neuropathy, a disorder of damage to the peripheral nerves (sensorimotor) resulting in sensory disturbances, especially in the lower extremities. According to Oktaviah (2014) complications of DM neuropathy, which can cause diabetic patients to experience decreased sensitivity. Common symptoms of peripheral neuropathy are distal paresthesias, pain like pain or burning, stabbing, lack of protective sensation, and cold feet. The occurrence of peripheral neuropathy puts DM patients at risk for injury to the peripheral area. The most frequent result is the occurrence of gangrene ulcers on the feet due to trauma due to the process of peripheral neuropathy (Setiawan et al., 2019). Diabetes mellitus is the leading cause of non-traumatic lower extremity amputations in the United States. As many as 50% of amputations in the United States are due to diabetes. Based on the results of the study, about 60.3% of people who experience DM and complications of sensory neuropathy will cause disturbances in the sensation of vibration, pain, cramps, tingling, numbness, internal stimulation or temperature, and loss of tendon reflexes in the feet that will cause disturbances. a protective mechanism in the feet (Silalahi et al., 2015). According to WHO (World Health Organization) in 2016, high blood sugar exceeding the limit resulted in 2.2 million deaths, by increasing the risk of cardiovascular and other diseases. According to data from the International Diabetes Federation (IDF) in 2013 it was estimated that there were 382 million people with diabetes mellitus and it is estimated that this will increase to 592 million people in 2035. The results to Riskesdas (2018) the prevalence of DM in Indonesia is around 1,017,290 people (1.5%). High blood sugar levels for a long time will damage the peripheral nerve vessels so that the process of sending signals between the central nervous system and the peripheral nervous system is disrupted. This disorder is called diabetic peripheral neuropathy and almost 30% of DM patients experience neuropathy (Pranata, 2017; Prasetyo & Aetyaningsih, 2011).

Blood sugar levels cause the accumulation of glucose in the nerves. This accumulation causes nerve cell edema and triggers the stimulation of various enzymes that can damage nerve cells through both metabolic and neurovascular factors. Metabolic disorders stimulated by the accumulation of sorbitol and fructose can damage nerve cells. Neurovascular disorders will disrupt the supply of blood and oxygen to nerve cells (Subekti, 2009). The impact of a decrease in foot sensitivity to loss of protective sensation makes it vulnerable to injury to the

feet without realizing it. Diabetic foot ulcers if not treated properly can lead to diabetic foot ulcers and tissue necrosis that can lead to amputation.

One alternative to prevent complications of diabetic neuropathy is by doing activities and exercises such as foot gymnastics and foot SPA. According to Puspita (2019), diabetic foot exercise is an activity or exercise carried out by patients with diabetes mellitus to prevent injuries and help improve blood circulation in the legs. When doing leg exercises, blood vessels will dilate, making blood flow to the legs smooth so that nutrients and oxygen can meet the needs of the feet (Amin & Doupis, 2016). The results of research conducted by Ningrum et al., (2020) that the implementation of foot exercises can provide effective results in increasing foot sensitivity in diabetes mellitus patients who experience decreased foot sensitivity after regular foot exercises. In addition, leg exercises can also affect the decrease in blood sugar levels at any time. According to research conducted by Sukarja et al, (2017) this study found that between foot SPA and gymnastics together can increase foot sensation. Foot SPA which includes soaking, massage and foot exercises affects peripheral circulation. Foot massage can affect endorphins that reduce pain and increase excitement. Endorphins cause vasodilation of blood vessels so that they can increase blood circulation (Rahmi, 2017).

Thus, foot exercise therapy and foot SPA will be effective and beneficial for the feet. Feet get oxygen supply, complaints of tingling and numbness decreased, thereby increasing the sensitivity of the feet of DM patients and minimizing the risk of foot injuries. Based on the explanation that has been presented, the authors are interested in reviewing some of the literature or doing a summary of related literature on foot exercises and diabetic foot SPA on the sensitivity of the feet of patients with diabetes mellitus.

METHODS

This study uses the literature review method, which is an overall summary of various research studies that are determined based on a certain topic and time limit. This research is limited to the last 5 years (2015-2020). The data source used is secondary data in the form of journal articles according to the specified theme. Journal sources used are Google scholar, Garuda Portal, Proquest, and PubMed accessed online

Journal searches use keywords and boolean operators (AND, OR NOT or AND NOT) to broaden or specify searches. Search strategy by entering keywords, namely: “Pengaruh OR *Influence* OR *Effect* AND Senam Kaki OR *Foot exercise* OR *diabetic foot exercise* OR *foot ankle exercise* AND Sensitivitas kaki OR *foot sensitivity* OR *diabetic ptheriperal neuropathy* AND Diabetes melitus OR *Diabetic*” atau “Pengaruh OR *Influence* OR *Effect* AND SPA Kaki OR *Foot SPA Therapy* OR *Foot massage* OR *Foot bath* AND Sensitivitas kaki OR *foot sensitivity* OR *diabetic ptheriperal neuropathy* AND Diabetes melitus OR *Diabetic*” atau “Pengaruh OR *Influence* OR *Effect* AND Senam Kaki OR *Foot exercise* OR *diabetic foot exercise* OR *foot ankle exercise* AND SPA Kaki OR *Foot SPA Therapy* OR *Foot massage* OR *Foot bath* AND Sensitivitas kaki OR *foot sensitivity* OR *diabetic ptheriperal neuropathy* AND Diabetes melitus OR *Diabetic*”.

The process of collecting literature review data. Based on the results of a literature search through 4 databases using predetermined keywords, the researchers found 1197 articles that matched the keywords. The search results were then checked for duplication, there were 11 similar articles that were removed and 1186 articles were left. Then screening was carried out based on the title (n=87), abstract (n=34), and full text (n=14) which was adjusted to the theme of the literature review. The assessment carried out based on the feasibility of the inclusion and exclusion criteria obtained as many as 14 articles that can be used in the literature review. The articles obtained were then analyzed and synthesized and then summarized in a literature summary table.

RESULTS

Study Characteristics

Fourteen articles that were eligible and met the inclusion criteria were divided into 2 sub-topics, namely the impact of foot exercise on foot sensitivity of DM patients (8 articles) and foot SPA on foot sensitivity of DM patients (6 articles). Most of them used a quasi-experimental method (64%), randomized control trial (29%), and pre-experimental (7%).

The research article also uses a pre-post test design approach. The average number is >30 people. Studies that are in accordance with this literature review were carried out on average in Indonesia, 10 studies, 2 studies in Brazil, and 1 study in Myanmar.

Characteristics of the Study of Diabetes Mellitus Patients.

The characteristics of the study patients in the study were all people who had DM in each country. The average age is 40-70 years and is multi-regional. Gender characteristics of most people who experience DM are women. Another characteristic is the duration of being diagnosed with diabetes. The results of various studies, one of which is a study from Sukartini et al, (2020) showed that the duration of being diagnosed with diabetes was <5 years (39%), 5-10 years (25%) and >10 years (36%). In addition, Hastuti & Rinawati's research (2020)

shows results for <5 years (66%), 6-10 years (28%), 11-15 years (4%), and 16-20 years (2%). So the average duration of being diagnosed with DM is < 5 years, causing diabetic neuropathy.

Leg Gymnastics

Based on 8 research articles that discuss foot exercises, it shows that there is a good impact on foot sensitivity as evidenced by the several research articles above showing the results of the significance of $p < 0.05$

Foot SPA.

Based on 6 research articles discussing foot SPA, the results showed a significant impact on the foot sensitivity of DM patients as evidenced from several research articles above showing significant results of $p < 0.05$

DISCUSSION

Based on the results of a literature review conducted by researchers, it is generally explained that foot exercise therapy and foot SPA can increase foot sensitivity and reduce complaints due to peripheral neuropathy in DM patients. This is supported by the results of the analysis of the fourteen research articles which prove that after the intervention of foot exercise and foot SPA, as well as measurements using various instruments to measure the sensitivity level of the feet of DM patients, the results showed that there was a better chance after foot exercise and foot SPA.

Based on the results of the analysis of fourteen articles, it was found that patients with DM were on average 40-70 years old. DM can affect anyone, even those in productive age who are at risk of getting it. This disease is often diagnosed in people aged > 40 years. As we age, cells become more insulin resistant, decreasing their ability to metabolize glucose. Furthermore, insulin secretion from pancreatic cells is decreased and inhibited (Andrews et al., 2005). With increasing age, the quality of blood vessels will decrease causing blood circulation to decrease or be disrupted which has an impact on the risk of decreased sensitivity in the feet.

In general, DM patients in the study in the articles obtained were most often female. The results of the research by Hastuti & Rinawati, (2020) showed that 66% of the 50 people were female. The female gender is at risk of developing DM disease associated with a large BMI and menstrual cycle syndrome during menopause which results in the accumulation of fat which results in inhibition of glucose transport into cells (Trisnawati SK & Setyorogo S, 2013). Hormonal changes will easily occur when menopause causes unstable blood sugar levels. So women have to control their blood sugar better and maintain a healthier lifestyle.

Another factor is the duration of diagnosis of DM. The results of the study (Sukartini et al., 2020) showed that the average duration of being diagnosed with DM was <5 years (39%). In addition, other research results from Hastuti & Rinawati, (2020) show that the average length of time being diagnosed with DM is <5 years (66%). According to research by Loughlin, D.T, & Artlett, (2009) in Suyanto & Susanto, (2016) prolonged hyperglycemia results in a non-enzymatic Maillard reaction glycosylation reaction between protein and reactive carbonyl and dicarbonyl compounds. The degradation of protein glycosylation results in the formation of -dicarbonyl, 3-deoxyglucosone (3DG), which then forms advanced glycation end products (AGEs), causing peripheral neuropathy. Decreased pancreatic B cell function causes insulin disorders and chronic hyperglycemic conditions that damage nerve cells.

Looking at some of the facts above from the various research results, the role of health workers, especially nurses, is very necessary for providing nursing care and providing health education, besides that it is also necessary to provide an intervention that can help DM patients to avoid complications, one of which is diabetic foot. which begins with decreased sensitivity to stimuli or peripheral neuropathy. Given that diabetes mellitus is a chronic disease, the main way is to control both the pharmacological and non-pharmacological aspects. One of the non-pharmacological therapies to overcome the loss of foot sensitivity is diabetic foot exercise which aims to improve blood circulation (Sukron & Efraliza, 2021).

Diabetic foot exercise aims to improve blood circulation so that nutrients to the tissue run more smoothly, strengthen small muscles, calf muscles, and thigh muscles, and overcome the limitations of joint motion that are often experienced by people with diabetes mellitus (Wibisono, 2009).

In addition, there are other non-pharmacological therapies, namely diabetic foot SPA. Diabetic foot SPA can improve blood flow and make patients feel comfortable and relaxed (Affiani, Rahmi, and Astuti Puji, 2017). Foot gymnastics and foot SPA are therapies that DM patients can do to prevent complications of diabetic feet.

The Impact of Foot Exercise on Foot Sensitivity in Diabetes Mellitus Patients.

Foot exercise can prevent complications of DM, namely diabetic neuropathy which can lead to diabetic feet. Doing foot exercises regularly can reduce the status of peripheral neuropathy by almost 80% (Embuai, 2020).

Diabetic foot exercises are performed to improve blood circulation, strengthen small muscles, prevent foot deformities, increase calf and thigh muscle strength, and overcome joint motion limitations. The sensitivity of contracting muscle cells to insulin will increase so that high blood glucose levels in the blood vessels can be used by muscle cells as energy (Subekti, 2009; Widiarti, 2010). Decreased blood glucose levels reduce the buildup of glucose in nerve cells thereby increasing circulation and sensitivity of the nerves of the feet.

Foot exercise is done by moving the muscles and joints of the legs. with a duration of 30 minutes and moderate to high-intensity exercise (70% -80% DNM). Leg gymnastics can be done anywhere on a chair in a sitting position and requires a newSPAper for one of the media. The most important thing is that this foot exercise therapy must be done regularly and intensively (at least 3 times a week) (Embuai, 2020; Fadlilah et al., 2019; Embuai et al., 2019; Suhertini & Subandi, 2016; Sukartini et al., 2020).

The technique of doing foot exercises begins with positioning the client to sit upright with feet touching the floor and then moving the toes of both feet up and down, moving the heels to the right and left, rotating the ankles, rotating the heels, lifting and straightening the legs forward and backward and up and down. then straighten one leg and lift it, rotate the ankle to the ankle, all the movements were done for a count of 10 times, then write in the air with the feet from numbers 0 to 9 do it alternately, then put a newSPAper on the floor, form the newSPAper into a ball with both feet, open the ball into a sheet using both feet, then tear part of the newSPAper with both feet, after that transfer the torn newSPAper to the whole paper and wrap it all into a ball shape with both feet (Setyoadi & Kushariyati, 2011). Foot exercises that are done regularly and pay attention to the procedure will give good results in increasing the sensitivity of the feet.

Foot exercise influences neuropathic status. The results showed that doing foot exercises intensively (at least 3 times a week) for 3 months could reduce the risk of peripheral neuropathy (Embuai, 2020). This is in line with the research of Suhertini & Subandi, (2016) that leg exercises are carried out continuously for 8 weeks with a frequency of 3 times/week. Duration for 30 minutes with moderate to high-intensity exercise (70% 80% DNM). Based on the various research results above, although there are differences in the time, duration, and frequency when doing foot exercises, the final results obtained all affect foot sensitivity and peripheral neuropathy scores. Leg gymnastics can be done at any time as desired and adapted to the conditions and abilities of the patient's body with diabetes mellitus, but if it is done with attention to duration and frequency, it will give maximum results.

Based on the results of the 8 articles found, the significant results of each article were $p < 0.05$, which means that there is an effect of foot exercise on foot sensitivity. In Camalia Suhertini and Subandi's research, (2016) that from the results of the study the average foot sensation value of DM patients with diabetic neuropathy in the intervention group before foot exercise was 8.61 and after foot exercise was 5.55, meaning that the foot sensation value of diabetic neuropathy patients decreased by 3,061 point which means that neuropathy complaints have decreased. This study used the Michigan Neuropathy Screening Instrument (MNSI) (W.H Herman, 2014). The MNSI includes two separate assessments of foot sensation and a physical assessment of the foot. If the foot sensation value is 7 then it is considered neuropathy and if the foot physical assessment value is 2.5 (W.H Herman, 2014).

Therefore, foot exercise is one of the preventions of peripheral neuropathy. When doing leg exercises the body will experience an increase in metabolism. The accumulation of sugar in the blood and nerve fibers is processed into energy to meet metabolism so that blood flow will be smooth and increase the sensation of the feet of DM patients. So it can be said that there is an impact of foot exercise on the sensitivity of the feet of patients with diabetes mellitus.

Impact of Foot SPA on Foot Sensitivity of Diabetics Mellitus Patients

Foot SPA is one of the therapies to prevent complications in DM patients. Diabetic foot SPA affects peripheral circulation to reduce complaints of diabetic neuropathy (Hastuti & Rinawati, 2020). This SPA is also beneficial for all parts of the foot, it will get an adequate supply of oxygen, so the tingling and numbness which are signs and symptoms of diabetic neuropathy will decrease or decrease (Priyanto, 2012). Performing foot SPA is expected to increase foot sensitivity and prevent complications of diabetes mellitus, namely diabetic foot ulcers.

Diabetic foot SPA consists of soaking with saltwater and massaging the feet. Then on the last day after giving the action, the researcher re-measured the patient's peripheral neuropathy and compared it with the pretest (Hastuti & Rinawati, 2020). A foot SPA is a foot treatment in the form of cleansing and massage with warm water which usually uses a special salt mixture for foot SPAs. The diabetic foot SPA consists of various activities, namely diabetic foot exercises before the foot SPA, skin cleansing, which is cleansing using a soft and mild baby bath soap, pedicure, which is cutting and scraping nails if you have long nails, foot mask, which is the act of giving body scrubs. to clean dead skin cells, but this action is not carried out every day so that the skin layer does not get thinner, and finally, foot massage, which is a superficial massage of the feet to increase blood circulation (Affiani, 2017).

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This is the same as according to Budi Purwanto, (2014) that foot SPA includes activities such as diabetic exercise before entering the foot SPA stage. After that, enter the foot SPA stage, namely skin cleansing (cleansing), pedicure (cutting and trimming toenails), monofilament test (diabetic neuropathy examination), natural vaporizer (softening dead skin cells), foot mask, exfoliation (exfoliating dead skin cells), foot massage (foot massage). These activities cause vasodilation of blood vessels so that they can increase blood flow and improve foot sensation. Foot SPA which is carried out by paying attention to techniques and procedures and is carried out regularly will give better results in increasing foot sensitivity and reducing complaints of peripheral neuropathy.

Diabetic foot SPA intervention given to patients once a week for 4 weeks can reduce complaints of peripheral neuropathy and increase foot sensitivity (Hastuti & Rinawati, 2020). In addition, research from Wardani, Zahroh, et al., (2019) performed 2x/week for 4 weeks had a significant effect in reducing complaints of peripheral neuropathy. This diabetic foot SPA was performed for ± 30 minutes for 5 consecutive days showing an increase in blood circulation. Besides being able to improve blood flow, it also makes patients feel comfortable and relaxed (Affiani & Astuti, 2017). Based on some of the studies above, although there are differences in duration and frequency, the result of all of them is the same effect on foot sensitivity and reduces complaints of peripheral neuropathy. But it is better if you pay attention to the use of time according to the duration and frequency, the more often and routinely you will get maximum results.

Based on 6 articles that were found to be related to foot SPA on foot sensitivity, the significant result of each article was $p = 0.000$, which means that there was an effect of foot SPA on foot sensitivity. In the study (Wardani, Wijayanti, et al., 2019) that foot SPA can increase foot sensitivity, it was proven in the intervention group before foot SPA the average foot sensitivity value was 2.70 after foot SPA there was an increase to 2.77 with a significant $p = 0.00$ which means that there is an effect of foot SPA on foot sensitivity. Foot SPA which includes soaking, massage, and foot exercises directly affects peripheral circulation. Foot massage or foot massage can affect the hormone endorphins, reduce pain and increase excitement. Endorphins cause vasodilation of blood vessels so that they can increase blood circulation (Sukarja et al., 2017).

Diabetic foot SPA is a step to prevent gangrene wound complications because when doing foot SPA there are a series of activities such as cleaning and cutting nails which aims to prevent nails from getting too long and going in so that they can injure the feet. Foot massage activity that connects to the pancreas organ and stimulates the pancreas to produce insulin and makes blood vessels vasodilate, peripheral blood circulation becomes smooth. So it can be said that there is an impact of foot SPA on the foot sensitivity of diabetic patients.

CONCLUSION

There is a good impact of foot exercise on the sensitivity of the feet of DM patients so that it can prevent complications in DM patients, namely diabetic feet which start from a decrease in foot sensitivity. There is a good impact of foot SPA on the foot sensitivity of DM patients, it is found that patients who are given diabetic foot SPA increase the sensitivity of the feet to minimize the risk of foot injuries that lead to gangrene.

It is hoped that this literature review can be used as a basis for nursing interventions and can provide information both for the development of further research or for the community, especially foot SPA not many are familiar with a foot SPA. It is hoped that foot SPA will be widely implemented and introduced to DM patients, not only SPA for beauty but SPA for health and foot care as an effort to prevent diabetic feet. So this foot exercise therapy and foot SPA are expected to be an intervention for the prevention of diabetic foot in patients with diabetes mellitus.

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The Effect Of Basic Life Support Health Education In First Aid Accident In Public Senior High School 3 Sidoarjo

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ABSTRACT

Introduction: Basic life support is the action taken by the whole community to help victims who are in a state of threat. Low levels of students' knowledge related to Basic Life Support have an impact on the emergence of forms of prosocial attitudes and behaviors such as helping. This research aims to find out the influence of health education about basic life support on the act of first aid accidents in the cognitive, affective, and psychomotor realms in the Senior High School 3 Sidoarjo. **Methods:** The type of research used is a one-group pre-post test design. The research population is class X and XI students who are active in the pmr organization of Senior High School 3 Sidoarjo as many as 33 people. Sampling using probability technique: simple random sampling with a sample of 30 people. The data is analyzed with a software application using Wilcoxon test with $\alpha=0,05$. **Result:** Statistical tests show that there is a significant influence between basic life-support health education and first aid action in school environments (p-value 0.000). **Conclusion:** The increasing the level of knowledge of students, the more affective and psychomotor levels of students, so that the action of first aid accidents in the school environment the better. **Recommendation:** It is expected that the school will always do health education periodically to improve students' ability regarding basic life assistance so that there is an increase in performing first aid accidents in the school environment.

Keywords: Health Education, Basic Life Support, First Aid

INTRODUCTION

Traffic accidents are a public health problem that is included in non-communicable diseases. According to Law No.22 of 2009 on Traffic and Road Transport, a traffic accident is an unexpected and accidental road event involving a vehicle with or without other road riders resulting in human and/or property casualties. The increase in the number of motorcycle vehicles has the highest number of increases. The main cause of traffic accidents based on Haddon's Matrix consists of three factors, namely human factors, environmental factors, and vehicle factors that are divided into three stages, namely in the pre-crash stage, the stage of the accident, and post-accident (Soffania, 2019). Accidents happen all the time and for some age groups are the single leading cause of death (Annas, 2016). Traffic accidents for young people, who drive vehicles quickly. Aggressive driving behavior is an act intentionally committed in driving that tends to increase the risk of traffic accidents motivated by impatience, annoyance, hostility, and/or attempts to save time (Soffania, 2019). Factors that influence aggressive driving habits are age, which is high mostly involving male drivers between the ages of 17-35 years and while women show lower levels of aggressive driving habits, driving skills can be demonstrated by a driver's experience in driving and driver's license ownership (Soffania, 2019). Adolescence that lasts between the ages of 10-19 years where at that age does not have a driver's license. So they tend to drive at unstable speeds and make movements that endanger other drivers. The Global Status Report on Road Safety (WHO, 2015) states that every year, worldwide, more than 1.25 million victims die from traffic accidents and 50 million people are seriously injured. Of these, 90% occur in developing countries. (World Health Organization 2015 in KOMINFO 2017). In Indonesia, motorcycle accidents are the largest contributor to traffic accidents. Korlantas Polri statistics show that motorcycles are the largest contributor to traffic accidents in the two quarters of the period at the end of 2016 and the beginning of 2017, which was 63,251 incidents. In Indonesia, the most traffic accidents occurred between the ages of 15-19 years with a figure of 4414 people in 2017 (Korlantas Polri, 2017 in Soffania, 2019). Adolescence is a transition from childhood to adulthood that lasts between the ages of 10-19 years. Especially at this age, which is the transition period experienced by students will affect the mindset, attitudes and behavior patterns. A student will tend to search for themselves.

Sidoarjo Regency is the region with the second highest accident rate in East Java after Kediri regency with an incident rate of 1287 victims (Central Statistics Agency, 2013 in Soffania, 2019). Basic life support is

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an action taken to help victims who are in a state of threat (East Java PPNI Training, 2016 in Wulandari, 2016). Basic Life Support is an emergency measure to free the airway, aid breathing and maintain blood circulation without the use of aids. This help must be given quickly and appropriately, because incorrect handling can be bad, disability and even death in accident victims (PUSBANKES 118 DIY 2014 in Annas, 2016). Basic Life Support is one of the efforts that must be done immediately by someone if they find a victim in need therefore, every health worker must master basic life support (Keenan, Lamcraft Joubert, 2009). Based on the results of a survey of researchers to the trustees of the extracurricular organization PMR Senior High School 3 Sidoarjo, it was found that most members of the organization did not have the courage to perform first aid when outside the organization's duties or outside of school. This is because they are rarely trained overall on Basic Life Support first aid, so they do not have enough knowledge and courage to provide assistance both in school and outside of school. And few members are routinely trained on Basic Life Support first aid due to race events. Basic life-aid knowledge can shape attitudes or helpful behaviors for students. According to research Dhikloni Purba (2019), after interviewing students of the teenage red cross (PMR) Health Vocational High School Wira Husada Medan about basic life support knowledge there are some people who do not know about providing basic life support to others. And according to Utami's research (2009) often adolescents are less concerned and understand when they need Basic Life Support training or also called first aid, when they need it when they become part of a socially responsible society. Still low levels of knowledge of students related to basic life support have an impact on the emergence of forms of prosocial attitudes and behavior towards those around them. The first hour is a very important time in the rescue of accident victims, which can reduce up to 85% of the death rate. The help referred to here is basic life support (Pamaya 2014 in Ambarwati 2015). Based on the description above, researchers are interested in finding out about the influence of Basic Life Support health education on accident first aid actions in the cognitive, affective, and psychomotor realms in the Senior High School 3 Sidoarjo.

METHODS

The design used in this study is pre-experimental with this type of research that is one-group pre-post test design. One group pre-post test design is a study involving one group of subjects, which is then observed before intervention, then observed again after being given intervention. The population in this study was students of grades X and XI at Senior High School 3 Sidoarjo who were active in PMR organizations, with a population of 33 people with a large sample of 30 people who had met the inclusion criteria. Sampling technique using probability sampling is simple random sampling which is each element selected randomly with independent variables, namely health education with basic life support and dependent variables that are students' ability in accident first aid. How to collect data using questionnaires on basic life support as well as demonstration videos. How to collect data using questionnaires on basic life support as well as demonstration videos. Data is collected through Google's online application forms and virtual interviews through software applications.

RESULTS

General Data

Table 1. Identification of gender, age, previous Basic Life Support training experience, and experience performing accident First Aid on Senior High School 3 Sidoarjo students in April 2021

Characteristics	Criterion	Frequency (f)	Percentage (%)
Gender	Girl	28	93,7
	Boy	2	6,3
Total		30	100
Grade	X	17	56,7
	XI	13	43,3
Total		30	100
Have Received Basic Life Support Education	Once	3	10

	Never	27	90
Total		30	100
Have Done First Aid Act	Once	2	6,3
	Never	28	93,7
Total		30	100

Table 1 shows that of the female sexes there are 2 people or 6.3% of the male sex, and 28 or 93.7% are female from 30 students who are active in the pmr organization of State High School 3 Sidoarjo. From. Then of the 30 students of class X and XI of which 17 people or 56.7% are students of class X and 13 people or 43.3% are students of class XI. From the data obtained is in accordance with the criteria of inclusion of researchers. Students who get basic life support health education as many as 3 people or 10% of 30 students and while students who have done first aid accidents are 2 people or 6.3% of 30 students.

Special Data

Table 2. First aid action accident in the environment of Senior High School 3 Sidoarjo in the cognitive realm before and after being given basic life support health education in April 2021

Cognitive	Pre Test		Post Test	
	Frequency	(%)	Frequency	(%)
Good	14	46,7	28	93,3
Enough	16	53,3	2	6,7
Not Enough	0	0	0	0
Total	30	100	30	100

Based on table 2, cognitive levels are known in performing accident first aid measures in the Sidoarjo State High School environment. In the pre-test cognitive realm it was found that 14 students or 46.7% had a level of knowledge "Good" and as many as 16 students or 53.3% had a level of knowledge "Enough" and no students who had a level of cognitive "Less". In the post test cognitive realm it was found that 28 or 93.3% of students had a level of knowledge "Good" and 2 or 6.7% of students had a level of knowledge "Enough" and no student has a level of cognitive that is "Lacking".

Table 3. Emergency first aid measures in the Senior High School 3 Sidoarjo environment in the affective realm before and after being given basic life support health education in April 2021

Affective	Pre Test		Post Test	
	Frequency	(%)	Frequency	(%)
Positive	30	100	30	100
Negative	0	0	0	0
	Frequency	(%)	Frequency	(%)
Total	30	100	30	100

Based on table 3, it is known that the affective students in performing first aid actions in accidents in the environment of Senior High School 3 Sidoarjo. In the pre-test of the affective realm it was found that 30 students or all students had a level of "Positive" attitude and no students had a level of attitude that was "Negative". In the post test of the affective realm it was found that 30 or all students had a "Positive" attitude and no student had a level of attitude that was "Negative".

Table 4. First aid action accident in the environment of Senior High School 3 Sidoarjo in the psychomotor realm before and after being given basic life support health education in April 2021

Psychomotor	Pre Test		Post Test	
	Frequency	(%)	Frequency	(%)
Good	7	23,3	23	76,7
Enough	22	73,4	7	23,3
Not Enough	1	3,3	0	0
Total	30	100	30	100

Based on table 4, the psychomotor level of students in performing first aid actions in accidents in the environment of Sidoarjo State High School. Pre-tests in the psychomotor realm found that 7 or 23.2% of

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students had a "Good" level of action, and 22 or 73.4% of students had a "Sufficient" level of action, and 1 or 3.3% of students had "Less" actions. In the post test in the psychomotor realm it was found that 23 or 76.7% of students had a "Good" level of action and 7 or 23.3% of students had a "Sufficient" level of action and none of the students had a "Less" psychomotor level.

Table 5. The effect of basic life support health education on accident first aid measures in the Senior High School 3 Sidoarjo environment in April 2021

Before			After		Sig	α
Cognitive	Frequency	(%)	Frequency	(%)		
Good	14	46,7	28	93,3	0,000	0,05
Enough	16	53,3	2	6,7		
Not Enough	0	0	0	0		
Total	30	100	30	100		
Affective						
Positive	30	100	30	100	0,001	0,05
Negative	0	0	0	0		
Total	30	100	30	100		
Psychomotor						
Good	7	23,3	23	76,7	0,000	0,05
Enough	22	73,4	7	23,3		
Not Enough	1	3,3	0	0		
Total	30	100	30	100		

Table 5. The effect of basic life-support health education on accident first aid measures in high school environments Based on table 5. It is known the results of the test of the effect of basic life support health education on the actions of students in performing accident first aid actions in the Senior High School 3 Sidoarjo environment. Before the data test, the data that has been obtained first is carried out a normality test. Normality tests in the cognitive, affective, and psychomotor realms are obtained sig < α 0.05, so that data in the cognitive, affective, and psychomotor fields are distributed abnormally so that the data test used is the Wilcoxon test. Based on the data test conducted, there was an influence of health education on the first aid action of accidents in the Sidoarjo State High School environment. Students' cognitive, affective, and psychomotor abilities gained improvement or influence after being given health education on basic life support. Evidenced by the results of the Wilcoxon test with a sig (2-tailed) value of < α 0.05 so that the conclusion of the test result is H0 rejected or can be interpreted that there is a difference or influence of health education about basic life support on accident first aid measures in the Senior High School 3 Sidoarjo.

DISCUSSION

1. First Aid Action Accident In The Environment of Senior High School 3 Sidoarjo in the Cognitive Realm Before And After Being Given Basic Life Support Health Education.

Based on the results of this study it was found that in the cognitive realm / level of ability of state high school PMR members 3 Sidoarjo about the act of first aid before being given basic life support health education is a small percentage have a good level of knowledge and most have a sufficient level of cognitive and no student has a lack of cognitive level. After being given health education is all students have a good cognitive level and a small percentage have a sufficient level of knowledge and no student has a lack of cognitive level. Students who have ever received basic life support health education have a level of knowledge that is not much different from students who have never received basic life support health education. The results of data obtained by online interviews, obtained the results that before being given health education about basic life assistance some students do not understand at all about the series of basic life support measures so that basic life support health education makes students understand and understand the series of basic life support measures of petama classification. Knowledge is the result of human sensing or the result of knowing a person to objects through the senses they have (eyes, nose, ears, etc.), so that by itself at the time of sensing produces knowledge is greatly influenced by the intensity of attention and perception of the object (Notoatmodjo, 2014). According to Benjamin, S. Bloom 1956 in Indrayani 2014, basically cognitive is the intellectual ability of students in thinking, knowing, and solving problems and

related to thinking skills, including the ability to memorize, understand, apply, analyze, mensistesis, and the ability to evaluate. Another factor that leads to an increase in a student's level of knowledge of basic life support is the curiosity of students. According to Benjamin, S. Bloom 1956 in Indrayani 2014, basically cognitive is the intellectual ability of students in thinking, knowing, and solving problems and related to thinking skills, including the ability to memorize, understand, apply, analyze, mensistesis, and the ability to evaluate. Another factor that leads to an increase in a student's level of knowledge of basic life support is the curiosity of students.

2. First Aid Action Accident In The Environment of Senior High School 3 Sidoarjo in the Affective Realm Before And After Being Given Basic Life Support Health Education.

Based on the results of this study in the affective realm / attitude of students of PMR Sma Negeri 3 Sidoarjo about the act of first aid before and after being given basic life support health education is obtained that all students have a positive attitude and no student has a negative attitude. There is no improvement in the affective realm of students both before and after being given health education on basic life support. Cognitive levels or knowledge levels that increase after the granting of health education have an effect on students' attitudes in first aid actions. Attitude is also a person's closed response to a particular stimulus or object, which already involves the opinion and emotion factors concerned (Notoatmodjo, 2014). Basically the affective realm is a realm related to attitudes and values and some experts say that a person's attitude can be predicted changes when one has high cognitive power. Based on the results of research that has been done, that there is no difference in the attitude of students before and after being given health education about basic life support because students have become accustomed to acting to perform first aid on victims of fainting in school. Because of this, students are trained in behaving and increasingly positive levels of student attitudes when knowledge increases and they understand well.

3. First Aid Action Accident In The Environment of Senior High School 3 Sidoarjo in the Psychomotor Realm Before And After Being Given Basic Life Support Health Education.

Based on the results of research on the realm of psychomotor / skill levels of students of PMR State High School 3 Sidoarjo about the act of first aid before being given basic life support health education obtained that a small percentage of students have a good psychomotor level, and most students have a sufficient psychomotor level, and very few students have a less psychomotor level. While after being given basic life support health education is all students have a good psychomotor level and a small percentage of students have adequate psychomotor levels. In accordance with the results of the study obtained results that, students who have done first aid actions have a psychomotor level that is not much different from students who have never done first aid. The psychomotor realm is the ability produced by human motor function in the form of skills to do something and the skill of doing something includes motor skills, intellectual skills, and social skills. Based on the results of research that has been conducted, according to researchers psychomotor improvement students are also influenced by student curiosity as well as students' interest in appropriate first aid actions. So that students find out about first aid actions by understanding basic life support theories and observing demonstration videos provided, so that students can perform appropriate first aid actions.

4. Effect of Basic Life Support Health Education on Accident First Aid Action In Senior High School 3 Sidoarjo Environment.

In accordance with research conducted by researchers, it was obtained that there is an influence of health education about basic life support on accident first aid measures in the Sidoarjo State High School environment. Students' cognitive, affective, and psychomotor abilities gained improvement or influence after being given health education on basic life support. Evidenced by the many positive improvements between before and after the grant of health education, as well as the results of the Wilcoxon test with a sig (2-tailed) value of $< \alpha 0.05$ so that the conclusion of the test results is that H_0 is rejected or the hypothesis is accepted that there is an influence of health education about basic life support on the first aid action of accidents in the Sidoarjo State High School environment. Health education is very influential on the formation of better knowledge, attitudes and skills of students. Students' attitudes and skills are further improved through response and participation in following the provision of health education, curiosity and learning intentions shown by students. Knowledge should also be followed by good attitudes and skills because from education we can form good attitudes and skills. Researchers assume that to convey material about basic life support by using methods that practice or demonstrate to students is considered more appropriate to use because in addition to students getting information, students also get an idea of the right first aid techniques that can be applied when performing accident first aid actions.

CONCLUSION

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Based on the objectives, results of research, and discussions conducted by researchers, it can be concluded as follows:

1. The level of knowledge of students in the cognitive, affective, and psychomotor realms before being given health education about basic life assistance to first aid accidents in the state high school environment 3 Sidoarjo mostly have sufficient knowledge.
2. Students' level of knowledge in the cognitive, affective, and psychomotor realms after being given health education on basic life support to accident first aid in the Senior High School 3 Sidoarjo environment is mostly well informed.
3. The increasing the level of knowledge of students, the more affective and psychomotor levels of students, so that the action of first aid accidents in the school environment the better.

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BULLYING BEHAVIOR AMONG PRIMARY SCHOOL STUDENTS

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ABSTRACT

Bullying has been recognized as a trigger for health problems for school-age children, especially children at the primary school level, as they are associated with a range of adjustment issues including poor mental health and bullying. There are four forms of bullying: physical, verbal, relational, and cyberbullying. This study aims to identify bullying behavior in grade IV and V students at SDN Jatirejo. The research design used is a descriptive research design with a population of 53 grade IV and V students at SDN Jatirejo. All students were taken as the samples of the study. The data were collected using questionnaires. The data obtained are presented in the form of tables and narratives. The results of the study reveal that 53 (100%) grade IV and V students make bullying to others. It is recorded that as many as 31 (58%) students engage in severe bullying. The study also found that 20 (38%) students experienced severe physical bullying, 26 (49%) severe verbal bullying students, 20 (38%) severe relational bullying, and 24 (45%) experienced cyberbullying. It is concluded that the majority of the students bully other students. It is important to reduce bullying behavior among students by involving parents and schooling a counselor in the school to create an anti-bullying environment. The nurses are encouraged to provide health education about bullying.

Keywords: Bullying, Behavior, Students

INTRODUCTION

Bullying among school-age children in Indonesia is the second place after Japan (Susanti et al., 2018). Bullying is the trigger of health problems among the students due to mental problem adaptation and violence (Rahayu & Permana, 2019). One of the most concerning issues is the violence among school-age students. Bullying may occur in playgrounds where most children spend their time with friends. Kicking, hitting, calling friends with improper names, isolating another student, mocking, and using social media to ridicule friends are the common forms of bullying.

The Indonesian Bureau of Protection of Children (KPAI) claims 369 bullyings were reported in 2014. Between 2011 and 2017, the KPAI received 26,000 cases and 34% of the cases are bullying. In 2018, the KPAI reported 366 (22.4%) bullying cases were filed. Diyantini et al. (2015), found that 71.9% relates to physical bullying, 46.9% were verbal bullying, and 40.6% were linked to relational bullying.

School-age between 6-12 years old is a time of growth and development change resulting from the characters and personalities of children (Diyantini et al., 2015). Rahayu & Permana (2019) There are at least four factors that making children to bullying, such as individual factor, family, environment, and peers. Bullying impacts both the bullies and victims. The bullies tend to be temperamental and feel powerful whereas the victims tend to worry, be depressed, and lead to suicide.

Parents, school counselors, and the environment play an important role to cut off bullying habits among children by providing health education for the children. Parents can be role models for their children through behavior that children may imitate. School counselors are responsible to provide counseling and the enforcement of all school rules about anti-bullying behavior. The environment is essential to prevent bullying by providing a positive supportive environment by modifying the environment, stand fairness within the community.

A nurse can provide health education to reduce bullying activities. Various methods such as discussion, lecture, and distribution of leaflets about anti-bullying would be beneficial. Health education is important to socialize the implication of bullying, especially for school-age children.

METHODS

The study uses a case study approach with a descriptive design. The population of the study includes 53 Year IV and V SDN Jatirejo and all of them were selected as the participants. The variable is bullying behavior. Research permission was granted from the school principal. The data were collected using questioners. The data were analyzed, edited, scored, and tabulated. The data were presented in frequency distribution tables and descriptively described. The respondents were also informed consent, confidentiality is managed and respondents will appear anonym.

RESULTS

Table 1 The Age of the Year IV & V Students in Bullying Behavior Among Primary School Students During March 2021

Age	Frequency	Percentage (%)
9 Years Old	2	4
10 Years Old	24	45
11 Years Old	27	51
Total	53	100

Table 1 shows that of the 53 students, the age of bullying behavior at SDN Jatirejo Wonoasri Madiun is mostly 11 years old with 27 students (51%).

Table 2 The Sex of Year IV and V of the Year IV & V Students in Bullying Behavior Among Primary School Students During March 2021

Gender	Frequency	Percentage (%)
Males	24	45
Females	29	55
Total	53	100

Table 2 shows that from a total of 53 students, the majority of students' gender bullying behavior at SDN Jatirejo Wonoasri Madiun was female, as many as 29 students (55%).

Table 3 The Bullying Behavior of the Year IV & V Students in Bullying Behavior Among Primary School Students During March 2021

Bullying Behavior	Frequency	Percentage (%)
Mild Bullying	3	6
Moderate Bullying	19	36
Severe Bullying	31	58
Total	53	100

Table 3 shows that out of a total of 53 students, all students were bullying. Bullying behavior At SDN Jatirejo Wonoasri Madiun mostly with severe bullying category as many as 31 students (58%).

Table 4 Physical Bullying Behavior of the Year IV & V Students in Bullying Behavior Among Primary School Students During March 2021

Physical Bullying	Frequency	Percentage (%)
Mild Bullying	15	28
Moderate Bullying	18	34
Severe Bullying	20	38
Total	53	100

Table 4 shows that from a total of 53 students, all students did physical bullying. Physical bullying behavior At SDN Jatirejo Wonoasri Madiun mostly with the heavy category as many as 20 students (38%).

Table 5 Verbal Bullying Behavior of the Year IV & V Students in Bullying Behavior Among Primary School Students During March 2021

Verbal Bullying	Frequency	Percentage (%)
Mild Bullying	11	21
Moderate Bullying	16	30
Severe Bullying	26	49
Total	53	100

Table 5 shows that from a total of 53 students, all students did verbal bullying. Verbal bullying behavior At SDN Jatirejo Wonoasri, Madiun, most of the students were in the severe category as many as 26 students (49%).

Table 6 Relational Bullying Behavior of the Year IV & V Students in Bullying Behavior Among Primary School Students During March 2021

Relational bullying	Frequency	Percentage (%)
Mild Bullying	16	30
Moderate Bullying	17	32
Severe Bullying	20	38
Total	53	100

Table 6 shows that from a total of 53 students, all students do relational bullying. Relational bullying behavior At SDN Jatirejo Wonoasri Madiun mostly with heavy category as many as 20 students (38%).

Table 7 Cyber Bullying Behavior of the Year IV & V Students in Bullying Behavior Among Primary School Students During March 2021

Cyber Bullying	Frequency	Percentage (%)
Mild Bullying	18	34
Moderate Bullying	24	45
Severe Bullying	11	21
Total	53	100

Table 7 shows that from a total of 53 students, all students do cyber bullying. Cyber bullying behavior At SDN Jatirejo Wonoasri Madiun mostly with moderate category as many as 24 students (45%).

DISCUSSION

The study reveals that bullying behavior among Year IV and Year V students in SDN Jatirejo tends to practice severe bullying. Bullying occurs when students are unknowledgeable about the negative implication of that behavior to their friends. There are many contributing factors to bullying among children. According to Rahayu & Permana (2019) identifies that family, mass media, peers, and socio-cultural environment are the main causalities of bullying.

A study among 98 primary school students in Depok revealed that 31.8% of students were bullied by their friends (Guna et al. 2019) . The study also found that children age between 9-13 years old admitted to bullying other students.

The study also shows that most students experience severe physical bullying. Physical bullying is the most visible one as physical contact occurs between the bullies and the bullied one. Physical bullying is caused by imitating or replying to bullying among peers. According to Jamil (2019) physical bullying is the most observable one but it is not as severe as other types of bullying. Children who physically bully others frequently tend to be the most trouble makers who accumulate their bullying for criminals.

Furthermore, the study also describes that bullying is a serious problem among students. Similar to physical bullying, verbal harassment also occurs among the students, at the level of a severe one. Verbal bullying is the most frequent and the easiest bullying found that daily found among the students. This kind of bullying is the trigger for other bullying and frequently becomes the starting point of further bullying.

verbal bullying is negative behavior making others uncomfortable and repeatedly occurring through words. Sometimes bullies children are unaware that their words offend other children or their peers (ZAKIYAH et al., 2017).

The study raises another form of bullying in the school, which is relational bullying. It is shown that the students experienced severe relational bullying. The forms of relational bullying are making distance with others, looking at others with hatred. Children who make relational bullying sabotage another social status. They do not aware that placing others improperly within their group is a kind of bullying that may hurt somebody else.

According to ZAKIYAH et al. (2017), relational bullying may take in form of cutting off one's social relations to degrade their self-esteem through ignorance, make distance, and avoiding to contact with someone else.

The development of technology has created another form of bullying, which is cyberbullying. The study found severe cyberbullying among IV and V Years students in SDN Jatirejo. Children have access to a wide range of television programs that exposes hatred, anger, and conflicts. Children are vulnerable to copy such behavior and practiced them to treat their friends (Sari, 2017). Television cinematographic frequently overload with such behaviors as mocking and threatening friends.

CONCLUSION

This study concludes that the possibility of bullying occurs among the students at the school where the study was conducted. Students are vulnerable to become bullies for others and being bullied. The level of bullying is alarming. All kinds of bullying such as physical, verbal, relational, and cyberbullying are considerable at a severe level. Reducing the bullying behavior and impacts of bullying on students is essential to avoid destructive acts of the children. Therefore, schools need to anticipate the bullying behavior by improving the quality of counseling and education about the implication of bullying. Parents need to actively support the school by providing anti-bullying environment within their families.

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Case Study of Verbal Abuse Against Adolescence

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ABSTRACT

Parents may verbally abuse their children accidentally. Verbal violence may lead to psychological disturbance in children. This study aims to identify the verbal abuse among teenagers at SMAN 1 Probolinggo. A descriptive design is adopted for this study. The study variable is verbal abuse and measured using google form. The data were analyzed and presented in a table and narration. The results of the study illustrate that 7 (11%) teenagers sometimes experience verbal violence, 28 (47%) have never experienced such abuse, and 25 (42%) never experience verbal abuse. Even though most children do not experience verbal violence, the case is still persistent in many cases. Parents are advised to avoid verbal abuse to their children.

Keywords : *Verbal abuse, Teenagers*

INTRODUCTION

Verbal abuse or verbal violence is repeatedly use of words to threatening, criticizing, yelling, expelling, and negative labeling for someone. Parents sometimes unaware that they unintentionally abuse their children by verbal violence. Continuing verbal abuse leaves prolong and severe pain for the children.

In Indonesia, it is reported that 1.975 cases of verbal abuse in 2015 and increased to 6.820 in 2016. By sex, 96.22% of girls and 88.65% of boys experience verbal abuse. During School From Home due to Covid-19 Pandemin in 2020, the Wahana Visi Indonesia reported an increase of verbal abuse for 49.2 million (62%) children. In 2006, a survey of violence against women and children by the Board of Statistical Bureau reported that 32.6% of boys and 34.43% of girls in East Java Province suffer from verbal violence. The Centre of Service for the Victims of violence for women and children noted that 44 cases of verbal abuse to children occurred in 2016

One of the contributing factors of verbal abuse is that the parents unaware that they have treated their children wrongly. Sari (2019) found that 18 (48.6%) mothers do not have adequate knowledge about verbal violence, 12 (32.6%) mothers just have moderate knowledge, and only 7 (19%) mothers have good knowledge of the issue. The negative spontaneous response of parents is apparent when they think that their children didn't behave as they wish. Parents are unsupportive and over-judged their children. These behaviors are considered unintentionally verbal abuse of parents against their children.

The external and internal implications of parents' verbal abuse are predictable. Anxiety or worriedness internally impacts verbal abuse (Tamisa, 2016). Pressure may scare the children limiting them to explore their world. Externally, The memory of verbal abuse remains in the mind of the children who experience or eye-witnessing verbal abuse and may practice it in the future. The psychological implications of verbal abuse against children will make them over-sensitive, emotional disorder, aggressiveness, disturbed social relation leading to a sociopath or antisocial personality disorder. Asri Maulida (2017) found that verbal abuse is a serious problem as it causes psychological disturbances such as less confidence, self-isolated, depression, and unwillingness to attend schooling.

Verbal abuse is sometimes perceived as a common thing and unaware by parents. Knowledge and attitude about the implications of verbal violence are poor as it misperceived by many. Abuse or violence is frequently associated with physical rather than psychological. This study is intended to identify the verbal abuse among students in SMAN 1 Probolinggo. The study will contribute to improve understanding about the verbal violence and it consequences for the children.

METHODS

This study adopts the descriptive design focuses on exploring the health phenomenon in society including risk factors without analyzing the cause and effect of the phenomenon (Heriyanto, 2017). The population is 60 of Year 9 students in SMAN 1 Probolinggo. Using judgment sampling procedure, we recruited 60 students to

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participate in the study. The variable is verbal abuse against teenagers. We use Google Forms to collect the data. All personal information of respondents is confidentially protected.

The steps of data analysis including editing, coding, scoring, and tabulation. The scoring system applies the interval formula to identify the class range to determine the category and criteria of verbal abuse. The data were also descriptively analyzed and presented in tables and narration.

RESULTS

The category of data include demographic information of the respondents, such as age (Table 1), sex (Table 2), and verbal abuse (Table 3).

Tabel 1 The age of the respondent in March 2021

Age	Frequency	Percentage (%)
16	8	13
17	52	87
	60	100

Tabel 2 The sex of the respondent in March 2021

Sex	Frequency	Percentage (%)
Male	28	47
Female	32	53
	60	100

Tabel 3 The Incidence of Parent's Verbal Abuse Against Their Children

Verbal Abuse	Frequency	Percentage (%)
Always	0	0
Frequently	0	0
Sometimes	7	11
Rarely	28	47
Never	25	42
Total	60	100

DISCUSSION

The study found that 7 (11%) of the students sometimes experience verbal abuse, 28 (47%) rarely, and 25 (42%) never experience verbal violence. The figures imply that possibility of the children getting oral harassment is minimum. The percentage of children who suffered from verbal viciousness smaller than those who did not experience the problem. However, the figures imply that verbal harassment against children is evident. The violence occurs when the knowledge of parents on the issue is lacking. According Fitriani, Y., Pratiwi, K., & Sutanto (2015), parent's verbal abuse against their children is related to their knowledge, experience, as well as the environment of the children.

A study by Indrayati, N., & Livana (2019) in Ngilir Primary school, Kendal, revealed that 8 out of 61 children (13,1%) snapped out by their parents, calling their children by screaming (47%), parents yelled when talking to their children (21.3%), parents ashamed their children in public using bad utterances (16%), parents did not criticize their children (36%), blaming children as a fool (21%), 36.1% children are not punished for their wrongdoing, and 19.7% parents labeled their children as naughty. Another study Utami, I., Idriansari, A. (2014) by in Indralaya State Primary School showed that 38 (40.2%) mothers comparing their children with other children, 41 (50%) mothers swearing to their children, and 8 (9.8%) mothers shaming their children as a fool. These studies showed that parent's verbal abuse occurs at different ages of the children, including primary school students. The situation is unhelpful for the children as an experience of verbal abuse at an early age may have prolonged negative consequences for the children. School-age children are highly dependent on their parents. Misbehavior of the parents may influence their physical and psychological development and growth. On the other side, 7 (11%) of the children were sometimes verbally abused by their parents. Even though the children were not frequently harassed orally by their parents, the experiences will leave negative marks in their memories that may disturb their psychological and social behavior. This study found that 35.4% of the children were devalued by their parents, over-blaming their children (50.8%), and unfairly treated (41.5%). Verbal

abuse poses a negative impact on children. They may suffer from depression and influence their emotion and psychologic. Being compared to other children may ruin the confidence, lack of sensitivity, growth disturbances, emotional disorder, being aggressive, barriers in social interaction, sociopath, and may trigger suicide (Nazhifah, 2017). Therefore, verbal harassment against children should be stopped to avoid trauma.

CONCLUSION

The study concludes that the possibility of verbal abuse of parents to their children is evident with a small percentage. Even though the verbal abuse percentage is considerably low, it is a still serious problem as it remains for a long time and may become a barrier for emotional, psychological growth and development. Shortly, verbal abuse should be avoided by whosoever since it ruins the future of the children. It is suggested that parents need to behave well to their children by controlling their speaking manner and treating their children fairly.

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Family Social Support To The Girls Experiencing Anxiety During Menarche at Dusun Jombang

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ABSTRACT

Girls may suffer from anxiety during the menarche period. The social support of family to the girls with menarche is essential. The study is intended to identify the family social support to their adolescences with menarche who experience anxiety at Dusun Jombang. It is a descriptive study using a single variable, family social support. The populations are 67 families and 20 among them were chosen as the samples using the purposive procedure. The data analysis includes distribution and descriptive tables in percentage. The results of the study are 9 (45%) provides good emotional social support and 11 (55%) with good instrumental supports. The study summarizes that families provide good social supports to their girls with menarche. It is advised that parents need to maintain their social support to reduce the anxiety of their children.

Keywords: Social Support, Adolescence, Menarche, Anxiety

INTRODUCTION

Family support is essential in health care, especially patient with anxiety. The social support may take the forms of empathy, informative, instrumental, and appraisal support. Social support, both physical and psychological, is important for the girls who suffer from menarche. Young girls are not well prepared to face their menstrual events. The situation is getting worse due to the absence of support from family, poor knowledge of parents to assist their girls, the taboo or feel ashamed to inform their girls about menstruation. Poor social support from family for their teenagers about first menstruation may lead to anxiety. For this reason, parents need to aware the importance of their support to their girls entering menarche period (Sukarni & Wahyu, 2013).

The Indonesian Basic Health Research (Riskesdas, 2013) showed that that 37.5% of Indonesian women experience *menarche* at the age of 13-14 years; 0.1% at age 6-8 years; 19.8% aged 15-16 years and 4.5% aged over 17 years. The age of *menarche* for adolescent girls in Indonesia ranges from 12-14 years. A study at the Darul 'Ulum Jombang Islamic boarding school found that 12 respondents (80%) had experienced *menarche* and 3 respondents (20%) had not experienced *menarche* (Mukhoirotn and Taufik 2016). It also found that 87% of girls with menarche have poor knowledge, 90% fail to receive support from their family, and 90% of them suffer from anxiety and restlessness. They girls argued that they have poor support from their families and limited knowledge to the health problem. A study in Jombang Village revealed that 9 (87.5%) of parents acknowledged that their daughters experienced anxiety during menarche, especially when parents support is absence. It also found that 1 (12.5%) of family reported that their daughter free from anxiety as they fully support her during menarche time.

There are many factors related to the lack of support from parent to their daughters with menarche, such as limited knowledge, feel ashamed to talk about reproductive health, lack of communication, or busy parents. These situations may trigger anxiety during menstruation as it is unpleasant. The implication of lack support from family may make the girls to perceive menarche in negative ways by seeing it as disease. The lack of support may also cause pathological symptoms such as fear, internal conflict, dizziness, nausea, and dysmenorrhea. Lacking on knowledge and social support from family risk girls from Urinary Tract Infection (UTI) and cervical cancer. This of course needs serious attention with parents providing the right information (Mandle and Edelman, 2006 in Isnaeni 2011).

The Law No. 10/1992 outlines the right equality for reproductive health. It is supported by the President Regulation N0. 7/ 2005 about the Medium-Term Development Plan (RPJM) 2005-2009 declares the need to

improve the quality of adolescence reproductive health. The rule requires parents to provide attention and information to their teenager girls about menstruation to avoid potential problems such as menarche. The study aims to identify the social support of family to their children with menarche problems.

METHODS

The study uses a descriptive design. The populations. of the study include 20 parents with teenager girls experience menarche in Dusun Jombang. They are all taken as the sample of the study. A questionnaire is used to collect the data needed. Descriptive analysis is performed and the results are presented in tables frequency distribution. The Head of Jombang Village has granted permission for the research. We guarantee that the identification of respondents is confidential, anonymity, and consent form is provided.

RESULTS

Emotional Support

Table 1. Distribution of Emotional Support to the Girls with Menarche

Emotional Support	Frequency	Percentage (%)
Good	9	45
Enough	4	20
Less	7	35
Total	20	100

Instrumental Support Data

Table 2. Distribution of Instrumental Support to the Girls with Menarche

Instrumental Support	Frequency	Percentage (%)
Good	11	55
Enough	8	40
Less	1	5
Total	20	100

DISCUSSION

Emotional Support

The results show that 9 (45%) families provide emotional support for their daughter who experience menarche. Parents give advice and attention are ways to give emotional support for their daughters by listening their complaints such as dizziness or pain when menarche. Parents provide comfort and emotional support may reduce the negative implication of menarche. According to House in Met (1994), family need to provide emotional support for their daughters with menarche, including empathy, care, and attention to make the comfortable, being loved, and care when facing pressure in their life.

The study reveals that 20% families provide sufficient emotional support while 35% provide less emotional support for their daughters. Girls who have not obtained support their families because they do not get motivation from their families. Emotional support from family is important as it will give positive energy or feeling for the girls. According to Putri (2015) identifies that giving attention and and showing a sense of care and affection for children so that children feel safe, comfortable, and loved.

The Instrumental Support

The study found that 11 (55%) of families provide instrumental support for their children. Making facilities available to support their daughters during menarche is a simple way to support them during the hard time. Providing sanitary napkins, pant liners, and food with high iron contains is important to maintain the health of menarche girls. The provision of materials for menarche is an evident that parents are available to support their girls instrumentally. This important that such support will free the girls from health problems, including pain on lower abdomen. According House in Smet (1994), the instrumental support comes in form of direct provision of facilities and materials to deal with the menarche.

CONCLUSION

Based on the results of research and discussion on Family Social Support for Adolescents Who Experience Anxiety During Menarche in Dusun Jombang, it can be concluded that some families provide good support to young women who experience anxiety during menarche. The forms of support are emotional support and instrumental. The study recommends that the family should provide more support and attention and information to adolescent girls at puberty so that they can face the menarche period and reduce the potential

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health problems such as anxiety and depression. Also, further study is necessary is important to investigate other characteristics dealing with social support for girls who have their menstruation for the first time.

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Family Support to Elders with Gout Arthritis on Obeying Low Purine Diet

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ABSTRACT

Reducing the incidence of gout needs uric acid diet therapy, especially foods containing purins. Obedience to gout diet is a key to recover and family support plays an important role. The study aims to map the family support to the elders with gout arthritis in taking low purin diet at Desa Sidomulyo Kecamatan Megaluh Jombang. Descriptive design applies in this study. The population is 20 families who have elder of their family members suffered from gout arthritis. All population were considered as the study samples. The research variable is family support on low purin diet of elders. The data were collected using questioners. Data analysis process includes editing, coding, scoring, and tabulating. The study found that 8 (40%) families provided good instrumental support, 9 (45%) gave a well informational support, and 12 (60%) provided appraisal support to the elders with gout arthritis to manage their low purine diet compliance. Social support is available for elders with arthritis to maintain the low purine intake. It is concluded that elders with gout obtained a good support from their families.

Keywords: Family support, complainece, low purin diet, elders, Gout Arthritis

INTRODUCTION

Gout occurs when the excessive deposit of uric acid crystal in joints. Consumption of food containing high purins is the contributor of gout. The use of medicine relates of hypertension, diabetes, obesity, hyperlipidemia are the triggers of gout (Wahyuningsih, 2013). Gout is the second health problem after osteoporosis in Indonesia with the rate of 1.6-13.6/100,000 people. The prevalence of gout increases in line with the age of individual (Lumunon, Bidjuni, & Hamel, 2015). In 1986, the incidence of gout is in the fourth place in Java (4.8%) and among villagers (1.7%) (Kanis, Induniasih, & Amigo, 2013). The Health Department of East Java Province reports that 4,027 elders suffer from gout (Wardani, 2015). While the Health Department of Jombang reports that gout is the 7th place gout

(6.28%) in 2014.

Consumption of foods with high purine causes the increase of uric acid in blood which is in turn create gout (Damayanti 2012). Reducing the risk of gout needs uric acid therapy including diet on low purine foods (Krisnatuti, 2006). Purine can be found in most foods with protein. For that reason, it is difficult to avoid foods with protein as we need protein for growth (Almatsier, 2009). Low purines diet is gout care management to reduce the uric acid and reduce weight (Mansjoer, 2000). The gout sufferers need to have adequate food for the illness. Charlis (2009) explains that incomppliance to purine intake among gout patients resulting the inflammation, pain, redness on joints arthritis and paralysis. Kluwer (2011) stresses that the incidence of gout may cause rupture, tophus, kidney stones, hypertension and heart illness.

Diet obedience depends availability foods, and support from surroundings (Sherman *et al.*, 2000). Previous study claimed that poor social support leads to diet obedience (Aggarwal *et al.*, 2010). Family may support patient by providing healthy foods and reducing the intake of unhealthy (Barbiera, Attree, Todd., 2008). Family support is essential for low purine diet Keren (2011) in his study found that patient with gout need adequate support from their family in the form of good nutrition, psychic conditions being ashamed, stigmatized in the society. Family support is important for medication of chronic diseases (Suryaningsih, 2013).

To what extent the family provide social support to the elders with gout in Desa Sidomulyo Kecamatan Megaluh Jombang is unknown. The information the ways elders maintain low purine intake and how their families involve in this process is lacking. The study, therefore, intends to identify the social support of families to the elders with gout regarding the low purine consumption. Due to physical limitation, elder need full support from their families to manage their health and wellbeing.

METHODS

The study adopts descriptive method. It is conducted in Desa Sidomulyo, Sub-District of Megaluh, Jombang. The populations of the study are 20 families with one of their members has the history gout. All population were taken as the samples of the study. The variable is family support to low purine obedience. The data were collected using questioners and analyzed descriptive and presented in table of frequencies

RESULTS

Table 1. The Age of Respondents in February 2021

Age	Frequency	%
10-20	1	5
21-30	9	45
31-40	7	35
41-50	3	15

Table 2. The Sex of the Respondents

Sex	Frequency	%
Male	5	25
Female	15	75

Table 3 Education Level of Respondents

Education	Frequency	%
Primary	1	5
Junior High	4	20
Senior High	9	45
Tertiary	6	30

Table 4. Instrumental Support of Families for Member with Gout Arthritis

Instrumental Support	Frequency	%
Good	8	40
Moderate	5	25
Poor	6	30
Total	20	100

Table 5. Informational Support of Families for Members with Gout Arthritis

Informational Support	Frequency	%
Good	9	45
Moderate	4	20
Poor	7	35
Total	20	100

Table 6. Appraisal Support of Families for Members with Gout Arthritis

Appraisal Support	Frequency	%
Good	12	60
Moderate	2	10
Poor	6	30
Total	20	100

Table 7. Emotional Support of Families for Members with Gout Arthritis

Emotional Support	Frequency	%
Good	9	45
Moderate	5	25
Poor	6	30
Total	20	100

DISCUSSION

Instrumental Support

The study describes that 8 (40%) families provide a good instrumental support for their family members who suffered from gout arthritis. It is also found that 5 (25%) gave moderate support, and 6 (30%) with poor support. A study by Lestari (2011) found that the bigger family support the higher is patients with gout arthritis compliance of diet. Instrumental support includes the provision of material assistance and services is important to improve the obedience of elders to purine diet. Elders need financial support for medication and family is responsible to provide such support. Elders also need assistance for transportation to the health facilities, comfortable housing, and foods.

Informational Support

The study found that 9 (45%) families give good informational support for elders with gout. The information mostly relates about the illness (gout), cost of medication, good diet for people with gout. The study also describes 4 (20%) families only provide minimum informational support for the elders with gout. According to Nurhidayati (2011), informational support is essential enabling elders to understand about their illness, healthy foods, and healthy lifestyle. Sarafino explains that the presence of group to individual with gout to share their time (Sarafino, 2011). Sense of togetherness makes individual with gout feel confident to undergo medication. Individual with strong family support decreases the vulnerability of illness and recovery rate improve.

Appraisal Support

The study implies that the family provide a good appraisal support. It is found that 12 (60%) families support the elders who are living with them by arising their confidence to pass through their illness. The elders were convinced that their illness is curable. Appraisal support may take in forms of appreciation to what the elders have done to care their illness. Setiadi (2008) describes that family may give feedback, guidance, appreciation to support recovery process. Quoting House & Khan, Rima et. Al. (2012) describes that social support enable to help individual to reduce the negative impact of their conditions. Individual who obtains social support have positive rewards, self-esteem, and optimism. Elders with gout will have high motivation to recovery when they have optimism in their live.

Emotional Support

The study reveals that 9 (45%) families provide emotional support for the elders suffered from gout arthritis. Ali and Ariani (2009) describes that family support give positive impacts to the gout arthritis patients to practice healthy diet. Patients will have awareness and feel confident to practice the good diet on gout, and lessen the burden of the illness, and feel confident to the medication process. Quoting House & Khan, Rima et. Al., (2012), social support is expressed in empathy, attention, and care by providing information, knowledge, or advices. Furthermore, Ganster and Victor explain that social support may improve health and psychological wellbeing. The support may positively motivate patient with gout to recover from their illness.

CONCLUSION

The study found that families provide good social support for elders with gout arthritis within their families in terms of informational, instrumental, appraisal, and emotional support. Social support is an important factor to improve the health and wellbeing of the elders who suffered from gout. The support is also important to improve the compliance of elders to health and good diet. Social support is worthwhile to the elders to cope with their gout illness

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The Effect of Creambath Massage to Reduce Blood Pressure of Dinda Salon Costumers with Hypertension

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ABSTRACT

Introduction: Hypertension becomes a threat to community health because of its potentially to complications condition. Sometimes hypertension sign and symptoms such as headache, shortness of breath, dizziness, chest pain, heart palpitations and nasal bleeding, but not always. One of hypertension medications are non- pharmacological or complementary therapy. As an example is massage blood pressure reduction hyperten- sion client. **Methods:** Methods used is a research design pseudo treatment (quasy-experiment) with static- group comparison design approach. The population 70 people. Sampling techniques using purposive sam- pling with a sample of 60 people. Research instruments using SOP sheets massage creambath. The data was analyzed with a software application using wilcoxon test with a confidence interval of 95% and $\alpha=0.05$. **Re- sults:** Statistical test is known that there is a significant influence between the action of massage creambath to decrease blood pressure Dinda Salon customers who have hypertension with (p-value 0.000). **Conclusion:** There is a significant effect of massage creambath with to reduce blood pressure of Dinda Salon customers who have hypertension. **Recommendation:** It is expected that people with hypertension remain obedient in taking hypertension medications, stress management and routinely undergo non-pharmacological therapy, especially massage creambath can be one of the options.

Keywords: Massage creambath, Blood pressure, Hypertension

INTRODUCTION

Hypertension becomes a threat community health cause it's potentially a complication like stroke, coro- nary heart disease and chronic kidney disease (Kemenkes.RI, 2019). Most of hypertension client doesn't have sign and symtomp. That's why it's called Silent Killer.

The estimated number of hypertension cases in Indonesia is 63,309,620 people, while the death rate in Indonesia due to hypertension is 427,218 deaths (P2PTM Kemenkes, 2020). Out of 1,283,119 people in Suraba- ya who measured their blood pressure, 399,435 people (31.13%) had high blood pressure (hypertension) (Sura- baya City Health Office, 2017).

Hypertension occurs because the volume of blood pumped by the heart increases, resulting in increased blood volume in the arteries. In some clients of the disease, the increase in blood pressure is caused by kidney disease (Yanti, E., Rahayuningrum, D.C &Arman, E 2019)

High blood pressure over a long period of time will damage the arterial endothel and accelerate athero- sclerosis. Complications of hypertension include damage to body organs such as the heart, eyes, kidneys, brain, and large blood vessels. If done routinely massage techniques (massage)is believed to lower blood pressure, lower levels of the hormone cortisol and lower anxiety, so it will have an impact on the decrease in blood pres- sure and improvement of body function. With massage therapy in particular (masase), endurance increases so that the stamina of the body also increases (Tarigan, 2009 in Udani, 2016).

Creambath can be one way to reduce stress that usually makes the muscles around the head, neck, and shoulders stiff. Because, creambath process includes massage activities in the head, neck, and shoulder area. Massage on the scalp is useful to make the cream more pervasive maximally, stimulate hair growth, blood circulation, but also relax muscle tension in all three areas. The soft and refreshing aroma of creambath cream will also give a soothing effect (Matrix, 2019). Based on the background that has been presented researchers are in- terested to conduct research on the influence of creambath massage action on the decrease in blood pressure of Dinda Salon customers who have hypertension.

METHODS

The design used is a research design pseudo treatment (quasy-experiment) with Static-group comparison design approach. With a population of 70 hypertension clients with a large sample of 60 clients who meet the inclusion criteria. Sampling technique is by purposive sampling with free variables namely creambath massage action and bound variable that is blood pressure.

How to collect data by using observational data on common hypertension clients, Standart Operating Procedure (SOP) creambath massage to ensure clients get the same treatment and sphygmomanometer to measure the blood pressure of hypertension clients before and after being given massage creambath. The data obtained will be tabulated and analyzed.

RESULT

Table 1. Characteristic frequency distribution of hypertension clients at Dinda Salon Surabaya.

Characteristics of hypertension clients	Obedient		Disobeying		P Value
	f	%	f	%	
Age					
1. 30-40	9	30	9	30	0.767
2. 40-50	4	13.3	10	33.3	
1. 3. 50-60	17	56.7	11	36.67	
Gender					
1. Men	15	50	15	50	0.170
2. Women	15	50	15	50	
Occupation					
1. TNI/POLRI	1	3.3	0	0	0.707
2. Civil Servants	3	10	2	6.67	
3. Private	9	30	11	36.67	
4. Other	17	56.67	17	56.67	
Education					
1. Elementary School	4	13.3	3	10	0.024
2. Junior High School	8	26.67	6	20	
3. High School	12	40	14	46.67	
4. S1	6	20	7	23.33	
Long suffering hypertension					
1. 1-5 years old					0.924
2. 5-10 years old	22	73.3	25	83.3	
3. 10-15 years old	8	26.67	4	13.3	
	0	0	1	3.3	

Most hypertension clients in the age range of 50-60 years are 17 people (56.7%) in the compliant group and 11 people (36.67%) disobedient groups. And in gender characteristics obtained data as many as 15 people (50%) women and 15 men in both groups. Other jobs such as Housewife and Self-Employed dominated in both groups of 17 people (56.67%). For the most education level is with a high school education level of 12 people (40%) in the compliant group and 14 people (46.67%) disobedient groups. The most results for the old characteristics of suffering from hypertension are 1-5 years with a total of 22 people (73.3%) in the obedient group and 25 people (83.3%) in the non-compliant group.

Table 2. Distribution of frequency of blood pressure measurement results before creambath massage action in hypertension clients at Dinda Salon Surabaya.

Classification of hypertension	Obedient		Disobeying		P value
	F	%	F	%	
Pre-Hypertension	1	3.33	0	0	0.123
Stage 1	12	40	6	20	
Stage 2	17	56.67	26	86.6	

After statistical tests using chi square test obtained a P value of 0.123 and the results of blood pressure measurement of hypertension clients before the creambath massage action in the obedient group taking antihypertension drugs according to the American Heart Association (AHA) in 2017 at most in stage 2, namely as many as 17 people (57%). While in the non-compliant group took antihypertension drugs amounted to 26 people (86.67%) stage 2 classification.

Table 3. Distribution of frequency of blood pressure measurement results after creambath massage action in hypertension clients at Dinda Salon Surabaya.

Classification of hypertension	obedient		Disobeying		P value
	F	%	F	%	
Normal	1	3.33	0	0	0.000
Pre-Hypertension	11	36.67	6	20	
Stage 1	18	60	12	40	
Stage 2	0	0	12	40	

After the statistical test chi square obtained the value of P value after the creambath massage action of 0.001. And it can be known that the results of blood pressure measurement after creambath massage in the obedient group taking antihypertension drugs obtained figures as many as 18 people (60%) stage 1. While in the group did not comply with taking antihypertension drugs results of blood pressure measurement after the action of creambath massage 12 people (40%) stage 1 and 12 people (40%) stage 2.

Table 4. Effect of creambath massage action on hypertension clients in Dinda Salon.

Classification of hypertension	Delta Obedient		Delta Disobeys		P value
	F	%	F	%	
Normal	-1	-	0	0	0.000
Pre-Hypertension		33,3			
	-	-	-6	-20	
		33,3			
Stage 1	10	-6	-20	-20	
Stage 2	17	56,7	14	46,	

Based on the results of wilcoxon test obtained a value of P 0.000 So, it is proven that the influence of creambath massage action on the blood pressure of Dinda Salon customers who have hypertension in the obedient group taking antihypertension drugs or non-compliant groups. And it can be known that the value of delta classification stage 2 in the obedient group decreased by 17 people (56.7%) decreased the classification of hypertension. While in the non-compliant group obtained delta value of 14 people (46.78%) decreased the classification of

hypertension.

DISCUSSION

1. The blood pressure of hypertension clients in Dinda Salon before and after massage creambath

From the results of blood pressure assessment before the creambath massage action in table 2 seen in the group obediently taking drugs and non-compliant taking antihypertension drugs where both are most in the classification of hypertension stage 2.

While in table 3 it is known that there are differences where in the compliant group most found in the classification of stage 1 hypertension. And in the group of non-compliant taking antihypertension drugs obtained results in stage 1 and stage 2 at the same amount. However there is a reduction in frequency before being given a creambath massage action and afterwards.

Based on the opinion of Muttaqin (2009) in Udani (2016) suggests that the body has a regulatory mechanism (regulation) to blood pressure, heart regulation serves to regulate the active blood supply to the tissues. Blood supply regulation is influenced by factors, namely cardiac output, peripheral blood vessel pressure, and blood volume/flow. Anwar & Masnina research, (2019) showed that respondents with high compliance had normal systolic blood pressure of 17 respondents (20.5%) and systolic blood pressure increased by 0 respondents (0.0%), respondents with moderate compliance had normal systolic blood pressure of 30 respondents (36.1%) systolic blood pressure increased by 4 respondents (4.8%) while respondents with low adherence had normal systolic blood pressure of 0 respondents (0.0%) systolic blood pressure increased by 32 respondents (38.6%).

It can be known that in the obedient group that has previously been routinely taking medication or in other words his blood pressure must be controlled and stable. So it is possible that the decrease in blood pressure that occurs in the obedient group taking antihypertension drugs as a result of antihypertension drugs.

But there can also be seen a decrease in non-compliant groups taking drugs. Where obtained a large enough classification decrease so it is known that there is a significant decrease in blood pressure also in the group of non-compliant taking a

2. Effect of massage creambath action on blood pressure reduction of hypertension clients in Dinda Salon

After wilcoxon statistical test to find out the effect of creambath massage action on blood pressure reduction of Dinda Salon customers who have hypertension. In the group obediently taking antihypertension drugs obtained a value of P 0.000 So, it is proven that the influence of creambath massage action on the blood pressure of Dinda Salon customers who experience hypertension both in the group obediently taking antihypertension drugs and non-compliant groups taking antihypertension drugs.

Although in the obedient group of taking antihypertension drugs suspected the influence of drugs influence in the stability of blood pressure but in the group of non-compliant taking antihypertension drugs is enough to prove that the influence of creambath massage action against the decrease in blood pressure of Dinda Salon customers who experience hypertension.

Treatment of hypertension is not only with medicines only, complementary treatment methods with reflexology therapy can be a good alternative option in terms of benefits and safety. Reflexology is a non-invasive therapy and helps to stop further damage from the body. Reflexion helps reduce stress from the body when applied to the legs. Applying pressure on the legs helps in the rebuilding of the body's balance. It also helps in reducing pain, improving blood flow, reducing blood pressure and cholesterol (Ayushveda, 2009) in (Sari et al., 2014).

Giving massage for 3-5 minutes can provide a relaxing effect on the body, in addition to the back massage can also stimulate the production of endorphin hormones, this hormone can provide a calm effect in patients and vasodilation occurs in blood vessels so that blood vessels become relaxed and there will be a decrease in blood pressure (Labyak & Smeltzer, 1997) in (Yanti et al., 2019).

Creambath massage is not uncommon. The whole series of massage actions given is not only merely a massage but also there is a form of relaxation caused by aromatherapy of the cream given and also the vasodilation effect of blood vessels by aromatherapy of the cream given and also the vasodilation effect of blood vessels by steam tools (warm steam).

Almost all people from various circles are very familiar with this massage technique. All hair beauty salons definitely have a creambath massage treatment offered. So that the public knows where to go to get this treatment. Especially when feeling dizzy, tired and a lot of thoughts.

This is an ease for hypertension clients to easily get non-pharmacological therapy that aims to decrease blood pressure so that hypertension clients are able to carry out this therapy regularly and close to their respective residences.

CONCLUSION

Based on the results of research on the effect of Creambath massage action on blood pressure reduction of Dinda Salon customers who have hypertension, it can be concluded Blood pressure decreases in both groups after the

action of creambath massage and Creambath massage action is able to lower the blood pressure of Din- da Salon customers who have hypertension quickly.

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CASE STUDY PARENTS' PERCEPTIONS ABOUT EARLY MARRIAGE IN WONOKASIAN VILLAGE, SIDOARJO REGENCY

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ABSTRACT

CASE STUDY OF PARENTS' PERCEPTION TO EARLY MARRIAGE AT WONOKASIAN KABUPATEN SIDOARJO

Parents play an important role and responsibility in the decision of early marriage of their children. Parents have different perceptions about early marriage and their decision to allow their children to get married earlier. This study aims to explore the parent's perception about early marriage at Desa Wonokasian Sidoarjo. The study adopts a descriptive design.

The variable used in this study is the perception of parents about early marriage. The population consists of 20 parents that have teenagers within their family at Wonokasian Village, especially Rt 19 Rw 07. The 20 parents are all selected as the respondents of the study. A set of questionnaires is developed as the data collection procedure. The study resumes that 14 parents (70%) have a negative perception of early marriage, and 6 (30%) positively perceived the early marriage practice. The study concludes that most parents disagree with the early marriage practice. It is suggested that parents need to maintain their knowledge, attitudes against early marriage

Keywords: Perception, Parents, Early Marriage, teenagers

INTRODUCTION

Parental perception of early marriage is the interpretation or knowledge of parents about early marriage that is captured by the senses, whether it is a statement or conversation. There are various factors behind the occurrence of early marriage and it becomes a big problem when there is no search for the right problem analysis based on accurate and reliable data and alternative solutions to solve this problem. From considerations of religion and economic conditions related to early marriage that influence a person in generating a perception. In terms of religion, parents perceive that early marriage is much better to prevent children from committing adultery. However, from the economic point of view, they perceive that early marriage can reduce the burden on their parents.

Many marriage dispensations are proposed by parents whose children experience pregnancy outside of marriage (BKKBN, 2010). From the religious factor, parents understand that if a child has a relationship with the opposite sex, there will be a religious violation and as a parent, it is obligatory to protect and prevent it by immediately marrying off the children. As a child's parent, stating that if a child has a relationship with the opposite sex is adultery, therefore as a parent, you must prevent this by immediately getting married (BKKBN, 2011). Early marriage in Indonesia is concluded that the cause of early marriage is due to economic factors, mostly from poor families, on the grounds that it can reduce the burden of dependents on parents and improve the welfare of teenagers who are married and usually there is a compulsion to do early marriage. So from some of these factors parents have different perceptions related to early marriage.

With so many positive perceptions about early marriage that appear, it has an impact that more and more parents support their children to marry early. But in fact, marrying off their children who are not old enough, the impact on young families in terms of economic needs will result in stress, due to not being economically ready on the one hand to encourage consumption and new needs due to fast changing times (BKKBN, 2012). The impact of marriage at a young age is that there is a biological impact, namely the biological child's reproductive organs are still in the process of growing towards maturity so they are not ready to have sexual intercourse, especially until pregnancy and childbirth occur. If forced, it will cause trauma, extensive tearing of the birth canal and infection that will endanger their reproductive organs and endanger their lives. As for the Psychological Impact, psychologically the child is not ready to understand about sexual

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relations, so it will cause prolonged trauma in the child's soul and difficult to heal. The child will be depressed and regret his life which ended in a marriage that he himself did not understand the decision of his life, so that the family had difficulty becoming a quality family. As for the social impact, namely marriage reduces the freedom of self-development, the community will feel lost as an asset for teenagers who should join together to serve and take part in society. However, due to the reason that they are already married, their activeness in society is reduced. The economic impact, which makes it difficult to increase family income, so that the failure of the family to go through various kinds of problems, especially economic problems, increases the risk of divorce.

The solution is to provide socialization to parents regarding the impacts that will arise after children have early marriages. After being given socialization, the perception of parents who initially allowed their children to do early marriage could be the perception of parents changing to not allowing their children to do early marriage. So with this perception parents can prevent early marriage in their children.

METHODS

The research design used based on the type of research is descriptive research with a case study approach. The population of this research is parents who have teenage children in Wonokasian Village Rt 19 Rw 07 . population of this study as many as 20 people. Because all members of this population were made respondents, so in this study the sample was all parents in Wonokasian village Rt 19 Rw 07 a total of 20 people. In this study, the total sampling technique was used, namely the sampling technique by taking the entire population as respondents or samples (Heriyanto, 2017). The research tool used by the researcher is a questionnaire. After the data is collected, data processing is carried out. The data that has been collected is then recorded and grouped according to the research objectives. This research uses descriptive analysis in the form of tables and narratives. Various procedures related to research ethics, including informed consent (consent sheet), anonymity (without name), confidentiality (confidentiality).

RESULTS

The data obtained from the results of research that has been carried out are the perceptions of parents about early marriage in the Wonokasian village, Sidoarjo district, that most parents have a negative perception about early marriage in the Wonokasian Village, Sidoarjo Regency, as many as 14 (70%) parents And a small proportion of parents have a positive perception of early marriage in Wonokasian Village, Sidoarjo Regency, as many as 6 (30%) parents.

Table 1. Frequency distribution of the ages of parents with their teenage daughters in Klitih Hamlet, Wonokasian Village Rt 19 Rw 07 in March 2021

Area	Frequency	Percentage (%)
Umur:		
31-38	1	5
39-45	10	50
46-55	9	45
Jumlah	20	100

The above shows that the age of parents with teenage girls is 39-45 years old (50%) or 10 people.

Table 2. Distribution of Parents' Perceptions About Early Marriage in Klitih Hamlet in Wonokasian Village in March 2021

Parents perceptions	Number (person)	Percentage (%)
Positif	6	30
Negatif	14	70
Total	20	100

Table 2 above shows parents' perceptions of early marriage in Wonokasian Village, Sidoarjo Regency. In March 2021, 70% or 14 respondents had negative perceptions.

DISCUSSION

The data obtained from the results of research that has been carried out are the perceptions of parents about early marriage in the Wonokasian village, Sidoarjo district, that most parents have a negative perception about early marriage in the Wonokasian Village, Sidoarjo Regency, as many as 14 (70%) parents. And a small proportion of parents have a positive perception of early marriage in Wonokasian Village, Sidoarjo Regency, as many as 6 (30%) parents.

Parents who have negative perceptions about early marriage in Wonokasian Village, Sidoarjo Regency as many as 14 (70%) parents because parents have a firm attitude, high knowledge and have a lot of information that is known about early marriage and parents who have good experience. someone has experienced about early marriage which is negative so that it is the formation of an attitude of personal experience that leaves a strong impression and there is a deeper and imprinted appreciation. So that it raises awareness that eventually parents will behave in accordance with the knowledge they have. and parents will think back when their children ask permission to have an early marriage. This is because parents have sufficient knowledge, attitudes, actions, and experience. Factors that influence perception include Attitude, Education, Information, and Experience (Miftah Toha, 2003: 154). Therefore, parents who have negative perceptions need to be given counseling, especially counseling about the negative impacts that arise about early marriage so that parents will still have negative perceptions about early marriage. And with this perception, parents can prevent early marriage in their children. and parents are monitoring more for their children's associations.

Parents who have a positive perception of early marriage in Wonokasian Village, Sidoarjo Regency are as many as 6 (30%) parents because parents think that early marriage can prevent children from immoral acts, and prevent children from promiscuity. The feelings of parents, especially mothers who approve of their children to marry at an early age, on the other hand there are feelings of anxiety and worry but are more dominant in their feelings of pleasure because they feel that their children are saved from promiscuity and are protected from adultery and what their children do on the basis of Islamic law. . Basically, parents approve of early marriage, but in this case the mindset of parents to opinions about whether or not parents agree or disagree is also reviewed from the educational background of the parents. as is the case with research by Pakal (2012) which shows that lack of knowledge has a 3.2 times greater risk for early marriage compared to the knowledge of someone who is well educated (Pakal, 2012).

CONCLUSION

The results of the study on parents' perceptions of early marriage in Wonokasian Village, Sidoarjo Regency, the researchers can conclude that most parents do not agree with early marriage, because the perception of parents who do not agree with early marriage considers early marriage to be more negative than the negative side. the positive. While a small proportion of parents who have a positive perception they see the positive side of early marriage.

For teenagers, it is better to look at a social phenomenon first from various angles, thus it will not cause subjectivity in order to interpret it, and teenagers are more able to filter themselves. for example by deepening religion or busying themselves with courses or organizations.

For Respondents, it is expected that parents will better equip their teenage children with various information and knowledge about religion, as well as become friends for the child where the child can tell everything he experiences, whether it's about achievements or problems he is facing.

For Educational Institutions It is hoped that the results of this study can be used as input to add library materials and increase knowledge for female students and readers in general about parents' perceptions of early marriage.

For further researchers, it is hoped that further researchers will further refine and develop this research with better methods so that even better results will be obtained.

For the Government to set a minimum age limit for mature marriage. This is intended so that both parties are really ready and mature in terms of physical, psychological, and mental. as well as providing advice to parents and the community about the impacts that can arise due to early marriage.

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Case Studi of Family Efforts towards Hyperthermia Treatment in Children

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ABSTRACT

Inability for family to treat hyperthermia in children can impact on children to suffer from high fever, cold hands and feet, and even spasm. The effects of spasm in children impact on respiratory problems, even recurrent spasm can trigger brain damage. Efforts to lower hyperthermia cause activity, alertness, and appetite improve and prevent organ damage due to spasm. This research aimed at investigating family efforts in treating hyperthermia in children.

Design of this research was descriptive. Variable was family efforts to treat hyperthermia in children. Population and sample were mothers who had 3 to 10-year-old children and resided in Bajang Mlarak Village, Ponorogo District, East Java Province, and they were 20 mothers. Sampling technique that was utilized was total sampling. Measuring instrument in this research was questionnaire. Data in this research were analyzed by frequency distribution.

Research results showed that most of the families 50% had good hyperthermia management efforts. Most of family efforts in treating hyperthermia in children were able to lower child's body temperature with good procedures. Improving family efforts in treating hyperthermia in children can be conducted by providing appropriate and easy information to be understood and by improving efforts of parents' ability in treating hyperthermia to procedures.

Keywords: Hyperthermia Treatment, Family, Children

INTRODUCTION

Family will be very worried if the child suffers from hyperthermia and the family feels unable to treat hyperthermia (Friedman, 1998). Inability for the family in treating hyperthermia in child can cause the child to suffer from high fever, cold hands and feet, and even spasm. Lowering hyperthermia causes the child's activity, alertness, and appetite improve and prevent organ damage due to spasm (Arvin, 2000). Data in Indonesia, the incidence of fever was 465 (91%) from 511 mothers (Setyowati, 2013). Data from East Java Provincial Health Office (Indonesia) in 2018 stated that prevalence of fever was 47%. Meanwhile, data from Ponorogo District Health Office (Indonesia) in 2018 stated that incidence of fever in Ponorogo was 356 cases and it increased 18% from 2017. As we know that fever (hyperthermia) is a symptom manifestation of one of the causes in health problems due to bacteria or viruses. Fever occurs due to stimulation of endogenous or exogenous pyrogens against endothelium of the hypothalamus which impacts on the increase of thalamic activity. Fever that occurs in children requires different treatment from adults. Inability for the family to lower hyperthermia in children can impact on disorders of childhood growth and development, respiratory problems, and spasm (Lusia, 2015). Even, recurrent spasm can trigger brain damage. Treatments that can be conducted by family in order to prevent the effects of hyperthermia are such as family must be able to overcome the causes of hyperthermia and pay more attention to the behavior of their child appropriately by improving information and motivation. Improving the ability to treat physical therapy aims to lower fever, increase immune system, and minimize chronic or long-term hyperthermia (Lubis, I.N., 2016).

METHODS

Design of this research was descriptive (Notoatmodjo, S.2010). Variable in this research was family efforts to treat hyperthermia in children. Population and sample in this research were mothers who had 3 to 10-year-old children and resided in Bajang Village, Mlarak Subdistrict, Ponorogo District, East Java Province, Indonesia and they were 20 mothers. Sampling technique that was utilized in this research was total

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sampling. Measuring instrument in this research was questionnaire. Data in this research were analyzed by frequency distribution (Heriyanto, B. 2017).

RESULT

1. Frequency distribution of maternal characteristics according to age, education level, and occupation
Table 1. Frequency distribution of maternal characteristics according to age, education level, and occupation in Bajang Mlarak Village, Ponorogo District, East Java Province, Indonesia, March 2021

According	Frequency	Procentage(%)
Age		
20 – 30 years	5	25
31 – 40 years	11	55
41 – 50 years	4	20
Education Level		
No / Primary School education	2	10
Secondary School education	4	20
High School education	9	45
Higher education	5	25
Worked		
House wife	9	45
Private	10	50
Government employees	1	5
Total	20	100

Research results according to table 1 showed the frequency distribution of mothers according to age that most of the respondents (11 mothers (55%)) were 31-40 years old. According to education level, almost half of the respondents (9 mothers (45%)) had graduated from high school education. Meanwhile, according to occupation, half of the respondents (10 mothers (50%)) worked in private sector.

2. Family Efforts in Treating Hyperthermia in Children
Table 2. Frequency Distribution of Family Efforts in Treating Hyperthermia in Children in Bajang Mlarak Village, Ponorogo District, East Java Province, Indonesia, March 2021.

Family Efforts in Treating	Frequency	Procentage (%)
Well	8	40
Sufficient	10	50
Deficient	2	10
Jumlah	20	100

Research results according to table 2 showed frequency distribution of family efforts in treating hyperthermia in children that half of the respondents 10 mothers (50%) had sufficient effort.

DISCUSSION

Research results showed that half of the respondents (50% of mothers) had sufficient effort in treating hyperthermia in children. It was possible because almost half of the respondents (45% of mothers) had high school education. Through high school education level, the mother's ability to manage information and understand it in the effort to lower hyperthermia; do compress, bathe, give drinking water, give a rest, and provide health services for children with hyperthermia had not been optimal. Research data showed that there were 8 mothers (40%) who had good treatment efforts. This was possible because 5 mothers (25%) had higher education level. Thus, the mothers had an ability to absorb and analyze the obtained information and they could practice to treat hyperthermia in children well. In addition, the mothers also had a strong motivation in obtaining the ability to treat hyperthermia in children, hence, they had good ability. This was in

accordance with a theory that stated the lower the education, the less knowledge was possessed and the higher the education, the more knowledge was possessed (Mubarak, 2007). Other things that influenced the efforts for the family were occupation and mother's age. Half of the mothers (50%) worked in private sector. As we know that working mothers have limited time in seeking several information that relate to health and care for children. This limitation causes the mother to conduct efforts to treat hyperthermia based on limited knowledge and time, thus, it influences the mother's efforts in treating hyperthermia in her children. Regarding age, most of the respondents (11 mothers (55%)) were 30-40 years old, which was a mature age for a mother in providing care for children. Mother's experience in caring for children influenced mother's efforts in treating hyperthermia in children. This was in accordance with a theory that knowledge was influenced by age, education level, occupation, interests, and experience (Mubarak, 2007). Cognitive ability for a person was influenced by person's developmental stage (Potter, Perry, 2005).

In order to improve the ability of family efforts in treating hyperthermia in children, it could be conducted by improving knowledge through seeking information from internet, tabloids, education and health personnel, taking advantage of health education that was provided by health services, utilizing quality time to be together with children as well as possible, and improving parents' motivation. Thus, the motivation became parents' strength for the treatment efforts according to procedures for children with hyperthermia.

CONCLUSION

Most of family efforts in treating children with hyperthermia had sufficient ability to provide either physical treatment or medical services. Suggestions for families to prevent the impact of hyperthermia, among others, families must be able to overcome the causes of hyperthermia and pay more attention to the behavior of their children appropriately by increasing information and motivation. improve the efforts of parents' abilities in handling hyperthermia with procedures.

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Improving the Quality of Life of PLWHA through the Combined Peer and Family Supporting Model

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ABSTRACT

People living with HIV / AIDS (PLWHA) have been facing several problems such as the physiological problems as well as the stigma and discrimination that can increase their psychological burden. This study aimed to analyze the combined supporting model on the quality of life of PLWHA in RSUD dr. H. Ansari Saleh Banjarmasin. This study was an observational study, by observing the quality of life of PLWHA who are assisted in the VCT Poly Hospital of dr. H. Ansari Saleh Banjarmasin. The sample of this study were PLWHA who were registered at dr. H. Ansari Saleh Banjarmasin. This study used purposive technique with inclusion criteria, PLWHA who was first diagnosed as HIV positive by a physician, adult, can read and write and willing to be a respondent. Exclusion criteria for PLWHA aged < 19 years. The results showed that peer and family supporting model by peer and family were significant that affected the quality of life of PLWHA so if the two models are combined, it can be used to assist PLWHA.

Keywords: . PLWHA, support system, quality of life

INTRODUCTION

People living with HIV / AIDS (PLWHA) have been facing several problems such as the physiological problems as well as the stigma and discrimination that can increase their psychological burden. These problems have an impact on decreasing the quality of life. Fayer and Machin (2007) suggested that quality of life is a person's views or feelings about their functional abilities due to disease. Quality of life is closely related to physical health, psychological conditions, level of independence, social relationships and individual relationships with their environment (WHO 2007).

People living with HIV/AIDS susceptible to be infected by other diseases due to decrease on the immune system. They also get tired quickly, fever, lose weight drastically and bed rest. They also have difficulty in daily activities. This condition declines in their quality of life, so interventions are needed to support their quality of life.

Nasronudin (2006) revealed that one of the factors that has an important role to increase the quality of life of people living with HIV/AIDS was social support. This study also in line with study from Wolcott (2005) in Pequegnat & Belt (2011). The role of the family in caring for people living with HIV/AIDS can help daily needs, both morally, and materially.

The number of HIV AIDS cases in Indonesia have been increasingly . It reached peak in 2019, which was 50,282 cases (Directorate General of P2P Ministry of Health RI 2019). The 2019 HIV, AIDS and STI Information System (SIHA) reported that the number of cases of HIV and AIDS in men is higher than women. In 2019, 64.50% of HIV cases were male, while 68.60% of AIDS cases were male.

South Kalimantan, although not included in the five provinces with the highest number of HIV cases, however, there were always new HIV cases 4 new cases in 2018, 5 new cases in 2019. And in 2019, 462 HIV cases were recorded. The majority of the population in South Kalimantan is Muslim, religious and very fanatical. However, stigma and discrimination are still experienced by PLWHA. They think that HIV/AIDS is a disease caused by sexual behavior that not obey the religious rules. (South Kalimantan Health Office, South Kalimantan KPA, 2016).

Several previous studies have emphasized efforts to reduce HIV/AIDS cases and how to respond to HIV/AIDS healing, such as the research conducted by Suhardiana Rahmawati (2013) on the quality of life of

people with HIV/AIDS who are taking antiretroviral therapy. In this study, it was found that PLWHA did not develop their social life, spiritual life and did not receive social support from both their family and the people around them, due to stigma and discrimination. Mahdalena's 2015 research found that family support had no effect on adherence to treatment for PLWHA, because there were still many PLWHA who had not told their family about their illness, so the family did not provide support to regularly follow the treatment program.

Hayyinatun's research, Balqis (2018) states that there were various roles performed by the peer group support in stage of intervention for PLWHA, especially in the social dimension. Kale's research (2019) showed the results that the implementation of the role of the facilitator for PLWHA had an effect on the quality of life of PLWHA by starting to improve physical aspects, psychological aspects, the level of independence, aspects of social relations, environmental aspects, and spiritual aspects.

PLWHA must undergo regular treatment including taking ARV regularly for the rest of their lives. The length of time for treatment throughout the life of PLWHA is become a problem because PLWHA feels bored, so PLWHA needs support. The support can be provided by peers, family or VCT officers at a hospital or clinic. Based on the explanation above, this study aimed to analyze the combined supporting model on the quality of life of PLWHA in RSUD dr. H. Ansari Saleh Banjarmasin.

METHODS

This study was an observational study, by observing the quality of life of PLWHA who are assisted in the VCT Poly Hospital of dr. H. Ansari Saleh Banjarmasin. The variable of Quality of Life was the patient's perception of their life experience related to the illness and its treatment which describes the subjective assessment of HIV AIDS sufferers based on things they believe in, such as expectations, values and beliefs.

The sample of this study were PLWHA who were registered at dr. H. Ansari Saleh Banjarmasin. This study used purposive technique with inclusion criteria, PLWHA who was first diagnosed as HIV positive by a physician at RSUD dr. H. Ansari Saleh Banjarmasin, adult, can read and write and willing to be a respondent. Exclusion criteria for PLWHA aged < 19 years.

The PLWHA Mentoring Variable was measured by observation. The dependent variable of the quality of life study was measured by the quality of life instrument adopted from the World Health Organization (2002), WHOQOL-BREF. Descriptive analysis was carried out to determine the model of mentoring PLWHA. After that, analysis of the model used *Partial Least Square* (PLS) to determine the fit model that affects the quality of life of PLWHA.

This research was already granted ethical approval from the Poltekkes Ethics Commission of the Ministry of Health Banjarmasin.

RESULTS

The results of the study obtained assistance for PLWHA in RSUD dr.H. Ansari Saleh Banjarmasin showed that most of the respondents wanted to be accompanied: 96 respondents (96%). They wanted to accompany in their treatment program by 37 officers (38.50%), 19 fellow patients (19.79%) and husband/wife 18 people (18.75%).

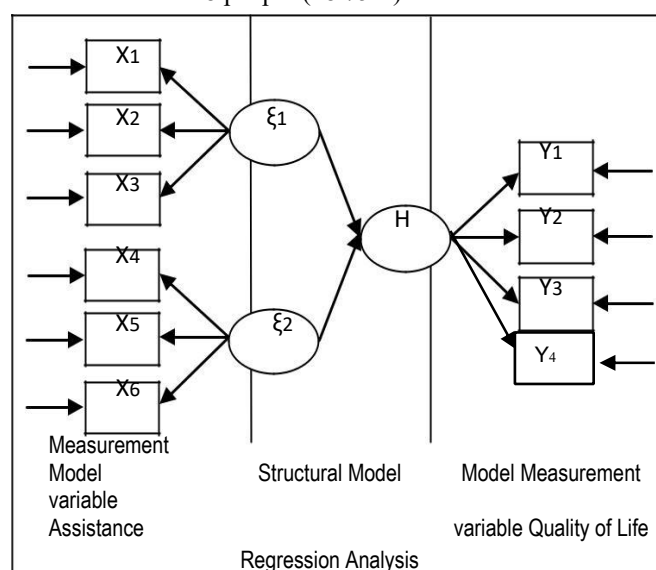


Figure 1. Structural Equation Modeling

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Description:

X1 = Gender

X2 = Minimum

X3 = experience

X4 = Education

X5 = Knowledge

X6 = Attitude

ξ1 = Mentoring Peer

ξ2 = Mentoring Family

η = Quality of Life

Y1 = Physical

Y2 = Psychological

Y3 = Social

Y4 = Environmental

Table 1. Composite Reliability

Variable	Composite Reliability
Peer support	0.929
Families support	0.883
Quality of Life	0.919

Table 2. Analisis inner weight

Variables	Estimation original sample	Mean subsample	Standard Deviation	T statistics
Peer support > Families support	0.215	0.222	0.165	1.303
Peer support > Quality of Life	0.167	0.187	0.136	1.223
Family support > Quality of Life	0.202	0.241	0.172	1.175

DISCUSSION

Based on the research model showed that supporting by peer and family were significant that affected the quality of life of PLWHA so if the two models are combined, it can be used to assist PLWHA. The model also showed that peer support was better than family support because peers have the same experience as PLWHA in terms of their illness.

Supporting can be viewed from the aspects of interpersonal communication consist of caring for others, being friends, comfort, motivate, and help others. Previous study mentioned that one of the things that can build interpersonal communication was interpersonal perception (2011:88). According to Rakhmat, interpersonal perception was the experiences about relationships and distinguish that humans are objects of perception (2011:88). The facilitator have to communicate that cause a reaction. According to Rakhmat, a supportive attitude is an attitude that reduces defensiveness in communication (2011:132). In this situation the support from a peer approach can reduce defensive attitudes, such as anxiety and confusion. This is the motive to take care each others. Because the facilitator provides information and solutions to the situation faced by HIV patients.

According to Freud, empathy was considered as understanding other people who have no emotional meaning for us (in Grace, 2011: 130). The ability to empathize is a supportive aspect for continuing of the supporting process. For this reason, the facilitator tries to make HIV patients accept their condition by showing active actions by giving attention. Through educational sharing that prioritizes comfort and being a good listener.

According to Rakhmat, a positive attitude in interpersonal communication refers to at least two aspects, namely: interpersonal communication. It will develop a positive feelings towards others and various communication situations (2011: 133). The support sytems try to set a good example regarding the proper lifestyle for PLWHA. Pay attention to positive words or language when communicating with HIV patients. Without punishing or giving a stigma to the patient's condition. In addition, the conversation that is built is having a motive to help HIV patients by not discriminating the conditions of HIV patients so that the information provided can be right on target. Equality does not require us to accept and agree to all verbal and nonverbal behavior. Equality means we accept the other party, interpersonal communication will be more

effective if the atmosphere is equal (Devito, 2011: 290-291). Thus, it can be understood that this is a motive to help others that is owned by the companions.

The communication process carried out by companions in a peer approach to HIV/AIDS patients is carried out in stages which is by paying attention to the situation and condition of the HIV patient. The importance of building gradual communication was to build closeness, foster trust, gain experience, and learn. Schutz concluded that: "Social action is action that is oriented to the behavior of others or in the past, present and future. Looking forward into the future is essential to the concept of action. Action is behavior that is directed to realize a predetermined future goal (determinate)" (in Kuswarno, 2009: 18). This understanding explains that social action in this case is a communication process based on past conditions and the background experience of the mentor and the HIV patient being mentored. Then oriented to the patient's behavior in the present and in the future. These mentoring actions are directed at realizing the goals in the future that have been set, namely to help others and solve problems for individuals who are directly affected by HIV/AIDS.

Construction of the Meaning was goal or way of life among PLWHA to live together and decrease the suffer from HIV/AIDS. According to Wendell Johnson, meaning related to the emotional dimension (in Sobur, 2003:258). This is in accordance with the meaning of the words given by the support system. In accordance with the opinion of Wendell Johnson, that meaning is in humans (in Sobur, 2003:258). Thus, the support system can interpret their role as a supporter. In addition, as a companion who regularly interacts and communicates intensely with HIV patients, it is possible to understand the difficulties of life experienced by HIV patients who are being accompanied by him. However, the meaning that can be communicated is only partially, in accordance with the explanation conveyed by Wendell Johnson, namely: the meaning we get from an event is multifaceted and very complex, but only part of these meanings are truly meaningful (in Sobur, 2003:258).

Family support in carrying out the treatment program was very meaningful for PLWHA because with the family accompanying means the family has provided support. Understanding the importance of family support for people living with HIV AIDS are expected to be able to participate in providing support according to the needs of the sufferer. By providing meaningful support, people living with HIV/AIDS will enjoy their days in peace and tranquility which in turn will provide many benefits for all other family members (Reinius, 2018).

Each companion must have patience and a high sense of empathy so it can motivate the spirit of PLWHA to continue their life. Companions with a family approach have understood to be able to reduce defensive attitudes in communication from both parties. This has been demonstrated by trying to understand that HIV patients experience anxiety and confusion in their behavior. This is the motive that the companion has to care for others. For this reason, mentors provide information and solutions to situations faced by HIV patients because they really need an environment that can support them, and can provide space for them to be able to communicate, express problems and other things in life like people without HIV.

CONCLUSION

Mentoring model the combination of peer and family was very effective in improving the quality of life of PLWHA in RSUD dr. H. Ansari Saleh Banjarmasin.

Assistance was needed by PLWHA, therefore PLWHA must be accompanied, from officers, peers, and family, in order to motivate PLWHA to improve their quality of life.

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Case Study Parents' Efforts In Preventing Acute Respiratory Infection In Toddlers

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ABSTRACT

Prevention of acute respiratory infection (ARI) in toddlers by parents will work well if the parents have an ability. Lack of information and motivation for the parents impacts on poor parents' ability in preventing ARI which impacts on ARI, pneumonia, and even disorders of childhood growth and development. This study aimed at identifying parents' efforts in preventing ARI in toddlers.

Design of this research was descriptive. Variable was prevention effort of acute respiratory infection. Population and sample were parents who had toddler (1 to 3-year-old child) and resided in Endrosono Urban Village, Surabaya City, East Java Province, and they were 25 parents. Sampling technique was total sampling. Measuring instrument was questionnaire. Measuring instrument in this research was questionnaire, data in this research were analyzed by frequency distribution.

Research results showed that most of the parents who had toddlers 19 parents (76%) had good prevention efforts. The biggest parents who have good ability are 56% housewives and 64% high school education. Most of the efforts of families who work as housewives and have high school education in preventing ARI have good abilities. Most of the efforts of parents' family had good ability. Improving family efforts in good preventing can be conducted by the parents through getting appropriate and easy information to be understood. In other words, improving parents' motivation can be through improving the efforts of parents' ability in preventing based on the procedures.

Keywords: Prevention of Upper Respiratory Tract Infection, Parents, Toddler

INTRODUCTION

The incidence of acute respiratory infection in children occurs due to the lack of parents' efforts in prevention (Arvin, 2000). Prevention of acute respiratory infection (ARI) in toddlers by parents will work well if the parents have good ability. Lack of information and motivation for parents impacts on poor parents' ability in preventing ARI which impacts on ARI, pneumonia, and even disorders of childhood growth and development. Data from *Riskesdas* (basic health research) in 2018 stated that the prevalence of ARI that occurred in under five-year-old children (toddlers) in Indonesia based on diagnosis and symptoms which were suffered was 20.6%. Data on the prevalence of ARI in toddlers in East Java Province was 31.1% and Surabaya was 12.2% (Riskesdas, 2018). The incidence of ARI in toddlers related to immune system. Furthermore, toddlers were susceptible to be infected ARI because their body system was still poor and the cause of ARI prevalence rate was very high (Hidayah, 2015). ARI in toddlers impacted on decreasing appetite, lethargy, malaise, headaches, and body aches (Trihono, 2013). As we know that ARI can occur due to virus and bacteria which are inhaled into the respiratory tract. Then, the response of body defense moves and it occurs a decrease in immune reactions, thus, mucus secretion increases, productive cough occurs, and respiratory tract is clogged and even asphyxia. In addition, the impact of ARI can cause Pneumonia. If it is not treated immediately, it can cause death (Suparyanto, 14).

Maintaining and improving parents' efforts in preventing the occurrence of ARI can be conducted by the parents through getting appropriate and easy information to be understood either through media or health workers. In other words, the improvement of parents' motivation can be through improving the efforts of parents' ability in preventing acute respiratory infection (ARI) in toddlers based on the procedures. The parents can maintain immunity by fulfilling children's nutrition, maintaining personal and environmental hygiene, and conducting early treatment of ARI for the toddlers (Widoyono, 2011).

METHOD :

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Design of this research was descriptive (Notoatmodjo, 2010). Variable in this research was prevention of acute respiratory infection (ARI). Population and sample in this research were parents who had toddlers (1 to 3-year-old child) and resided in Endroso Urban Village, Surabaya City, East Java Province, Indonesia and they were 25 parents. Sampling technique that was utilized for this research was total sampling. Research time February 2021. Measuring instrument of this research was questionnaire. Moreover, data of this research was analyzed by frequency distribution (Heriyanto, 2017)

RESULT

Frequency Distribution of Parental Characteristics based on education and worker

Table 1. Frequency Distribution of Parental Characteristics based on education and worker in Endroso Urban Village, Surabaya City, East Java Province, Indonesia, February 2021

According	Frequency	Procentage(%)
Education Level		
No / Primary School education	2	8
Secondary School education	1	4
High School education	16	64
Higher education	6	24
Worked		
Housewife	14	56
Private	7	28
Government employees	4	16
Total	25	100

Research results based on table 1 showed frequency distribution of parental characteristics based on education and most of the parents (16 parents (64%)) were graduated from high school education. Meanwhile, based on occupation, more than half total of parents (14 parents (56%)) worked in private sector.

Parents' Efforts in Preventing Acute Respiratory Infection (ARI)

Tabel 2. Distribution of Parents' Efforts in Preventing Acute Respiratory Infection (ARI) in toddlers in Endroso Urban Village, Surabaya, February 2021

Parents' Efforts in Preventing	Frequency	Procentage (%)
Well	19	76
Sufficient	6	24
Jumlah	25	100

Research results showed frequency distribution of parents in preventing Acute Respiratory Infection (ARI) in toddlers was mostly good (19 parents (76%))

DISCUSSION

Research results showed that most of the parents (19 parents (76%)) had good efforts in preventing acute respiratory infection. It was possible because most of the parents (64%) had high school education and 24% of the parents had higher education. Through high school education and higher education, the parents are able to obtain, manage, and understand several information that relate to ARI through media or health workers which can be sorted appropriately and easily to be understood. In order to improve parents' motivation, it can be conducted by improving the efforts of parents' ability in preventing ARI in toddlers based on the procedures. Parents can maintain immunity by fulfilling their children's nutrition, maintaining personal and environmental hygiene, and conducting early treatment of ARI for their toddlers. Regarding the parents' education, it was in accordance with a theory which stated that the lower the education, the less knowledge was possessed and the higher the education, the more knowledge was possessed (Mubarak, 2007).

Another thing that influenced the efforts in preventing ARI was occupation. Most of parents (56%) did not work, thus, the parents had unlimited time to care for their toddlers. Parents were free to seek more information

that related to ARI prevention and child care. This free time allowed the parents to be able to do prevention efforts based on optimal knowledge and time. Hence, it influenced better parents' efforts in preventing ARI. In other words, parents' experiences in preventing ARI influences parents' efforts to prevent ARI occurrences in toddlers. In accordance with the research results which stated that education and occupation were one of factors that influenced the efforts in preventing disease. There was a positive correlation between education level and efforts in preventing ARI. The higher the respondent's education level, the better the proportion of the respondent's good efforts (Karim 2017). Moreover, it was in accordance with a theory which stated that knowledge was influenced by age, education level, occupation, interests, and experience ((Mubarok, 2007). Furthermore, efforts in maintaining and improving parents' ability in preventing the occurrence of ARI which is stable or to be better, can be conducted by the parents through getting appropriate and easy information to be understood either through media or health workers. However, in order to improve parents' motivation, it can be conducted by improving the efforts of parents' ability in preventing ARI in toddlers based on the procedures. The parents can maintain immunity by fulfilling children's nutrition, maintaining personal and environmental hygiene, and conducting early treatment of ARI for their toddlers (Widoyono, 2011).

CONCLUSION

Most of the efforts of parents' family had good ability in preventing of acute respiratory infection (ARI). Suggestions for families in preventing ARI by increasing knowledge skills that are appropriate and easy to understand. Increasing parental motivation can be through increasing the ability of parents to prevent in accordance with procedures

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**FAMILY SUPPORT IN CARING FOR PEOPLE WITH MENTAL DISORDERS
AT THE MENTENG HEALTH CENTER PALANGKA RAYA CITY**

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ABSTRACT

The prevalence of household incidence with schizophrenia/psychosis mental disorders in Palangka Raya City based on the results of the 2018 Reskesdas reached 2.9 per mile, while the results of a preliminary survey at the Menteng Health Center in Palangka Raya City, in 2019 data on patients with mental disorders There were 87 people with mental disorders (ODGJ) who came to visit, and most of the ODGJ did not visit or check themselves regularly. Family support in the care and treatment of ODGJ is very important in healing clients with mental disorders.

The purpose of this study was to determine emotional support, instrumental support or physical support, and family knowledge support in caring for family members with mental disorders (ODGJ) in the working area of the Menteng Public Health Center, Palangka Raya City, through a descriptive method with a sample of 52 people.

The results showed that the family's emotional support in caring for ODGJ was always in the 94.2% category, the instrumental/physical support in the 94.2% category, and the knowledge support in the 100% always category.

The study concludes that emotional support, instrumental support, and knowledge support are very important for clients with mental disorders so that the healing process becomes better.

Keywords: support, emotional, instrumental, knowledge, family, ODGJ

INTRODUCTION

The phenomenon of mental disorders is currently experiencing a significant increase and is increasing every year in various parts of the world, around 450 million people in the world experience mental disorders. There are at least one in four people in the world who experience mental problems and mental health problems. Mental disorders that exist throughout the world have become a very serious problem. Health and Behavior Advisor from the WHO Southeast Asia region (WHOSEARO), found that although mental disorders are not the main cause of death, they are the main cause of disability in the productive age group (WHO, 2017). Meanwhile, the results of Riskesdas in 2018 Indonesia experienced an increase in the number of people with mental disorders, where the prevalence of severe mental disorders reached 7.0 per mile. The highest prevalence of psychosis was in the province of Bali (11.0 per mile). While the lowest was in the province of Riau Islands (3.0 per mile), while the survey results of households with schizophrenia/psychosis mental disorders in the city of Palangka Raya reached 2.91 per mile, this indicates that people with mental disorders in the city of Palangka Raya is still quite high.

Profile of the city of Palangka Raya in 2018, health services for ODGJ Severe reached the target of 319 people, and 300 people (94.04%) received health services according to standards, the target data is still not by the mandate of PMK Number 4 of 2019 concerning technician standards for fulfilling service quality based on minimum service standards (SPM) in the health sector where it is stated that every ODGJ is required to receive health services according to standards (100%) (Menkes RI, 2019), This is also reinforced by Law Number 18 of 2014 concerning mental health, which ensures that everyone can achieve a good quality of life, and provide integrated, comprehensive and sustainable health services through promotive, preventive, curative and rehabilitative efforts (UU RI, 2014)). So as not to cause social impacts in the form of rejection, exclusion, and discrimination. In addition, it can have an impact on the economy in the form of loss of productive days to earn a living for sufferers and their families. Families who care for people with mental disorders must be able to have positive coping with stress, the burden experienced. So that family support can have an effect on health and well-being which serves to reduce mortality and recovery, improve cognitive function, physical, and emotional health. Family support has a positive influence on the healing of people with mental disorders.

The results of the preliminary survey obtained data from ODGJ patients who visited the Menteng Public Health Center area as many as 87 people, and most of the ODGJs did not make visits or check themselves regularly according to the set time. Family support in the care and treatment of ODGJ is very important in healing clients with mental disorders. Based on this phenomenon, researchers are interested in researching the Analysis of Family Support Caring for ODGJ Patients in the Work Area of Menteng Public Health Center in Palangka Raya City.

METHODS

This research is descriptive research, namely research that describes a phenomenon, or events as they are. The research location is in the working area of Menteng Public Health Center, Palangka Raya City. The study was carried out in February-March 2020. Sampling in this study was carried out with a purposive sample with a sample of 52 people, with inclusion criteria being families who care for people with mental disorders, are involved in treating ODGJ patients, and live in one house, age 17 years, cooperative and willing to be a respondent. Data collection in this study was conducted through a family support questionnaire that was measured using a Likert scale which includes emotional support, instrumental support, and information/knowledge support, which have been tested for validity and reliability.

RESULTS

Based on the results of research conducted at the Menteng Palangka Raya Health Center in 2020, using primary data using a questionnaire, it can be processed and displayed in the form of a frequency distribution. The results of the study on the description of family support in caring for people with mental disorders at the Menteng Health Center, Palangka Raya City can be seen in the following table.

a. Characteristics of Respondents

Characteristics of respondents who treat patients with mental disorders (ODGJ) in the working area of Menteng Health Center are mostly male as many as 27 people (51.90%). Judging from the age, most of them were 46 - 55 years old as many as 15 people (28.80%), high school education equivalent as many as 22 people (42.30%), private jobs as many as 21 people (40.40%), married status as many as 32 people (61.50%) and the relationship with patients mostly father/mother and biological children is 14 people (26.93%), as described in table 1 below

Table 1: Frequency Distribution of Characteristics of Respondents Caring for Patients with Mental Disorders (ODGJ) in the Work Area of Menteng Health Center, Palangka Raya City

Characteristics Of Respondents	Amount(n)	Presentation (%)
Gender		
Female	25	48.10%
Male	27	51.90%
Age		
17 - 25	2	3,84%
26 - 35	10	19,23%
36 - 45	10	19,23%
46 - 55	15	28,80%
56 - 65	11	21,20%
>65	4	7,70%
Education		
Elementary school	10	19,20%
Junior high school	3	5,80%
High school	22	42,30%
University	17	32,70%
Occupation		
Civil servants	14	26,90%
Private employee	21	40,40%
Laborer	4	7,70%
Housewife	2	3,80%
Unemployed	11	21,20%
Marital Status		
Not married/ single	9	17,30%
Married	32	61,50%
Widower/widow	11	21,20%

Relationship with patient		
Husband/wife	13	25,00%
Mother/father	14	26,93%
Biological children	14	26,93%
Siblings	10	19,23%
Grandchild	1	1,91%
Total	52	100,00%

b. Description of Respondents' Family Support

The results of the distribution of family support in caring for patients with mental disorders (ODGJ) in the work area of the Menteng Health Center, Palangka Raya City are explained in table 2 below.

Table 2: Frequency Distribution of Respondents' Family Support in Caring for Patients with Mental Disorders (ODGJ) in the Work Area of Menteng Public Health Center, Palangka Raya City

Family Support	Amount (n)	Presentation (%)
Emotional Support		
Often	3	5,8%
Always	49	94,2%
Instrumental/Physical Support		
Often	3	5,8%
Always	49	94,2%
Knowledge Support		
Always	52	100%
Total	52	100,0%

DISCUSSION

a. Description of Respondents Characteristics

Based on table 1, the frequency distribution of the characteristics of respondents who treat patients with mental disorders (ODGJ) in the working area of the Menteng Public Health Center, Palangka Raya city, it is found that male outnumbers female. This is in line with the theory which says that men have the nature of responsibility and are ready to face situations that relate to themselves and others around them. Men have wider problem-solving abilities than women, using more effective coping strategies. But in providing support for treating mental patients, women are more patient and painstaking. (Ririn, 2017). Women also have a larger social network to other sources that provide information support, while men have less formal access, men's names are responsible and capable of making decisions in the family.

The frequency distribution of respondents' characteristics by age, which is mostly in the age range of 46-55 years, is 28.80%. The results of this study indicate that the age of the family is in the phase of family development reaching the generativity phase, which aims to care for and guide others, can be in the form of desired expectations in family life and efforts to leave their legacy to the next generation. (Friedman, 2013). The distribution of knowledge distribution analyzed based on the most recent education is high school education as much as 42.30%. This shows that the higher a person's education, the easier it is to receive information, which is what they have increased. The level of education of a person to have broader knowledge, abilities, and skills. Individuals who are reasonably expected to have a good level of education can know and be aware of making decisions and behavior following appropriate values or norms. The higher a person's education, the easier it is to receive information, and finally the more knowledge (Notoatmodjo, 2015). The level of education of a person to have broader knowledge, as well as abilities, and skills. And with a fairly good level of education, a person is expected to know and be aware of making decisions and behavior by values or norms. The frequency distribution based on occupation, based on the analysis shows most or 40,40% are working in the private sector. This affects the support of socio-economic factors, namely the higher a person's economic level is usually more responsive to the symptoms of the disease felt. So he will immediately seek help when he feels there is a problem with his health. This is in line with what was stated The level of education of a person to have broader knowledge, as well as abilities, and skills. And with a fairly good level of education, a person is expected to know and be aware of making decisions and behavior following values or norms. The frequency distribution based on occupation, based on the analysis shows most or 40,40% are working in the private sector. This affects the support of socio-economic factors, namely the higher a person's

economic level is usually more responsive to the symptoms of the disease felt. So he will immediately seek help when he feels there is a problem with his health. This is in line with what was stated (Rohana, 2016). that a person's low income can affect information about his health status and limited costs to reach health facilities in the media or health service centers. Humans are social creatures, which means humans need other people and their social environment as a means to socialize. Someone who has a good income will get good facilities too. (Rohana, 2016).

The frequency distribution based on the relationship with the client is father/mother (parents) and biological children of 26.93%. The role of parents is very important for family care at home. Parents have their respective roles, a father as a family leader, breadwinner, protector, and giver of security for his family. Mothers as caretakers, caregivers, child educators, protectors, and also as additional breadwinners. Friends found that motherhood has a fairly close emotional relationship in the family, this is also internal family support such as support from father or mother, husband or wife, as well as support from biological family or external family support. (Friedman, 2013).

b. Family Support Overview

The distribution of the frequency of family support caring for patients with mental disorders (ODGJ) in the work area of the Menteng Health Center, Palangka Raya City, in table 2, the results show that emotional support with categories is always 94.20%. This agrees with what Friedman stated that emotional support is support to provide a feeling of comfort, a feeling of being loved in the form of enthusiasm, and a sense of empathy. (Friedman, 2013). Empathy itself is the ability to feel the emotional state of another person, feel sympathetic, and try to help solve problems. Emotional support from family can help sick patients feel that their family accepts their situation and will continue to support and be by their side. The results of this study also agree with the research of Nirwan et al who found that the ability to care for patients and interpersonal factors had a significant influence on family support, the family felt the benefits of the family support provided, the better the perceived benefits, the better the support provided by the family. in caring for family members with mental disorders. (Nirwan, 2016). However, the results of this study do not agree with research conducted by Nasriati (2017) which suggests that stigma and family support in caring for family members with mental disorders are still low. caring for family members with mental disorders is still low. (Ririn, 2017). Family support is a very influential factor in the care of sick family members. Support from emotional families can help patients with mental disorders who feel more cared for so that patients can accept their situation, and continue to support treatment and their families.

The distribution of the frequency of family support caring for patients with mental disorders (ODGJ) in the work area of the Menteng Public Health Center, Palangka Raya City for instrumental/physical support in the always/high category, the result is 94.20%. Instrumental support is support where the family is expected to be able to facilitate all the needs of family members, be it bio, psycho, social, and spiritual needs. One form of family love for family members is as the main support system to help someone improve their quality of life. (Friedman, 2013). Friedman in 2013 stated that the components that need to be fulfilled by families to fulfill economic functions are related to meeting family needs such as clothing, food, shelter, and how to obtain resources to improve health status. The results of the study agree with Damanik's research in 2019 in Kutowinangun District about family attitudes and support for family members with mental disorders, the main thing being that family support is good (61.3%) (Damanik, 2019). Good family support can contribute to family members who are sick and provide good health service facilities. The high instrumental support in the results of this study shows that family members are ready to provide help and assistance to family members who are sick. The results of family support based on information or knowledge from the results of this study indicate the high category / always as much as (100.00%). These results indicate that families know how to care for family members with mental disorders. This result agrees with what Yohono 2017 stated that the family is an educator for other family members in carrying out independent care. (Yuhono, 2017). The same opinion was also expressed by Rahmayani & Hanum 2018 that knowledge or information in the family has an important role to increase family support in caring for family members who experience mental health disorders. (Rahmayani & Hanum, 2018). The results of this study also agree with Yunindra's 2018 research which suggests that all family support is in a good category (Yunindra, 2018).

CONCLUSION

Based on research on the description of family support caring for patients with mental disorders (ODGJ) in the working area of the Menteng Health Center, Palangka Raya City, it can be said as follows:

Characteristics in family support caring for people with mental disorders (ODGJ) show the results that the male gender is greater than the female gender. Characteristics of respondents in age family support caring for patients with mental disorders are more in the age range of 46-55 years, Characteristics of education and occupation of respondents who care for patients with mental disorders who have more high school education while for jobs that are more likely to work in the private sector, Characteristics of respondents based on marital status, the average married, the characteristics of the respondent's relationship with patients with mental disorders are the relationship between father/mother and siblings. The description of family support caring for patients with mental disorders (ODGJ) in the work area of the Menteng Health Center, Palangka Raya city shows results in the category always for emotional support and instrumental support. Meanwhile, for information support or knowledge of families who care for patients with mental disorders, the category is high/always. These results indicate that families know how to care for family members with mental disorders. However, it is necessary to increase emotional support, instrumental support for family members who experience mental disorders in the process of treatment and healing.

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Anxiety Heart Cateterization Of Coronary Heart Disease Patients

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ABSTRACT

Coronary heart disease can be detected by non-invasive diagnostic examination or invasive examination. Invasive examination performed is cardiac catheterization. In cardiac catheterization or coronary Cath Lab, many patients feel anxious because they are afraid of the pain that will be caused. The purpose of this study was to analyze differences in anxiety levels before and after cardiac catheterization in coronary heart patients.

The research design used was a *quasi-experimental* method using the method *one-group pre-test-post-test* to see differences in anxiety levels before and after cardiac catheterization. The population of this study is coronary heart patients who will undergo cardiac catheterization. The sample uses the slovin formula, size as many as 16 people. Analysis with *Paired Sample t-Test*.

The test results showed that there were differences in the level of anxiety before and after cardiac catheterization in coronary heart patients ($\alpha < 0.05$, i.e. $p\text{-value} = 0.000$). The conclusion is that cardiac catheterization affects the patient's level of anxiety. Suggestions are expected that the hospital and nurses can pay attention and improve efforts to handle anxiety in cardiac catheterization patients.

Keywords: Anxiety, Cardiac Catheterization.

INTRODUCTION

According to statistics from the *American Heart Association* from 2004 to 2015, deaths from coronary heart disease decreased by 35.5% but risk factors for coronary heart disease remained high. Coronary heart disease is 2 of 10 diagnoses in hospitals with the most expensive cost, which is around 10.4 billion (AHA, 2017)

. Coronary Heart Disease (CHD) is a health problem faced in various countries in the world. The number of factors that influence, causing the diagnosis and therapy of the disease continues to grow. In Indonesia, economic progress is one of the factors in the increasing prevalence of coronary heart disease. The progress of

the economy that continues to grow will change people's lifestyles and cause changes in public health patterns (Ramandika, 2012).

Coronary Heart Disease can be detected by non-invasive diagnostic tests or invasive tests. Invasive examination performed is cardiac catheterization. Cardiac catheterization is a supporting examination by inserting a catheter into the cardiovascular system to examine the anatomy and function of the heart. Cardiac catheterization is a technique that is internationally recognized as the best and most accurate technique for detecting blockages in the coronary arteries (Ramandika, 2012).

Coronary Artery Disease (CAD) is still a problem that causes high morbidity and mortality, although many medical interventions exist to treat coronary heart disease. Depression and anxiety are often experienced by patients and this interferes with the treatment and healing process. Askin L et al 2020.

In Indonesia, in 2010 the number of cardiac catheterization procedures increased to 3 million annually. In particular, Cipto Mangunkusumo Hospital, Jakarta, has performed 650 catheterization procedures in 2006 and 1125 procedures in 2007. Data from the National Heart and Blood Vessel Hospital Harapan Kita, on average almost 15-20 patients are treated each day and around 350-400 who seek treatment at the polyclinic. Patients undergoing catheterization examinations are about 25-30 patients per day (Simajuntak, 2014).

Cardiac catheterization or coronary Cath Lab actions have a lot of psychological effects on patients, especially anxiety, fear because they feel sick and worry about the side effects that will be caused. This feeling of fear becomes a form of anxiety that is difficult for heart disease patients to overcome, so holding pain is better than having to check it (Dakota, 2010). This is also supported by research from Xiao Y et al 2019, which says that the highest anxiety is experienced before the percutaneous coronary intervention by patients with coronary heart disease.

Anxiety is a vague worry, related to feelings of uncertainty and helplessness. Anxiety is experienced subjectively and communicated interpersonally. Anxiety is different from fear. Anxiety is an emotional response to an intellectual judgment of danger (Suliswati, 2009).

According to Simanjuntak Gohana's research conducted in 2014 with the title Overview of anxiety levels in patients who will undergo cardiac catheterization at Haji Adam Malik General Hospital Medan, it was found that almost half of the respondents experienced moderate levels of anxiety as much as (55.3%), supported by a score of 55.3%. The patient's average score is 32.55 which shows the criteria for moderate anxiety level and has a standard deviation of 11.76, while respondents who experience mild anxiety (31.6%), and respondents who experience severe anxiety (13.2%). Research conducted by Mea CPD (2018) on the level of anxiety in patients undergoing cardiac catheterization found that the level of anxiety before cardiac catheterization was higher than post cardiac catheterization.

One of the hospitals that has cardiac catheterization room facilities in North Sulawesi is Prof. RSUP. Dr. R.D Kandou Manado. In 2016, RSUP Prof. Dr. R. D Kandou Manado has performed 1206 catheterization procedures, and 1475 procedures in 2017 for the period from January to October. The results of the initial survey conducted through interviews and observations with patients who will undergo surgery in the Cath Lab room in January 2018 for 1 week about 21 people, there were 9 patients complaining of anxiety before the procedure was carried out and 3 patients feeling anxious after the procedure. Based on the description above, the authors are interested in analyzing the differences in the level of anxiety before and after cardiac catheterization in coronary heart patients in the Cath Lab room of RSUP Prof. Dr. R.D Kandou Manado. The purpose of this study was to analyze differences in anxiety levels before and after cardiac catheterization in coronary heart patients in the Cath Lab room.

METHOD

Type of research used is descriptive analytic research. The researcher will measure the independent and dependent variables, then will analyze the collected data to look for differences between the variables. The design of this study used a *quasi-experimental* method using a method *one-group pre-test-post-test design* to see differences in the level of anxiety pre and post cardiac catheterization in coronary heart patients in the Cath Lab room. The population in this study were patients who underwent cardiac catheterization in the cath lab at RSUP. The sample was determined using the Slovin formula and obtained 16 respondents. Determined according to the inclusion and exclusion criteria. The inclusion criteria were patients

with indications for cardiac catheterization and coronary heart patients. The data collection technique used to determine the anxiety level of pre and post cardiac catheterization patients was using the HARS (*Hamilton Anxiety Rating Scale*) questionnaire. The HARS scale consists of 14 question items. With an assessment of scores between 0-4, given 0 if there are no symptoms, 1 if symptoms are mild, 2 if symptoms are moderate, 3 if symptoms are severe, 4 if symptoms are very severe. Anxiety levels consist of 0-13 no anxiety, 14-20 mild anxiety, 21-27 moderate anxiety, 28-41 severe anxiety, 42-56 very severe anxiety. Five-finger hypnosis relaxation techniques will be given through lecture and simulation methods according to the standard operating procedures. Relaxation techniques are given to overcome or reduce the patient's level of anxiety. Statistical test using *paired t test* with 95% CI. Ethical Approval was obtained from the health research ethics commission of the Manado Health Polytechnic.

RESULTS

a. Characteristics of Respondents

Table 1. Distribution by Age of Respondents

No	Age	n	%
1	46-55 years	4	25
2	56-65 years	7	43.75
3	>65 years	5	31.25
Total		16	100

Based on table 1, it shows that some of the 16 respondents large age 56-65 years 7 people (43.75%).

Table 2. Distribution by Gender of Respondents

No	Gender	n	%
1	Male	12	75
2	Female	4	25
Total		16	100

Based on table 2, it shows that out of 16 respondents most of the respondents were male 12 people (75%).

Table 3 Distribution Based on Respondent Education

No	Education	n	%
1	Elementary School	1	6,25
2	Junior High School	3	18,75
3	Senior high school	11	68,75
4	College	1	6,25
Total		16	100

Based on table 3, it shows that most of the 16 respondents have high school education 11 people (68.75%).

b. Anxiety Levels

Characteristics of respondents based on anxiety levels before and after cardiac catheterization in coronary heart patients can be seen in the following table.

Table 4. Characteristics of respondents based on Anxiety Levels Before dan after undergoing Cardiac Catheterization

Variable	Category										Total	
	Not Anxiety		Mild		Moderate		Severe		Very Severe			
	n	%	n	%	n	%	n	%	n	%	n	%
Anxiety of coronary heart patients Pretest	2	12.5	6	37.5	5	31,25	4	25	0	0	16	100
Anxiety of coronary heart patients Posttest	13	81.25	3	18.75	0	0	0	0	0	0	16	100

Based on table 4, it shows that the respondents' anxiety before cardiac catheterization was mostly in the moderate category, there were 5 people (31.25%). Respondents' anxiety after undergoing cardiac catheterization was mostly in the non-anxious category, there were 13 people (81.25%).

Table 5. Results of analysis using Paired Sample t-Test Anxiety Level Difference Pre and Post Cardiac Catheterization Coronary Heart Disease Patients

Variable	N	Mean	SD	t	p-value
anxiety pre-catheterization	16	2.69	1.014	6.708	0.000
anxiety post-catheterization	16,	1.19	0.403		

The difference in mean anxiety before and after cardiac catheterization in coronary heart patients analyzed by Paired Sample t-Test. Table 5 shows that the average value of the patient's anxiety before cardiac catheterization are mean SD of 2.69 to 1.014 and after cardiac catheterization and was given five fingers hypnotic relaxation techniques are *mean* SD of 1.19 to 0.403.

Based on the results of data analysis, it was found that there was a difference between pre and post cardiac catheterization anxiety levels. Where the mean level of post-cardiac catheterization anxiety is lower. Based on the results of statistical tests using the Paired Sample t-Test, the p value < 0.05 was p = 0.000.

DISCUSSION

After presenting the data in the form of a frequency distribution table, a discussion of the research results was carried out according to the variables studied from the research results in accordance with the variables studied from the research results, it was obtained:

1. Characteristics of Respondents

Based on the results of research in the Cath Lab Room of RSUP. Prof. Dr. RD Kandou Manado, from 16 respondents showed that the most respondents were aged 56-65 years and the least was 46-55 years. According to Hastuti 2019, that anxiety that occurs when undergoing percutaneous coronary intervention (PCI) can occur because of feelings of discomfort both physically and psychologically and is also influenced by demographic factors, namely gender, age, and level of education most respondents were male 12 people (75%). According to the results of research

by Ramandika (2012), male respondents are at high risk of coronary heart disease because most have a history of smoking.

Based on the frequency of education, it shows that the education level of most respondents is SMA, totaling 11 people (68.75). This shows that in terms of education, most of the respondents are good. According to Notoadmodjo (2003) education can influence a person, including a person's behavior regarding lifestyle, especially motivation for attitudes, participating in education is needed to obtain information, for example, that supports health. This means that the higher the level of education, the easier it is for someone to receive and understand information. So it can reduce the level of anxiety.

2. Anxiety levels pre and post cardiac catheterization by providing hypnotic techniques five fingers

According Oktavamdani et al 2019, anxiety is often found in patients undergoing invasive measures, which are marked by an increase in heart rate. Interventions that can reduce anxiety are distraction techniques, hypnosis, cognitive behavioral approaches and the involvement of nurses and other health teams in patients (Hastuti 2019).

Based on research conducted, it was found that from 16 samples of heart patients before cardiac catheterization showed the highest number of mild anxiety, amounting to 6 respondents (37.5%). This study is in line with Simanjuntak Gohana's (2014) study which said that patients who will undergo cardiac catheterization with mild anxiety levels (31.6%) are the second most experienced patients.

Anxiety or anxiety can be overcome with relaxation techniques, distraction, spiritual activities and hypnotherapy (Keliat, 2015). The five finger hypnosis technique is an act of helping clients change perceptions of anxiety, stress, tension and fear. The client is in a relaxed state, given suggestions and moves the fingers on command (Long, 2010).

In this study, patients were given a five-finger hypnosis technique after cardiac catheterization showed the highest number at the level of not being anxious, amounting to 13 people (81.25). These results indicate that five-finger hypnosis can reduce anxiety. This study is in line with the research of Widyanti (2013) in patients who will undergo surgery who said that anxiety decreased before and after being

given the five-finger hypnosis technique at dr. Soedarso Hospital Pontianak, West Kalimantan.

CONCLUSION

There is a difference in the anxiety level of pre and post cardiac catheterization patients after being given the five finger hypnosis relaxation technique. The anxiety level of the pre-cardiac catheterization patient was in the moderate level of anxiety. The post-cardiac catheterization patient's anxiety level was in the non-anxious category. The results of this study recommend that the five-finger hypnosis technique can be used to reduce anxiety in post-cardiac catheterization patients.

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QUALITATIVE ANALYSIS OF EARLY MARRIAGE AND THE IMPLICATIONS ON FAMILY LIFE IN BITUNG CITY

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ABSTRACT

Developments in today's digital era, people face various kinds of adolescent problems, including the incidence of early marriage due to freedom of association, the existence of free mass media showing television, internet, pornographic videos, and others are media that have a major influence on adolescent behavior, another cause is promiscuity. too much and the lack of attention from parents to take care of children because they are too busy with work, often children are only cared for by housemaids (F Rahman 2017). The implications of early marriage for family life include inadequate child care and education, and fights that often end in divorce (Rahmawati, 2014). This study aims to identify the risks of early marriage and analyze the implications of early marriage on family life. The research method is qualitative and presented in an exploratory descriptive manner, the population of all adolescents under 16 years of age for women and adolescents under 19 years of age for men who live in Bitung City, the sample was taken purposively, namely 6 main informants, while for the triangulation of 10 informants totaling 16 people, the data analysis in this study used the method of content analysis (content analysis), namely data collection, data reduction, verification and then presented in descriptive form, the results showed that all informants said that it was very risky. for adolescents to marry early at the age of 16 and under for girls and under 19 for boys. According to informants, early marriage causes many problems, including family life, where teenagers and parents will experience difficulties so that future life is not eternal. The impact of early marriage on the community includes teenagers not being able to socialize with the community, and also the Minahasaculture does not allow teenagers to marry under the age of marriage. This study concludes that adolescents can explain if early marriage causes many problems, both for family life and community life. It is recommended to the government to families and communities to be able to give

loving attention to adolescents in daily interactions and to foster good relations between parents and children as well as families and communities.

Key Words : Early Marriage, Implication, Family Life

INTRODUCTION

Developments In developments in the current era of globalization, humans face various kinds of challenges and problems. Among these problems is the emergence of various forms of juvenile delinquency. Teenagers at school age are generally focused on learning and doing useful things, but in fact, they do various forms of inappropriate actions that should not be done. This delinquency often occurs in children, but the most dominant occurs in adolescence and adulthood. At this time, adolescents experience very fast growth and development process or called the transition period (puberty), with the freedom of association, the mass media are free to broadcast such as television. E-mail, the internet, and others are media that have a major influence on the behavior of today's teenagers, (F Rahman 2017), Another cause is excessive promiscuity and lack of attention from parents to raise children because they are too busy with work, often children are only cared for by domestic helpers, this can be proven by the number of cases in Bitung City, North Sulawesi province, (Bitung City Profile 2020).

In two consecutive years in 2019-2020, cases of early marriage in Bitung City, North Sulawesi Province have increased, as shown in the table below.

No	District Name	The year 2019		The year 2020	
		Dropout from school	Early marriage	Dropout from school	Early marriage
1	Aertembaga	5 People	2 People	6 People	3 People
2	Girian	6 People	3 People	7 People	4 People
3	Madidir	4 People	2 People	5 People	3 People
4	Maesa	4 People	3 People	5 People	4 People
5	Matuari	5 People	3 People	6 People	6 People
6	Ranowulu	2 People	3 People	3 People	5 People
7	Lembeh Utara	1 Person	1 Person	1 Person	1 Person
8	Lembeh Selatan	1 Person	2 People	1 Person	1 Person

Based on the table above, cases of early marriage in Bitung City from 2019 to 2020 have increased in each sub-district. This indicates that public awareness to marry at the ideal age is still lacking. In this case, the role of the government and religious leaders should be maximized to overcome these problems.

In addition to the role of the government and religious leaders, parents, as well as the closest family in the community in Bitung City, can educate teenagers in a better direction, especially attention and affection in raising children.

This problem must be researched considering the incidence of early marriage cases in 2019 in Bitung City consisted of 8 sub-districts, 51 (21%) cases dropped out of school and married at an early age 57 (23%) cases while in 2020 there were 60 (28%) cases of dropouts, married at an early age as many as 68 (35%), this shows that there has been an increase in cases of early marriage for 2 (two) consecutive years. (Bitung City Profile)

The purpose of this study was to explain the risk of early marriage, and the impact of early marriage on family and community life in adolescents aged 16 years and under for women and under the age of 19 for boys.

METHOD

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This study uses a research design with a qualitative approach which is presented in an exploratory descriptive manner. The approach to data collection time is cross-sectional. The sample of this study was 6 adolescents under 16 years for girls and under 19 years for boys and 10 people consisting of the Head of Environment and parents of teenagers. The data used in this study was primary, namely in-depth interviews (In-depth. interviews) on research subjects and secondary data through observation of daily activities/activities to see behavior at home. Collecting data through in-depth interviews conducted with open-ended questions assisted by writing instruments equipped with a tape recorder and observation sheets in the form of a checklist, the main informants were 6 adolescents, consisting of 4 young women and 2 young men under 16 years for young women, while young men under 19 years old, junior high school students, and as informants triangulation was carried out on 10 people consisting of 6 Heads of Environment, and 4 parents of teenagers, then carried out the implementation, namely making Workshops/Seminars equipped with providing videos and pocketbooks about consequences/risks early marriage occurs with adolescents aged under 16 years for women and under 19 years for men and parents are included as companions, Data analysis is processed according to its characteristics with content analysis, namely data collection, data reduction, verification presented in descriptive form , then the conclusion is drawn, (USF Jannah-Egalita, 20 15)

RESULTS AND DISCUSSION

The results showed that the main informants were 6 teenagers consisting of 4 young girls, 2 boys under 16 years old for girls, and under 19 years old for boys, namely IU1, IU2, IU3, IU4, IU5. , IU6 is a junior high school student. For triangulation informants, 10 people as environmental heads and parents of teenagers are called IT1, IT2, IT3, IT4, IT5, IT6, IT7, IT8, IT9, IT10 with ages between 45-55 years, the last education is SMA / SMK SMK by gender 4 girls, 6 boys

1. Risk of early marriage at age 16 and under for women and under 19 for boys

Information that can be obtained from in-depth interviews about the risks of early marriage includes what will happen if there is an early marriage, how to avoid it, what are the barriers to socializing in the community, how to avoid early marriage in appendix 6. Based on in-depth interviews with key informants, namely teenagers 16 years and under for girls and under 19 for boys about the risk of early marriage, all said that if there is early marriage, early marriage is very risky because it has no future, it is difficult to get a job, domestic violence behavior occurs because of an early age and there is a risk of divorce and the death of mother and child and can occur prematurely because the reproductive organs are not yet mature to receive fertilization. (IU1, IU2, IU3, IU4, IU5, IU6). This can be seen in box 1 below :

Box 1. Information from Informants on the Risk of Early Marriage in adolescents aged 16 years and under for women and under 19 for boys

"...We explain no ma'am.... that people who have a future are not guaranteed and think they can get a job and it's hard to get a job..." (IU1).

"... I think it's a loss because of early marriage, there is domestic violence because the mindset is still young...." (IU2).

"... If there is a marriage under the age of tantu, the risk of bacere increases and the risk of maternal and child mortality increases..." (IU3).

"..... If there is a marriage, domestic violence must occur because we do not know exactly what RT is ..." (IU4).

"...for this lady, you have self-respect, so if you do that...." (IU5)

"....oh yes ma'am, there is a fatal risk...." (IU6).Early

"...marriage is very risky because it doesn't have a future. , it is difficult to get a job, there is domestic violence behavior due to an early age and the risk of divorce and maternal and child death, premature, immature reproductive organs accept conception (IU1, IU2, IU3, IU4, IU5, IU6).

The statement above can be explained that all the main informants are teenagers aged 16 years and under for girls and under 19 years for boys, if there is early marriage there is no future for teenagers, and violent behavior in domestic fights, abortion to a baby will happen. premature birth, because the reproductive system is not perfect. (Rahmawati 2014)

From this description, it can be explained that all the main informants and triangulation of informants said that it was very risky if teenagers did early marriage at the age of 16 years and under for girls and under 19 years for boys.

This This study can be concluded as a whole about the risk of early marriage, adolescents will experience failure in family and community life due to dropping out of school, at risk of abortion, and will experience abnormal labor, namely babies born prematurely. , because the reproductive system is not perfect. DewiDolifah's 2016 research concluded that underage marriage often occurs because it is influenced by social media, children want to imitate and try porn videos.

2. Impact on family life if early marriage happens

The information that will be obtained from in-depth interviews about the impact on family life if there is an early marriage is, what are the impacts if there is early marriage, how is family life if there is an early marriage in the family, how do parents and siblings respond. For you, how to avoid early marriage can help seen from the results of in-depth interviews with key informants, as in Box 2 below:

Box 2. Information from Informants on Impact on Family Life in the event of Early Marriage

"... if there is an early marriage, the children are at risk of dropping out of school, there is hope that you will become rebels in the environment..." (IT1)
 "... iya no bu it anak2 if married young so there must be a risk" (IT2)
 "... Yes ma'am dorang be so naughty risk of community-acquired many denglaengmobekeng-laeng no" (IT3)
 " Yes, it's not just naughty mom, so what's wrong with parents so stenga dies looking for doi for school people, there's no work, midfielder...." (IT4)
 ".....oh yeah, so that's what I heard, parents...." (IT5)
 "....Kong dang how is it really risky, no...." (IT6)
 "....It's really very risky if you young marriage occurs" IT7)
 "....Yes, we also think that if you marry young, there is a risk..." (IT8)
 "....Depe on the risk of bacere no".....(IT9)
 "....Very risky for people myself with my parents and brother...." (IT10)
 "....Early marriage is very risky, some drop out of school, some want to cause problems in the community and there is no hope in the future (IT1,IT2,IT3,IT4,IT5, IT6, IT7,IT8,IT9,IT10)

From the description above, it can be explained that the impact that occurs on family life is if teenagers marry early. Families will be disappointed, parents will be disappointed because they dropped out of school and family self-esteem is very disappointing, even though culture does not justify early marriage, (DA Triningtyas 2016)

3. Impact on the Community in the Occurrence of Early Marriage

The information to be obtained from in-depth interviews about the impact on the community if there is an early marriage is, how will the local community respond if there is early marriage, what is the life of the community if there is early marriage. marriage in the community, what is the impact on society and parents if there is early marriage. results of in-depth interviews with key informants, as shown in Box 3 below

Box 3. Information from Informants on Impact on Society in the event of Early Marriage

"...It's possible that we drop out of school and our parents are very disappointed because my parents and sister hope that we have dreams, ma'am....." (IU1).
 "We feel ashamed because we are the talk of people and parents feel disappointed and hopeless....." (IU2)
 "Look, ma'am, there are 2 possibilities for our parents to keep going to school, but it's also difficult, ma'am we have to take care of our children, ..." (IU3).
 "....We stopped going to school and finally nyanda can get a job, just hope our parents will lower the self-esteem of our family and others, we will feel good....(IU4)
 ".....Io no worries about the impact on your family, you are angry with us..... (IU5).
 "....Indeed, if you are young, there will be turmoil at home....(IU6).
 "...The impact on the family is that parents are very disappointed, there will be talk between families and will also drop out of school without getting a job thereby lowering the self-esteem of the family....." (IU1, IU2, IU3, IU4, IU5, IU6)

Regarding the community regarding early marriage, these problems will not end continuously if there is early marriage, some will become a nuisance because they do not finish school and get married at a young age.

The same statement from the results of in-depth interviews with triangulation informants from the Head of the Environment and parents of teenagers said that early marriage has an impact on society and will disrupt the surrounding environment because teenagers are not old enough and must be given spiritual motivation and guidance in each religion.

From the description above, it can be concluded that all community groups do not approve of teenagers marrying at a young age, although Minahasa culture does not allow teenagers to marry under the age of marriage, it is better to marry at an adult age so as not to disturb the community.

CONCLUSION

The conclusion in this study is that adolescents can explain that early marriage has a very dangerous impact if there is early marriage, many problems will be experienced, adolescents and parents will experience difficulties in family life so that future lives are not happy, and adolescents will not be able to socialize with the community and do not allow teenagers to marry under the age of marriage.

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LITERATURE REVIEW: THE EFFECT OF PRONATION POSITION ON HEMODYNAMIC CHANGE IN PREMATURE BABY WITH RDS

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ABSTRACT

The biggest cause of neonatal death is premature birth, reaching 35.2%. The mortality and morbidity rate in premature infants is mostly caused by *respiratory distress syndrome* (RDS). One of the management is giving pronation position. The design of this research is literature review using the compare technique is to summarize and criticize the similarities of articles and presented in new articles, with data sources: search for research journals that have been carried out and published in national and international online journals published in Indonesian and English from 2016-2020 using Google Scholar. The results of the analysis showed that the average oxygen saturation of all initial journals was 93% to 96%. The average initial respiratory rate was 55x/minute to 66x/minute. In addition, heart rate, temperature and pulse have improved. Each duration can increase hemodynamic status due to after the pronation position given will provide calm and comfort to the baby which has an impact on circulation in the body to be smooth. The results of the P value in all journals used were <0.05, meaning that there was a significant effect before and after the pronation position was carried out. This is because the heaviest part of the lungs is located on the back, so patients who lie down with their weight on their back will have a harder time getting enough air. The pronation position can be applied to premature babies to improve hemodynamic status which has an impact on the baby's quality of life.

Keywords: Prone position, Hemodynamic, Premature baby

INTRODUCTION

Low Birth Weight (LBW) babies are babies born with a body weight of less than 2,500 grams (Arief, 2009). Low birth weight is caused by premature birth. Premature birth in babies occurs before 37 weeks of gestation. The infant mortality rate is one of the indicators in determining the health status of children. In 2013 almost 1 million newborns died in the first 24 hours of life, meaning 16% of the total under-five mortality and more than a third of neonatal deaths (Sri Wahyuni, 2020).

The main cause of neonatal death is respiratory distress at birth. Occurs in premature babies who have respiratory problems will experience respiratory distress syndrome or commonly called Respiratory Distress Syndrome.

Respiratory Distress Syndrome is a condition in premature infants that gives clinical features in the form of increased respiratory effort, decreased lung compliance, atelectasis with decreased FRC, impaired gas exchange and extensive interstitial edema. The incidence of respiratory distress syndrome is 60-80% occurring in premature infants and only 5% in mature infants (Erlita, R, 2013).

The World Health Organization states that the prevalence of babies with LBW in the world is 15.5% or about 20 million babies born every year (Journal of Development 2020). According to the results of the 2018 basic health research, the prevalence of LBW in Indonesia is around 6.2%. From 2012 to 2019, there was a reduction from 20 million to only 14 million infant deaths (Ferdiyus, 109). LBW cases occurred in Indonesia, which was ranked 6th out of 7 countries in Southeast Asia. The newborn mortality rate in East Java is still high, currently East Java has not reached the SDGs target of infant and maternal mortality of 70/100,000 births, while East Java is still 90/100,000 births (Affanda, 2020). Sidoarjo Regency in 2018 the infant mortality rate

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with LBW reached 4.38 per 1,000 live births. Sidoarjo is ranked 8th in East Java (Central Bureau of Statistics East Java).

Respiratory Distress Syndrome is an immature development of the respiratory system, or an inadequate amount of surfactant in the lungs in premature infants due to a lack of age at birth which causes physiological functions in the body, especially the lungs, which have not been able to adapt to the external environment. The most common cause of respiratory distress syndrome is a lack of surfactant in the lungs. Surfactant is a liquid that coats the inside of the lungs. The fetal lungs begin to make surfactant during the third trimester of pregnancy (week 26 through labor).

One of the treatments that support oxygen therapy in previous studies is setting the baby's position, namely the provision of a pronation position. The pronation position is a lying position on the abdomen with the head turned to the side (Guisterners 2020). Pronation position is performed to improve respiratory physiology and cardiovascular stability by reducing abdominal compression. Giving the pronation position is not spared in the baby's own efforts to breathe spontaneously. All journals said that giving the pronation position had a positive effect in changing hemodynamic status which became more stable. For this reason, by adjusting the pronation position in premature infants with Respiratory Distress Syndrome, it can be included in neonatal care interventions. This is to help reduce infant mortality due to Respiratory Distress Syndrome.

This literature study was carried out by researchers because there are still many cases of infant mortality with Respiratory Distress Syndrome that cannot be saved or even defects in the respiratory system. This study aimed to analyze the effect of the prone position on the hemodynamic status of preterm infants with respiratory distress

Identifying hemodynamic status before being given a prone position on a LBW (Low Birth Weight Babies) with *Respiratory Distress Syndrome* through *literature review*. Mengidentifikasi hemodynamic status is given after the prone position on LBW (Infants Low Birth Weight) with *Respiratory Distress Syndrome* through *literature review*. Analyzing the effect of pronation position on hemodynamic changes in LBW (Low Birth Weight Babies) with *Respiratory Distress Syndrome* through *literature review*.

METHODS

Design of this research is literature review using the compare technique is to summarize and criticize the similarities of articles and presented in new articles , with data sources : search for research journals that have been carried out and publish in national and international online journals published in indonesian and english from 2016-2020 using google scholar database with keywords: Effect, Change hemodynamic, premature baby with respiratory distress syndrome. Research journals found according to keywords are then filtered through the inclusion and exclusion that have been set. A total of 10 journals obtained were filtered using inclusion and exclusion obtained as many 3 journals. Then 2 of 10 journals were search not full text. So, that 5 fulltext articles were reviewed. With The respondents was 126. Gender characteristics of the research respondents were male and female infants with an average gestational age of 24-36 weeks with premature birth. Infant respondents in this study with the lowest body weight is 700 grams and the largest is 2500 grams. Reviewing the abstract whether it is in accordance with the chosen theme, then reading the full text journal, analysis and identify of purpose in journals and reviewing it. To further clarify the analysis of the abstract and the full text of the journals, read and identify. The method of data analysis is the summary of the research journal data entered into the table and then analysis the contents contained in the research objectives and research result. Based on the journals review as described in table 1 then the research grouped the data as follows:

Study design :

Table 1. research designs from review journals

No	Study design	Total	Percentage
1	Quasi experimental design	4	80%
2	pre-experimental with a one- group approach pre-test-post test design	1	20%

Total	5	100%
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The research design reviewed is an used a Quasi-experimental design with 4 journals (80%) and pre-experimental with a one-group approach pre-test-post test design as many as 1 journals (20%).The Research subject or samples used in the research reviewed are all elderly people with joint pain (100%).

RESULTS AND DISCUSSION

a. Hemodynamic status before being given a pronation position in LBW (Low Birth Weight Babies) with *Respiratory Distress Syndrome*

1. Journal 1 (Effect of Pronation Position on Hemodynamic Changes)

Table 2 Heart Rate, RR, and SpO2 before the baby is given a pronation position

Variable	Mean	Median	SD	Min – Max
HR before	156.62	162.00	15.86	123.00-180.00
RR before	48.65	48.00	16.72	18.00-106
SpO2 before	92.87	92.00	4,331	84.00-100.00

2. Jurnal 2 (Effect of Position of pronation In Premature Babies With CPAP Installed Against Hemodynamic Status In space Rs Nicu An-Nisa Tangerang)

Table 3 hemodynamic status before granting the prone position

variable	Mean	SD	Min - Max
Frequency breath before	73.97	5,881	65-85
pulse rate before	162.60	7614	148-178
oxygen saturation before	94.00	1,114	92-99
Frequency temperature before	36 717	0.0950	36.5-36.9

3. Journals 3 (Comparison of the Effectiveness of Prone and Lateral Positions on Oxygenation Status in Infants with Respiratory Distress Syndrome in the NICU Room at GUN Hospital UNG JATI)

Table 4 Average HR, RR and oxygen status before pronation position

Variable	Mean
HR before	141.34
RR before	36.13
SpO2 before	94.65

4. Journal 4 (The Effect Of Prone Position To Oxygen Saturation Level And Respiratory Rate Among Infants Who Being Installed mechanical Ventilation In NICU KOJA HOSPITAL)

Tabel 5 Distribusi Saturasi oksigen dan frekuensi pernapasan sebelum posisi pronasi

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variable	Group	Measurement	Mean	SD	SE
of Oxygen Saturation	Intervention	Before	91.13	2,031	0718
	Control	Prior	87.75	3,370	1,191
respiratory rate	Intervention	Before	55.38	12 939	4,575
	Control	Before	71	1,069	0378

5. Journal 5 (Quarter Turn From Prone Position Increases Oxygen Saturation In Premature Babies With Respiratory Distress Syndrome)

Table 6 Oxygen saturation before pronation position

Variable	Median (minimum-maximum)	Mean ± SD	P value
Oxygen saturation before	94(89-96)	93.25±2.17	0.000

From all the journals above, it can be seen that the hemodynamic status of LBW infants who experience *Respiratory Distress Syndrome* is not yet in a stable state before being given a pronation position. All of the above journals use oxygen saturation, respiratory rate, and temperature in determining hemodynamic status. The mean gestational age in this study was 24-36 weeks with preterm delivery. With the lowest weight is 700 grams and the largest is 2500 grams.

b. Hemodynamic status after being given a pronation position in LBW (Low Birth Weight Babies) with *Respiratory Distress Syndrome*

1. Journal 1 (Effect of Pronation Position on Hemodynamic Changes)

Table 7 Heart Rate, RR, and SpO2 after 1 hour and after 2 hours the baby is given a pronation position

Variable	Mean	Median	SD	Min – Max	P value
HR after 1 hour	145.75	147.00	24.05	141.00-174.00	0.027
HR after 2 hours	141.10	144.00	15.39	118.00-176.00	0.008
RR after 1 hour	47.87	44.00	12.52	26.00-88.00	.748
RR after 2 hours	47.68	48.00	14.60	19.00-102.00	.733
SpO2 after 1 hour	96.46	97.00	2.86	90.00-100.00	0.000
SpO2 after 2 hours	97.25	98.00	2.68	91.00-100.00	0.000

2. Jurnal 2 (Effect of Pronation Position in Premature Babies with Cpap Attached to Hemodynamic Status in the intensive care unit Rs An- Nisa Tangerang)

Table 8 Hemodynamic status after giving the pronation position

Variable	Mean	SD	Min – Max
Respiratory rate after	69.50	4.516	63-79
Pulse rate after	144.87	7.660	130-157 Overall
oxygen saturation	96.87	1,074	95-99%ve

temperatures afterFrequency 36 827 0907 36.7-37

3. Journal 3 (Comparative Effectiveness Prone Position Status With Lateral Against Oxygenation In Infants With Respiratory Distress Syndrome In Hospital NICU Space MOUNTAIN TEAK)

Table 9 average HR, RR, and oxygen status after pronation position

Variable	Average	95% CI	P value
HR after	8.23	6.47-9.98	0.000
RR after	2.03	1.73-2.32	0.000
SpO2 after	1.52	1.25-1.79	0.000

4. Journal 4 (The Effect Of Prone Position To Oxygen Saturations level And Respiratory Rate Among Infants Who Being Installed Mechanical Ventilation In NICU KOJA HOSPITAL)

Tabel 10 Distribusi Saturasi oksigen dan frekuensi pernapasan sesudah posisi pronasi

variable	Group	Measurement	Mean	SD	SE	P Value
Saturation	Intervention	After	95.25	1488	0526	0002
Oxygen	Control	After	85	4209	1488	0024
Frequency	interventions	After	65.13	9891	3497	0026
Respiratory	Control	After	62.38	3662	1.295	0.000

5. Journal 5 (Quarter Turn From Prone Position Increases Oxygen Saturation In Premature Babies With Respiratory Distress Syndrome)

T able 11 Oxygen saturation after pronation position

Variable	Median (minimum-maximum)	Mean ± SD	P value
Oxygen saturation after	96.5(95-99)	96.55±1.32	0.000

From all the journals above, it can be seen that the hemodynamic status of LBW infants with *Respiratory Distress Syndrome* after being given intervention in the pronation position improved. This means that the hemodynamic status of LBW infants can be said to be in a stable state or within normal limits. In giving this intervention the pronation position uses a control system, by installing a pulse oximeter on the baby to determine the state of hemodynamic status when the pronation position intervention is given.

c. Effect of Pronation Position on the status of hemodynamic changes after giving the pronation position

Table 12 Effect of pronation position on hemodynamic status in LBW infants with RDS

N O	TITLE	RESULT
1	Effect of Pronation Position on Hemodynamic Changes	There is an effect of pronation position on hemodynamic changes (HR, RR, and SPO2) with P-Value = 0.008
2	Effect of Pronation Position on Premature Babies with Ckap Attached to Hemodynamic Status in the Nicu Room at Rs An-Nisa Tangerang	There is an effect of pronation position on hemodynamic status with P-Value = 0.000

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3	Comparison of the Effectiveness of Prone Position with Lateral to Status Oxygenation in Infants with Respiratory Distress Syndrome in space NICU hospitals MOUNTAIN TEAK	There is the effect of the prone position with a value of P-value = 0.000
4	The effect Of prone position to Oxygen saturations Level And Respiratory Rate Among Infants Who Being Installed Mechanical Ventilation in NICU KOJA HOSPITAL	There is a government influence given a pronation position with a P-Value = 0.02
5	Quarter Turn From Prone Position Increases Oxygen Saturation In Premature Babies With Respiratory Distress Syndrome	There is an effect of giving a pronation position with a P-Value value = 0.026

From the results of the analysis table above, it can be said All journals that conduct research say that giving the baby a pronation position can affect the hemodynamic status of LBW who experience Respiratory Distress Syndrome. Based on the results of the above analysis, P value <0.05, it means that there is an effect of pronation position with hemodynamic status.

Based on the 5 literature reviews used, it is known that before the pronation position was carried out, most of the respondents did not experience an increase in hemodynamic status and depended on oxygen therapy devices such as ventilators so that there were many cases of death in premature infants with respiratory distress syndrome. Efforts to reduce cases of mortality in premature infants by giving pronation position. Some literature mentions that giving the prone position to premature infants with respiratory distress syndrome can improve the hemodynamic state of the body.

LBW is related to gestational age that is not yet full term besides that it is also caused by dysmaturity. This problem occurs due to impaired growth of the baby while in the womb caused by maternal diseases such as placental abnormalities, infections, hypertension. Good nutrition is needed by a pregnant woman so that the growth of the fetus does not experience obstacles, and then it will give birth to a baby with a normal birth weight. Mothers with chronic malnutrition during pregnancy will give birth with low birth weight. The baby really needs adjustment to the environment, this is because his physiology is still mature. With a lack of gestational age in the fetus, this can affect the physiological functions of the baby being born. This causes hyaline membrane disease. Hyaline membrane disease is caused by surfactant deficiency. Surfactant is found in the alveoli. The surface of the alveoli in the lungs is lined by a thin layer called the *alveolar lining layer*. Pulmonary surfactant is a complex material consisting of lipids and proteins that is secreted by type II pneumotocytes that line the alveoli. These cells begin to appear at about 21 weeks of gestation and begin to produce surfactant for the first time between 28 and 32 weeks of gestation. The main function of this surfactant layer is to reduce the surface tension at the air-water interface of the alveolar fluid layer, so that the normal mechanism of breathing can continue. Second, is to maintain the stability of the alveoli and prevent the alveoli from collapsing. Third, surfactants can prevent pulmonary edema. Surfactant deficiency or dysfunction causes severe respiratory disease. *Respiratory Distress Syndrome* in neonates is a form of disease due to surfactant deficiency that is often found and is closely related to prematurity. In premature babies, they can experience or a condition *respiratory distress syndrome* when the baby is deficient in surfactant. This can cause the tension in the alveoli to increase so that the alveoli collapse. When the alveoli collapse there will be decreased ventilation and hypoxia occurs. Babies who experience this will try to compensate for the oxygen supply by doing rapid shallow breathing in an effort to expand the lungs. However, this can result in slowing of respiration resulting in respiratory acidosis.

Unstable hemodynamic status in LBW with *respiratory distress syndrome* due to premature birth. This is in line with the Christian theory (2014) that prematurity is a gestation period of less than 37 weeks and the body weight corresponds to the gestation period. So that the production of surfactant in infants is not perfect.

Surfactant is a liquid that coats the alveoli so that it helps the alveoli to develop the lungs which begin to form at 22 weeks of gestation, only reaching sufficient amounts before term. The function of surfactants is to keep the alveolar sacs growing and filled with air. Babies who have surfactant deficiency will experience hypoxia so that the alveoli collapse. This condition will cause vascular constriction and decreased pulmonary perfusion, which eventually results in *respiratory distress syndrome*. Factors that facilitate the occurrence of RDS in premature are caused by the alveoli that are still small so that it is difficult to develop, the development is not perfect because the thorax wall is still weak, and the production of surfactant is not perfect.

This is in line with the theory expressed by Marcdante (2014), that gestational age less than 28 weeks is usually followed by immaturity of the lung parenchyma, chest wall and capillary helium which causes lung collapse at the end of respiration.

There is an inverse correlation between the incidence of RDS and gestational age, the younger the baby, the higher the risk of RDS. However, LBW infants who have RDS are more dependent on lung maturity than gestational age.

Provision of pronation position intervention with different durations of time, namely 30 minutes, 1 hour and 2 hours and some use intervention and control systems. Every duration that is done has a significant impact. Every 30 minutes the first pronation position gives the baby peace of mind which has an impact on blood circulation, the next 1-2 hours the baby's blood circulation will become calmer so that it affects the hemodynamic status to be more stable. It can be said that each increase in time in the intervention of the pronation position makes the hemodynamic status much better. Because the pronation position is a position given to reduce abdominal compression and cannot be separated from the distribution of pressure in the lungs more evenly. The duration of giving the baby a pronation position is adjusted to the needs, comfort, and state of hemodynamic status.

In all journals that have provided intervention in the pronation position, the results of oxygen saturation in infants have increased with an average initial oxygen saturation of 93% to 96%. And the average initial respiratory rate is 55x/minute to 66x/minute. In addition, heart rate, temperature frequency and pulse have improved. The increase in oxygen saturation and respiratory rate is caused by the pronation position which causes the intrapleural pressure, transpulmonary pressure, and lung inflation to be more homogeneous, especially in the dorsal part of the thorax. Pronation position can reduce lung pressure by intra-abdominal organs so that it will improve oxygenation and carbon dioxide clearance

Galiatsatos the heaviest part of the lungs is located on the back, so patients who lie with their weight on their back will have a harder time getting enough air. This study is in line with Venus, et al (2020) stated in their study that when the patient is in the supine position, the compressive effects of gravity are amplified on the chest wall, thereby compressing the dorsal segment and expanding the ventral segment. On the other hand, if the patient is in the prone position, the effect of the chest wall will counteract the gravimetric effect.

Anatomically it is also explained that the increase in oxygen due to where the anatomy of the heart is on the left between the top and bottom of the lungs makes the pulmonary pressure increase. Arterial pressure at the apex is lower than at the base of the lung. Low arterial pressure causes a decrease in blood flow in the apex capillaries, while the basal capillaries distend and increase blood flow. The effect of gravity affects ventilation and blood flow where blood and air flow increases at the lung bases.

Based on the results of the research on the 5 journals described above, it is known that after the intervention of giving the pronation position to premature infants with respiratory distress syndrome showed that almost the majority of respondents experienced stabilization and even an increase within normal limits in hemodynamic status. This happens because giving the baby a pronation position reduces compression on the abdomen and reduces the burden on the lungs on the back. So that the lungs on the back can develop perfectly because there is no pressure.

CONCLUSION

Based on the results of the literature review from the five journals, it can be concluded that hemodynamic status is unstable in low birth weight babies who experience RDS due to incomplete surfactant production in the pulmonary alveoli due to premature birth. pronation, the more stable the hemodynamic status, and there is a very significant effect between the pronation position and hemodynamic status with the p-value ($p < 0.05$).

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It is hoped that the world of education can complement the existing literature, especially theories related to the effect of giving the prone position to premature babies with respiratory distress syndrome so that it can be useful for students who will conduct similar research. The results of this study are expected to be input in conducting non-pharmacological treatment to overcome the problem of mortality in infants. It is hoped that further researchers can conduct research using more samples and by using different research methods so that comparisons can be seen and are expected to get even better results.

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The Correlation Between Nutritional Status with the Age of Menarche at Teenage Girls in Barengkrajan Village

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ABSTRACT

Menarche is the first menstruation experienced by woman. There are many factors that affect the age of menarche, one of them is nutritional status. The purpose of this research was analyzing the correlation between nutritional status and the age of menarche in teenage girls in Barengkrajan village. This research is using an analytical design with non experimental research by using cross sectional study. The subject was 62 teenage girls in Barengkrajan who is 12-14 years old and already got menarche. The data was analyzed by using chi-square test. The result is 54% teenage girls in Barengkrajan village have had menarche in upnormal age and also having upnormal nutrition status, while 74% teenage girls in Barengkrajan village have had menarche in normal age and also having a normal nutrition status. Based on chi square test, the researcher got p value=0,031, so p value<0,05, Ho rejected and it means that there is a correlation between nutritional status with the age of menarche in Barengkrajan village. This research is in line with the other research. Teenage girls who have a higher Body Mass Index (BMI) were having an earlier menarche, while teenage girls who have a lower Body Mass Index (BMI) were having a late menarche, so hope the family can support teenage girls for having a good nutrition in order to have a normal status of menarche.

Keywords: nutritional status, menarche, teenage girls

INTRODUCTION

Adolescence or also known as puberty is period of transition between childhood and adulthood, there is no boundary between the end childhood and early puberty, but it can be said that puberty begins with the functioning of the ovaries and ends at the ovaries are functioning steadily and regularly. Clinically puberty begins with the emergence of sexual characteristics, namely the growth of pubic hair, enlarged breasts and menstruation. (Sibagariang, 2016)

Menarche is the first menstruation that occurs which is a typical of the maturity of a healthy, non-pregnant woman. Generally Teenagers who experience Menarche are aged 12-13 years. Impact if Adolescent girls experiencing early menarche that is less than 12 years is risk of developing breast and ovarian cancer too long exposed to the hormone estrogen, while the impact if age Late menarche is the rapid onset of menopause. There are several Factors that affect the age of menarche are ethnic, genetic, and social factors economy and nutrition (Proverawati, 2017)

A national study in the United States showed that age menarche has fallen from 12.5 years old in the 1990s to 12.3 years old in 2000s (Sudikno, 2019). The average age of menarche in Indonesia is at 13.64 years old (Nuraliah, 2018). In Indonesia, Teenage girls aged 10-19 years have menstruating as many as 70.1% and 29.9% have not had menstruation (Riskesdas, 2018)

In East Java, adolescent girls aged 10-19 years have received menstruating as many as 73.6% and have not had menstruation as many as 26.4%. The average age of menarche in East Java is 12.56 years old (Riskesdas, 2018). Meanwhile in Sidoarjo, teenage girls aged 10-19 years have had menstruation as many as 79.03%, with the average age of menarche in Sidoarjo is 12.42 years old (Riskesdas, 2018)

The results of the preliminary survey on August 10, 2021 which conducted on teenage girl in Barengkrajan Village, based on the results of Interviews with 7 people found that 1 teenage girl had menarche at the age of <12 years old, 4 teenage girls menarche at the age of 12 years old, and 2 teenage girls menarche at the age of >12 years.

From the explanation above, we know that every teenage girls has different age of menarche, it can be depends by nutrition status. So the author wants to do a research related to the correlation between nutritional status with the age of menarche of teenage girls in Barengkrajan Village.

METHODS

This research is using an analytical design with a non-experimental method on teenage girls who has experienced menarche, with approach Cross Sectional. The subject of this research are 62 teenage girls who had got menarche and their age is 12-14 years old. The sample is using Probability sampling with Simple random sampling technique. The variables of this research are nutritional status as independent variable and the age of menarche as dependent variable. The criteria for nutritional status based on BMI value, which <18,50 is underweight, 18,50-24.99 is normal, and >24,99 is overweight, while the categories of menarche is depend of their age when they got menarche, <12 years old is fast, 12-13 years old is normal, and >13 years old is slow. The research was placed in Barengkrajan village on August 20, 2021. The data is collected in a day where the data is primary data, collected by using questionnaire (open ended question) which ask demography data (name, age, address, etc) and spesific data (height, weight, and the age of menarche). The measuring tools in this research are weight scales and stature meter. Data collection procedure of this research is : first, the researcher determine the appropriate research subject, after find the subject, the researcher give them informed consent, then the researcher measure the weight and height, and also asking the age of their menarche, then the researcher give the quistionnaire and ask them to fill it by giving them instruction when they don't understand, after that the researcher check the data filling in the questionnaire, entering data into the categories, and then the last is analyzing data. The hypothesis of this research is there is a correlation between nutritional status with the age of menarche at teenage girls in Barengkrajan village. Analysis data of this research is using univariate analysis and bivariate analysis, univariate analysis aims to explain or describe the characteristics of each research variable and bivariate analysis was used to determine the correlation between nutrition status with the age of menarche in teenage girls in Barengkrajan village, to prove that there is a significant correlation between the independent variable and the dependent variable Chi-square analysis was used, at the limit of significance statistical calculation of p value 0,05. When the calculation results shows the value of $p < p \text{ value } 0,05$ then it is said H_0 rejected and H_1 accepted, it means that both variables statistically have a significant correlation. This research is using case study ethics which are informed consent, anonimity, and confidentiality.

RESULTS

Based on the results of research conducted on August 20, 2021 in Barengkrajan village by measuring height and weight then distributing questionnaires, the data had been collected then the researcher analyzing it. From univariate analysis, the researcher got frequency distribution of respondents by age in Barengkrajan village, frequency distribution of respondents' weight in Barengkrajan village, frequency distribution of respondents' height in Barengkrajan village, frequency distribution of respondents based on IMT at teenage girl in Barengkrajan village, frequency distribution of respondents based on nutritional status at teenage girl in Barengkrajan village, and frequency distribution of respondents based on age of menarche at teenage girl in Barengkrajan village.

Table of frequency distribution of respondents by age in Barengkrajan village

Age	Frequency	Percentage (%)
12 Years old	1	1 %
13 Years old	29	47 %
14 Years old	32	52 %
Amount	62	100 %

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The table above means that almost the teenage girls in Barengkrajan village are 14 years old, which are 32 girls with the percentage 52%

Table of frequency distribution of respondents' weight in Barengkrajan village		
Weight	Frequency	Percentage (%)
31 Kg – 40 Kg	20	32 %
41 Kg – 50 Kg	31	50 %
51 Kg – 60 Kg	4	7 %
≥ 61 Kg	7	11 %
Amounts	62	100 %

The table above means that a half of teenage girls in Barengkrajan village having weight for about 41Kg-50Kg as many as 31 girls with the percentage 50%

Table of frequency distribution of respondents' height in Barengkrajan village		
Height	Frequency	Percentage (%)
≤ 140 cm	6	10 %
141 cm – 150 cm	38	61 %
>150 cm	18	29 %
Amounts	62	100 %

The table above means that almost the teenage girls in Barengkrajan village are having height for about 141cm – 150cm, which are 38 girls with the percentage 61%

Table of frequency distribution of respondents based on IMT at teenage girl in Barengkrajan village		
IMT	Frequency	Percentage (%)
<18,50	17	27 %
18,50 – 24,99	36	58 %
>24,99	9	14 %
Amounts	62	100 %

The table above means that almost the teenage girls in Barengkrajan village are having normal IMT, which are 36 girls with the percentage 58%

Table of frequency distribution of respondents based on nutritional status at teenage girl in Barengkrajan village		
Nutrition Status	Frequency	Percentage (%)
Not normal (Underweight and Overweight)	26	42 %
Normal	36	58 %
Amounts	62	100 %

The table above means that almost nutrition status of the teenage girls in Barengkrajan village is normal, which is 36 girls with the percentage 58%

Table of frequency distribution of respondents based on age of menarche at teenage girl in Barengkrajan village.

Menarche status	Frequency	Precentage (%)
Not Normal (Fast dan slow)	26	42 %
Normal	36	58 %
Amounts	62	100 %

From the table above, it means that almost menarche status of teenage girls in Barengkrajan village is normal, which is 36 girls with the precentage 58%.

While from the bivariate analysis, the researcher can determine the correlation between nutrition status with the age of menarche in teenage girls in Barengkrajan village.

Cross table of the correlation between nutrition status with the age of merache in Barengkrajan village.

Nutrition Status	The age of Menarche		Amounts	p-value
	Not Normal	Normal		
Not Normal	19 (54 %)	16 (46 %)	35 (100 %)	0,031
Normal	7 (26 %)	20 (74 %)	27 (100 %)	
Amounts	26 (42 %)	36 (58,1 %)	62 (100 %)	

From the table above, the result is 54% teenage girls in Barengkrajan village have had menarche in upnormal age and also having upnormal nutrition status, while 74% teenage girls in Barengkrajan village have had menarche in normal age and also having a normal nutrition status. Based on chi square test, the researcher got p value = 0,031, so p value < 0,05, Ho rejected and it means that there is a correlation between nutritional status with the age of menarche in Barengkrajan village.

DISCUSSION

Based on the calculation results, it was found that there was a correlation between nutrition status with the age of menarche at teenage girls in Barengkrajan. This is in line with the research of Munda (2013) which states that there is a correlation between nutritional status based on BMI with the age of menarche in Elementary School and Junior High School girl students in Manado. The results of this study is also in line with research conducted by Laadjim (2013) regarding the correlation between nutritional status and the age of menarche in teenage girls at SMPN 8 Gorontalo City, where there was a significant relationship between nutritional status and the age of menarche. However, the result of this study are different from the results of research conducted by Sri Aminingsih, et al (2015) regarding the correlation between nutritional status and age of menarche in teenage girls in Brajan Mojosongo Boyolali Village, where there is no correlation between nutrition status with the age of menarche in teenage girls in Brajan Mojosongo Boyolali, it could be happened because the respondents' age of menarche can be affected by the other factors.

CONCLUSION

Based on the result of this research conducted 62 teenage girls in Barengkrajan village, it showed that teenage girls who had abnormal menarche status were 20 people (32%), slow as many as 5 people (8%), while most of them had normal menarche status as many as 37 people (60%). Nutritional status is closely related to the state of fat in the body, nutrition affects sexual maturity in adolescents. Teenage girls who have a higher Body Mass Index (BMI) were having an earlier menarche, while teenage girls who have a lower Body Mass Index (BMI) were having a late menarche. The results of these data can be concluded that menarche status of teenage girls in Barengkrajan is on average classified as normal, although there are some teenage girls who have menarche status in the fast and slow categories. So hope the family can support teenage girls for having a good nutrition in order to have a normal status of menarche.

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LITERATURE REVIEW : RELATIONSHIP BETWEEN CENTRAL OBESITY AND HYPERTENSION

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ABSTRACT

The number of people with hypertension continues to increase every year, it is estimated that by 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 10.44 million people die from hypertension and its complications. The chairman of the Hypertension Doctors Association said that every year there are nearly 9.5 million cases of hypertension worldwide. The high prevalence of hypertension in Indonesia is caused by several factors that contribute to the emergence of hypertension. One of the factors is central obesity. Several studies have found that hypertension is more common in individuals with central obesity than general obesity. The purpose of this study was to determine the relationship between central obesity and the incidence of hypertension through a literature review journal. This study uses a literature review design in 5 journals with observational analytic methods. The population used is aged 15-65 years. The results of the study indicate that there is a relationship between central obesity and the incidence of hypertension. An increase in fat around the abdomen results in a decrease in adiponectin so that the process of atherosclerosis can easily occur. Some data found that the obesity rate of society is very high. The magnitude of the impact of hypertension on various non-communicable diseases indicates the need to control hypertension by controlling the risk factors that contribute to hypertension, namely central obesity, by implementing a healthy lifestyle.

Keywords: Relationship;Hypertension;Central Obesity

INTRODUCTION

Hypertension is defined as a persistent increase in arterial blood pressure. WHO states that hypertension occurs when a person's condition has a systolic pressure equal to or higher than 140 mmHg and a diastolic pressure equal to or higher than 90 mmHg consistently for some time (WHO, 2015). Hypertension is divided into two types, namely primary hypertension (essential) and secondary hypertension. Hypertension is triggered by several risk factors, such as genetic factors, obesity, excess sodium intake, dyslipidemia, lack of physical activity, and vitamin D deficiency (Dharmeizar, 2012).

Until recently hypertension is still a big enough problem. Based on data from the WHO in 2018 (World Health Organization), this disease affects 22% of the world population. While in southeast Asia, the incidence of hypertension reached 36%. Data from the World Health Organization (WHO) 2015 shows around 1.13 Billion people in the world bears the hypertension, it means that 1 out of 3 people in the world diagnosed with hypertension. The number of people with hypertension continues to increase every year, it is estimated that by 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 10.44 million people die from hypertension and its complications. The Data Sample Registration Survey of 2014 shows that hypertension is the third largest cause of death in Indonesia with a percentage of 6.7% after stroke and heart disease.

Riskesdas 2018 stated the prevalence of hypertension based on the results of measurements in the population aged ≥ 18 years by 34.1%, the highest in South Kalimantan (44.1%), while the lowest in Papua by (22,2%). The estimated number of cases of hypertension in Indonesia amounted to 63.309.620 people, while the death rate in Indonesia as a result of hypertension by 427.218 death. Hypertension occurs in the age group 31-44 years (31,6%), age 45-54 years (45,3%), age 55-64 years (55,2%). From the prevalence of hypertension

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of 34.1%, it was known that 8.8% were diagnosed with hypertension and 13.3% of people diagnosed with hypertension did not take medication and 32.3% did not take medication regularly. Chairman of the Hypertension Doctors Association, Dr. Tunggul D Situmorang, SpPD-KGH, FINASIM said that every year there are nearly 9.5 million cases of hypertension worldwide.

Ways to prevent hypertension are low-salt diet, control body weight and maintain ideal body weight, increase physical activity, and reduce smoking and alcohol consumption. Meanwhile, people find it difficult to implement a healthy diet and regular exercise as well. This causes high rates of obesity in society.

As one of the risk factors of hypertension, obesity is also an issue of their own health in Indonesia. Based on the results of Basic Health Research (Riskesdas) 2018, the prevalence of population obesity increase of 14.8% in 2013 to be the 21.8% in 2018. Surabaya is the city with the highest prevalence of obesity and central obesity in East Java, which is 27, 3% and 39.2%.

The study of Framingham say that the excess weight (overweight and obesity), accounted for approximately 26% of cases of hypertension in men and 28% in women. Research Jullaman say that people who have a BMI classified as obese have a risk of 1.64 times to suffer from hypertension degrees 1 compared to the relatively normal BMI. Also, Sari's research states that people with central obesity have a 1.6 times risk of suffering from hypertension grade 1 compared to those who are not centrally obese (Rohkuswara et al., 2017).

According to WHO (2000), central obesity is a condition of excess abdominal fat or central fat. Central obesity is more associated with health risks than obesity. It can be said that central obesity is defined as a male with an abdominal circumference of > 90 cm or a female with an abdominal circumference of > 80 cm (WHO, 2018). Obesity, especially central obesity, is a major cause of metabolic syndrome, which includes: insulin resistance, type 2 diabetes mellitus, hypertension, sleep apnea syndrome, non-alcoholic fatty liver disease (NAFLD), dyslipidemia, and all risk factors for cardiovascular disease.

Central obesity is more dangerous although the Body Mass Index (BMI) within normal limits. In the calculation of the Body Mass Index (BMI), only height and weight used as a reference and does not take into account muscle mass. While muscle mass is the weight compared to body fat. So people with more muscle mass have a tendency of higher weight. The accumulation of fat around the abdomen may increase the risk of erectile dysfunction and cancer. The fat that is close to vital organs trigger damage due to inflammation in the inner part. In addition, central obesity can increase the risk of atherosclerosis. Visceral fat that wraps the organs in the abdominal cavity can affect the function of the hormones the organ.

Based on this background, the researcher is interested in conducting a study entitled "Relationship Between Central Obesity and Hypertension". This study aims to analyze the relationship between central obesity and the incidence of hypertension in terms of the results of a literature review.

METHODS

The design of this research is a literature review with a compare technique, which summarizes and criticizes the similarities of articles and is presented in a new article, with data sources: using the e-resources database Perpurnas, Google Scholar, ProQuest, PubMed, and PMC, research that has been carried out and published in journals national and international online publications published in Indonesian and English from 2016-2020 with the keywords Relationship, Hypertension, Central Obesity. Research journals found according to keywords are then filtered through the inclusion and exclusion that have been set. Reviewing the abstract whether it is in accordance with the chosen theme, then reading the full text journal and reviewing it. To further clarify the analysis of the abstract and the full text of the journal, read and observe. The data analysis method is a summary of research journal data that is entered into a table and then analyzed the contents contained in the research objectives and research results.

Based on the search results using the e-resources database of Perpurnas, Google Scholar, ProQuest, PubMed, and PMC with the keywords Relationship, Hypertension, and Central Obesity, the researchers found 296 journal titles that matched these keywords. The articles found according to these keywords do not all have a theme or purpose that is in accordance with the research and there are duplicate articles. The researcher then conducted a search by looking for keywords in the title (in the title) that matched the same keywords and obtained 157 journals. Research articles that have the same theme or research content are then selected based on criteria that are in accordance with the research objectives. Research journals that were not selected, had similarities and did not meet the inclusion criteria, were then excluded as many as 139.

A total of 157 journals obtained were filtered using inclusion and exclusion obtained as many as 108 journals. The research journals were then selected by looking at the abstracts that matched the research theme and then selected based on the most appropriate criteria and in accordance with the research objectives, there were 52 journals. Then the journals obtained were filtered to see whether the article had full text or not, then

31 articles were excluded because full text articles were not available so that 21 full text articles were obtained. The feasibility assessment was carried out on 48 full-text articles. Research articles that have the same theme or research content are then selected based on the criteria and according to the research objectives. Research journals that were not selected have similarities, and do not meet the inclusion criteria, then 16 articles were issued, so that 5 fulltext articles were reviewed.

RESULTS

Based on the journal review as described, the researchers grouped the data as follows:
Study Design

Table Research Designs from Review Journals			
No	Study design	Total	Percentage
1.	<i>Cross sectional</i>	4	80%
2.	<i>Descriptive comparative study</i>	1	20%
Total		5	100%

A contributing factor in the literature review of the relationship between central obesity and the incidence of hypertension is cross-sectional. Overall, each study discusses the relationship between central obesity and the incidence of hypertension. Studies consistent with this systematic review were conducted in Indonesia and China.

No.	Characteristics	N (Total)	% (Percentage)
1.	Gender • Man • Woman • Not known <i>Journal 1-5</i>	26.176 342.449 147	7,09 92,86 0,039
2.	Age • 20-40 years old • 41-59 years old • 60 years old and over • Not known <i>Journal 1-5</i>	148.412 102.153 64.424 53.783	40,24 27,70 17,47 14,58
3.	Residential Area • Urban • Rural <i>Journal 1-5</i>	165.119 203.653	44,78 55,22
4.	BMI • Normal • Obesity • Not known <i>Journal 1-5</i>	218.989 116.827 32.956	59,4 31,7 8,9
5.	WC / LP • Normal • Abnormal • Not known <i>Journal 1-5</i>	179.230 188.928 614	48,60 51,23 0,17
6.	Smoking Status • Never • Has stopped • Still smoking	302.920 2.648 8.541	82,14 0,7 2,3

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	<ul style="list-style-type: none"> • Not known <i>Journal 1-5</i>	54.663	14,82
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Respondents taken from journals obtained and used in this study include age, area of residence, BMI, waist circumference, and smoking status. The total number of respondents from the 5 journals reviewed amounted to 368,772 respondents. Based on a review of the five journals, the majority of respondents are female (92.86%), aged 20 to 40 years (40.24%), live in rural areas (55.22%), have a normal BMI (48.60%), had an abnormal abdominal circumference (51.23%), and had never smoked (82.14%).

No.	Characteristics	N (Total)	% (Percentage)
1.	Gender <ul style="list-style-type: none"> • Man • Woman <i>Journal 2, 4, 5</i>	36.634 152.480	19,38 80,62
2.	Residential Area <ul style="list-style-type: none"> • Rural • Urban <i>Journal 1-5</i>	158.216 30.898	83,66 16,34
3.	Rating Standard <ul style="list-style-type: none"> • WHR • WSR • WC <i>Journal 4</i>	854 792 678	66,98 62,12 53,18

From the results of 5 journals that have been reviewed, it was found that respondents with central obesity amounted to 189,114 people from a total of 368,772 respondents with a percentage of 51.28%. A total of 152,480 respondents (80.62%) who experienced central obesity were female. A total of 158,216 people from 189,114 (83.66%) respondents with central obesity live in rural areas. From the results of the review, it was found that the WHR assessment had the highest prevalence of central obesity (66.98%).

No.	Characteristics	N (Total)	% (Percentage)
1.	Gender <ul style="list-style-type: none"> • Man • Woman <i>Journal 2, 4, 5</i>	26.247 131.560	16,64 83,36
2.	Age <ul style="list-style-type: none"> • 20 years old and over • 40 years old and over • 55 years old and over <i>Journal 2, 4</i>	25.049 40.916 54.225	15,87 25,92 34,36
3.	Residential Area <ul style="list-style-type: none"> • Rural • Urban <i>Journal 1-5</i>	87.347 70.460	55,35 44,65

Based on 5 reviewed journals, it was found that respondents with hypertension were 157,807 out of 368,772 respondents with a percentage of 42.79%. A total of 131,560 people from 157,807 respondents (83.36%) with hypertension were female. A total of 54,225 people from 157,807 respondents (34.36%) with hypertension were aged 55 years and over. A total of 87,347 people from 157,807 respondents (55.35%) with hypertension live in rural areas.

The results of a review of 5 journals found that 100% of the journals stated that there was a relationship between central obesity and the incidence of hypertension. This is in line with the theory which states that obesity is one of the causative factors that cause hypertension. Respondents with central obesity who also had hypertension amounted to 115,286 people from a total of 368,772 respondents with a percentage of 31.26%.

DISCUSSION

Based on 5 reviewed journals, it was found that respondents with central obesity amounted to 189,114 people from a total of 368,772 respondents with a percentage of 51.28%. A total of 152,480 respondents (80.62%) who experienced central obesity were female. These results are in line with the theory that central obesity is more common in women than men. This is because the proportion of fat in men is mostly found in the upper part of the body, such as the abdomen, while the proportion of fat in women is more in the lower part of the body, such as the waist and pelvis (Pujiati, 2010). In Indonesia, the prevalence of central obesity at the age of > 15 years is mostly experienced by women by 42.1%, while men by 11.3% (Balitbangkes, 2013).

It can also be found that 158,216 people out of 189,114 (83.66%) respondents with central obesity live in rural areas. The prevalence of central obesity increased more rapidly in rural areas compared to urban areas in this study. These results are in line with research which found that the prevalence of central obesity in rural residents increased faster than residents in urban areas. Along with urbanization, the food consumption capacity of people in rural areas is growing rapidly. Therefore, it is possible that the decline in health is accelerated. In Anidaul's thesis (2019) it was found that energy has a greater influence on obesity in rural areas than in urban areas. Energy has a 13,115 times greater effect on obesity in rural areas. This finding may be due to the fact that the amount of energy intake in rural areas is greater than in urban areas. The results of this study found that energy intake was significantly associated with central obesity. Rural communities tend to have poorer consumption patterns of sodium, fat, and vegetables and fruit than urban communities.

In the classification of central obesity calculations assessed, namely WC, WSR, and WHR, it was found that the WHR assessment had the highest prevalence of central obesity (66.98%), followed by WSR (62.12%) and WC (53.18%). These results are in line with the theory which states that the WHR calculation is better at detecting hypertension, hypercholesterolemia, and hypertriglyceridemia compared to other standard calculations because it has a higher level of sensitivity (Septina et al., 2010). Based on this discussion, it can be concluded that central obesity can occur due to several factors such as food consumption, physical activity, and lack of knowledge.

Based on 5 reviewed journals, it was found that respondents with hypertension were 157,807 out of 368,772 respondents with a percentage of 42.79%. A total of 131,560 people from 157,807 respondents (83.36%) with hypertension were female. This is in line with the thesis of Mayli Faroh Nabila (2014) which states that women are 1.2 times more likely to develop hypertension than men. This incidence is thought to be because women have more risk factors for hypertension than men. The risk factors in question are consumption of salty foods, consumption of fatty foods, not eating vegetables and fruit, light physical activity levels, and obesity.

From the results of the review, it was found that 54,225 people from 157,807 respondents (34.36%) with hypertension were aged 55 years and over. This is in line with the thesis of Mayli Faroh Nabila (2014) which states that the higher the age group, the higher the proportion of hypertension. Research conducted by Aisyiyah (2009) states that increasing age will be followed by an increase in a person's blood pressure. The increase in the number of cases in the older age group is possible due to the physiological factors of human blood vessels. Physiologically, human blood vessels change with age. Human blood vessels at the age of 1-10 years will be slippery and elastic. At this age the blood vessels function normally. Entering the age of 10-20 years, appear patches of fat in the blood vessels. This is influenced by a person's lifestyle and diet. These fatty patches partially regress but others will continue to develop into fibrous plaques and eventually become atheroma. This process appears at the age of 20 years and over. The appearance of plaque in these blood vessels causes narrowing, so that when the volume of blood passing through these blood vessels remains constant, an increase in blood pressure will occur (Price & Wilson, 2006).

The results also show that 87,347 people out of 157,807 respondents (55.35%) with hypertension live in rural areas. This is in line with Helni's research (2020) which says that the prevalence of hypertension in rural areas is 1.22 times compared to urban areas. Age, obesity, diabetes, hyperlipidemia and smoking are risk factors for hypertension in both urban and rural areas. Lack of exercise is a risk factor for hypertension in rural areas, in addition the level of awareness and treatment is lower in rural areas, while in urban areas specific risk

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factors are obesity and alcohol consumption. According to the Director of Non-Communicable Disease Control, Ministry of Health, Dr. Ekowati Rahajeng, SKM, MKes, said that the increasing number of people with hypertension in this village is due to the large number of instant and fast foods that are spread in rural areas. Research conducted on women in Nepal states that rural communities who have low socioeconomic status are increasingly at risk for developing hypertension. In addition, the lack of knowledge of rural communities about hypertension is also one of the factors that support the high risk factors for hypertension owned by rural communities. Based on this discussion, it can be concluded that the incidence of hypertension can be caused by several factors such as lack of knowledge, food consumption, and physical activity.

Based on 5 reviewed journals, it was found that respondents with central obesity who also had hypertension amounted to 115,286 people from a total of 368,772 respondents with a percentage of 31.26%. This shows that 60.96% of respondents with central obesity also have hypertension.

These results prove that there is a relationship between the incidence of central obesity and the incidence of hypertension. Central obesity is more at risk of experiencing health problems, especially those related to cardiovascular. This happens because the location of the stomach is closer to the heart than the hips.

In people with central obesity there are several mechanisms that can cause hypertension. Intra-abdominal fat plays an important role in increasing blood pressure. This is because in people with large abdominal circumference (high intra-abdominal fat) there is a decrease in adiponectin levels as an antiatherogenic, so that by decreasing levels of this specific protein, an increase in blood pressure can occur (Olinto et al., 2004). The decrease in adiponectin, then the process of atherosclerosis can easily occur. Atherosclerosis is a condition in which the walls of medium and large arteries become stiff and thickened as a result of fatty lesions (atheromatous plaques) on the inner surface of the artery walls. The loss of arterial distensibility (artery becomes stiff) causes blood pressure to increase and blood cannot expand when blood from the heart passes through the artery (Kaplan & Victor, 2014).

A high-fat diet will cause obesity and in the process hyperinsulinemia, an increase in free fatty acids (FFA), and renin-angiotensin aldosterone (RAA) will occur. This will cause Na reabsorption so that there is fluid and salt retention in the kidney glomeruli which will result in hemodynamic changes in the form of increased peripheral resistance, blood volume, cardiac output, and blood pressure. Sympathetic nerve stimulation due to obesity will stimulate the release of catecholamines which have an impact on increasing blood pressure. Neurohormonal changes that occur in obese patients are related to leptin. Leptin is an amino acid produced by the body's adipose tissue and its synthesis is encoded ob/ob. This leptin functions in the regulation of appetite and energy expenditure through central nervous system regulatory mechanisms. Leptin also plays a role in natriuresis, diuresis, increased insulin sensitivity, and sympathetic nerve stimulation which further stimulates catecholamine release and angiogenesis. Leptin itself is present in the blood in low levels in normal people, but in obese individuals, leptin levels increase and cause hyperleptinemia. Hyperleptinemia is closely related to resistance or increased levels of leptin in the blood. The effect of this resistance depends on the organ that responds to it. If resistance occurs in the kidneys, it will cause diuresis and natriuresis disorders, resulting in changes in hemodynamic mechanisms. This hemodynamic mechanism will further trigger an increase in blood pressure.

Hypertension if left uncontrolled can be fatal because it can cause heart attacks, strokes, kidney failure, blindness and cognitive impairment (WHO, 2015). The magnitude of the impact of hypertension on various non-communicable diseases indicates the need to control hypertension by controlling the risk factors that contribute to hypertension, namely central obesity, by implementing a healthy lifestyle.

Weight loss in overweight respondents had an impact on lowering blood pressure later in life. A meta-analysis of 18 studies showed that weight loss of 3% to 9% of initial body weight reduced systolic blood pressure and diastolic blood pressure by 3 mmHg, respectively. Research from the "Trial of Nonpharmacological Interventions in the Elderly (TONE) study" revealed that a diet that reduced body weight by 3.5 kg in people aged 60 to 80 years with hypertension reduced blood pressure by 4.0/1.1 mmHg.

Based on the above discussion, it can be concluded that central obesity affects the incidence of hypertension. The magnitude of the impact caused by hypertension indicates the need for prevention. For this reason, it is necessary to educate the public on how to implement a healthy lifestyle to prevent and treat central obesity and hypertension that occurs in the community through health services such as posyandu and puskesmas.

CONCLUSION

Based on the results of research and discussion it can be said that the research library of the 5 the literature it is known that there is a relationship between central obesity with the incidence of hypertension. The presence of increased fat around the abdominal resulted in a decrease in adiponectin so that the process of

atherosclerosis can easily occur. The mechanism of the increased activity of the sympathetic, the other being the failure function of the sensitivity of the baroreceptor, increased free fatty acids, angiotensin II, insulin, and leptin can enhance the increase in vascular resistance that can lead to the occurrence of hypertension. The magnitude of the impact caused by obesity and hypertension indicates the need for prevention. For this reason, it is necessary to educate the public on how to implement a healthy lifestyle to prevent and treat central obesity and hypertension that occurs in the community through health services such as posyandu and puskesmas.

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LITERATURE REVIEW KANGAROO MOTHER CARE TREATMENT FOR TEMPERATURE CHANGE IN LOW BIRTH WEIGHT BABIES

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ABSTRACT

Introduction: based on Indonesian Ministry of Health in 2016 the incidence of Low Birth Weight is one of the causes of the high babies mortality rate in Indonesia. LBW is a newborn baby weighing less than 2500 grams regardless of gestational age. LBW babies have immaturity thermoregulation system so babies are susceptible to complications of hypothermia. According to Rahmayenti (2009), the benefits of PMK are overcoming hypothermia. **Purpose:** to analyze the effect of kangaroo mother care on body temperature changes of LBW babies. **Methods:** this study uses a literature review method. Articles or journals searched by 4 electronic databases with keywords and Boolean operators (AND, OR NOT or AND NOT). The topic of the selected articles are implemetation of kangaroo mother care for temperature body change in low birth weight babies published in 2016-2019. **Results:** all respondents in the literature have an increase in body temperature after being treated with the kangaroo mother care. The body temperature of majority respondents are change to normal range of body temperature. Kangaroo mother care treatment increased the body temperature of LBW babies at least 0.1°C. There are difference changes in body temperature on this study due to difference implementation time of kangaroo treatment in each journal. Thus the kangaroo mother care has an effect on changes in body temperature of LBW babies. **Suggestion:** KMC can apply as often as possible to increase the baby's body temperature.

Keywords: LBW, benefit of kangaroo mother care, body temperature changes, the effect of kangaroo mother care

INTRODUCTION

Healthy is one of the important aspects in a country. A strong nation consists of a healthy society. One of the indicators to improve public health is decreasing the infant mortality rate (IMR). IMR is the number of deaths under one year of age occurring among the live births in a given geographical area during a given year, per 1,000 live births occurring among the population of the given geographical area during the same year. Based on Indonesian Ministry of Health in 2016 the incidence of Low Birth Weight (LBW) is one of the causes of the high babies mortality rate in Indonesia.

LBW is a newborn baby weighing less than 2500 grams regardless of gestational age. Survei Demografi Kesehatan Indonesia (2017) explained that the incidence of Low Birth Weight Babies (LBW) in Indonesia reached 6.2%. The number of LBW is far from the average are Madiun (8.6%), Situbondo (5%), and Bondowoso (4.6%) (Hartiningrum and Fitriah, 2018). This number must be reduced to improve the health indicators of Indonesian.

LBW babies are susceptible to have cognitive development disorders, mental retardation, and get infections easily that can cause illness or even death (De Onis et al., 2019). Adults with LBW on past medical history are prone of suffering from degenerative diseases. It can cause an economic burden to individuals and society (WR, 2019). LBW babies caused by premature birth due to the inability of the uterus to hold the fetus. The factor from mom are parity, pregnancy spacing, smoking, drugs, maternal diseases during pregnancy and complications, which can cause fetal growth restriction while in the womb.

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Complications by LBW babies such as meconium aspiration syndrome, symptomatic hypoglycemia, hyaline membrane disease (caused by incomplete surfactant) bring out membranes alveoli collapse, neonatal asphyxia, and hyperbilirubinemia showed up if LBW not handled properly (Nining, 2016).

One of the problems in LBW babies is immaturity of the thermoregulation system. LBW has a few subcutaneous fat (brown fat), so LBW can lose body heat easily because the larger ratio of skin surface area to body weight, and has no reflex control of the skin capillaries. According to Rahmayenti (2009) the benefits of kangaroo treatment (PMK) can prevent hypothermia because the mother's body can provide warmth to her baby continuously by contacting the mother's skin with the baby's skin. Therefore, the authors conducted this study with the aim of analyzing the effect of kangaroo care methods on changes in body temperature of low birth weight infants through a literature review.

METHODS

The design of this study is a literature review with a compare technique, like summarizing and critiquing the similarities of the articles and presented in a new article. The data used from national research journals online published, this data is called secondary data. This data is the result of research that has been done by previous researchers. The literature search was carried out in March - May 2021 using electronic databases, like Garuda Ristekbrin, Google Scholar, Neliti, ReasearchGate. Search articles or journals using the keywords LBW, benefits of kangaroo method care, changes in baby body temperature, effects of kangaroo treatment method. After getting data, based on keywords, the author conducted a duplication screening, title, abstract, and full text. The data analysis method is a summary of research journal data that is entered into a table and then analyzed the contents contained in the research objectives and research results. The sample used in this study were LBW infants who did FMD with the age of 0-28 days.

RESULTS

Based on the results and analysis of a literature search on Google Scholar, Garuda Ristekbrin, Neliti, and ResearchGate, the authors found 25 journals that matched the topic. The search results obtained were checked for duplication, and removed 3 similar journals so 22 journals left. The selected journals filtered by looking at the match titles with the research objectives. Titles which not match with the criteria are excluded, so 20 journals left. After that the journals were adjusted to the inclusion and exclusion, so 13 journals left. The journals were re-selected based on the abstract and the remaining 8 journals. After re-screening by inclusion and exclusion criteria, the journals were selected by the full text and 6 journals are remaining. Then the selected journals were adjusted to the themes and objectives of the research and the remaining 5 journals could be used in the literature review.

Based on the selected journals, then the researchers grouped and mapped the data as follows:

Study Design:

Table Research Designs from Review Journals			
No	Study design	Total	Percentage
3.	<i>Preexperimental design</i>	3	60%
4.	<i>Case study</i>	1	20%
5.	<i>Quasi experimental design</i>	1	20%
Total		5	100%

Factors that contribute in the baby's body temperature changes after kangaroo treatment are pre-experimental design. Overall, each study discusses body temperature changes of low birth weight babies after undergoing kangaroo treatment. Studies consistent with this systematic review were conducted in Indonesia, namely Palembang, Jepara, Bengkalis, Bukittinggi, and Pasuruan.

Table of Respondent Characteristics Based on Literature Review

Journal	Respondent	Age	Gender	Birth Weight
Journal 1	17 babies	2-21 days	a. male: 5 babies b. female: 12 babies	1800 gr – 2400 gr
Juornal 2	1 babies	7 days	-	1500 gr
Journal 3	34 babies	-	-	-
Journal 4	15 babies	-	-	-
Journal 5	21 babies	a. 0-3 days: 17 babies b. >3 days: 4 babies	-	a. <1000 gr: 1 babies b. 1000-1500 gr: 2 babies c. 1501-244 gr: 18 babies

Respondents in this study who matched by inclusion criteria were low birth weight babies who were undergoing kangaroo care. The total respondents was 88 babies. The respondents to journal 1 were 17 babies, the respondents to journal 2 were 1 baby, respondents to journal 3 were 34 babies, journal 4 respondents were 15 babies, and journal 5 respondents were 21 babies. The baby's birth weight in journal 1, journal 2 and journal 5 was <2500 grams. Respondents in journal 1 are classified as low birth weight babies. Respondents in journal 2 were classified as very low birth weight babies. Meanwhile, respondents in journal 5 classified into very very low birth weight is 1 baby, very low birth weight is 2 babies, and low birth weight is 18 babies.

Table of Body Temperature Change		
Journal	Averenge Body Temperature	
	Before KMC	After KMC
Journal 1	36.2 °C	36,47 °C
Journal 2	35.8 °C	36.2 °C
Journal 3	35.49 °C	37.10 °C
Journal 4	35.5 °C	36.6 °C
Journal 5	36.7 °C	36.8 °C

Before the implementation of the kangaroo mother care, only respondents in journal 5 had body temperatures within normal limits, while the body temperatures of respondents in other journals were below normal. After doing the kangaroo mother care, only respondents in journal 2 who have not reached the normal body temperature limit, but there is an increase in body temperature of 0.4°C. After doing KMC, the average baby's body temperature changed by 0.27°C in the first journal, 0.4°C in the second journal, 1.61°C in the third journal, 1.1°C in the fourth journal, and 0.1°C in the fifth journal.

DISCUSSION

According to the five journals, the kangaroo mother care is a method for newborn babies by placing the baby on the mother's chest vertically in a naked state using only a diaper and a head covering. The baby is left naked, only wearing a diaper, and a head covering so there is direct contact with the baby's skin and mother's skin. The baby is secured with a long cloth or sling. The baby's head is turned to the right or left, with a slightly upturned (extension) position. The tip of the strap is right under the baby's ear.

According to baby's position, the author assumes that the kangaroo mother care can increase the baby's body temperature. This is in line with the research of D. Farida and AR Yuliana (2017) which stated

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that after the kangaroo method was treated with a minimum frequency of 3 times a day with an intensity of 2 hours, it was found that there was a change in the patient's temperature when treated with an infant warmer with a temperature of 33°C, body temperature only in 36°C, when treated by the kangaroo mother care, the baby's body temperature increases by 1°C from 35.6°C to 36.6°C.

Another study is suitable by Heni Heriyeni (2018) research explained that the average body temperature of babies before the kangaroo method was 35.74°C with the lowest temperature of 34°C and the highest temperature of 36°C. Meanwhile, after treatment with the kangaroo method, the average body temperature increased to 37.2°C with the lowest temperature of 36°C and the highest temperature of 38°C. The kangaroo treatment method in this study was carried out for 1 time in 1 day.

In addition, Wati, RCR., Etika, R., Yunitasari, E. (2019) explained that the kangaroo method of care can maintain the stability of the baby's breathing pattern so that the baby can breathe regularly. Hendayani Research, WL. (2019) also said that mothers who take care of the kangaroo method can cope with stress due to the long period of baby care because mothers react emotionally to their babies so that they are more confident, skilled in caring for their small babies and tend to be more confident to give breastfeeding their babies.

The kangaroo mother care was carried out intermittently. Before doing the kangaroo treatment, the researchers explained the kangaroo method according to the Standard Operating Procedure (SOP). The shortest time for implementing the kangaroo method of care is journal 4 which is carried out for 1 day with a duration of 1 hour, and the longest is journal 5 which is carried out for 3 days with a frequency of 2 times for 90 minutes. While journal 1 is held for 7 days 1 time for 1 hour. Journal 2 is held for 3 days 3 times per day for 2 hours. Journal 3 is held for 1 day 1 time.

Baby's body temperature measured twice time, before and after the kangaroo mother care. After the kangaroo method was carried out, only respondents in journal 2 had not reached the normal limit of body temperature, but there was an increase in body temperature of 0.4°C. After doing kangaroo mother care, the average body temperature of the baby experienced a temperature change of 0.27°C in the first journal, 0.4°C in the second journal, 1.61°C in the third journal, 1.1°C in the fourth journal, and 0.1°C in the fifth journal.

The heat transfer process in kangaroo mother care is carried out by conduction, namely the transfer of heat from and through direct contact between two objects. As long as the skin temperature is higher than the ambient temperature, heat is lost through radiation and conduction. However, when the ambient temperature is higher than body temperature, the body gains heat from the environment through radiation and conduction. LBW babies receive mother's body heat because the mother's body temperature is higher. Surface temperature fluctuates depending on blood flow to the skin and the amount of heat lost to the external environment.

The five literatures show that there are differences in temperature changes in the respondents of each journal after being treated with the kangaroo method. This is because there are differences in the duration of the kangaroo method of treatment carried out by researchers in each journal. In addition, physiological factors of low birth weight babies such as lack of subcutaneous fat or brown fat on the skin, immaturity of the body temperature regulation system, relatively wider body surface, and the absence of reflex control of the skin capillary blood vessels cause differences in the heat stimulation received by each LBW babies. Immature physiology of LBW babies and responses to stimuli that do not encourage LBW babies to be in a hypothermic state.

Muslihatun (2010) in Nurcahayati et al (2016) researched said that the kangaroo method care is a method to replacing the incubator that can prevent babies from experiencing hypothermia. This happens because there is heat transfer between the body of the mother and baby. It was found that the kangaroo mother care can provide changes in the body temperature of LBW babies of at least 0.1°C. Changes in the baby's body temperature that are very influential are found in the third journal with a temperature change of 1.61°C.

The results of the five journals showed p value < 0.001 in journal 1, there was an increase of 1°C in journal 2, p value = 0.000 in journals 3 and 4, and p value = 0.002 in journal 5, where 0.05. The value of 0.05 can be interpreted that there is a difference in body temperature of LBW babies before and after the kangaroo method treatment or kangaroo method care affects changes in the body temperature of LBW babies.

Based on the results of a literature review study, the respondent's body temperature before carrying out the kangaroo method was in the range of 35.49°C-36.7°C. This shows that most of the respondents' body temperatures in the literature are below the normal limits of body temperature. After doing the kangaroo method, body temperature of most respondents are increase within normal limits of body temperature and in the range of 36.2°C-37.1°C.

According to the author's assumption, the kangaroo method of care has an effect on changes in the baby's body temperature due to an increase in the body temperature of LBW babies after doing the kangaroo mother care.

The effect of kangaroo mother care on body temperature changes in the literature carried out at different times shows that there are differences in changes in body temperature after the kangaroo method is treated. With the kangaroo method of care there is a mechanism for increasing the baby's heat by conduction. Conduction is the transfer of heat between objects at different temperatures in direct contact with each other. Heat moves following a normal gradient from a hotter object to a cooler one because it is transferred from molecule to molecule (Perinansia, 2015 in the research of D. Farida and A.R Yuliana, 2017).

Kangaroo method treatment affects changes in body temperature of LBW babies because in the kangaroo method treatment process occurs a conduction heat transfer process that can transfer heat about 60% between the mother's skin to the baby's skin. Based on Heni Heriyeni (2018) research the mother's body heat transfers to the baby's body by following the mother's body heat to a cooler temperature, namely the baby's body. It means that the baby's cold body is in direct contact with the mother's warm skin and a process of heat transfer occurs between the mother's and baby's skin. So the baby does not lose heat, either through radiation, convection, evaporation, or conduction.

That research suitable by Hendayani, WL. (2019) researched that the average body temperature before doing the kangaroo method treatment was 35,547 with a standard deviation of 0.2669. Meanwhile, the average body temperature after treatment with the kangaroo method was 36,667 with a standard deviation of 0.2769. The results of the T test obtained p value 0.000 (0.05) it can be concluded that there is an effect of the kangaroo care method on the body temperature of LBW infants in the Perinatology Room of RSUD Dr. Achmad Mochtar Bukittinggi in 2018. Therefore, the kangaroo method of treatment can be applied as a substitute for the incubator for LBW babies so that the baby does not lose body heat either through radiation, convection, evaporation, or conduction.

Based on the conclusions we have obtained, several suggestions can be recommended, as follows: it is hoped that kangaroo mother care can be applied to keep LBW babies warm and prevent hypothermia complications. The kangaroo mother care can be given as often as possible for LBW babies to increase the baby's body temperature going to the normal limit body temperature, so the baby does not lose body heat either through radiation, convection, evaporation, or conduction.

CONCLUSION

Based on the results and discussion of literature research from 5 literatures, KMC has an effect on changes in body temperature of LBW infants. It is proven by an increase in body temperature in the respondents of each journal. This is because during FMD the baby does not lose body heat because there is a heat transfer of about 60% by conduction between the mother's skin to the baby's skin.

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LITERATURE REVIEW SELF CARE MANAGEMENT ON BLOOD SUGAR LEVEL CONTROL IN DIABETES MELLITUS TYPE 2 CLIENTS

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ABSTRACT

Diabetes mellitus is one of the non-communicable diseases which is increasing every year. Good blood glucose control is an important factor in reducing the risk of complications in people with diabetes mellitus. In an effort to prevent and control diabetes, it can be done through measures *self care management* that have an effect on optimally controlling blood glucose levels and preventing complications that a rise. This research aims to determine the relationship between self care management and control of blood sugar levels in patients with type 2 diabetes mellitus. This research uses a method *literature review*. Making articles via the internet publication of three databases, *Google Scholar, PubMed, Science Direct* and starting in 2019 until 2021. The majority of patients with diabetes have high levels *self-care management* of high with uncontrolled blood sugar levels. In the *literature review*, it was found that all of the research journals (100%) showed a relationship between *self care management* and control of blood sugar levels as evidenced by the average *p value* of the five journals was < 0.05 . *Self care management* is related to the control of blood sugar levels in patients with type 2 diabetes mellitus. The ability of people with diabetes mellitus to perform *management* regularly and optimally in implementing the five pillars of activities *self care self care* can help control blood sugar levels of patients with more control, so there needs to be motivation and confidence. diabetics on their ability to perform self behavior *care management*. The role of health workers is also needed in providing education about actions *self care management* so that the understanding of diabetes patients also increases so that they can maintain their health conditions.

Keywords: Diabetes self management, blood glucose, type 2 diabetes mellitus.

INTRODUCTION

Diabetes Mellitus is a non-communicable disease which is increasing every year. WHO estimates that globally, 422 million adults over the age of 18 were living with diabetes in 2014. Worldwide, the number of people with diabetes has increased substantially between 1980 and 2014, increasing from 108 million to 422 million or about four times. Diabetes caused 1.5 million deaths in 2012. It is noted that blood sugar levels above the maximum limit resulted in an additional 2.2 million deaths, increasing the risk of cardiovascular and other diseases (WHO Global Report, 2016).

In the 10 countries with the highest diabetes sufferers, Indonesia is in 7th place with 10.7 million sufferers as the highest diabetes sufferer in 2019 in the world. Indonesia is the only country in Southeast Asia that is ranked 3rd with a prevalence of 11.3% on the list, so it can be estimated that Indonesia has a large prevalence of diabetes cases in Southeast Asia (International Diabetes

Federation, 2019). The increased prevalence of diabetes mellitus in Indonesia based on the doctor's diagnosis at age ≥ 15 in the year 2013 of 1.5% has been reached 2% in 2018. In addition, according to the results of blood sugar tests are an increasing number of people with diabetes mellitus than 6.9% in 2013 to 8.5% in 2018 (Riskesdas, 2018).

Diabetes Mellitus (DM) is a metabolic disease characterized by hyperglycemia that occurs due to abnormalities in insulin secretion, insulin action, or both. DM classification generally consists of type 1 DM or *insulin dependent diabetes mellitus (IDDM)* and type 2 diabetes or non insulin dependent diabetes mellitus (NIDDM). Type 2 diabetes is caused by the cells β inside the pancreas produces insulin in small amounts or insulin resistance. The number of people with type 1 DM is 5-10% while in type 2 DM there are 90-95 of DM sufferers worldwide (ADA, in Widiastuti 2020). Diabetes mellitus is one of the diseases that ranks 4th out of 10 causes of death in the world (WHO, 2017). In addition, diabetes mellitus is the 3rd of the 10 highest causes of death in Indonesia with a total of 6.7% (Ministry of Health, 2017).

In an effort to prevent and control diabetes, self-care management actions can be carried out in people with diabetes mellitus which refer to Orem's self-care theory. *Self care* is an action that seeks for others to have the ability to develop or develop their abilities so that they can be used appropriately to maintain optimal function (Alligood & Tomey, in Asyrofi 2018). According to the *Association of American Diabetes Educators (AADE)* in 2017 there are 5 domains in *self-care* diabetes which include diet regulation, physical exercise, controlling blood sugar levels, good medication management and taking care of the feet.

The criteria for controlling diabetes mellitus are based on the results of examination of glucose levels, HbA1c levels and lipid profiles. The definition of well-controlled diabetes mellitus is when blood glucose levels, lipid levels, and HbA1c reach levels according to the specified target (Perkeni, 2019). Uncontrolled blood sugar levels can lead to impaired cognitive function in people with diabetes mellitus. Increased fasting blood glucose (GDP) and post prandial blood glucose (GDPP) levels are also directly associated with an increased risk of complications. In people with diabetes mellitus whose blood sugar has not been controlled for a long time, there will be disturbances in nerve cells and small blood vessels (microvascular) and large blood vessels (macrovascular). Damage to small blood vessels occurs in the eyes, kidneys, and nerves. Meanwhile, damage to large blood vessels can accelerate the occurrence of atherosclerosis (H Bangun, 2019).

Based on the data and problems above, the application of management *self care* in people with diabetes mellitus is very important so that the patient's blood sugar levels are within normal limits and to prevent complications that can worsen the condition of people with diabetes mellitus so as to reduce morbidity and mortality due to diabetes. Thus, researchers want to analyze the relationship between *self-care management* of blood sugar level control in patients with Type 2 Diabetes Mellitus by reviewing several journals/articles that have been published from 2019 – 2020.

METHODS

This study uses a *literature review* method that discusses *self care management* for controlling blood sugar levels in patients with diabetes mellitus. type 2 diabetes. The data used in this study is secondary data obtained not from direct observation, but obtained from the results of research that has been done by previous researchers. Sources of secondary data obtained in the form of reputable journal articles both nationally and internationally with the theme of diabetes mellitus. Searching for literature journals in this *literature review* uses four databases, namely *Google Scholar*, *PubMed*, and *Science Direct* with keywords that match the research title variable. The journals that have been found are then selected by observing whether the abstract is in accordance with the research objectives. Furthermore, the journal analysis is carried out in detail by reading, observing, and comparing the contents of the journal as a whole. The data analysis method is a summary of research journal data that is entered in a table and then analyzed for the research objectives and research results.

RESULTS AND DISCUSSION

Based on the search results using 3 databases, namely *Google Scholar*, *PubMed*, and *Science Direct* using the keywords self management diabetes, blood glucose, type 2 diabetes mellitus, the researchers managed to find 5 journals that matched the research objectives. Of the 5 research journals, an analysis has been carried out that meets the research inclusion criteria. Journals according to this systematic review were conducted in Indonesia with three studies (Errick et al., 2019; Larasati et al., 2020; Syahrizal et al., 2019) while the other studies were conducted in Nepal (Sushant et al., 2019) and the other in Saudi Arabia (Abdulaziz et al., 2021). The respondents are the people who suffer from diabetes mellitus type 2. The study has been mentioned about *self-care management* diabetes and blood sugar levels with the respondent amounted to between 51- 480 people. Respondents in the study were aged 18 to 90 years with different regions. The characteristics of the *gender* respondents are slightly more female than male.

Based on the journal reviews as described in table 1, researchers can classify the data as follows:

Table Research Design from Review Journals

No.	Study design	Total	Percentage
1.	Google Scholar	3	60%
2.	PubMed	1	20%
3.	Science Direct	1	20%
Total		5	100%

In all journals published *literature review* that have been analysis, the researcher found that there were 3 articles (60%) with the results of *self care management* in the good category. Meanwhile, 2 articles (40%) got the results of *self care management* in the poor category. This is likely due to several factors that influence it. Several factors that may influence *self behavior care management* in people with diabetes mellitus include age, gender, education level, economic status, and duration of diabetes mellitus.

Self care management Diabetes is an action taken by individuals to control diabetes including treatment and prevention of complications. In *self-care management*, diabetes there are several pillars of activity consisting of regulating diet (diet), physical activity/sports, blood sugar monitoring, drug consumption compliance, and foot care (Huang, in Hidayah 2019). The purpose of *self-care management* diabetes is to achieve blood sugar levels in the normal range so as to prevent complications and reduce morbidity and mortality due to diabetes mellitus (Cita, 2019).

In patients with type 2 diabetes mellitus, efforts to increase the success of diabetes mellitus control in the management of diabetes mellitus can be achieved by implementing *self care management* diabetes that is carried out optimally and as well as possible by the patient. In accordance with Luthfa's research (2019), the better *self-management* of diabetics, the better their quality of life.

In all journals in the *literature review* that have been analysis by researchers, shows the results of 3 articles (80%) most of the respondents have uncontrolled blood glucose levels while 1 article (20%) with controlled blood glucose levels in people with type 2 diabetes mellitus. The cause of uncontrolled blood glucose levels can be influenced by several factors such as lack of exercise, increased amount of food consumed, increased stress and emotional factors, weight gain and age, as well as the impact of treatment from drugs such as steroids.

Blood sugar levels are the amount of glucose (sugar) in the blood, also known as serum glucose levels, which are monitored by the pancreas. According to the *American Diabetes Association* (2009), the criteria for diagnosing diabetes include the presence of classic symptoms and plasma glucose levels when > 200 mg/dL (22.2 mmol/L), fasting plasma glucose levels > 126 mg/dL (7.0 mmol/L).), 2-hour plasma sugar levels at OGTT > 200 mg/dL (11.1 mmol/L), and HbA1c levels

($\geq 6.5\%$) . With information reviewed from SMBG (*Self Monitoring of Blood Glucose*), patients can change their diet, physical activity, and even medications to reduce postprandial elevation, reduce the risk of complications, and feel much better because they no longer have elevated glucose levels (Pearson, 2010). 2009). The definition of well-controlled diabetes mellitus is when blood glucose levels, lipid levels, and HbA1c reach the expected levels (Perkeni, 2019).

Blood sugar levels are one of the important parameters to determine the condition of metabolic disorders in patients with diabetes mellitus. Various complications can arise due to uncontrolled blood sugar levels such as neuropathy, hypertension, coronary heart disease, retinopathy, nephropathy, and gangrene. According to the research, it has been *Diabetes Control and Complication Trial* (DCCT) shown that controlling blood sugar levels can reduce the risk of retinopathy by 76% and can prevent retinopathy from worsening by 54%. In addition, research by *United Kingdom Prospective Diabetes Study* (UKPDS) showed that every 1% decrease in HbA1C was accompanied by a 35% reduction in the risk of microvascular complications.

In the *literature review*, it was found that all of the research journals (100%) showed a relationship between *self care management* and control of blood sugar levels as evidenced by the average *p value* of the five journals was < 0.05 . Where the direction of the relationship between the variable *self care management* and the patient's blood sugar level is negative or inversely proportional, meaning that the lower the ability *self care management*, the more uncontrolled blood sugar levels (more than the normal limit for blood sugar levels).

If diabetics know how to do self-care and carry out all aspects of *self-care management* properly and consistently, the patient's blood sugar level will be controlled within normal limits. This is in accordance with the results of Puspita's research (2019), with *p value* of $0.000 < 0.05$ which indicates that the Diabetes Self Management Education (DSME) intervention group has a greater effect on changes in blood sugar levels when compared to the control group. In addition, Kurniawan (2020) also explained that low *self-care management* results in uncontrolled blood sugar levels and good *self-care management* results in controlled blood sugar levels.

The level of knowledge and ability of diabetics affects the behavior of activities *self care management* and controlled blood sugar levels. The success of diabetes management through *self care management* can be seen from the results of the patient's blood sugar levels because the purpose of supporting blood glucose levels is to find out whether the diabetes therapy target has been achieved so that the drug dose can be adjusted if the therapeutic target has not been achieved (Perkeni, 2019).

CONCLUSION

Based on the above results, the researchers conclude that *self-care management* is related to blood sugar control type 2 diabetes mellitus patients with diabetes mellitus ability in doing *selfcaremanagement* routine and optimal in implementing the five pillars of activities *self-care* can help sugar. The patient's blood is getting more controlled, so there needs to be motivation and confidence for diabetics in their ability to carry out self behavior *care management*. The role of health workers is also needed in providing education about actions *self care management* so that the understanding of diabetes patients also increases so that they can maintain their health conditions.

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LITERATURE REVIEW: THE EFFECT OF BABY MASSAGE ON BABY'S WEIGHT GAIN

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ABSTRACT

Introduction: Infants are very vulnerable to being affected by various things due to the organs' immaturity that still not working optimally and cause many problems, emotionally and physically. It is worse if the infants are LBW or in poor status nutrition. One of the solutions that is recommended is giving baby massage. It strengthen baby's muscles and improve baby's cognitive. Touching skin-to-skin and giving moderate pressure on certain points on the baby's body can stimulate various nerves and growth hormones that are having great role in increasing weight. **Purpose:** This study aims to analyze the effect of infant massage on baby's weight gain. **Methods:** This study uses a literature review method. The data was taken from previous research with the topics discussed that following the research topics from 2017-2021 as many as 6 journals. **Results:** It can be concluded that giving baby massage is proven to be effective in increasing the baby's weight. There was a significant increase in baby weight in babies who were given baby massage compared to those who were not. **Suggestion:** Request to health workers to make baby massage a regular program for all parents with children. Thereby, parents can be motivated apply baby massage regularly to their babies so that it can improve the babies' health, especially in gaining weight.

Keywords: Effect of baby massage, benefits of massage, infant's weight gain, low birth weight newborns

INTRODUCTION

Infants are very vulnerable to being affected by various things, both by the surrounding environment and their bodies. This is because the organs are still immature, so they are not working optimally. Various conditions can occur in newborns are infection, fever, jaundice, hypothermia, etc.

There are 6,700 newborns who die every day in the world. Infant mortality in Indonesia is ranked 10th highest in the world, which is more than 60 thousand babies. (WHO, 2019). It was reported that of the total under-five deaths in Indonesia in 2020, 72% (20,266) of them occurred at the age of 0-28 days, 19.1% (5,386) at the age of 29 days-11 months, and the rest at the age of 12-59 months. Of all causes of death for neonates aged 0-28 days, as much as 35% occur due to birth weight below normal or LBW (low birth weight). One in every three neonatal deaths is caused by LBW (Pusdatin, 2020). Research in Ethiopia stated that the risk of neonatal death due to LBW (low birth weight) was very high, almost fourfold from the national estimate of the country's NMR at that time. This shows body weight plays an important role in the life of infants.

In general, infants weight can be divided into 3 types, namely less than 2.5 kg (low birth weight), 2.5-4 kg (normal birth weight), and more than 4 kg (macrosomia). Too light or too heavy in weight can affect infant's life. It can increase the risk of heart disease and diabetes (Abdulai, 2015).

According to UNICEF, in 2015, out of a total of 20.5 million newborns, 14.6% experienced LBW. Almost half of LBW population was born in South Asia, which is 47% of all LBW in the world. In the long term, infants with LBW face the threat of stunting during their growth period. In general, premature babies are closely related to LBW because they have less time to grow and develop than babies who born normally (Parul,

2013). For 15 years, from 2000 to 2015, there was no statistically drastic decline in LBW. However, in 2025, it is alleged that the WHA target to increase the annual average rate of reduction will be achieved. (UNICEF, 2019)

According to HNN (Healthy Newborn Network), the number of live births in Indonesia in 2018 was 4.8 million. As much as 10% of the total births were LBW newborns. In the following year, based on the Indonesian Health Profile 2019, there were 14.1 million babies aged 0-2 years and 4.7 million babies were born alive. Babies with low birth weight are closely related to inadequate daily nutrition. 3.8% of infants aged 0-2 years were malnourished and 11.4% were undernourished (Pusdatin, 2019).

In order to increase the newborn's strength to survive and stay healthy, one of the suggestions from WHO to parents and care workers to provide essential newborn care is skin to skin contact between mother and infant. This action increases bonding in the relationship, provides comfort and security, and helps the infant's body stays warm. One solution that is highly recommended is baby massage.

Baby massage uses the principle of touching, one of practical solutions to overcome various problems in babies in terms of emotional, social, and physical. If done regularly, baby massage by parents can increase the feeling of mutual understanding and bonding in the relationship between parents and children. This action will be accepted by the baby as a form of real affection / affection from his parents. This affects how the baby feels. Babies will feel safe, appear calmer, cried less, happier, and more assured from the moment they start the massage. For parents, feedback is precious and helping them to gain confidence in handling their babies. A positive relationship will also be formed.

In terms of physical, baby massage can strengthen baby's muscles and joints, improve baby's cognitive, and is very beneficial for premature babies with less than normal weight and babies with special needs. According to research conducted by Seidhagah, body massage can increase the mean of weight of low birth weight in preterm neonates at the age of two months and it can be used as a simple effective and safe non-medical intervention that can improve weight gain velocity of preterm low birth weight infants.

From the data, the researchers used a literature study to determine the effect of baby massage for baby's weight gain. Based on the problems above, the practice of baby massage continuously everyday needs to be more spread and be in regular program for mothers and babies because it has a lot of benefits for both of them, such as gives comfort and helps baby gaining weight.

METHODS

The design of this study is a literature review method using compare technique to summarize and analyze the differences and similarity of journals and presented in a new journal. The data was taken from previous research from research studies databases in national and international online journals with the topics discussed that following the research topics from 2017-2021 using the Google Scholar and Proquest with the keywords: Effect of baby massage, benefits of massage, infant's weight gain, low birth weight newborns. The researchers found 2,800 journals that matched the keywords. The researchers then matched the inclusion criterias, such as publishing period of the last five years, Indonesian and/or English language, infants aged one year old as sample, original research articles, research themes on the effect of baby's massage for baby's gain weight, using experimental study design, and removed all the duplicated articles. There were as many as 97 journals. The research journals were then selected by looking at the abstract that matched the research purpose. There were 31 journals. Among 31, only 6 journals that was appropriate for this study. The data analysis method for this study was making the summary of the chosen research journals and then analyzing the contents that contained in the research purpose and research results.

RESULTS&DISCUSSION

Based on the results from Google Scholar and Proquest with keywords and other criterias, such as publishing period of the last five years, Indonesian and/or English language, infants aged under one year old as research subjects, original research articles, research themes on the effect of baby's massage for baby's gain weight, and using experimental study design, only 6 journals that met with those criterias, the reseachers' purpose and objective views. The chosen journals will be used as literature review references with the stage of analyzing and summarizing the contents of the journal, final conclusions, then presenting them on paper.

Based on the chosen journals, the researchers categorized the data as follows:

Table 1. Research designs of review journals

Study Design	Frequency	Percentage
<i>Quasi eksperimental design</i>	6	100%
Total	6	100%

The table above means that all of the chosen review journals are using quasi experimental design with type of quantitative research. In contrast to other experimental type, quasi experimental design has treatment, impact measurement, experimental unit, but the experimental class is not chosen randomly in order to conclude the changes caused by the experiment/treatment.

The samples have passed the criteria applied by each of the original authors of these journals. Broadly speaking, the sample criterias are the infant is less than one year old, healthy, and there are no certain diseases that require the use of assistive devices. The total respondents of the six journals selected were 274 infants. Journal 1 was 16 infants, journal 2 was 32 infants, journal 3 was 66 infants, journal 4 was 20 infants, journal 5 was 83 infants, and journal 6 was 57 infants. The age of the respondents varied, but remained within the limit of less than 12 months. In journal 1, all respondents were neonates and aged less than 28 days, journal 2 was 0-6 months old, journal 3 was 3 months old, journals 4 and 5 were less than 12 months old, and journal 6 ranged from 3 to 9 months.

Table 2. Duration and frequency of baby massage

No.	Duration per session	Frequency	Total session
1.	15 minutes	5 days in a row	5 times
2.	15 minutes	2x a week for 4 weeks	8 times
3.	15 minutes	2x a week for 6 weeks	12 times
4.	15 minutes	1x a week for 4 weeks	4 times
5.	15 minutes	1x a week for 4 weeks	4 times
6.	15 minutes	1x a week for 4 weeks	4 times

Table above describes that 6 review journals provide the same duration in each massage session, which is 15 minutes. This is in accordance with the massage session determined by dr. Field, routine baby massage composed of 5 minutes of slow massage, 5 minutes of kinesthetic stimulation of the extremities, and 5 minutes of slow massage again. The total time required is 15 minutes per session.

The majority of the frequency of baby massage in the table above is once a week which is carried out in journal 4, 5, 6. Twice a week was an option for those who feel that once a week is too short. While in the first journal, it was done every day in order to get maximum results. Combining the frequency and duration of the experiment, journal 3 gave the highest total session, which was 12 times. Followed by journal 2 and 1, 8 times and 5 times, consecutively. While in journals 4, 5, 6, the total sessions were the same, namely 4 times.

Sudarmi's research (2020) showed that there are positive interactions that occur between mothers and babies during and after baby massage, it can be seen from the way mothers respond to their babies when they are hungry and make it easy to breastfeed immediately to give breast milk. Baby massage is a very effective treatment in improving the nutritional status of babies, especially for babies who are in a poor nutritional status.

In every chosen journals, the data collection tool used checklist sheets, baby massage SOP, and baby scales. The mothers accompanied their babies during the procedure and actively participated during the massage intervention under supervision. Several things that need to be prepared when doing a baby massage are the warmth of the room, the massage time, the baby's condition in a quiet alert state, and a calm surrounding condition. Nutritional factors also play an important role. If this is not considered properly, then the possibility of data bias and data inaccuracy will increase. The reason splitting sample into two groups, experimental group and control group, is important to know the comparison between infants who were given baby massage and babies who were not given baby massage. In the last journal, it was also stated that baby massage can improve the quality of baby's sleep because babies feel more relaxed and comfortable and baby's growth and development can be also boosted.

Table 3. Comparison of mean of weight gain after babies being massaged

No.	Sample	Experimental Group	Control Group
1.	16 neonates aged 0-28 days	Gaining 281 grams with difference value before-after 325.000	Not mentioned the exact weight gain but mentioned difference value before-after 100.000
2.	32 babies with history of LBW aged 1-6 month old	Gaining 500 grams	Gaining 286,75 grams
3.	66 babies aged 3 month old	Gaining 700 grams	Gaining 100 grams
4.	20 babies aged 0-12 month old	Has difference weight gain at least 180 grams and a maximum 380 grams more than the control group	Gaining weight but less 180-380 grams than the experimental group
5.	83 babies aged 0-12 month old	Gaining 331 grams	Gaining less than 300 grams
6.	57 babies aged 3-9 month old	Gaining 977 grams	Gaining 41 grams

All the journal reviews divided the samples into two groups, the experimental group that was given baby massage and the control group that was not receiving any intervention. In each groups, the condition of the babies before and after receiving treatment were recorded and then calculated and compared the differences between the groups that were given treatment and those who were not. The studies were carried out in cities in Indonesia, such as: Lampung, Tasikmalaya, Padang, Pekanbaru, Malang, and Klaten.

The average weight of neonates before and after infant massage showed significant differences. In journal 1, there was a difference in weight gain in neonates who are massaged and not massaged. Increase in the weight of neonates in intervention respondents (281 grams with difference value 325,000) and control respondents (difference value 100,000). In journal 2, The average weight of infants was 2.295 grams (experiment) and 2.288 grams (control). After baby massage is given, there is an increase in the baby's weight. The difference in the baby's weight gain before and after being given baby massage in the experimental group was 500 grams and in the control group only 268.75 grams. In journal 3, the difference in the baby's weight gain after receiving a baby massage was a stark contrast. The intervention group had a difference of 700 grams compared to the post-test control group which only got a difference of 100 grams. In jurnal 4, babies who were given baby massage with those who will not experience a difference in weight gain, which is a minimum of 180 grams and a maximum of 380 grams. In journal 5, there was an increase in the baby's weight after the intervention of baby massage using the Brazy et al technique for 15 minutes, once a week for a month. The result of the increase had exceeded the minimum standard of weight gain in one month. In journal 6, the difference in the baby's weight gain before and after massage in the intervention group was 977 grams, while in the control group it was only 41 grams.

There was a significant increase in body weight in infants who were given this massage due to increased levels of IGF-1, namely growth hormone, in infants who had been given baby massage. (Sudarmi, 2020). Touching and giving moderate pressure on certain points on the baby's body can stimulate various nerves and growth hormones. After the baby is given massage, there is an increase in vagal activity, insulin as food absorption hormone, and IGF-1 as growth hormone. Gastric motility also increases causing gastric emptying to occur faster, so the need for food also increases and affects the baby's weight. (Field, 2011)

Boys and girls showed differences in weight gain, as noted in journal 1. The growth of male neonates was faster than female neonates with an average weight gain after baby massage, which was 300 grams. This is because men have a higher level of need for breast milk. In addition to affecting body weight, baby massage has also been shown to affect growth and development, as well as sleep quality, as stated in the research journal 6. There were significant differences in the effect of weekly baby massage for one month by the mother on the growth and development and quality of infant sleep between the intervention and control groups. The rate of development of a child who is massaged can increase from a doubtful child to a child according to the stage of development, while in grub control there is no acceleration.

The results of this research on the effects of baby massage on baby's weight gain, based on a literature review of 6 journals sourced from Google Scholar and Proquest, found that baby massage is effective in increasing baby weight. Shown according to the results, as many as 3 journals (50%) had $p \text{ value} = 0.000 < \alpha$ (0.005), 2 journals (33.33%) had $p \text{ value} = 0.001 < \alpha$ (0.005), and 1 journal (16.66%) has $p \text{ value} < 0.005 < \alpha$.

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All respondents experienced weight gain. There was a clear difference in weight gain between the experimental group that was given baby massage and the control group that was not given any treatment.

This means baby's massage has correlation with weight gain. It is effective to increase baby's weight. Many hormones and nerves are stimulated after baby being massaged. The principle of touching used during baby massage greatly enhances the baby's condition, both psychologically and physically. A study about the importance of skin-to-skin in the first hour after birth showed this unique time for both mother and infant, individually and in relation to each other, provides vital advantages to short- and long-term health, regulation and bonding (Ann-Marie, 2019). Moreover, other study reported changes were not only happened to infants, mothers that be part of study also showed improvisation in feeling and action towards their infants' need. They became more sensitive and responsive in connection with infants' bid, also more able to provide adequate scaffolding, providing support for infants' learning in a way that is well-timed and well-matched to the situation. (Alessio, 2016).

Giving olive oil at the time of baby massage is recommended. Study results of Mahnaz et al. (2016) showed a positive effect on weight gain, which was 21 grams daily in average in infants using olive oil for massaging and only 7 grams in massaging without oil.

Some of the chosen journals only explained results generally and did not mention things that seems not too important but actually need to know in detail, such as exact number of the weight's gain of control groups, detail treatment, condition, and steps that is used in intervention. The larger of sample, the more accurate it is to represent the population. Future research should focus on the impact of infant massage on infants that live in different environment, effect equipments in infant massage, or impact different kind of baby massage in longterm study to know which technique is more effective.

CONCLUSION

Based on the results of this research and discussion above, it can be concluded that giving baby massage regularly had proven to be effective to increase baby's weight. It was found that there was a significant increase in infants who were given baby massage compared to those who were not given. It also had a lot of benefits for baby's health, both psychologically and physically. In addition, improving the quality of sleep and baby's growth and development, including gross motor skills. The results of this research of baby massage are expected to be input in helping gaining baby's weight. It is hoped that parents or family can apply baby massage regularly to their babies so that the baby and parents can take many benefits of baby massage, especially increasing baby's weight.

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LITERATURE REVIEW: THE EFFECTIVENESS OF SELF MANAGEMENT IN PATIENTS WITH HEART FAILURE

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ABSTRACT

Heart failure is the inability of the heart to pump adequate blood to meet the tissue needs for oxygen and nutrients, in addition to a long healing process. Despite treatment improvements, heart failure remains an unresolved health burden in the world and in Indonesia. The application of proper self-management can reduce prevalence rates and improve quality of life. The purpose of this study was to examine the effectiveness of self-management in patients with heart failure. Design of this study Literature review, data source: using the Google Scholar database, published in Indonesian and English from 2016-2020. The sample used was 396 respondents. The results showed that self-management is effective in improving the quality of life of heart failure patients. The application of self-management helps individuals manage themselves, changes can last a long time and minimize recurrence. It is shown by the results of 2 articles (40%) having a p value = 0.000 ($p < 0.05$) indicating a very effective effect, as many as 2 journals (40%) having a p value = 0.001 $< (0.05)$ indicating that there are effective effect and 1 journal (20%) has a p value = 0.017 $< (0.05)$ indicating an ineffective effect. Self-management treatment methods are not only about educating patients but also demonstrating self-management care methods. Pay attention to the development of abilities and make sure the patient can apply them. Make it interesting to increase the interest of heart failure patients in implementing self-management for their daily lives.

Keywords: Effectiveness; Self Management; Heart failure.

INTRODUCTION

Heart failure, often called congestive heart failure, is the inability of the heart to pump adequate blood to meet the tissue's needs for oxygen and nutrients (Smeltzer, 2001). Heart failure is a disease with a long healing process. Despite improvements in treatment and prevention, chronic heart failure (HF) remains a serious health burden and carries a poor prognosis.

According to Groenewegen (2020) in the European Journal of Heart Failure, it is estimated that 64.3 million people live with heart failure worldwide. In developed countries, the known prevalence of heart failure is generally estimated at 1% to 2% of the general adult population. Heart disease claimed 9 million lives in 2019, up 2 million since 2000. This represents 16 percent of the total deaths from all causes of disease. More than half of the additional 2 million deaths occurred in the Western Pacific region. Meanwhile, the European region experienced a 15 percent decrease in deaths. The average life expectancy of people in the world reached more than 73 years in 2019, this figure is up from life expectancy in 2000 which was almost 67 years.

Heart disease is not only an unresolved problem in the world but also in Indonesia. Riskesdas 2018 data shows that the prevalence of heart disease based on doctor's diagnosis in Indonesia is 1.5%, with the highest prevalence rating in North Kalimantan Province at 2.2%, then DIY at 2%, and Gorontalo at 2%. The PTM Ministry of Health of the Republic of Indonesia (2019) in commemoration of World Heart Day (HJS) 2019: Healthy Hearts, Superior HR, stated that people with Heart Disease when viewed from the side of work gave the highest results in government officials, namely PNS/TNI/Polri/ BUMN/BUMD with a prevalence of 2.7%. Based on the 2013 Basic Health Research Data, the Research and Development Agency of the Indonesian

Ministry of Health and the Target Population Data, the Indonesian Ministry of Health's Center for Data and Information. Based on the doctor's diagnosis, the highest estimated number of patients with heart failure was in East Java Province as many as 54,826 people (0.19%), while North Maluku Province had the least number of sufferers, as many as 144 people (0.02%).

Heart failure is a disease with the highest mortality and requires a long treatment process and frequent in and out of the hospital will have an impact on the patient's life for the disease he is experiencing. The impact experienced is a psychological reaction to the impact of heart failure faced by patients (Zaviera, 2007). In knowing the illness he is suffering from is serious, a person will think about his illness, the method of treatment that will be taken, the costs spent, the prognosis of the disease, and the length of recovery from the disease. Although pharmacological and medical management have improved rapidly, the mortality rate from heart failure remains high, reaching 50% within 5 years of diagnosis (Yancy et al., 2013). In addition, heart failure is the disease that most often requires hospitalization (Roger, 2013; Siswanto et al., 2010; Yancy et al., 2013) with a heart failure rehospitalization rate in Indonesia of 29% (Siswanto et al., 2010). The high number of hospitalizations has an impact on the high health expenditures for patients with heart failure.

One of the efforts to overcome the above problems is self-management efforts. Self-management action in heart failure patients is to perform treatment independently. Several studies have shown that treatment outcomes in heart failure patients are better in patients who engage in consistent self-care. Fernandes et.al (2008) developed a self-management program for heart disease and demonstrated success in the application of a program based on changing independent resources by providing skills training to modify health risk factors such as smoking, physical activity, lifestyle, and food intake. Previous studies have revealed beneficial effects of self-management interventions on heart failure knowledge, quality of life, and heart failure-related outcomes.

From the explanation above, it can be concluded that heart failure patients feel a significant impact of their disease on physical, emotional, and overall aspects. Excessive thoughts and deep anxiety can also reduce life expectancy in heart failure patients and certainly increase the prevalence of heart disease deaths. Long-term symptoms that arise in patients with heart failure will affect the patient's functional status and ability to properly self-care.

Literature studies conducted by researchers show that there is still little research on self-care in heart failure patients in Indonesia so that researchers are interested in researching this. This study aims to analyze the effectiveness of self-management in reducing the prevalence of death from heart failure in Indonesia and improving the quality of life of patients with heart failure.

METHODS

Design of this research is literature review using the compare technique is to summarize and criticize the similarities of articles and presented in new articles, with data sources: search for research journals that have been carried out and published in national and international online journals published in Indonesian and English from 2016 -2020 using the Google Scholar database with keywords: Effectiveness, Self Management, Heart failure. Research journals found according to keywords are then filtered through the inclusion and exclusion that have been set. Reviewing the abstract whether it is in accordance with the chosen theme, then reading the full text journal and reviewing it. To further clarify the analysis of the abstract and the full text of the journal, read and observe. The method of data analysis is the summary of the research journal data entered into the table and then analyzed the contents contained in the research objectives and research results.

RESULTS

Based on the search results using the Google Scholar database with the keywords effectiveness, self management, heart failure, researchers found 1790 journal titles that matched these keywords. The articles found according to these keywords do not all have a theme or purpose that is in accordance with the research and there are duplicate articles. The researcher then conducted a search using the Google Scholar database by looking for keywords in the title (in the title) that matched the same keywords and obtained a total of 586 journals. Research articles that have the same theme or research content are then selected based on criteria that are in accordance with the research objectives. Research journals that were not selected, had similarities and did not meet the inclusion criteria, were then issued as many as 1204.

A total of 586 journals obtained were filtered using inclusion and exclusion obtained as many as 211 journals. The research journals were then selected by looking at the abstracts that matched the research theme and then selected based on the most appropriate criteria and in accordance with the research objectives, there were 101 journals. Then the journals obtained were filtered to see whether the article had full text or not, then 53 articles were excluded because full text articles were not available so that 48 full text articles were obtained. The feasibility assessment was carried out on 48 full-text articles. Research articles that have the same theme or research content are then selected based on the criteria and according to the research objectives. Research

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journals that were not selected have similarities, and do not meet the inclusion criteria, then 43 articles were issued, so that 5 fulltext articles were reviewed.

Based on the journal review as described in table 3.2. then the researcher grouped the data as follows:
Study Design

Table Research Designs from Review Journals			
No	Study design	Total	Percentage
6.	<i>Cross sectional</i>	2	40%
7.	<i>A descriptive comparative study</i>	1	20%
8.	<i>Randomized controlled trial</i>	1	20%
9.	<i>Quasi experimental design</i>	1	20%
Total		5	100%

Factors that contribute to the literature review of the effectiveness of the implementation of self-management on heart failure patients as a whole, each study discusses the effectiveness of self-management in patients with heart failure. The types of research into 5 journals are 2 journals (40%), 1 journal (20%), 1 journal (20%) and 1 journal (20%). The research sample used in the study that was reviewed was heart failure patients with the implementation of self management (100%), with a total of 396 respondents.

Based on a literature review of 5 literatures, it is known that before being given a self-management treatment method, heart failure patients require a long treatment process and are often in and out of the hospital. This will have a negative impact on the patient's life for the disease he is experiencing. In addition, heart failure is a disease that most often requires re-hospitalization. 2013; Siswanto et al., 2010; Yancy et al., 2013) with a heart failure rehospitalization rate in Indonesia of 29% (Siswanto et al., 2010). The high number of hospitalizations has an impact on the high health expenditures for patients with heart failure.

Efforts to reduce the prevalence of complications in heart failure by conducting self-management methods in the care of patients with heart failure. Some literature states that the implementation of self-management can have a positive impact on heart failure patients.

Heart failure is a condition where the heart as a pump is not able to meet the needs of blood for the body's metabolism, the heart's activity fails to meet the needs of the body, the pump function of the heart as a whole does not run normally. Heart failure is a complex collection of symptoms in which a patient must have the following appearance: Symptoms of heart failure (typical shortness of breath at rest or during activities with / without fatigue); signs of fluid retention (pulmonary congestion or ankle edema); there is objective evidence of structural or functional disturbances of the heart at rest (Indonesian Cardiovascular Specialist Association, 2015). In the past, heart failure was thought to be the result of reduced contractility and myocardial disease (pumping power) so that inotropes were needed to increase it and diuretics and vasodilators to reduce the load. The new paradigm related to heart failure refers to the Neurohumoral Model where Heart Failure is considered a progressive remodeling process due to the burden or disease on the myocardium so that prevention of progression with neurohumoral blockers such as ACE-inhibitors, Angiotensin Receptor-Blockers or beta-blockers is preferred in addition to drugs. Conventional diuretics (diuretics and digitalis) are supplemented by more recent therapies such as biventricular pacing, recycronizing cardiac therapy (RCT), intra cardiac defibrillator (ICD), left ventricular reconstruction surgery (LV reconstruction surgery) and myoplasty.

The strength of the heart to respond to stress is not sufficient to meet the body's metabolic needs. The heart will fail to do its job as a pumping organ, resulting in what is called heart failure. According to Bahrudin (2016) in the Book of Medical Surgical Nursing 1, the clinical manifestations that occur in left heart failure are: Dyspnea/difficulty breathing, Cough, Easily tired, and Anxiety and anxiety. Moderate symptoms in right heart failure include: Edema of the lower extremities resulting in weight gain, Hepatomegaly and tenderness in the right upper quadrant of the abdomen due to enlarged veins in the liver, and Anorexia and nausea this occurs due to enlarged veins and venous stasis in the abdominal cavity. . Heart failure is one of the diseases with the highest mortality and requires a long treatment process and is often in and out of the hospital, which will have an impact on the patient's life for the disease he is experiencing. The impact experienced is a psychological reaction to the impact of heart failure faced by patients (Zaviera, 2007).

Self-management is a process in which the client directs his own behavior change with a therapeutic strategy or some combination of strategies (Cormier & Cormier, 1985:519). The ability to control yourself in your thoughts and actions for your better future. The process of achieving independence Self-management is

the patient's individual capacity to deal with his health problems, the symptoms and the physical and psychosocial consequences of his health problems, and to make lifestyle changes inherent to the health problems (Barlow 2002). Self-management programs provide opportunities to improve the quality of life for people with heart failure. These programs encourage individuals to take responsibility for their health by monitoring their condition, educating themselves about their particular condition, knowing what management and treatment is available to them, and partnering with their doctor in assessing the progress of their disease. The aspects of self-management discussed from the five journals are as follows: Patient Education in Self-management, Self-Efficacy in Self-management, Symptom Control, and Self-care in Self-management.

The word effective comes from English, namely effective which means successful or something that is done successfully. Popular scientific dictionaries define effectiveness as the appropriateness of use, use or support for a purpose. Based on the opinion above, effectiveness can be interpreted as a communication that goes through a certain process, in a measurable way, namely the achievement of predetermined goals or objectives. With a budgeted cost, a set time and a predetermined number of people. If these provisions run smoothly, then the planned goals will be achieved as desired.

Assessment of the effectiveness of the implementation of self-management for heart failure patients is based on indicators, namely an increase in the quality of life of heart failure patients with the implementation of self-management. If after the self-management intervention there is an increase in the patient's skills in implementing self-management and producing good things for improving the quality of life, then self-management care in improving the quality of life of heart failure patients is said to be effective.

The results of self-management research on the quality of life of heart failure patients, based on a literature review of 5 journals sourced from Google Scholar and have been identified, show that the quality of life of heart failure patients is related to the implementation of self-management. In the self-management treatment method, there is an increase in the quality of life of heart failure patients. The highest quality of life improvement was 28.67, and the lowest was 0.03. The method of self-management treatment is to achieve the ability to adapt independently to the daily routine and to get the best quality of life. To achieve this goal, patients with heart failure need to acquire special self-management skills, in addition to receiving medical therapy.

Researchers assume that the application of good self-management has a major effect on a person's quality of life. This study is in line with research by Galson (2009) which states that community-based self-management programs provide opportunities to improve the quality of life of stroke survivors. Supported by the theory of Riegel et al (2014), that Self Care Management means without active supervision, direction or personal assistance. A CHF patient who refuses to perform a function is considered a non-functioning person, even though he or she is considered capable. Self Care Management is the ability to perform functions related to activities of daily living, namely the ability to live independently in society without or little help from others.

It can be concluded that the implementation of self management is related to improving the quality of life of heart failure patients as indicated by the highest quality of life improvement as much as 28.67, and the lowest as much as 0.03. The application of good self-management has a big influence on the quality of a person's life. This method can achieve the ability to adapt independently to the daily routine. Therefore, it is hoped that the self-management treatment method is not only about educating the patient but also demonstrating the self-management treatment method. Heart failure patients need to acquire special self-management skills, in addition to receiving medical therapy. Pay attention to the development of abilities and make sure that the patient can apply them.

The results of the study on the effectiveness of self-management on the quality of life of heart failure patients, based on a literature review of 5 journals sourced from Google Scholar and identified, found that self-management is effective in improving the quality of life of heart failure patients. It is shown in accordance with the results that as many as 2 articles (40%) have a p value = 0.000 ($p < 0.05$) which indicates a very effective influence, as many as 2 journals (40%) have a p value = 0.001 $< (0.05)$ which indicates that there is an effective effect as much as 1 journal (20%) has a p value = 0.017 $< (0.05)$ which indicates an ineffective effect. A diagnosis of heart failure usually means complex long-term therapy and lifestyle adjustments for the patient and family. The self-management treatment method has the benefit of being effective in reducing the possibility of recurrence in heart failure patients. This is because the application of self-management can help individuals manage themselves and changes in individuals can last a long time.

This study is in line with Prihatiningsih and Sudyasih (2018), self-care in heart failure patients can reduce rehospitalization rates and improve quality of life. Patients who have good self-management can have the motivation to handle the disease, by knowing the knowledge of the disease by preventing the emergence of symptoms of the disease and how to handle the patient by managing the symptoms that appear.

From the results above, it can be concluded that self-management is effective in improving the quality of life of heart failure patients. The implementation of effective self-management in improving the quality of life in heart failure patients is shown by the results of 40% very effective journals, 40% effective journals and 20% ineffective journals. The application of self-management can help individuals manage themselves,

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changes in individuals can last a long time and reduce the possibility of recurrence of heart failure patients. Therefore, it is hoped that the future self-management treatment method will always be applied. Make it more interesting to increase the interest of heart failure patients in implementing self-management for their daily lives.

DISCUSSION

Based on the conclusions we have obtained, several suggestions can be recommended, as follows: it is hoped that the self-management treatment method is not only about educating patients but also demonstrating self-management treatment methods. Heart failure patients need to acquire special self-management skills, in addition to receiving medical therapy. Pay attention to the development of abilities and make sure that the patient can apply them. It is hoped that the self-management treatment method will always be applied in the future. Make it more interesting to increase the interest of heart failure patients in implementing self-management for their daily lives.

CONCLUSION

Based on the results of research and discussion, it can be said that literature research from 5 literatures is known that the application of self management is related to improving the quality of life of heart failure patients as indicated by an increase in the highest quality of life by 28.67, and the lowest by 0.03. Self management is effective in improving the quality of life of heart failure patients as shown by the results of 2 journals (40%) stating a very effective effect, as many as 2 journals (40%) stating there was an effective effect.

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Kualitas Hidup Pasien Gagal Jantung Kongestif Di Rsud Dr. Moewardi', Keperawatan Stikes Kusuma Husada Surakarta.

SELF-EFFICACY IN SELF-CARE OF TYPE 2 DIABETES MELLITUS CLIENTS AT KEMANGI VILLAGE BUNGAH DISTRICT GRESIK REGENCY

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ABSTRACT

Self-efficacy in performing self-care is important for Type 2 Diabetes Mellitus clients. Low self-efficacy on self-care makes clients feel afraid and worried about their illness. The study is intended to identify the self-efficacy to perform self-care of type 2 diabetes mellitus clients at Desa Kemangi Kecamatan Bungah Kabupaten Gresik. The descriptive design applies in this research. The population includes 54 patients with type 2 Diabetes mellitus. The purposive sampling matching the criteria selects 32 patients as the sample of the study. The variable is self-efficacy in self-care. The research instrument uses the Diabetes Mellitus Self Efficacy Scale (DMSES) questionnaire. The analysis shows that 26 (81.25%) clients have high self-efficacy to conduct self-care to their illness. The conclusion that high self-efficacy of self-caring their illness is very high. It is advised that clients need to collaborate with peers to share experiences about caring the diabetes mellitus.

Key Words:Type 2 Diabetes Mellitus, Self-Efficacy, Self-Care

INTRODUCTION

The self-efficacy of clients with diabetes mellitus relates to their belief in their ability to achieve a better quality of life (Aziman & Marleni, 2020). A study by Aziman and Marleni found that there were 42 (44.2%) clients with type 2 diabetes mellitus who have low self-efficacy problems (44.2% or as many as 42 people). Thirty clients among them also experienced complications of diabetes mellitus (Aziman & Marleni, 2020). The complaints include being unable to follow the diet and taking medication as recommended by the doctor when outside the home, and being unable to do physical activity. The physical makes getting tired and sometimes discouraged them to exercise (Anindhita, Diani, & Hafifah, 2019).

The Indonesian Health Basic Research 2018 reported that the prevalence of Diabetes Mellitus based among the population aged > 15 years in East Java Province increased to 2.6% of the entire population of East Java. Data from the Health Service of Bungah District, Gresik Regency in 2013, there were 9397 people affected by Diabetes Mellitus, dominated by females (5807) and males (3590) (Riskedas, 2018). The factors that influence self-efficacy in diabetes mellitus self-care are age, education level, social and economic status, marital status, gender, length of experience with diabetes mellitus, family support, depression, motivation (Nadzirah, 2016).

Another study also found that there were several psychological impacts that appeared due to low self-efficacy in patients with diabetes mellitus. The patients complained of anxiety about the disease, dependence on self-care, and being afraid of their disease (Ngurah & Sukmayanti, 2014). When a diabetes mellitus client is unable to care for themselves, the higher is the risk for complications (Kiratnawati, 2012).

The efficacy in the self-care management of diabetes mellitus patients can be improved through sufficient family support and group support. A nurse also has a significant contribution to improve efficacy in self-care among DM clients by acting as a health educator. Health education may increase the knowledge about DM which is, in turn, increase their efficacy in managing their disease in the long and short term (Pratiwi, 2018). This study, therefore, aims to identify the self efficacy of Type 2 DM in Self-Care management to their illness. This is important because failure to self-care of DM frequently associated with the poor self-efficacy of the client.

METHODS

This research uses a descriptive approach. The populations are 54 clients of type 2 diabetes mellitus in Kemangi Village, Bungah District, Gresik Regency. Based on the criteria of participation, the purposive sampling method is used to choose 32 diabetes mellitus clients as the participants of the study. The criteria are suffering from diabetes mellitus ≥ 6 months, residents of the village Basil, Bungah District, who are willing to be involved in this research. The data collection tool used is a DMSES (Diabetes Mellitus Self Efficacy Scale) questionnaire. After the data is collected, data processing is carried out. The data collected are recorded and grouped according to the research objectives. This research uses descriptive analysis in the form of tables and narratives. Various procedures related to research ethics, including informed consent, anonymity, confidentially are adequately performed.

RESULTS

Table 4.1 Distribution of the duration of suffering from Diabetes Mellitus Type 2 clients with type 2 diabetes mellitus in Kemangi Village, Bungah District, Gresik Regency March 2021 in Kemangi Village, Bungah District, Gresik Regency March 2021

The duration of suffering from Diabetes Mellitus Type 2	Frequency	Percentage (%)
6 Month – 1 year	4	13
1 – 5 year	16	50
6 – 10 year	10	31
>10 year	2	6
Total	32	100

Table 4.1 shows that half of clients with type 2 Diabetes Mellitus in the Kemangi Village, Bungah District, Gresik Regency, 8 patients (50%) have suffered from type 2 diabetes mellitus for 1-5 years.

Table 4.2 Distribution of the frequency of self-efficacy in self-care clients with type 2 diabetes mellitus in Kemangi Village, Bungah District, Gresik Regency March 2021

Category	Frequency	Percentage (%)
Very High	26	81.25
High	2	6.25
Medium	4	12.5
Total	32	100

Table 4.2 shows that the majority, 26 (81.25%), of Type 2 DM clients have very high self-efficacy on self-care of Type 2 DM.

DISCUSSION

The results showed that 26 (81.25%) clients of type 2 diabetes mellitus had very high self-efficacy in carrying out self-care diabetes mellitus. The self-care management of Type 2 DM includes checking blood glucose, diet management for ideal body weight, physical exercise or sports, following treatment programs, foot care (Kadar, Sillonga, & Sjattar, 2019). This study also found that the clients with Type 2 DM have suffered more than 1 year. The length of suffering from the illness makes the clients are more aware and practice self-care. This is an important factor as the longer they suffered from the illness, the more they understand how to manage self-care. More knowledge for the practice may improve self-efficacy to perform self-care. Meanwhile, clients who have suffered from diabetes mellitus since 2020 less than 1 year have moderate self-efficacy in self-care of moderate diabetes mellitus, namely 4 people (13%). The duration of suffering from DM is also related to the client's behavior in self-care of diabetes mellitus. Clients who have been diagnosed with DM for a long time will learn from their experiences so that they can carry out self-care properly.

The experience referred to in this case can be sourced from the client's own experience of success or the experience of others who are similar to the conditions experienced by the client. Patients who have long

suffered from diabetes mellitus can have a high quality of life and self-efficacy as well as a good way of self-care because they can learn their behavior and how to care for their health from the experience, they have gone through during the disease so that the client can understand well the things that must be done. carried out regarding self-care of diabetes mellitus in daily life and carrying out these self-care activities consistently and responsibly (Pramana, Susanti, & Sukarni, 2019). Almost half of the clients use the experiences of others who are similar to their condition in carrying out treatment for the disease they are experiencing (Herlina & Sitorus, 2016).

Clients who have been diagnosed with DM for a long time will learn from their experiences so that they can carry out self-care properly. Experience is one of the factors that can affect an individual practice because the longer the client has diabetes mellitus, the more experience he has in managing his disease. Knowledge of the disease will also increase indirectly as the client's experience in managing the disease increases, so the more experience a person has, the higher his knowledge will be (Pramana, Susanti, & Sukarni, 2019).

In addition to emphasizing the 5 parameters in self-care, it should be considered about increasing the experience of clients and those around them in managing type 2 diabetes mellitus. So, in this case it is necessary to form a peer group for diabetes mellitus clients as a forum for sharing their experiences about diabetes mellitus. So, they can share information and provide motivation to each other to increase self-efficacy in self-care of type 2 diabetes mellitus clients.

CONCLUSION

The study concludes that most of the clients suffering from Type 2 DM have high self-efficacy in performing self-care to their illness. It re-emphasizes that the clients need to be actively involved in the caring process. By doing so, the independence of clients to manage their own health care will improve their self-confidence (or efficacy) to attain the best result of their medication. It is recommended that clients need to improve their awareness about self-efficacy in health care. Health staff are required to provide health education for the Type 2 DM clients about the treatment, including the benefits of self-care and self-efficacy.

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Case Study Of Peer Support To Obese Students At Diploma 3 Sutopo Nursing Program

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ABSTRACT

Obesity bears psychological and social consequences for adolescences, such as an increase in depression of being denied or isolated by their peers. Poor peer support makes obese people feel lonely and anti-social behavior. The study aims to map the peer support obtained by obese students at Diploma III Keperawatan Sutopo Surabaya. It is a descriptive study. The population is 116 students and were all appointed as the research participants (total sampling). The research variable is peer support. The data were collected using a questionnaire, analyzed, and presented in distribution tables. The study reveals that 102 (88%) students provide poor support to their obese colleagues. The study concludes that obese students obtained poor support from their peers. The study recommends that students need to support their obese friends by informing them with information and supports how to overcome obesity.

KeyWords : Peer support, Obesity, Students

INTRODUCTION

Worldwide, the epidemic of overweight and obese adolescents is increasing over the last 2 decades. By 2025, it is estimated that obesity will become the number 1 health problem in the world (Yusuf A., 2018). Obesity brings psychological and social consequences to adolescents, an increased risk of depression because they are more often rejected by their peers and ostracized and teased because of their weight (Wulandari, Lestari & Fachlevy, 2016).

Social support has an influence on eating disorders and adolescent physical activity that causes obesity and overweight (Yusuf A., 2018). Yusuf in his study found that peer social support consisting of emotional, informational, instrumental, and assessment support was mostly low (Yusuf, 2018). Low social support can increase the potential for depressive symptoms in obese adolescents (Sari & Suryaputri, 2019). Intensive studies have been conducted to seek the relationship between social support and physical health, morbidity, mortality, and quality of life (Sari & Suryaputri, 2019). Someone who loses weight depends on support from family and friends as the main source of support (Yusuf A., 2018).

The results of the 2013 Basic Health Research (Riskesdas) for adolescents aged 13-15 years in Indonesia found that the prevalence of obesity is 10.8%, consisting of 8.3% obese and 2.5% severely obese (RISKESDAS, 2013). The results of this research show that the prevalence of obesity is alarming. The number of obesity and overweight in the population over the age of 18 years is 13.6% with the population overweight and 21.8% with obesity (RISKESDAS, 2018). Obesity examination shows that 1,163,118 (16%) of population are obese (RISKESDAS, 2018). The East Java Province reported that 1,163,036 (15.51%) experienced obesity (East Java Provincial Health Office, 2018). The contributing factor of being obese and obesity is genetic or endocrine diseases (10%). Environmental, psychological, and social factors have increased their influence on the high prevalence of obesity and overweight in recent years (Yusuf A., 2018).

Obesity may risk the quality of life of society in the future. The nutritional status and knowledge also contribute to the incidence of obesity (Hendra, Manampiring & Budiarmo, 2016). Obesity may relate to various chronic degenerative diseases such as hypertension, coronary heart disease, stroke, cancer, type 2 diabetes, and bone disorders (Masrul, 2018). In obese adolescents, psychosocial problems may occur. An obese teenager may

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experience bullying such as being ridiculed, ostracism, or physical violence such as being pushed, beaten, and kicked (Utami, Probosari, & Panunggal, 2018).

The existence of social support for healthy eating and physical activity is an element of the social environment that plays an important role in weight loss and weight management. Support from friends and family is the main source of someone who will lose weight (Yusuf, 2018). A provision of support or assistance from peers makes teenagers feel loved and appreciated by the surrounding environment (Sari & Indrawati, 2016). Peers are an important source of emotional support throughout the adolescent transition. The intensity and time spent with friends are greater in adolescence than at any other time in the life span. Peers are an important aspect in adolescent development (Oktariani, 2018).

METHODS

The research design used is descriptive research. Descriptive research is also often called non-experimental because this research does not control and manipulate research variables (Hermawan, 2019). The populations are 116 Year II and III students of the DIII Nursing Study Program, Sutopo Surabaya. They have friends with obesity. All populations are taken as the sample using a total sampling mechanism. The variable in this study is peer support for obese students.

Data were collected using questionnaires. The data were analysed descriptively and presented in tables and narration is provided. This research adequately concerned the research ethic, including anonymity, confidentiality, and informed consent were provided for the respondents.

RESULTS

Table 1 Peer Support in Students with Obesity in Nursing DIII Study Program Sutopo Surabaya in February 2021

Category	Frequency	Percentage (%)
High	14	12
Low	102	88
Total	116	100

The table 1 implicitly described that the majority, 102 (88%) of the students do not provide peer support for their friend with obesity

DISCUSSION

The results of the study described in table 1.1 showed that very little peer support was given to students with obesity in the high category as many as 14 students (12%). This is because the support received is meaningful and useful in the current situation. The support provided is by reminding each other to do physical activity every day on a regular basis and planning to exercise together. Peer support is needed in adolescence. In this age group, they will face various kinds of problems that they cannot solve on their own without the support of their closest people, in this case their peers. This is supported by research conducted (Oktariani, 2018) showing the effect of peer support on increasing in preventing sedentary behavior that can cause obesity in adolescents. Individuals with high social support will have more positive thoughts about some difficult situations that are being experienced. High peer support can prevent the occurrence of obesity in adolescents. According to Johnson in Rianti (Wahyuni, 2016), peer support is support that comes from peers, namely by providing information related to what teenagers should do in socializing with the environment, providing reciprocal relationships for something teenagers do in groups.

Table 1.1 shows that almost all students who provide peer support to obese students are low as many as 102 students (88%). This is due to the lack of concern for non-obese students for obese students. The low level of support cannot give a positive meaning to individuals with obesity and they are unable to overcome the difficulties experienced both in terms of friendship and the surrounding environment. Students with obesity conditions can make them feel unappreciated in certain ways. Feelings that are not appreciated for a long time can interfere with mental health which can make individuals afraid to express what is happening to them. There is one factor that can affect the lack of peer support, namely the type of support (Lutfi, 2012) the type of support received will have meaning if the support is useful and in accordance with the existing situation. The possibility of providing the type of support that is given is not accepted and therefore causes a lack of peer

support. This treatment also causes people to feel insecure because they are judged too low by their surroundings (Umami, 2019). This is supported by research (Yusuf A. , 2018) who conducted research on social support for overweight and obesity adolescents in public and private high schools as well as public and private vocational schools in the city of Banjarbaru which stated that there was no influence of peer social support for The condition of weight, food consumption, and physical activity of adolescents with overweight and obesity who are in the low or less category should have an important role when they are in high school. Low social support is associated with an increase in depression and eating disorders in adolescents. (Yusuf A. , 2018). Therefore, as a friend who has an obese friend, we should provide a form of support by providing information about how to have a normal weight and giving encouragement to achieve a normal weight so that it can give positive meaning to individuals with obesity so that individuals with obesity are more feel valued and their existence can be accepted in the surrounding environment. There are several limitations experienced and can be a number of factors so that future researchers pay more attention, namely in the process of collecting data, the information provided by respondents through questionnaires sometimes does not show the actual opinion of respondents, this happens because of differences in thoughts and understanding of each respondent. also other factors such as honesty in filling out respondents' opinions and the number of respondents, which only 116 students, of course, is still not enough to describe the real situation.

CONCLUSION

The results of the study of peer support on obese students in the DIII Nursing Study Program Sutopo Surabaya can be concluded that almost all of them are low. Low peer support can affect the incidence of obesity in adolescents, because the group will face various kinds of problems that they cannot solve on their own without the support of their closest people, in this case their peers.

It is hoped that students can increase support for peers who have obesity by providing information about how to have a normal weight and encouraging them to achieve a normal weight.

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The Implication of Late Sleeping towards the Brain Fatigue among the Final Year Students

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ABSTRACT

Late sleeping may reduce physiological and psychological health, including brain fatigue. The aim of this study is identify the impacts of late sleeping towards the brain fatigue among Year 3 students of Sutopo Nursing Program. The study adopts descriptive design. The population comprises all Year 3 semester 6 students at the school. The population 30 students who sleep late and all of them were appointes as the samples of the study (total sampling). The variables are late sleeping and brain tiredness. The data were collected using questionnaire and analyzed descriptively. The study results show that all students who sleep late suffer from brain fatigue at different levels. There are 29 (96,7%) students experienced moderate brain tiredness due to spending much time awake at night, and only 1 (3,3%) who experienced serve brain fatigue. It is concluded that night late sleeping triggers brain fatigueness. The study recommends students to spend adequate duration of sleeping at night to avoid brain tiredness.

Keywords: Brain Fatigue, late sleeping, students

INTRODUCTION

Sleeping late at night is mostly experienced by many people, including students and workers. Students are known of having a heavy study load due to academic tasks, such as preparing their lessons, assignments, and projects. The study load makes students spend longer time at night to complete their tasks. The students of the Nursing Program at Sutopo are not only fulfilled their academic tasks but also engage in extracurricular activities such as student association. Students tend to complete their tasks at night. Consequently, they spend a long time staying awake, which reduces their sleeping quality which is in turn negatively impacted their health and wellbeing.

Individual needs physical rest as well as human's brain. Heavy workload reduces the capacity and function of the brain leading to anxiety and depression (Makarim, 2019). Brain fatigue occurs when individual works for a long duration without a substantial break. Brain

fatigue occurs when individual works or do their activities without sufficient break. The brain is the center of all activities and it conducts all parts of the body to function properly. When the brain is in a problem, therefore, the ability of the brain to control all functions is weakening.

In a survey of 1,508 respondents in America, most of the people age between 19-29 years old (51%) claim that they stay awake until late. The National Sleep Foundation found that 36% of people between 10 and 29 years old argued that 40% of them found it difficult to wake up in the morning and felt sleepy in class. The survey also implies that individual spending 6.5 to 7.5 hours for night sleep is live longer than those spend less time (Sulistiyani, 2012).

There are some reasons to stay awake until midnight, including completing their assignments or final project, watching movies, palying gadgets, games, clubbing. Excessive practice of these behavior may lead to sleeping disorder, including insomnia (Sulistiyani, 2012). Night sleeping less that 7-8 hours may reduce the brain function. It may also create stress which is in turn impacts the brain performance. Poor sleeping also causes reduction of cognitive performance and poor concentration (Sulistiyani, 2012). Afifah describes that poor sleeping may impact emotional condition, cognitive ability, decrease of thinking ability and memory, lost productivity, headache, forgetful, depression leading alzhemier (Afifah, 2020). Afrilia explains that poor sleeping may reduce the brain function (Afrillia, 2017). The failure of brain to function optimally due to poor sleeping risk individual to suffer from *brain fog*.

Brain Fog is a condition where individual unable to concentrate, unable to focus, easily distracted, and thingking process disorder. *Brain fog* is a symptom influences thinking performance, confuse, and difficult to speak. *Brain fog* is the condition of headache, difficult to think, distracted mind, difficulties to understand and remember something (Afrillia, 2017). Brain fog may disturb cognitive function, poor concentration, difficult to think, and failure to focus for something (Pranandhita, 2020).

Brain is a sensitive organ and need sufficien supply of oxygen (KA, 2017). The poor supply of oxygen to brain may cause dizziness and decrease of memory. Poor quality and duration of sleeping is a causality of poor transmission oxygen to brain leading to brain fatigue or brain fog. Staying awake until midnight contributes to poor supply of oxygen to brain. This study aims to identify the implication of late sleeping at night to the incidence of

brain fatigue among the final year students at Sutopo Nursing Program. This study is important to mitigate the potential harms of sleeping late for the students who are struggling to complete their research project.

METHODS

The study adopts a descriptive design. The populations of the study are 30 students on sixth semester (or the final year) students. These students are struggling to finalize their research project forcing them to work at late night. Late sleeping refers condition when individual still awake until morning time (after 12 am onward). All of the population were taken as the samples of the study. The data were collected using questionnaires and the Subjective Self Rating Test (SSRT) and Chalder Fatigue Scale issued by the International Fatigue Research Conference (IFRC) is used to assess the brain fatigue level. The data were descriptively analyzed and presented in table frequencies accompanied by narration. The study comply the ethical good practice in research where all the rights of respondents are maintained. They were provided with informed consent, appear anonymity in all forms of publication, and confidentiality of the respindents are quaranted.

RESULTS

Table 1. The Sex of the Students

Sex	Frequency	%
Male	5	16,7
Female	25	83,3
Total	30	100

Table 2. The Age of the Students

Age	Frequency	%
20 Years	15	50
21 Years	14	46,7
22 Years	1	3,3
Total	30	100

Table 3. The Impacts of Late Sleeping to the Incidence of Brain Fatigue

Category	Frequency	%
Severe	1	3,33
Moderate	29	96,67
Mild	0	0
Total	30	100

DISCUSSION

The data analysis reveals that the majority of the students who go to bed late at night suffered from moderate brain fatigue. It also shows that one student experience a serious brain fog. This study claims the adverse implication of poor sleeping to the health of their brain. One of the main causalities of brain fog is lack of sleeping. Lack of sleeping leaves individual's brain keeping working and unable to rest. Consequently, brain experience tiredness, unwell, and function improperly leading to fatigueness. According to Sarfriyanda et. al., (2016) students are vulnerable to poor sleeping quality. They found that 47% of the students at Nursing Faculty of the University of Riau have poor sleeping quality as they still awake until the midnight. The poor sleeping quality may impacts to the cognitive performance of an individual. The brain works heavily when individual have iniadequate sleeping time (Rafknowledge, 2004). According to Prasadja (2009), poor sleeping quality results on the decrease of an individual mental capability.

Brain fatigue is a serious and harmful for individual health and wellbeing. It may reduce the fully function of brain which in turn decrease the overall performance of individual either psychological and physics. A study by Lohitashwa (2015) reported that poor sleeping quality causes disturances on physiological and psychological health. Lack of sleeping leading to brain fog makes students easily get tired, poor concentration, stress, anxiety, and anxiety. Brain fog also influence the academic achievement of students. A study in Pakistan showed that poor sleep quality among medical students have negatively impact their academic achievement (Maheswhari & Shaukat, 2019).

Beside the study load, late sleeping among students are also triggered by the living perception among the young people of being strong physic. Young age is the time where physical fitness is maximum and young people think that they are strong, fresh, and healthy. They ignore the potential risks of health problems and fell fine with their health (Harismi, 2021). Therefore, they continuous engage in internet to accomplish their research project until in the morning. Nowadays, academic demands forces students to surf in internet for hours (Sulistiyani, 2012). Consequently, they spend much time in front of the computer screen without realizing that they need rest for their body system to recovery. Unawareness of the risks of late sleeping is not cause brain fatigue but also seriously risk the health, wellbeing and academic permance of students.

CONCLUSION

It is evident that poor sleeping risks individual to brain fatigue or brain fog. The final year student are vulnerable to lack of sleeping time due to over study load, including the completion of research project. This study found that most of the students who use a proportion of regular sleeping time for completing their project experience brain distraction, especially brain fatigue. Brain fatigue potentially harms the health and wellbeing of the students with heavy studyload. Consequently, brain fatigue may risk the academic performance of the students. It is suggested that students need to adjust the study time and have adequate duration of sleeping at night. Students need to achieve both academic performance and healthy live.

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EFFECTIVENESS OF PROLANIS ON REDUCING AND STABILITY OF BLOOD GLUCOSE LEVELS OF PATIENTS TYPE 2 DIABETES MELLITUS IN COMMUNITY HEALTH CENTER CARE SIKO TERNATE CITY

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Abstract

Chronic hyperglycemia in people with DM resulted in atherosclerosis and stroke and caused 1.5 million deaths in 2012. Promotive and preventive is one of the most effective efforts to reduce the incidence of type 2 DM disease. The Chronic Disease Management Program (Prolanis) is a promotive and preventive program for each first-rate facility in managing type 2 DM disease and Hypertension. The purpose of the research is to examine the effectiveness of Prolanis in lowering and stabilizing blood glucose levels of people with TYPE 2 DM in Siko Care Center ternate city. The design of the study with purposive sampling technique aims to accommodate all type 2 DM patients numbering 46 people. The data is analyzed with the *Paired Sample T-test*. The number of female study subjects was 34 (73.9%) while men were 12 (26.1%). The bivariate test obtained a value of $p = 0.000$. Decrease and stability of blood sugar can be achieved with a good program and portion of physical exercise, program, and the portion of physical exercise gradually, continuously, rhythmically, and as needed. Prolanis activities can reduce and maintain the stability of blood glucose levels Type 2 DM in Siko Care Center Ternate City.

Keywords: Type 2 DM and Prolanis

INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease of the endocrine system characterized by the presence of hyperglycemia caused by a lack of the hormone insulin due to the inability of the pancreas to produce insulin, the work of insulin is not maximal and or because of both (ADA, 2015).

Chronic hyperglycemia can result in failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels, leading to the risk of microvascular disorders of the retina, renal glomerulus, and peripheral nerves as well as macrovascular nodes such as atherosclerosis, coronary artery disease and stroke (ADA, 2014).

Type 2 DM is the most common cause in the community. Globally, an estimated 422 million adults lived with DM in 2014, compared with 108 million in 1980. The prevalence of DM in the world has nearly doubled since 1980, increasing from 4.7% to 8.5% in the adult population. This reflects an increase in related risk factors such as weight loss or obesity (Infodatin Kemenkes RI, 2018).

DM disease caused 1.5 million deaths in 2012. Higher than the maximum limit resulted in an additional 2.2 million deaths, increasing the risk of cardiovascular and other diseases. DM disease causes 43% of the 3.7 million deaths before the age of 70. Percentage of deaths caused

DM that occurs before the age of 70 years is higher in low- and middle-income countries than in high-income countries (WHO Global Report, 2016 in Infodatin Kemenkes RI 2018).

In Indonesia, the number of people with DM in 2000 was 8.4 million and is expected to increase by 21.3 million by 2030. This number places Indonesia ranked 4th highest number of DM sufferers in the world after India, China, and the Americas (WHO, 2016).

Based on data compiled by the Department of Disease Eradication and Environmental Health (P2PL) of the North Maluku Provincial Health Office, distribution of DM sufferers in Hospitals and Health Care Facilities in North Maluku Province in the period 2012 - 2015, the number of new cases of DM sufferers in 2012 amounted to 863 cases with deaths as many as 63 cases while in 2015 the number of new cases of DM sufferers increased to 1633 cases with deaths as many as 125 cases (Mustafa, 2016).

The increase in the incidence of Diabetes mellitus is due to genetic-related multifactor diseases, behavioral factors (Olokoba *et al*, 2012), and environmental factors (Sunita, 2015). According to data from the Indonesian Ministry of Health, the number of diabetes mellitus patients who are hospitalized and outpatient in hospitals ranks first of all endocrine diseases.

Promotive and preventive Pis is one of the efforts that make it possible to reduce the incidence of non-communicable diseases, especially type 2 DM.

The Chronic Disease Management Program (Prolanis) is a promotive and preventive program developed by BPJS Kesehatan in collaboration with First Level Health Facilities.

The goal is that participants with chronic diseases achieve optimal quality of life with indicators of 75% of registered participants who visit the Primer community Health Facility have "good" results on specific examination of Type 2 DM disease and Hypertension following the relevant Clinical Guidelines to prevent the onset of disease complications (Practical Guide Prolanis BPJS Health).

The implementation of Prolanis was launched by the government in 2014 for each first-rate facility in managing type 2 DM disease and Hypertension. Siko Care Health Center has implemented Prolanis, activities carried out to include medical consultation/ education activities, Home Visit, Reminder, club activities, and health status monitoring.

Regularly every Friday morning Prolanis participants at Siko Care Health Center gather and carry out activities including DM Gymnastics, monitoring health status, and diet-related education for participants. The hope of the implementation of Prolanis for people with type 2 DM conducted continuously has an impact on the reduction and stability of blood glucose levels, this is a consideration of researchers to research the Effectiveness of Prolanis Against The education and Stability of Blood Glucose Levels of People with Type 2 Diabetes Mellitus at the Siko Care Center of Ternate City.

SUBJECTS AND METHODS

This type of research is quantitative with a quasi-experimental design of Nonequivalent Control Group Design. The design approach in this study used a cross-sectional (Dahlan MS, 2013).

The research procedure has received a recommendation from the Health Research Ethics Commission of the Health Polytechnic of the Ministry of Health of Ternate with the number LB.02.04/2.3/170/2019. The subjects in this study found 46 people recruited from Prolanis participants at the Siko Health Center in Ternate City (Dahlan MS, 2013). In this study, observations were made on the activities of the participants of Prolanis Health Center Siko in Ternate City including medical/ educational consultations, Home Visits, Reminders, club activities, and health status. Furthermore, regularly every Friday morning, participants carry out DM exercise activities, monitoring health status and education related to diet. Activities carried out by research subjects were observed for 4 weeks and were examined 4 times for blood glucose levels. The results of the glucose examination were analyzed by using the Paired Sample T-Test.

RESULTS AND DISCUSSIONS

Based on the data of research results conducted at Siko Care Center in Ternate City, the following data was obtained:

1. Analyzes Univariate

Table 1. Frequency Distribution By Gender of Respondents in Siko Care Center Ternate City in 2019

Gender	N	%
One	12	26,1
Woman	34	73,9
Total	46	100

Source: Primary Data of 2019

Based on Table 1, the frequency distribution by gender shows that the majority of respondents are female, namely 34 respondents (73.9%) and 12 respondents (26.1%) are male.

2. Bivariate Analysis

a. Table 2. Analysis The difference on Examination 1 and 2

	Mean	N	Std. Deviation	Std. Error Mean
Examination 1	229,8	46	56,6	8,3
Examination 2	191,5	46	48,7	7,1
		N	Correlation	Sig.
Examination 1 & Examination 2		46	,770	,000

Based on the results of the analysis of differences in examination 1 and 2 in Table 2 shows that the average value in examination 1 is 229.8 and the average value in examination 2 is 191.5 with a correlation value of 0.770 with a significance of 0.000.

b. Table 3. Analysis The difference on Examination 1 and 3

	Mean	N	Std. Deviation	Std. Error Mean
Examination 1	229,8	46	56,6	8,3
Examination 3	180,8	46	45,1	6,6
		N	Correlation	Sig.
Examination 1 & Check 3		46	,788	,000

Based on Table 3, the results of the analysis of differences in examinations 1 and 3 show the average value in examination 1 is 229.8 and the average value in examination 3 is 180.8 with a correlation value of 0.788 with a significance of 0.000.

c. Table 3. Analysts The difference on Examination 1 and 4

	Mean	N	Std. Deviation	Std. Error Mean
Examination 1	229,8	46	56,6	8,3
Examination 4	171,3	46	43,3	6,3
		N	Correlation	Itself.
Examination 1 & Examination 4		46	,697	,000

Based on Table 4, the results of the analysis of differences in examinations 1 and 4 show that the average value in examination 1 is 229.8 and the average value in examination 4 is 171.3 with a correlation value of 0.697 with a significance of 0.000. Bivariate Test results in Tables 1-4, with Wilcoxon Signed Rank Test, obtained a p-value of 0.000. With the degree of meaning $\alpha \leq 0.05$ means $p < \alpha$ so it was decided that H_a was accepted and H_o was rejected or there was a Prolanis Effect on The Decrease in Sugar Levels In The Blood of Type 2 Diabetes Mellitus Patients in The Siko Treatment Of Ternate City which was done through the measurement of prolanis participants' blood glucose levels as much as 4 times.

Prolanis is a program that is needed by people with DM, this is because DM is one of the chronic diseases with lifelong treatment. Sufferers of chronic it is generally often non-compliant in the management of the disease independently (Harmilan, Supodo, and Heriyanto, 2019).

The results of bivariate tests between examinations one against examinations two, three and four, obtained a value of *p-value* 0.000 which shows the influence of prolanis in lowering and maintaining the stability of blood glucose levels. This is in line with research conducted by Harmilan, Supodo & Heriyanto (2019) on the Effect of Prolanis Gymnastics on Elderly Blood Sugar Levels in Latoma Village of Unaaha District of Konawe Regency which found that Prolanis influences the decrease in blood sugar of diabetic Mellitus.

Decrease and stability of blood sugar can be achieved with a good physical exercise program and portion. based on research conducted by Watuseke, Ake & Akay (2017) on the effectiveness of prolanis gymnastics against the decrease in blood glucose levels in clinical practice dr. Francis Karamoy Winebetan Village South Langowan Subdistrict in blood glucose levels with DM can experience decrease and

stability after the program and portion of physical exercise gradually, continuously, rhythmically, and as needed.

According to Suryanto (2013) in Watuseke, Ake & Akay (2017) other programs and portions of physical exercise, another thing that supports the effectiveness of prolans gymnastics against the decrease in sugar levels in the blood of diabetic Mellitus patients is the knowledge of the patient itself. Some people in Indonesia still think that the treatment of diabetics is only with treatment, so they do not know the benefits of physical exercise in the prevention of diabetic complications (Harmilan, Supodo, and Heriyanto, 2019).

In addition, one of the factors and decrease in blood sugar in diabetic Mellitus patients is the level of treatment compliance. In this study, patients who follow prolans routinely experience a decrease in blood sugar and stability. Along with research conducted by Tanty, Anggriani & Saragi (2019) about the influence of prolans on the *outcome* of clinics patient diabetes mellitus type 2 in Puskesmas District Pulogadung which found that the high level of compliance then the outcome of the clinic will be more controlled and vice versa the lower the level of compliance then the clinical outcome is more uncontrolled.

Referring to the theories and studies that have been mentioned, to be able to lower and maintain the blood sugar levels of patients with diabetes mellitus within normal limits so that improvement of the patient's quality of life can be achieved, a chronic disease management program is needed.

CONCLUSION

Prolans activities are effective in lowering and maintaining the blood glucose levels of diabetic Mellitus patients at Siko Care Center in Ternate City.

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WARM COMPRESS ON THE INTENSITY OF PAIN IN ELDERLY WITH ARTHRITIS PAIN : A LITERATURE REVIEW

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ABSTRACT

Background: Getting older is a process that continues naturally, starting from birth, and is generally experienced by all living things. This can occur due to a decrease in hormones that cause bone loss and affect the ability of bones to carry out the healing process. Diseases that are usually suffered by the elderly such as rheumatism and diseases that interfere with the musculoskeletal system. One of the pain management that can be handled by health workers is therapy using warm compresses. Warm compresses can provide a physiological effect by increasing joint muscle relaxation. **Purpose:** This study aims to determine the effect of giving warm compresses to the intensity of pain in the elderly with arthritis pain. **Method:** a literature review with scoping review method. In this study, the data source in the form of secondary data was obtained by conducting literature studies from journals that are following the research topic from 2012-2020 as many as 12 journals. **Results:** it can be concluded that the results of the literature review are known that warm water compress therapy is believed to reduce the intensity of joint pain in the elderly with arthritis pain. **Suggestion:** it is suggested in carrying out non-pharmacological treatment to overcome the problem of rheumatic pain that can be done alone or assisted by the family.

Keywords: Warm Compress, Pain Intensity, Elderly, Joint Arthritis

INTRODUCTION

Getting older is a process that continues naturally, starting from birth, and is generally experienced by all living things. Getting older causes a decrease in muscle tone, strength, and endurance of the musculoskeletal system, as stiffness and erosion of joints decrease movement of the joints. This can occur due to a decrease in hormones that cause bone loss and affect the ability of bones to carry out the healing process. This process usually occurs in the elderly (Tejawati, 2018).

According to the World Health Organization (WHO), there are four stages, namely: middle age 45-59 years old, elderly 60-74 years old, old age 75-90 years old, very old age > 90 years old (Artinawati, 2014), which is characterized by a decrease in the body's ability to adapt to environmental stress is an advanced stage of the elderly and old age is not a disease. Diseases that are usually suffered by the elderly such as rheumatic diseases and diseases that attack the musculoskeletal system. Elderly people with rheumatism will experience chronic back pain, muscle weakness, decreased height, decreased mobility, and joint pain (Tejawati, 2018).

According to the World Health Organization (WHO), rheumatoid arthritis sufferers worldwide reach 355 million people, which means that 1 in 6 people in the world suffers from rheumatoid arthritis. Rheumatoid arthritis has developed and has affected 2.5 million Europeans. WHO reports that 20% of the world's population is affected by Rheumatoid Arthritis of which 5-10% are aged 60 years (Sham, 2015).

The number of elderly people in Indonesia in 2016 was approximately 21 million. This number is expected to continue to grow as life expectancy increases. This will raise several risks, among others, because they are susceptible to degenerative diseases. Population census data shows that the number of elderly people in Indonesia in 2010 was 18.1 million people (7.6 percent of the total population), in 2014

increased to 20.24 million people (8.03 percent of the population), and is expected to reach 36 million people in 2025 (Setiati 2017).

The prevalence of joint disease/rheumatism/gout based on data from Riskesdas in 2013 was diagnosed to increase with age, the prevalence at the age of 45-54 (19.3% and 37.2%), at the age of 55-64 (25.2% and 45, respectively). 0%), at the age of 65-74 (30.6% and 51.9%) and the highest prevalence was at the age of 75 years (33% and 54.8%) (Riskesdas, 2013).

The South Sumatra Central Statistics Agency in 2015 stated that the number of elderly people in South Sumatra had reached 561,712 people or about 6.58% of the total population of South Sumatra. The comparison of the proportion of the elderly population of South Sumatra in 2015 between men and women was 48.37 versus 51.63 (BPS Sumsel, 2016).

In overcoming joint pain in the elderly, it is necessary to provide appropriate treatment both pharmacologically and non-pharmacologically. Pharmacological treatment of non-steroidal anti-inflammatory drugs (NSAIDs) in restraining the production of inflammatory mediators. Giving pharmacological therapy continuously causes dependence and disruption of the work of several organs in the elderly body (Rahmawati, 2017).

According to the Ministry of Health of the Republic of Indonesia (2018), how to deal with pain can be done in various ways such as relaxation techniques (deep breaths, skin stimulation, massage, back rubs, compresses using warm air), interaction therapy (by focusing on focusing not on pain instead of focusing on something else, watching TV, talking or listening to music).

One of the pain management that can be done by health workers is to use heat therapy. Heat therapy can be done using a warm compress. Warm compresses can have a physiological effect by increasing muscle relaxation and joint movement. The process of vasodilation that occurs when giving a warm compress can dilate blood vessels so that it can increase blood flow to the painful part. Warm compresses can also promote muscle relaxation and reduce pain from spasms and stiffness. Warm compresses work by conduction, which is the transfer of heat from the bladder into the painful joint. Heat works by stimulating pain receptors (nociceptors to block pain receptors (Pratintya, 2015).

The purpose of a warm compress is basically to provide a warm feeling to meet the need for comfort, reduce or pain, reduce or prevent muscle spasms and provide a warm feeling in certain areas. Warm compresses can be used to reduce the stimulation of nerve endings or block the direction of pain impulses to the inflamed brain. Warm compresses are a very effective method of reducing muscle pain or spasms. Heat can be transferred through conduction (heat bearing). Heat can dilate blood vessels and can increase blood flow (Rahmawati, 2017).

Based on the results of Salim's research (2016), explains that warm compresses are given at a maximum temperature of 50°C in 5-8 minutes. The warm compress will help the blood vessels dilate to keep blood circulating to the inflamed area. Decrease in pain or pain sensation from severe pain to mild pain or minimum pain or no pain as a cause of warmth. The warm effect can inhibit the motor nerve impulses of the muscles to reduce joint spasm and maximum relaxation. The warmth of the water will have an impact on decreasing the viscosity of the blood and synovial fluid. To reduce blood viscosity, it will make blood circulation effective to bring White Blood Cells and platelets to places that attack inflammation.

Based on the results of Pratintya's research (2015) entitled the effect of giving warm compresses to osteoarthritis joint pain in the elderly at the Budhi Dharma Ponggalan Umbulharjo Nursing Home Yogyakarta. The results showed that heat therapy using warm compresses can have a physiological effect by increasing muscle relaxation in joint movements. A warm compress with a temperature of 40.5°C - 43°C will be given to the joint area experiencing pain for 20 minutes (Pratintya, 2015).

From the data above, the researchers used a literature study to determine the effect of giving deep breath relaxation therapy in patients with hypertension.

Based on the above problems, the use of warm compresses to reduce joint arthritis pain in the elderly is still rare in the medical world, besides that from various literature, there are also differences of opinion in interpreting it.

METHODS

The design of this study used is a literature study. The type of literature review used in this study is a scoping review. Scoping review is a relatively new review method, used to clarify the working definition and conceptual boundaries of a topic or field, especially to review literature that has not been reviewed comprehensively, is complex or heterogeneous which does not allow for a systematic review. The method of collecting data used in this study comes from the results of research that has been carried out and published in national and international online journals. In conducting this study, the researchers searched research journals published on the internet using the Google Scholar search engine with the keywords: giving warm compresses, the elderly, joint arthritis pain. Research journals found according to keywords were then screened, viewed abstracts, then read full-text articles and reviewed. The data analysis method for the summary of the research journal is entered into a table sorted according to alphabetical order and the year of publication of the journal and following the format mentioned above. To further clarify the analysis of the abstract and full text of the journal, read and observe. The summary of the journal is then analyzed on the contents contained in the research objectives and research results.

RESULTS & DISCUSSION

Based on search results on Google Scholar with keywords giving warm compresses, the elderly, joint arthritis pain, researchers found 371 article titles that matched the keywords. The articles found according to these keywords did not all have a theme that was by the research objectives and there were duplicate articles. The researcher then searched using Google Scholar advanced search by looking for keywords in the title (in the title) that matched the same keywords and obtained as many as 185 journals. Research articles that have similar research themes/contents are then selected based on the most appropriate criteria and by the research objectives. Research journals that were not selected, there were similarities and did not meet the inclusion criteria were then excluded as many as 186.

A total of 185 articles found were then screened to see whether the article had a full text or not, then 90 articles were then excluded because there were no full-text articles available so that 95 full-text articles were obtained. The feasibility assessment was carried out on 95 full-text articles. Research articles that have similar research themes/contents are then selected based on the most appropriate criteria and following the research objectives. Research journals that were not selected had similarities, and did not meet the inclusion criteria were then excluded as many as 83 articles, so that 12 full-text articles were reviewed.

Based on the journal review as described in table 4.1. then the researchers grouped and mapped the data as follows:

Study Design

Table 4.2 Research Designs from Review Journals

No	Study design	Total	Percentage
10.	<i>Quasi experimental design</i>	6	50%
11.	<i>Pra-eksperimental dengan pendekatan one group pre test-post test design</i>	6	50%
Total		12	100%

The research design reviewed is an experimental study, and the research design used is a Quasi-experimental design with 6 journals (50%) and pre-experimental with a one-group approach pre-test-post test design as many as 6 journals (50%).

The Research subject or samples used in the research reviewed are all elderly people with joint pain (100%).

Based on the literature review of 12 literature, it is known that before warm compresses were applied, most of the respondents often felt moderate pain in the joint area. Efforts to reduce the intensity of joint pain in the elderly by doing warm compress therapy in the joint area. Some literature states that giving warm compresses to the joint area is believed to reduce the intensity of joint pain in the elderly.

The knee joint can be painful and can get worse if not treated immediately. This is because the muscles around the knee joint, especially the quadriceps muscle, atrophy and become weak. Decreased muscle function will reduce joint stability, especially weight-bearing joints so that it can worsen the disease state and cause deformity. Pain is a subjective sensation and unpleasant emotional experience that expresses verbal and non-verbal discomfort related to actual and potential tissue damage that is felt in the event of damage. In general, the joints suffer from joint cartilage deterioration, most of which occurs in weight-bearing joints and bone formation on the joint surface which if not used anymore will cause inflammation, pain, decreased joint mobility, and deformity. Bones have the function of maintaining the shape of the body as well as decreasing function, the calcium they contain begins to decrease, so they break easily and inflamed joints can cause serious pain. Feelings of pain felt by elderly people are reduced when compared to teenagers (Susanti, 2017).

Diseases that are usually accompanied by severe pain when suffered by adults do not feel anything, but by elderly people even though they feel sick, it is difficult to explain what they feel. In addition to the prominence of the bones around the joint will interfere with movement and cause pain if the joint is active. As you get older, this cartilage will shrink with aches and pains (Susanti, 2017).

Warm compresses provide a warm feeling in certain areas by using fluids or tools that cause warmth to the body. This action is not only to improve blood circulation but also to relieve pain, stimulate intestinal peristalsis, smooth inflammatory sap, and provide calm and pleasure to the client. Compression is given for joint inflammation, muscle spasms, flatulence, and cold (Asaski Team, 2017).

Compresses using warm water are based on the fact that compresses using cold water are not very effective at reducing heat. Due to contact with cold water, the blood vessels that are in contact with the cold compress will constrict (vasoconstriction) making it difficult to dissipate heat. The temperature control center receives information that the body temperature is in a warm condition, so the body temperature needs to be lowered immediately. When we have a fever we feel cold even though our body is experiencing an increase in temperature. Warm water compresses have several advantages, besides helping to reduce the cold, warm water also makes the body feel more comfortable and improves circulation (Tim Asaski, 2017).

Giving warm compresses gives a warm feeling to gout sufferers by using fluids that cause warmth to the body. The goal is to improve blood circulation, reduce pain, provide a sense of comfort or warmth and calm. Warm compresses can be trusted to reduce pain in gout sufferers. Warm compresses with a temperature of 30 degrees Celsius -45 degrees Celsius. With the type of receptor that responds to heat VRL-1 (Vanilloid Receptor-Like 1), related receptors that do not respond to capsaicin (a chemical that causes pain) but are nociceptors to stimuli that have the potential to damage pain so that it can reduce pain (Zahroh, 2018).

The results showed that there was an effect of warm compresses on reducing pain in the elderly who experienced joint arthritis pain. Warm compresses can reduce the pain of gouty arthritis sufferers. Warm compresses relieve pain by reducing muscle spasms, stimulating pain, causing vasodilation, and increased blood flow. Blood vessels will dilate thereby improving blood circulation in these tissues. The benefits can change the focus of attention on something other than pain or can act as a distraction so that someone is not focused on pain and can relax. By giving a warm compress, the blood vessels will widen thereby improving blood circulation in the tissue. In this way, the delivery of acids and nutrients to the cells is enhanced and the removal of the excreted substances is improved. Increased cell activity will reduce pain and will support the healing process (Zahroh, 2018).

According to Asaski's team (2017), the purposes of warm compresses are streamlining blood circulation, lowering body temperature, reduce pain, give a sense of warmth, comfort, and calm to the client, streamlining the discharge of exudate, stimulate intestinal peristalsis. The purpose of hot water compress are treamlining blood circulation, reduce pain, and stimulate peristalsis.

The following is an explanation of the effect of warm compresses in reducing the intensity of pain obtained from the literature review of several pieces of literature such as books and previous research journals.

The effect of a warm compress is to increase blood flow to the injured area. Continuous application of warm compresses is harmful to epithelial cells, causing redness, local weakness, and blistering may occur. Warm compresses are given for an hour or more (Tim Asaski, 2017).

Skin stimulation activates larger and faster transmission of A-beta sensory nerve fibers. This process reduces pain transmission through small diameter C delta-A fibers. The synaptic gate closes the transmission of pain impulses. A warm compress will increase blood flow, and relieve pain by removing inflammatory products, such as bradykinin, histamine, and prostaglandins that cause local pain. Heat will stimulate nerve fibers that close the gate so that pain transmission to the spinal cord and the brain is inhibited. This is because after 30 minutes of giving a warm compress to the body area will give a signal to the hypothalamus through the spinal cord (Trianipurna, 2019).

When heat-sensitive receptors are stimulated in the hypothalamus, the effector system issues signals that initiate sweating and peripheral vasodilation. Changes in the size of blood vessels are regulated by the vasomotor center in the medulla oblongata of the limbs of the brain, under the influence of the anterior hypothalamic so that vasodilation occurs. The occurrence of this vasodilation causes blood flow to every tissue, especially those that are inflamed, and pain increases so that the pain scale decreases in the inflamed tissue (Trianipurna, 2019).

According to research conducted by Wahida in 2012, the decrease in joint pain in the elderly, both in the control and intervention groups, was caused by individual coping in responding to stimuli. The maximum use of coping mechanisms will have a good impact on the level of individual adaptation and increase the level of stimulation to which the individual can respond positively. When individuals have a positive perception there will be a state of relaxation and chemical, nervous or endocrine changes in the body so that it will be easier to accept the healing suggestions given. The results showed that there was a significant difference after being given a warm compress on joint pain in the elderly (aged 60-74 years). In neuromuscular heat, therapy increases the pain threshold and increases nerve conduction velocity. In joints and connective tissue can increase tendon extensibility and reduce joint stiffness. The results of this study prove that warm compresses can reduce the scale of joint pain in the elderly.

According to Kozier & Erb in Trianipurna (2019), warm compresses for patients with joint pain function to overcome or reduce the pain that causes dilation of blood vessels so that heat can relieve ischemia by reducing muscle contraction and smoothing blood vessels so that it can relieve pain by reducing tension and increasing blood flow. blood in the joint area by decreasing synovial fluid viscosity and increasing tissue distensibility. Physiologically the body's response to heat is to cause dilation of blood vessels, reduce blood viscosity, reduce muscle tension, increase tissue metabolism and increase capillary permeability.

Warm compresses provide a warm feeling to meet the need for comfort, reduce or relieve pain, reduce or prevent muscle spasms and provide a warm feeling in certain areas. Warm compresses can be used to reduce or relieve stimulation of nerve endings or block the direction of pain impulses traveling to the inflamed brain. Warm compresses are a very effective method of reducing muscle pain or spasms. Heat can be transferred through conduction (heat bearing). Heat can dilate blood vessels and can increase blood flow (Rahmawati, 2017).

Warm compresses can reduce pain due to the process of vasodilation in blood vessels, causing dilation of blood vessels and increasing blood flow to the part that is experiencing pain. A decrease in the intensity felt by a person, can be caused by impulses that will suppress pain so that pain can be reduced. The impulse is a warm temperature that is given and hits the affected part of the pain. The local response

to heat occurs through the stimulation of nerve endings in the skin. The stimulation will send impulses from the periphery to the hypothalamus. If there is a continuous change through the temperature sensation pathway, there will be acceptance, and perception of the stimulus will change (Potter & Perry, 2005 in Pratintya, 2012).

Non-pharmacological management efforts using warm compresses will provide a sense of warmth, meet the need for comfort, reduce or relieve pain and reduce the occurrence of muscle spasms using hot water (37-40°C) or warm water (Hidayat, 2015 in Igrisa & Julyanation, 2015). The compress provided provides the advantage that there is no maceration of the skin (Potter & Perry, 2005 in Pratintya 2012).

Warm compresses have a vasodilating effect on blood vessels, increasing blood flow. Increased blood flows to an area and possibly reducing pain by accelerating healing, but in doing warm compresses it is used carefully and monitored carefully to avoid skin injury. With warm compress therapy, the body's physiological response will increase blood flow throughout the body, especially to the painful area so that it relaxes the body and creates a pleasant feeling, this feeling will reduce tolerance to pain caused by the brain and body feeling relaxed, will automatically make a person feel calm and comfortable. Feeling calm and comfortable in the elderly has a positive effect on accelerating a more optimal recovery which will always send a good message to the problematic body part. And treatment for Gout Arthritis includes pharmacological and non-pharmacological therapy. Non-pharmacological measures for patients with Gout Arthritis include warm compresses and cold compresses (Hasrul, 2018).

Based on the results of the research on the 12 journals described above, it is known that after the intervention of giving warm compresses to the elderly who experienced joint arthritis pain showed that most of the respondents experienced a decrease in their own pain on a mild and moderate pain scale. However, there were also some respondents who did not experience a decrease in the joint pain scale. This may be caused by several factors, including not doing warm compresses optimally, for example, the duration of the compress is too short, the elderly are afraid of hot steam so that the compress is lifted too often, the warm water used is not warm anymore because it is opened and closed too often.

The results of research on 12 journals all explain that giving warm compresses to the elderly with arthritis pain is very effective in reducing joint pain. This is because there is a process of vasodilation in the blood vessels, causing dilation of the blood vessels and increasing blood flow in the painful area. A decrease in the intensity felt by a person, can be caused by impulses that will suppress pain so that pain can be reduced.

CONCLUSION

Based on the description of the results of the research and discussion, it is known that before warm compresses were applied, most of the respondents often experienced moderate to severe pain in the joint area and after warm compresses, most of the respondents felt moderate to mild pain. Management efforts Non-pharmacologically using warm compresses will provide a sense of warmth, meet the need for comfort, reduce or relieve pain, accelerate blood circulation, reduce pain, provide a sense of comfort or warmth and calm.

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**Preparedness of Parents in Preventing Stunting at Jatirejo Village
The District of Nganjuk**

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ABSTRACT

Stunting among under two years children relates to chronic nutrition problems. Improving the nutritional quality of mother and child, improving exclusive breastfeeding, clean and healthy practices are among the factors to resolve the stunting. The study aims to identify the preparedness of parents to prevent stunting. The study used a descriptive case study approach and all of them were chosen as the samples of the study. The research variable is preparedness to prevent stunting. A set of questionnaires is used as a data collection instrument. The data were analyzed using distribution frequency tables. The study found that 4 (27%) parents well-prepared to prevent stunting, 3 (20%) have adequate preparedness, and 8 (53%) have poor readiness to avoid stunting. It is concluded that the preparedness rate of parents to prevent stunting is low. It is suggested that parents care of the nutrition intake before and during pregnancy, being informed about stunting through social media, and regular visit health centers for health care.

Key Words: Preparedness, Stunting, Parents

INTRODUCTION

The case of stunting among children is increasing in developing countries, including Indonesia. It is a serious problem for family with toddlers and parents that plan to have babies. Stunting relates disproportional between age and height in which the children's height is lower than expected among the child with a similar age range (KDPDTT, 2017). Over 2 years old children are more prone to stunting. According to the midwife at Jatirejo Village The District of Nganjuk, the incidence of stunting reaches 7% among toddlers. (Apriluana et al. 2018), explain that stunting risk the physical, mental, intellectual, and cognitive development of children.

The Indonesian Development Board indicates that East Java Province becomes a priority to resolve stunting in 2018-2019. The Regional Statistic Bureau and the National Team of Poverty Eradication Acceleration (2018), the district of Nganjuk was in 6th place of stunting case within the Province of East Java, reaching 18.07%. In 2018, there were 11 districts in the province where stunting prevention is campaigned such as the District of Jember, Nganjuk, Lamongan, and the District of Jember accumulates the number in 2019. The Ministry of Health of Indonesia (2018) reported that the prevalence of severe stunting in Indonesia was 19.3%, higher than the case in 2013 (19.2%) and 2007 (18%). Overall stunting both mild and severe stunting, the prevalence reaches 30.8%. The figures imply that Indonesian toddlers are still at risk of stunting regardless of the effort of the government for years to resolve the problem.

Different factors have identified some factors, but preventable ones, that trigger stunting such as eating habits, environment, parents' caring style, and family's income. The causality of stunting is multi-factors (Budiastutik, 2019). According to the WHO, the implications of stunting can be classified into short and long-term (WHO, 2017). In a study by (Hoddinot et al. 2013), stunting among 2 years old children have negative to their learning outcomes at school. Drop out, becoming short children, and weak palms clogging for 22%. The conditions lead to physical growth, especially stunting (Departemen Kesehatan Republik Indonesia, 2019).

Anticipating the incidence of stunting is crucial in the First 1000 Days of Life as it is intervenable (Rifiana & Agustina, 2019). This period is important as it may cause permanent damage when it is inadequately treated (Nefy, Lipoeto, & Edison, 2019). The Sustainable Development Goals (SDGs) 2030 defines stunting

as a target. Quality education, balance nutritional intake, health care for children are indicators to reduce stunting rate.

The role of nurses in reducing the incidence of stunting is through promotive and preventive handling. Promotively increase the knowledge of parents by providing health education about the fulfillment of balanced nutrition and nutrition for the needs of children's growth and development. Preventive efforts are carried out by providing education in the form of counseling for parents to monitor nutritional status, parenting patterns, and the child's environment. The methods used include discussions, questions, and answers, lectures, giving booklets, leaflets, or direct demonstrations. This research aims to identify the preparedness of parents to prevent stunting.

METHODS

This research is in the form of a case study using a descriptive research design. Describing the preparedness of parents to prevent the incidence of stunting is the objective of the study. The study was conducted at Jatirejo Village The District of Nganjuk, East Java Province. Using total sampling, namely the preparedness of parents to prevent stunting.. The population includes 15 parents with children age ranges 25-30 years old and 15 parents were all taken as the respondents.

The data collection was conducted during February and March 2021. The data collection procedure begins with taking care of a permit letter from the campus and submitting a research application permit to the head of the village. Describe the research process to be carried out. The data of this study were collected using questionnaire (the Stunting Quantitative Questionnaire) and distributed to 15 respondents which was distributed to parents. The instrument used is a questionnaire sheet filled out by parents. The data that has been obtained will be processed by means of editing, coding, scoring, and tabulating. From all the data collected, then the data will be analyzed using a frequency distribution table and the results will be described descriptively. From all the data collected, then the data will be analyzed using a frequency distribution table and the results will be described descriptively. Various ethical procedures of this research include informed consent (consent sheet), anonymity (without name), and confidentiality (confidentiality).

RESULTS

Table 1. Age Frequency Distribution of Parents at Jatirejo Village
The District of Nganjuk
in March 2021

Age	Frequency	Percentage (%)
25-26 year	15	50
27-28 year	7	23
29-30 year	8	27
Total	30	100

Table 1 shows that from a total of 15 parents (15 males and 15 females), the age of parents at Jatirejo Village The District of Nganjuk is mostly between 25-26 years old with 15 people (50%).

Table 2. Education Level Frequency Distribution of Parents at Jatirejo
Village The District of Nganjuk
in March 2021

Education Level	Frequency	Percentage (%)
Low	16	53
Moderate	10	33
High	4	13
Total	30	100

Table 2 describes that from a total of 15 parents (15 males and 15 females), the highest percentage of the education level of parents at Jatirejo Village The District of Nganjuk were in the low category as many as 16 people, both male and female (53%).

Table 3. Number of Children of Parents at Jatirejo Village The District
of Nganjuk
in March 2021

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Number of Children	Frequency	Percentage (%)
Low	5	53
Moderate	1	7
High	9	60
Total	15	100

Table 3 reveals that from a total of 15 parents, the highest percentage of the number of children of parents at Jatirejo Village The District of Nganjuk were in the high category as many as 9 children (60%).

Table 4. The Occupation of Parents at Jatirejo Village The District of Nganjuk in March 2021

Occupation	Frequency	Percentage (%)
Unemployment	11	37
Employment	19	63
Total	30	100

Table 4 shows that from a total of 15 parents (15 males and 15 females), the highest percentage of the occupation of parents at Jatirejo Village The District of Nganjuk were in the employment category as many as 19 people (63%) and unemployment category as many as 11 (37%).

Table 5. Family Income of Parents at Jatirejo Village The District of Nganjuk in March 2021

Income	Frequency	Percentage (%)
Low	10	67
Moderate	3	20
High	2	13
Total	15	100

Table 5 reveals that from a total of 15 parents, the highest percentage of the family's income of parents at Jatirejo Village The District of Nganjuk were in the low category as many as 10 families (67%).

Table 6. The Preparedness of Parents at Jatirejo Village The District of Nganjuk in March 2021

Preparedness of Parents to Prevent Stunting	Frequency	Percentage (%)
Good	4	27
Fair	3	20
Poor	8	53
Total	15	100

Table 6 shows that from a total of 15 parents, the majority of parents at Jatirejo Village The District of Nganjuk have poor preparation to reduce the risk of stunting as many as 8 parents (53%).

DISCUSSION

(1) Parents' Age in The Preparedness of Parents to Prevent Stunting

Based on the results of research conducted on 15 parents at Jatirejo Village The District of Nganjuk, data was obtained that parents have poor preparedness to prevent stunting. The age of parents is an indicator to measure their preparedness to avoid stunting their children. This study implies that parents are not mature enough to prevent the possibility of stunting. According to (Hurlock, 2017), productive age (from 20-35 years old) influences the ways an individual thinks, acts and emotions. The older an individual is, the more

knowledgeable and experience she/ he is. An immature parents are less prepared in terms of physiological and psychological. Getting mature makes individuals more prepared to provide nutritious food for their children. Age is an indicator that influences the maturity of parents to avoid the incidence of stunting.

A study by Ayungtiasdi in Gedanganak Primary School 1, SDN Gedanganak 02, SDN Gedanganak 3 Kecamatan Ungaran Timur dan SDN Candirejo 01, dan SDN Candirejo 02 Kecamatan Ungaran Barat, Kabupaten Semarang (2017) found that the influence age to the parents' preparedness to anticipate the incidence of stunting from 63 samples, 28 parents (44,4%) have a low level of knowledge, 26 parents (41.3%) have a good level of knowledge, and 9 parents (14,3%) have a moderate level of knowledge.

(2) Educational Level of Parents in The Preparedness to Prevent Stunting

This study showed that parents have a low level of education because their knowledge or information is not directly related to the educational level. An educated individual is expected to have adequate knowledge. It is assumed the level of education is reflected on the knowledge and experience of an individual. However, that does not mean that low education automatically reflected as a poor education. Low education does not guarantee that parents do not have adequate knowledge about the preparedness to prevent stunting. According to (Notoatmojo, 2018), explain that individual behavior, including knowledge is influenced by education.

According to the study of Oktavia in the research of (Thalita, 2018), 7 parents (23 %) and 9 (30 %) have a low level of education, 10 parents (33 %) have a moderate level of education, and 4 parents (13 %) have a high level of education.

(3) The Number of Children in The Preparedness to Prevent Stunting

According to the research, parents have a high number category of offspring. Based on the data from Nganjuk Health Center (Puskesmas Nganjuk, 2020) at Desa Jatirejo Kecamatan Kota Kabupaten Nganjuk, children from families with a high number of household members are more likely to be stunted than children from families with a moderate number of family members. The number of children potentially influences the quality of life received by the children. More children in a family need more resources to support the growth and development of children. As a result, families are advised to limit the number of children to fulfill their needs. Program in Family Planning (KB).

A study by (Habyarimana, F. 2016), found that the incidence of stunting in Rhandwa is influenced by the size of the family. Another study also reveals that children who live with another relative within the family for five years tend to get stunting (Cruz et al. 2017).

(4) Social and Economic Factors in The Preparedness to Prevent Stunting

The stunting problem is also closely related to the family's economic status. This study found that the parents are mostly self-employed, the socio-economic factors of parents are included in the lower category. It means that economic and social status becomes a hamper to the normal growth and development of children. Social and economic are also important determinants of the incidence of stunting. The situation makes the children are riskier to suffer from stunting (Windi, H. 2018). Families with a lower socio-economic have poor access to education, health care, and other social benefits.

According to this study, family income has an impact on the status of stunting in children under the age of five (Fikrina et al. 2017). This is also consistent with research conducted by (Eko, S. et al. 2018), which found a connection between the level of family income and the prevalence of stunting.

(5) The Preparedness of Parents to Prevent Stunting

According to this research, 15 parents at Jatirejo Village The District of Nganjuk, parents have a poor preparedness to prevent stunting (Suharsimi, A. 2013). Preparation made by parents is still very low. The efforts to improve nutrition of children, immunization, and parents education regarding stunting children are still low. There are parents who don't know that their child is stunting because they said that this is normal and fine for their child usually experiences. Parents thought that their preparation to become parents is good enough, but in reality it is still far from enough. It is based on the preparation efforts made by the parents. (Laksono et al. 2017), explain that the efforts to prepare childcare services are provided holistically to serve all of their needs to grow and develop, including health, nutrition, education, and protection, as well as integratively collaborate with educational institutions.

Parents can help prevent stunting by monitoring their children's nutritional patterns, performing routine health checks, and practicing healthy living habits. The aim is that children will not become stunted, that they will be able to grow and develop in line with their age, and that their nutritional patterns will be fulfilled in line with their growth and development age.

CONCLUSION

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The results of this research on the preparedness of parents to prevent stunting at Jatirejo Village The District of Nganjuk can be concluded that stunting is a problem of millions of people in developing countries, including Indonesia. The study concludes that the incidence of stunting in the context of the study is still evident. Parents' preparedness to prevent stunting is not optimum. Even though the majority of the parents are prepared to prevent stunting. However, the percentage of those who are not well-prepared for the situation is alarming numbers of factors have identified as the contributing factors of stunting. Education level, age and maturity, size of the family, social and economic factors are the determinants of the parents' preparedness to resolve stunting.

It is expected that parents with good preparedness can identify the preparedness to prevent stunting, especially regarding the implementation of efforts to prevent stunting, for parents with moderate and low preparedness are expected to understand more about the preparedness to prevent stunting by monitoring nutritional patterns and paying attention to the nutritional intake needed by children according to their needs. with the age of growth and development to prepare themselves from an early age to increase a better preparedness. To sum up the study advised that parents need to improve the alertness to prevent stunting to their children by improving their knowledge, provision of nutritious foods, and regular medical monitoring to the growth and development of their children. Parents can consult with nurses, midwives, and nutritionists to understand what needs to be prepared so that children do not become stunted.

The community is hoped to have good preparedness and skill to increase and maintain their knowledge, for people with low preparedness in preventing stunting in children are better prepared to prevent and overcome stunting in children.

Future researchers are expected to further develop knowledge and improve skills in taking actions regarding the preparedness of parents to prevent stunting based on existing theories.

The results of this study can be used as additional information for the development of children's behavior in pediatric nursing and maternity nursing as a reference to improve the preparedness of parents to prevent stunting. Increase socialization activities regarding stunting preparedness efforts for parents according to the correct procedure.

Researchers can add several variables related to readiness in efforts to prevent stunting so that research results are more accurate, as well as input and data sources for further research and encourage interested parties to conduct further research.

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THE RELATIONSHIP OF KNOWLEDGE ABOUT COVID-19 WITH THE HEALTH MAINTENANCE OF DIABETES MELLITUS PATIENTS

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ABSTRACT

Indonesia is currently facing a triple burden of health problems, namely high infectious diseases, increasing non-communicable diseases and the emergence of coronavirus disease. The emergence of the global pandemic Coronavirus Disease-19 (COVID-19) in Indonesia has become a serious concern. One of the co-morbidities of Covid-19 is Diabetes Mellitus. The purpose of this study was to identify the relationship between knowledge about Covid-19 and efforts to maintain the health of patients with Diabetes Mellitus during the Covid-19 pandemic in Tasikmalaya City. This study used a cross-sectional study design, with a total sample of 195 respondents. The sampling technique was purposive sampling. The results showed that there was a relationship between demographic factors (age, (pv= 0.01) education level (pv=0.005), family history of DM (pv= 0.03) and income (pv=0.01) and knowledge (pv= 0.0005) with efforts to maintain the health of patients with type 2 Diabetes Mellitus during the Covid-19 pandemic in Tasikmalaya City. This study concludes that age, education level, income, family history of DM and knowledge are independent factors associated with self-maintenance efforts. with knowledge as the most influential factor. The recommendation from this study is the need for a quasi-experimental study to change behavior in DM patients

Keywords: Covid-19, DM, health care efforts

INTRODUCTION

Indonesia is currently facing a triple burden of health problems, namely high infectious diseases, increasing non-communicable diseases and the emergence of coronavirus disease. Coronavirus Disease-19 (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus, or often called the Corona Virus. The increase in cases and deaths due to the Corona Virus is still a major problem in Indonesia. The Task Force for the Acceleration of Handling Corona stated that the comorbid factors that had a major influence on the death of corona patients in Indonesia were hypertension, diabetes, heart disease, lung disease and kidney disease <https://www.covid19.go.id/situasi-virus-corona>. This phenomenon indicates the need to control comorbid diseases, in this case PTM disease, so that the death rate from the Corona virus can be suppressed. The World Health Organization explains that PTM consists of four main groups, namely cardiovascular disease (coronary heart disease and stroke), cancer, chronic respiratory disease (asthma and chronic obstructive pulmonary disease) and diabetes.

Diabetes Mellitus is a metabolic disorder that occurs for years (chronic) caused by the inability of the pancreas to produce insulin in an amount that is in accordance with the body's needs (Risksedas Kemenkes, 2018). The World Health Organization (2017) states that insulin that is produced ineffectively causes blood sugar levels to become uncontrolled, resulting in an increase in blood sugar levels in the body. The condition of increasing blood sugar levels that exceed normal limits is called hyperglycemia (Gao, D., et al, 2013). The number of cases and prevalence of diabetes continues to increase every year in countries around the world (WHO Global Report, 2016). Meanwhile,

based on the results of the 2018 Basic Health Research, it showed that the prevalence of people with diabetes had increased from 1.6% in 2013 to 2.0 in 2018 (Ministry of Health, 2013; Ministry of Health, 2018)

Data on NCDs in Tasikmalaya City were 23,885 cases or 5.7% of the population over 19 years. Meanwhile, there were 380 cases of diabetes. This condition needs attention because the impact of diabetes causes various complications such as stroke, heart disease, kidney failure, blindness and amputation. If you watch out for people with a history of DM, they are a risk group in this Covid-19 pandemic (Mihaljcic, T., et al, 2017)

Various efforts to reduce the incidence and severity of Diabetes Mellitus, improve the quality of life of people with diabetes or diabetes, and prevent complications in diabetes, then carried out comprehensive management, namely the five pillars of Diabetes Mellitus management consisting of Education, Medical Nutrition Therapy (meal planning) , Physical Exercise, Pharmacological Therapy and Compliance in Monitoring Glucose Levels (Wattanakul, B. 2012). Diabetes management efforts can be interpreted as self-care efforts that must be carried out by a person with diabetes so that blood sugar levels are stable and avoid various complications that trigger and place people with diabetes as a vulnerable group during this Covid-19 pandemic. Kusnanto (2019) states that one of the factors that influence self-care with diabetes is knowledge, the better the knowledge, the better the handling of diabetes self-management.

The explanation above shows that knowledge about diabetes care is a factor related to diabetes health care efforts, but the relationship between knowledge of Covid-19 and efforts to treat early diabetes patients has never been studied before. This research was conducted in the City of Tasikmalaya. This study aims to describe knowledge about Covid-19 in the City of Tasikmalaya and identify the relationship between knowledge about Covid-19 and efforts to maintain diabetes health.

METHODS

This study used a descriptive research design with a cross-sectional approach. The research data was collected in the City of Tasikmalaya by involving 195 diabetics. Sampling was done by purposive sampling method according to the inclusion criteria of the sample. This research has passed the ethical test and has received approval from KEPK with the number 066/KEPK/X/2020 and applies 3 ethical principles, namely respecting human dignity, caring for welfare and goodness, and justice. The instrument used in this study was a socio-demographic questionnaire, a knowledge questionnaire about Covid-19. Validity and reliability tests were carried out on 30 respondents and the r-value of each question item was 0.351. Based on this value, it was stated to have adequate internal consistency as a research questionnaire. Data were analyzed using statistical data analysis software. Bivariate analysis to determine the significance of the relationship between the knowledge variable and the maintenance of diabetes health was carried out using the Pearson correlation test. Multivariate analysis was performed using linear regression.

RESULTS

The mean age of the respondents was 58.2 years, SD = 8.49, Min-max range: 27-89 years. Details of the characteristics of the respondents are described in Table 1 below

Table 1 Description of Respondents Characteristics (n=195)

Variable	n	%
Sex		
Male	58	29.7
Female	137	70.3
Marital Status		
Un married	1	0.5
Married	193	99
Divorce	1	0.5
Education		
Elementary Education	113	57.9
Secondary Education	60	30.8
Higher Education	22	11.2
Family History of Diabetes		
No history	67	34.4
With history	128	65.6

The characteristics of the respondents showed that the majority were women, married status, the proportion of low and middle education was balanced, and most of them were married and had a history of diabetes. The distribution of the average health care effort scores according to knowledge is described in Table 2 below:

Table 2

Distribution of the average score of respondents' health care efforts according to knowledge (n=195)

Variable	Mean	SD	Min-Mak	P Value
Knowledge	6,9	1,12	4-10	0,005

Knowledge about Covid-19 has a significant effect on diabetes health care efforts with a p value of 0.005. This shows that the better the knowledge about Covid-19, the better the efforts to maintain diabetes health as a Covid-19 comorbid.

The following is the final model resulting from the final multivariate analysis after going through the candidate testing process, interactions, and confounders

Table 3

Final Model Results of Health Maintenance Multivariate Analysis (n=195)

Variable	P Value
Age	0,014
Education	0,005
Family DM History	0,03
Pengetahuan	0,005

The variables mentioned above are included in the linear regression multivariate modeling and the final model is obtained as follows:

Health care efforts = $9.483 + 0.672 \text{ education} + 1.575 \text{ knowledge}$. Based on this model, it can be explained that the factor with the greatest influence is the knowledge variable.

DISCUSSION

The results showed that most (70.3%) of the respondents were female. This is in line with Amelia et al (2018) who reported that 74% or 85 of 115 respondents with diabetes were women. This condition is in line with the results of Basic Health Research (2018) and Fitriyani (2012) which state that Type 2 Diabetes Mellitus has a higher incidence in women compared to men. This is because women have hormonal factors that can trigger diabetes. The emergence of diabetes in women generally occurs during menopause where there is a decrease in the hormone estrogen and an increase in the hormone progesterone which can cause insulin resistance and an increase in blood glucose levels (Mustarim, S. W. 2019). In line with this, Pane (2017) explained that as many as 40% of diabetes cases experienced by women were caused by a higher fat content distribution, decreased energy distribution and a greater chance of increasing BMI than men. In addition, the condition of the Covid-19 pandemic with PSBB allows the community, especially women, to be more vulnerable to staying at home, this changes their lifestyle, including diet and lack of physical activity. Based on this, hormonal and lifestyle factors should be a concern in health services during the Covid-19 pandemic, because women are not only a vulnerable group with cormobid disease but also vice versa as stated by Susilowati and Hakiem (2020) that women as mothers who should stay healthy and be a role model in a clean and healthy lifestyle (PHBS) so that they can educate and maintain the health of family members from exposure to Covid-19 by maintaining PHBS and carrying out health protocols with 3 M (washing hands, keeping distance and wearing masks) (Chrvala et al., 2016).

The results of this study also show that most of the respondents in Tasikmalaya City have junior high and high school education, namely 63.1%. Conditions are in line with Netismar (2016) which shows that people with Diabetes Mellitus in South Jakarta show that low levels of education occupy the highest proportion. Research with similar results was reported by Masi (2016) on blood glucose monitoring compliance with DM management which showed that most of the respondents were at a low level of education. Researchers assume that a person's level of education is able to affect his ability to understand the information provided. A person's level of education is related to his ability to understand information into knowledge (Boakye et al, 2018). The low level of knowledge of diabetes mellitus management possessed by people with diabetes can affect controlling blood sugar levels (Manan, 2014). The higher a person's education level, the easier it will be for that person to receive information, so they generally have a good understanding of the importance of diabetes self-care and have the skills to use diabetes information obtained through various media compared to low levels of education (Abbasi et al, 2018). Education is associated with the level of knowledge which is also related to behavior change. Knowledge plays an important role in behavior change. Someone with a low level of education will tend to find it difficult to receive information, including those with diabetes in this study (Bhurji et al, 2016).

The results of statistical tests for this study indicate that there is a significant relationship between knowledge about Covid-19 and efforts to maintain diabetes health. This is in line with research conducted by Prasetyani, Apriani & Rahayu (2018) which reported that there was a significant relationship between knowledge and self-care ability in type 2 DM patients (p value = 0.019). A low level of knowledge about self-care can worsen health conditions and cause stress due to the inability to carry out self-care efforts (Wu., F et al, 2019) In a study conducted by Wijaya (2014) in Riyambodo (2017) that someone who has low knowledge tends to find it difficult to understand and accept the information provided. This is in line with Kusnanto (2019) which states that one of the factors that influence self-care with diabetes is knowledge.

Knowledge of people with diabetes about Covid-19 is an important tool to improve diabetes self-care efforts, the better the knowledge, the better the handling of diabetes self-management. This is in accordance with Adejoh's statement (2014) that the higher the level of knowledge of people with diabetes, the higher the level of self-management of people with diabetes. Furthermore, Pender (2011); Nies and Swanson (2015) state that increased knowledge can occur because of the provision of information designed to increase knowledge and good attitudes.

CONCLUSION

The results of statistical tests for this study indicate that there is a significant relationship between knowledge about Covid-19 and efforts to maintain diabetes health. This study concludes that age, education level, income, family history of DM and knowledge are independent factors associated with self-care efforts with knowledge as the most influential factor. The recommendation from this study is the need to conduct a quasi-experimental study on behavior change in DM patients.

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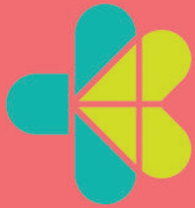
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**THERAPEUTIC COMMUNICATION MIDWIFE PRACTICE INDEPENDENTLY
ON MATERNAL STAGE I IN COVID-19 ERA**

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ABSTRACT

Communication about health care between Midwives and patients during the pandemic was less effective caused of fears. The pandemic lead to a sense of worry for the medical personnel will be contracting the virus COVID-19 caused not to be told of the patient in providing information about the diseases suffered. The absence of responsibility that must be implemented is expected to create communication therapeutic effective between the midwife and the patient. In this study the primary data was obtained through interviews conducted by the researcher to midwives who have experience working in the practice of midwives independently at least 5 years. Sample collection techniques in this research using non-probability in this research sampling with purposive sampling. Informants in this study are 5 people midwife independent practice to provide care on maternal stage 1. Data Analysis technique in this research is done at the time of data collection in progress and after completion of data collection in a particular period. Data or information that has been obtained, was noted or recorded by using radio cassette and made transcripts. The results of this research showed that the process of communication therapeutic consists of 4 phases, namely the phase of the pre-interaction phase, orientation, working phase and termination phase. How to provide therapeutic communication by approaching, providing confidence, listening to the mother's problems, providing motivation and solutions to the mother's problems to create a sense of trust on maternal stage I. The presence of the obstacles encountered when providing therapeutic communication in maternal stage I during the pandemic during the pandemic midwives have limitations in carrying out therapeutic communication due to precautions against the transmission of COVID-19.

Keywords: therapeutic communication, midwife, maternity, pandemic

INTRODUCTION

A pandemic causes a lot of health issues that need to be discussed. Pandemic Covid-19 has changed the world in one field of health (Lestari and Sularso, 2020). Communication in health care between Midwives and patients during the pandemic showed the presence of obstacles caused of fears. The pandemic raises concerns for medical personnel contracting the virus COVID-19 caused not to be told of the patient in providing information about the diseases suffered (Husain, 2020), but due to a responsibility that must be implemented are expected to create communication therapeutic effective between the midwife and the patient (Oisina, 2021) When cases of covid-19 increasing rapidly, When cases of covid-19 increasing rapidly, Midwives seek more effective management and feasible for these patients (Dahlia et al., 2021).

The process of therapeutic communication is needed to decrease the pain and fear in childbirth. Therefore, the midwives in process of childbirth should be able to help the patient more confident, because if the patient was not comfortable physically and mentally during labor it will cause anxiety which resulted in the pain and the fear increased, With therapeutic communication can reduce the problem of these patients (Judge & Sinduwiatmo, 2016) required training to midwives so that we can put ourselves in a situation based on professionalism with the way therapeutic." (Amfo et al., 2018).

Therapeutic communication occurs when preceded by a sense of trust between the midwife and the patient. In the implementation of the service midwifery care to the client, begins when the client must believe that the midwife can provide midwifery care in addressing the problem, midwives also should be professional so that the client does not hesitate on the ability of the midwife. In addition, midwives must be able to guarantee the service quality midwifery care so that the client is not in doubt, anxious, pessimistic and fear in undergoing the process of service of midwifery care (Ngalimun, 2019).

Prolonged labor often occurs in the first stage of childbirth, so the first stage is the mindfulness to determine whether a patient can be normally maternity or not. The pain duration of stage 1 caused by his and dilatation of cervix must be faced by the patient. Duration of progress of opening the cervix for primi where 1 hour to open the cervix as much as 1 cm and for multi only 30 minutes to open the cervix as much as 1 cm so that at the first stage, midwife must be able to provide support and encouragement and comfort to the patient remains calm in the face

of labor(Dewi, 2018).

One of the nonpharmacological therapy to reduce the pain in labor is therapeutic communication. Aims to help the health of the patient, then of therapeutic communication is to help in relaxation, ambulation, massage and therapeutic touch as well as the creation of an environment of emotional labor support. Before providing midwifery care, the professional midwife preferably begins with conveying ideas and thoughts to solve the problem of the client therefore the client can calm down. The ultimate goal of therapeutic communication that is as a remedy or therapy for patients can be realized (Dewi, 2018).

The results of a preliminary survey conducted by researchers on 3 midwives who provide maternity services in independent midwife practices, stated that there were obstacles in the implementation of therapeutic communication to mothers in labor due to anxiety and fear of being exposed to the covid virus. As well as limitations in the implementation of communication due to the use of complete personal protective equipment as prevention of infection against covid when in contact with maternity mothers.

Based on the background, the researcher is interested in examining the Communication therapeutic midwife practice independently on maternal stage 1 during the pandemic covid-19 in 2021.

METHODS

The approach in this research is qualitative with a case study approach. The focus of this research is about the process of therapeutic communication by the midwife practice independently on maternal stage I. In this case, the data obtained from in-depth interviews, observations, review of documents the results of the survey, and a variety of data to elaborate a case in detail. In this study, primary data were obtained through interviews conducted by researchers with informants with inclusion criteria, midwives who have experience working in independent midwifery practices for at least 5 years, providing maternity services, education at least diploma. In this study, the primary data was obtained through interviews conducted by the researcher to midwives who have experience working in the practice of midwives independently for at least 5 years. Secondary data obtained from the special referral consisting of literature, the orientation of the reading by reviewing literature related to the topic of therapeutic communication. Documentation study aims to obtain secondary data to support the research. In this study, sample collection Techniques using non-probability. Sampling was done by purposive sampling, which determines and selects a resource based on the characteristics of the special properties possessed by these samples. As for the research in this resource consists of five people midwife practice self-provide care on maternal stage I, ie the Midwife "N", age 63 years old, education DIII Midwifery, DIV of Obstetrics and S2 Health, carry out the practice for 30 years; the Midwife "WW", the age of 43 years old, education DIII Midwifery, DIV of Obstetrics and S2 the Health, carry out the practice for 20 years; the Midwife "HL" age of 41 years old, the education of DIII Midwifery, carry out the practice for 11 years, the Midwife "S" the age of 53 years old, education DIV of Midwifery, carry out the practice for 20 years, and the Midwife "SW" age of 53 years old, the education of DIII Midwifery, long practice 22 Years. Techniques Data analysis in this study was carried out at the time of data collection and after the completion of data collection within a certain period. The data or information that has been obtained, is recorded using a radio cassette and made a transcript, then transferred into a matrix and the data matrix is grouped according to the research objectives. Data were analyzed manually and compiled for alternative research problems. To see the validity of the information, triangulation of sources was carried out by checking the credibility of the data with various data collection techniques and various data sources.

RESULTS

Based on the research results, the authors obtain the existence of the process of therapeutic communication by the midwife practice independently on maternal stage I. As for the characteristics of the informants as follows:

Table 1. **The characteristics of the Informant Based on Age, Education, Duration of practice of the midwife**

Initials	Age	Education	Duration of practice
Informant "N"	63 years old	D III Midwifery DIV Midwifery S2 of Health	30 yrs
Informant "S"	53 years old	D III Midwifery	20 yrs
Informant "SW"	53 years old	D III Midwifery	22 years
Informant "W"	43 years old	D III Midwifery DIV Midwifery S2 of Health	20 years
Informant "H"	41 years old	D III Midwifery	11 years

DISCUSSION

Therapeutic communication is the communication that is done consciously, aims and activities centered to patient outcomes; refers to the approach that consciously planned with activities centered (Rachmaniar, 2015 in (Moestopo & Setianingsih, n.d.)).

In the phase of pre-interaction, the midwives know the first traffic possessed before contact with a person who will give birth. As a midwife who experienced 30 years of practice midwife self, informant “N” identifies the problem of maternal stage I in the pandemic covid-19 by doing the anamnesis in patients with stage I at the beginning of the entrance of the clinic, see the body language of the patient during stage I and also ask questions related to the health of the patient about the symptoms of covid, the following excerpt of the interview with the informant “N”:

“We can identify the problem patients of stage I in the pandemic covid-19 from the results of the anamnesis we are beginning at the time of patient admission, we can find the problems of the patient, we also see the body language of the patient during stage I, where the patients usually feel anxious and in pain, during the pandemic, we are also asking about the symptoms related to covid-19, that we can also alert”

The second informant midwife “S” identifying the problem of maternal stage I in the pandemic covid-19 by doing the anamnesis according to the standard precautions during the pandemic and adhere to the protocols of health, it can be seen from the excerpt of the interview on the informant “S”

“ We look at the History of the patient before, seeing the expression of the patient is anxious, afraid, worried, and make sure the patient using a mask and wash your hands before we identify the appropriate standard with the vigilance of the covid-19”.

It is almost the same with the informant third “SW” where the Informants do anamnesis to comply with the protocols of health and the prevention of infection, as manifested in the interview :

“ We ask questions and see the state of the patient whether there are symptoms that lead to covid-19, if not we still do that identification with the inspection based on the rules of the prevention of infection (PI)”.

“WW” as the informant fourth identify the problem patients of stage I in the pandemic covid-19 through the health status at the time of the previous visit and make a new inspection on the status of new patients, as the results of the interview as follows:

“That certainly during this pandemic our service is slightly different, because a lot of people without symptoms, we don't know how the symptoms, we do not know whether the patient is infected, we first see the status of the patient, if the patient is already known problem, but if the patient is from another place, we usually do inspection ordinary course, the examination standards”.

Based on the information obtained through in-depth interviews with 5 of the informant, the researcher concluded the stage of pre-interaction midwife should be able to identify the problems of the maternal stage I during the pandemic covid-19 is to do with the anamnesis with appropriately based on patient data. Midwives can also view a history of the health status of the patient, if the patient went to the midwife. Midwives also make observations on the language of the body of the patient to know the feeling of anxiety, fear and worry during the process of childbirth. During this pandemic, in identifying the problem, the midwife puts the protocol health aid delivery during the pandemic. Quoted from (Tangel, Proklani Panduwina’ Sugandi, 2019), where pre-interaction is the activity before contact and communication with the patient. Midwives before communication therapeutic have to recognize in advance so that it can achieve the goal of therapeutic communication is effective when the message is sent and received (Indirawaty et al., 2017). Quoted in the book Abdul Munith of the Application of Therapeutic Communication Nursing & Health, 2018 mentioned the purpose of therapeutic communication are: (1) self-awareness, self-acceptance and increase self-respect; (2) clarity of identity and increasing personal integrity; (3) the ability to form an intimacy, interdependence, interpersonal relationships with the capacity to give and receive (genuineness/sincerity, empathy, warmth); (4) push the function and improve the ability of the needs and achieve personal goals that are realistic. (Moestopo & Setianingsih, n.d.)

The phase of Orientation, in the second stage is called the phase of the introduction. In this stage midwives introduce themselves to the patient, greeting and start the initial approach by asking the name and the reason for his coming (Moestopo & Setianingsih, n.d.). The stage of this orientation is an important part of the activities of a midwife to focus on the patient's problems and complaints (Tangel, Proklani Panduwina’ Sugandi, 2019).

From interviews with informants “N” obtained the ways of the midwife in the development of a trusting relationship with the patient that will give birth to provide understanding about the process of childbirth and provide support to maternal stage I, the following quote in an interview:

“We should make the patient understand that the labor takes a long time, pain and other, and must be patient to deal with it”

It is also delivered informant “WW” the role of midwives in developing a trusting relationship with the patient that will give birth to explain the physiology of childbirth, giving understanding and confidence to the patient's stage I, from the interview informant expressed as follows:

“Before we give the orphanage dear patients and identifies the physiology of labor, provide understanding and confidence to the patient, that living and our dead by the midwife”

The informant “S” states how to build a trusting relationship with the patient that will be giving birth is through the approach to the patient with the assist for the opening of the session and ensure patient comfort. The following excerpt of the interview on the informant “S:

“ We're approaching the patient, encourage interaction and then accompanied during the opening of the session and make sure the patient feels comfortable”.

Informant “SW” also conveys the similar thing we can see from the results of the interview as follows;

“We must serve patient with affection and assured that if the patient is in a healthy state and her baby survived, if it can work just as well in the process of giving birth on stage I”.

The approach is taken informant “HL” started since the examination of the ANC (Antenatal Care) until towards the labor, following the results of the interview:

“We make the approach to the patient started doing the examination of the ANC, we held a meeting the day-to-day until the eve of the labor we perform the good communication”

Based on the information obtained through in-depth interviews with 5 informants, the researchers conclude on the stage of the orientation of the midwife in building a trusting relationship with the patient that will give birth to that is through the approach taken since the examination of the ANC, giving understanding, confidence and assist during the occurrence of the opening on the process of stage I labor then will arise a sense of trust that patients perceived to midwives. At this stage if the patient is not able to build a trusting relationship can be made to approach more slowly by giving understanding and assist and involve the family or the nearest person who accompanies patients in the process of childbirth (Alhassan, 2019). The provision of information to patients is very important so that the expected can change the level of knowledge of the patient. Eliminate worries with enough information. Although interpersonal styles play an important role in shaping the patterns of communication, communication with therapeutic midwives will look professional and patients who have problems in communicating will feel it easy and get the award so it does not feel controlled by other parties.(Moestopo & Setianingsih, 2018). Communication therapeutic effect on the process of understanding the actions of the decision of the patient and at once formed a tangle of new relationships. This is because in the process of understanding patients, midwives not only rely on medical treatment.(Priyantoko, Kartinawati, & Erwin, 2016)

The Working phase, in this phase midwives implement the plan of midwifery care that has been made at the stage of orientation where a midwife to help p which will give birth to overcome anxiety, boost self-reliance and responsibility toward her.

Based on the information obtained through in-depth interviews with 5 of the informant, stated that when the patient feels panic and fear, the midwife explained slowly that it is reasonably perceived when will give birth to, give support, confidence, teach relaxation techniques and guide patients to pray that feel comfortable and understand that childbirth is a natural process. Provide therapeutic communication by way of the approach, gives confidence, listen to the problems of the patient, providing motivation and a solution to the problem of the patient is giving rise to a sense of trust in the patient's stage I. The importance of therapeutic communication in the process of giving birth, because it can help engender a sense of confidence, if the client feels nervous either physical or mental in the face of another, then the resulting fear that the pain will increase, but if the patient is calm then the pain will be reduced. the midwife encouraged that maternal stage I involved actively in the therapeutic process by identifying the problems of the maternal stage I, provide support, encouragement, approach, recognizing the need and teach to meet the needs of the patient. For example, involve the family to massage the back of the patient and provide cold water compresses to reduce the pain of childbirth. How to midwives so always active listener every time the maternal stage I devote their thoughts is to listen first to what is delivered and understood his conversation. Midwives should also show interest and provide a reaction to verbal or nonverbal, which can encourage the patient to open himself to tell the story. The presence of the obstacles encountered when providing therapeutic communication in patients with stage I during the pandemic, namely the midwife has limitations in carrying out therapeutic communication due to prudence against the transmission of covid-19. However, these barriers can be overcome by asking for help from the family to achieve therapeutic purposes. Pandemic covid-19 resulting in the change of administration effects to the patient. Midwives in providing obstetric care are obliged to wear personal protective equipment for the prevention of infection in caring for the patient. Midwives have difficulty communicating with patients, especially when using a mask KN-95. When providing obstetric care, special attention will be made to assure that the patient can engage and understand what is delivered. During the pandemic, the technology is the method that's most useful to help connect patients and families. Some of the latest technological advances encourage health professionals to consider new and innovative approaches to health services (Dahlia, Massie, & Sari, 2021). This is following the statement of Indirawaty et al., (2017) where among

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the attitudes of midwives and in solving the problem is with the professional in taking such action on the circumstances of the patient's family in the process of childbirth.

The Termination phase, is the last phase of the stages of the therapeutic communication at this stage of the midwife evaluates the results of activities that have been carried out as a basis for the follow-up to come. therefore the activities of the right to change the feeling and memory as well as to evaluate the progress of the client and that goal has been achieved.

Based on the information obtained through in-depth interviews with informants stated that how midwives so that the patient always remember the goals that must be achieved in the therapeutic process is to provide understanding, identify the important points during the discussion or conversation that has been done, trying to close with the patient, remind if you forget. If the patient shows the behavior of resistance is to be patient and slowly remind the patient what will be done, give examples, give attention, give understanding. By observing the state of the patient where the situation became better, cooperative, more confident in the face of labor, more calm and relaxed as well as more show the attitude of the full hope it can give birth with normal is how midwives evaluate the therapeutic communication, maternal stage I. This is following opinion (Sari, 2020) without good communication health services will not be achieved with the maximum and therapeutic Communication aims to reduce the burden on patients and so the condition is better, If the midwife and the patient can establish a good interaction, it will create the atmosphere which is comfortable and relaxing. Where this will have a positive effect on the feelings of the patient so that they can be expressed complaints are perceived with the feeling of calm (Permatasari, 2016).

CONCLUSION

The process of therapeutic communication midwife practice independently on maternal stage in the pandemic Covid-19 done through the 4 phases, namely: phase pre-interaction, orientation, phase of work and termination. The implementation of therapeutic communication by promoting the protocol of health aid delivery during the pandemic. Where midwives being a good listeners, explain slowly what is perceived as the patient will give birth to, give support, confidence, teach relaxation techniques and guide patients to pray so that patients feel comfortable and understand that childbirth is a natural process. By applying therapeutic communication state of the patient became better, cooperative, more confident in the face of labor, more calm and relaxed well as more patients show the attitude of the full hope it can give birth with normal. To improve therapeutic communication services by midwives during the pandemic, it is hoped that further research related to therapeutic communication skills for midwives during the pandemic is expected.

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THE CORRELATION BETWEEN EXCLUSIVE BREASTFEEDING AND WEIGHT LOSS IN LACTATING WOMEN IN THE INDEPENDENT PRACTICE MIDWIFE YUSIDA IN 2020

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ABSTRACT

Exclusive breastfeeding for Palembang in 2018 by 76,5%. This achievement is still below the target of exclusive breastfeeding in Indonesia is 80%. Exclusive breastfeeding is one way to lose weight on a lactating women because the fat reserves in the body are used for the process of breast milk production. The purpose of this study is to determine the effect of Exclusive breastfeeding on weight loss lactating women. The design of this research is using the analytic method with the approach of cross-sectional. The population in this study were all women who have children aged 6-7 months in the independent practice midwife Yusida 2020. The samples were taken by purposive sampling which amounted to 62 people. The results showed that the majority of the sample experienced a weight loss that is of 59.7% and most of the s do not give exclusive breastfeeding as much as 33,9%. In the results of the bivariate analysis, there is a correlation between exclusive breastfeeding with weight loss with the results of the p-value of 0.006. This result supports the world health organization's recommendation of Exclusive breastfeeding for the first 6 months of life to reduce the risk of weight retention or addition of weight gain in postpartum women. It has been known that exclusive breastfeeding is beneficial for infants and mothers, promote breastfeeding as a strategy to promote weight loss is important, because the excess weight in women of reproductive age is a public health problem.

Keywords: Exclusive breastfeeding, Weight Loss

INTRODUCTION

Exclusive breastfeeding is breast milk given to the baby until the age of 6 months without the addition of any food except the drug. Breastfeeding is the right way and healthy to feed the baby. Breast milk is the best food for babies because this is what the babies need. Various nutrients contained in breast milk are very useful for the growth and development of infants as well as can increase the intelligence of the baby. In addition, breast milk also contains antibodies that can prevent the baby from infection so the baby is not easily affected by the disease (1).

In Indonesia, the presentation of exclusive breastfeeding still does not meet the target by the Ministry of health of the Republic of Indonesia is 80%. Based on data from the health center of the Department of Health of the City of Palembang (2018) Sei Selincah health center is a health center with the coverage of exclusive breastfeeding, which already exceeded the target in Palembang in 2018, that amounted to 79.1% (246 of babies exclusively breastfed). Efforts to promote breastfeeding usually include health benefits for mother and child. The body changes as a result of breastfeeding can be a direct benefit. Most women feel that breastfeeding has a positive effect on their body, such as body shape back before pregnancy, health benefits, physical benefits, benefits of eating, and psychological (2).

The benefit for lactating women is weight loss. As we know that the weight during pregnancy increased every month. With breastfeeding can help to reduce body weight, as the information when breastfeeding means the same by burning 200 to 500 calories per day (3).

Women who breastfeed exclusively turns more easily and more quickly return to their weight before the pregnancy. During the pregnancy, weight gain in addition to because there is a fetus also because of the accumulation of fat

in the body. The fat reserves were prepared as a source of energy in the process of breast milk production, by feeding the body will produce more breast milk so fat deposits serve as the backup power will be used. If the fat reserves are reduced, then the weight will be more quickly return to the state before pregnancy (4).

Breastfeeding exclusively can take 500 calories per day (the equivalent of swimming activities 30 rounds or cycling uphill for one hour) so that the lactating women's weight will be reduced naturally (5). Moreover, if the women is breastfeeding exclusively for 6 months and continued at least until the baby is 1 year old. In women who exclusively breastfeed their babies will experience a weight loss of 1-2 kg per month commencing from the weight loss. This is due to women who experienced a reduction of 250 kcal will be taken from the reserves of calories that fat reserves during pregnancy (6). This study will show the influence of Exclusive breastfeeding on weight loss in lactating mothers.

METHODS

The research method used is analytical, with a cross-sectional study design. The variables of this research were exclusive breastfeeding and weight loss. The study population was all women who come to visit the independent practice midwife Yusida who have children aged 6-7 months. The sampling technique is done by the purposive sampling method, the sample is of the population that met the inclusion criteria. The instruments used in this research are the sheet checklist, scales, data of maternal, and KIA book. The respondents of the research were required to fill the sheet approval and the guarantee of the confidentiality of respondent data. The analysis in this research is the analysis of bivariate statistical test chi-square (χ^2) with a significance level of 0.05 using SPSS software 20.0. The research hypothesis is that there is a correlation between exclusive breastfeeding with weight loss in lactating moms.

RESULTS

Variable weight loss is grouped into 2 categories: yes (when experiencing weight loss) and not (if not weight loss). Found that the frequency distribution of the weight loss lactating women from 62 of the majority of respondents experienced a weight loss of 59.7% and who do not experience weight loss as much as 40.3% of.

Table 1. Frequency Distribution Based On The Weight Loss

Weight loss	Frequency	Percentage
Yes	37	59.7
No	25	40.3
Total	62	100

Variables of Exclusive breastfeeding are grouped into 2 categories: yes (when fed exclusively breastfed), and not (if not exclusively breastfed). The results of the univariate analysis of the variables of exclusive breastfeeding can be seen from the table below that the majority of exclusive breastfeeding to 66.1%, and that does not give exclusive breastfeeding only 33.9%.

Table 2. Frequency distribution Based on Exclusive breastfeeding

Exclusively breastfed	Frequency	Percentage
Yes	41	66.1
No	21	33.9
Total	62	100

Bivariate analysis is used to determine the correlation between exclusive breastfeeding with weight loss can be seen from the table below. The results of the study found that of the 41 respondents who give exclusive breastfeeding is 73,2% experience weight loss. While the 21 respondents who were not exclusively breastfed are 66,7% who do not experience weight loss. The results of the Chi-Square test obtained a p-value of $0.006 \leq$ the value of α (0.05), the result show that there is a correlation between exclusive breastfeeding with weight loss in lactating women in the independent practice midwife Yusida 2020. With a value of OR = 5,455 which means that exclusively breastfeeding are at risk of undergoing weight loss 5,455 times compared to women were not exclusively breastfed.

Table 3 the correlation between Exclusive breastfeeding with Weight Loss in Lactating Women

Exclusively breastfed	Weight loss				Total		<i>P P</i> <i>P value</i>
	Yes		No				
	N	%	N	%	N	%	
Yes	30	73,2%	11	26,8%	41	100%	0,006
No	7	33,3%	14	66,7%	21	100%	
Total	37	59,7%	25	40,3%	62	100%	

DISCUSSION

Based on the results of the statistical test shows that there is an influence of exclusive breastfeeding with weight loss in lactating women in the independent practice midwife Yusida 2020. This can occur because of the time the baby sucks the mother's breast, occurring stimuli neurohormonal on the nipple and the areola. These stimuli will be forwarded to the pituitary through the nerve vagus, continue to the anterior lobe, of this lobe will be releasing the prolactin hormone, then enter into the circulation of the blood and to the glands breast milk makers so it will be stimulated to produce breast milk.

The body will take energy from the fat accumulated during pregnancy, especially in the thighs and upper arms, so that the weight of a lactating women will be more rapid return to the original weight. When pregnant, the body gains weight in addition to because there is a fetus also because of the accumulation of fat in the body. The fat reserves it actually was prepared as a source of energy in the process of the production of breast milk. At the time of feeding, the baby does imbibing for 15-25 minutes and the breast milk comes out to about 700-800 ml/day So that by feeding the fat reserves will be reduced by ½ kg (7). A lactating women will produce breast milk for about 750 CC every day. This condition is equivalent to a weight loss of about 200-500 calories per day, so in a week could lose about 0.5 kg (8).

The results of this study are in line with Anggraini's research (2019) show there is a correlation between Exclusive breastfeeding with weight loss postpartum, that women who breastfeed exclusively have the risk of 4,783 times decreased weight compared with women who did not breastfeed exclusively. The average weight loss of as much as 1.1 kg in the group of exclusive breastfeeding and as much as 0.4 kg in the group of breast milk is not exclusive (6).

Exclusive breastfeeding for at least 3 months resulted in weight loss of 3.2 pounds greater than 12 months postpartum (Jarlenski et al., 2014).

Different research conducted by Cahyati (2019), which shows a total of 43 women postpartum (71,7%) exclusive breastfeeding, 43 postpartum women (81,7%) experienced weight gain after breastfeeding exclusively. The results of the chi-square Test showed no correlation (p -value = 0,279) between exclusive breastfeeding with weight changes in postpartum women in the working area of Cipageran Cimahi Public health center.

One of the benefits of lactating women can lose weight because it can burn calories by 200-500 calories per day. Then the necessary nutrients is about 640-700 kcal/day. In the conditions of a healthy women can produce breast milk average of 850 ml/day, therefore, the women takes the energy of 750 kcal. Breastfeeding requires energy and the body will take it from the fat accumulated during pregnancy. Thus began loss breastfeeding will make faster down to the weight before pregnancy. With breastfeeding without realizing women are doing a diet because during lactation occurred fat burning naturally. Weight loss ranged from half to one kilogram per month provided with meal planning right (4).

The lactating woman who gives exclusive breastfeeding decreased the percentage of body fat by 31.8% and a mother who experienced a rise in body fat percentage as of 18.2%. On the contrary on the mother who does not give exclusive breastfeeding increased body fat percentage by 43.2% and women who experienced a decrease in body fat percentage as much as 6.8 percent (M. Repertoire, 2019).

Women who plan to breastfeed or are breastfeeding should be given realistic advice and improve the health of changes in body weight during lactation, should be informed that is normal to lose weight during the first 6 months of lactation. The monthly rate average weight loss is 0.5-1 kg after the first month of postpartum. Other research shows that lactating women for at least 6 months postpartum may lose weight faster than those who lactating for shorter periods and not lactating. (Laura N haik)

Important to be clarified, that the weight loss observed in this study can be attributed to the lower energy consumption based on the recommendations for women who are breastfeeding exclusively. Weight loss is greater during the period of postpartum is on women who have a diet low in energy and more physical activity. Several variables affect the recovery of body weight before pregnancy, age is not a determinant of weight change during the postpartum period. Women who have excess weight or obesity also showed a tendency to decrease body weight (12).

Weight gain or weight loss during breastfeeding is not a phenomenon that is not unexpected. Decreased levels of leptin after birth and the increased prolactin in early lactation are associated with increased energy intake, changes in the sensitivity of insulin and estrogen are also consistent with increased appetite and energy-saving during breastfeeding. Women who are overweight before pregnancy maintain a weight of about 7 kg after pregnancy, regardless of the duration of breastfeeding. Thus the change of weight of the women is related to breastfeeding at least in women with normal weight, and for women who are overweight during pregnancy is not reduced with breastfeeding (13).

According to the assumptions of the researcher, the influence of exclusive breastfeeding with weight loss in lactating women in the independent practice midwife Yusida is because lactating women will require more energy. This energy is taken from the reserve fat stored during pregnancy, then used as energy in the production of breast milk. So at the time of the lactating women, the fat will shrink so that the lactating women will reduce their weight.

CONCLUSION

The results of the bivariate analysis showed 41 respondents give exclusive breastfeeding and weight loss that 73,2% while 21 respondents who were not exclusively breastfed and did not experience weight loss that 66,7. The results of this study showed there is influence of exclusive breastfeeding with weight loss in lactating women in the independent practice midwife yusida 2020 with a p-value (0.006 to) < 0,05.

This result supports the world health organization's recommendation of Exclusive breastfeeding for the first 6 months of life to reduce the risk of weight retention or addition of weight gain in women postpartum. It has been known that exclusive breastfeeding is beneficial for infants and mothers, promote breastfeeding as a strategy to promote weight loss is important, because the excess weight in women of reproductive age is a public health problem.

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**THE INFLUENCE OF COUNSELING ON THE LEVEL OF KNOWLEDGE AND
ATTITUDE OF MOTHERS ABOUT CHILD DEVELOPMENT IN THE TALANG
JAMBE VILLAGE PALEMBANG**

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ABSTRACT

Growth is still a serious problem in developing countries. In Indonesia in the year 2016, approximately 56.4% had growth disorders in children aged under five years.¹ If the detection of growth the child has a delay, then it can lead to deviations in the child that is hard to repair. One of the factors that affect the growth of children is the knowledge and attitude of parents.² this Study aims to assess the Influence of Counseling On the Level of Knowledge and attitude of Mothers about Child development in Talang Jambe Village, Palembang. The research method used quasi-experiment with research design nonequivalent control group design.^{3,4} this Study using 30 samples in the control group and the treatment. The technique of determining the sample in the treatment group in this research is a nonprobability sampling method with accidental sampling. Data analysis used is a statistical test of Wilcoxon with a significance level of 0.05. The results of the statistical test, there is the influence of counseling sprouting up against the knowledge of mothers (p value= <0.001), and there is also the influence of counseling grow flowers against the attitude of the mothers in the treatment group (p value= <0,001). Conclusion suggestions researchers to carry out activities health education regularly, especially regarding the growth of the child to increase the knowledge of the mother.

Keywords: Counseling, knowledge, attitudes, growth

INTRODUCTION

Growth is still a serious problem in developing countries. in Indonesia in the year 2016, approximately 56.4% had growth disorders in children aged under five years.¹ If the detection of growth in the child has a delay, then it can lead to deviations in the child that is hard to repair. One of the factors that affect the growth of children is the knowledge of the parents especially the mother. Parents are one of the most important things in the process of early detection of child development.² Knowledge of the parents is needed so that the parents can do a screening to detect early. the majority of parents do not understand this, especially parents who have low motivation in stimulating the child following the age of development.⁵ Behaviors that arise because there are still many parents who assume that provide stimulation in children with itself will be owned when the time comes, whereas knowledge about the stimulation should be understood correctly by each parent.⁶ A mother should know about the stages of child development and stimulation to a child's development to be optimal.⁷ Knowledge is a very important thing that can affect the attitude of the mother towards the child's growth.⁸

The impact of lack of knowledge of mothers about the growth on his son is very unfortunate because if the child has impaired growth and slow development realized by the parents, can have an impact on the growth and development of children in a sustainable manner such as down syndrome, language disorders, disorders of intelligence.⁹ But it can be prevented by providing counseling child development in the mother.¹⁰ With the mother's knowledge about growth in children is considered very important, then you need counseling, given counseling child's growth is expected to improve the understanding and attitude of mothers towards toddlers about the growth on his son.¹¹ Counseling are some of the experiences that influence is favorable to the habits attitudes and knowledge that has to do with the health of every person, community, and nation, especially in the toddler age is the golden age (the Golden Period), which at this time parenting and guidance of parents is crucial in terms of development and growth in children.^{12,13}

Based on the description above, the researcher is interested to research the Influence of Counseling On the Level of Knowledge and attitude of Mothers about Child development in Talang Jambe Village, Palembang

METHODS

The research method used quasi-experiment with research design nonequivalent control group design. This study used 30 samples in the control group and the treatment. The technique of determining the sample in the treatment group in this research is a nonprobability sampling method with accidental sampling. The instrument used in this research is a questionnaire. Data analysis used is a statistical test of Wilcoxon with a significance level of 0.05. The population in this study were all mothers who have children aged 0-6 years. that as many as 88 people. The sample in this study of 30 mothers who had 2 toddlers as the treatment group and 30 mothers that have a toddler in the control group. Sampling technique in the treatment group, namely with nonprobability sampling method with accidental sampling, which is the mother of a toddler who comes to a village in Talang Jambe Palembang. Whereas in the control group, namely the mothers who have children who visit Integrated Healthcare Centertoddler and didn't get counseling to grow. The technique of data analysis using the Wilcoxon test with a degree of error of 5%.

RESULTS

Table 1.1 shows that the frequency distribution of level of knowledge of Mothers in the treatment group before counseling about the growth the most in the category enough that as much as 80%. While in the after counseling growth category is quite increased to 83.3%. This means an increase of knowledge of mothers about growth after counseling.

Table 1.1
The frequency distribution of knowledge about the growth in the treatment group (n=30)

mother's knowledge	counseling about growth			
	before		after	
	N	%	n	%
Less	1	3	0	0
Enough	2	8	2	8
	4	0	5	3
Good	5	1	5	1
		6		6
		7		7

Table 1.2 shows that the frequency distribution of level of knowledge of mothers in the control group at the time before counseling about the growth the most in the category enough that as many as 70% and the category is the category of less that is a 13.3%. Then at the time after the counseling category increased, namely in the category enough to be 86,7%. In the control group the knowledge of the mother increased, this happens because the toddler's mother get the intervention of the researcher. So the knowledge of mothers on the growth and development increased.

Table 1.2
The frequency distribution of knowledge about the growth in the control group (n=30)

mother's knowledge	counseling about growth			
	before		after	
	N	%	n	%
Less	4	13.3	0	0
Enough	2	70	2	86.7
Good	1		7	
	5	16.7	3	13.7

Table 1.3 shows that the frequency distribution of the attitude of the mothers in the treatment group at the time before the counseling category quite as much as 86,7%. Whereas in a moment after counseling about the growth, the attitude of the mother increased by as much as 13.3 percent. Then at the time after the counseling, both categories increased to 53%. This shows that the attitude of the mother's children in the treatment group increased after doing counseling about growth

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Table 1.3

The frequency distribution of the attitude of the Mothers in the Treatment group (n=30)

mother's attitude	counseling about growth			
	before		After	
	N	%	n	%
Enough	2	86.7	1	46.7
	6		4	
Good	4	13.3	1	53
			6	

Table 1.4 shows the results of the frequency distribution of the attitude of the mothers in the control group at the time before the counseling, that is in the category enough of 86,7% while in the good category of 13.3%. Then in a moment after counseling in both categories increased to 26.7%. These results indicate that the Integrated Healthcare Center cadres also affect the attitude of the mother that has a toddler to make the value of the attitude of the mother to be increased.

Table 1.4

Distribution of the frequency of the attitude of the Mothers in the Control group (n=30)

Mother's attitude	counseling about growth			
	before		before	
	N	%	n	%
Enough	2	86.7	2	73.3
	6		2	
Good	4	13.3	8	26.7

Table 1.5 shows that the average value of the knowledge of the mother while before counseling about the growth that 71,6 and increased to 74,63 there's a moment after counseling about growing up. In table 1.5 also showed no effect counseling about the growth of knowledge of mothers about growth in the treatment group with a p-value <0,00. Whereas in the control group the average value of the knowledge of the mother of 70,44 at the time of the beginning of the measurement and be 72,37 at the end of the measurement. In table 1.5 also shows that there is no difference in knowledge of mothers in the control group with a p-value of 0,229.

Table 1.5 also shows that the average value of the attitude of the mothers in the treatment group while before counseling about the growth that 75,15 and when after counseling about the growth be 80,30. The table also shows that there is an influence of counseling on growth against the attitude of the mother with a p-value <0,001. Whereas in the control group the average value of the attitude of the mother at the beginning of the research was 69,33 and increased to 71,47 at the time of the end of the study.

Table 1.5
the influence of counseling on growth against the mother's knowledge and attitude of the mother to child development

Mother's knowledge (n=30)	Average	SD	P value
Treatment			
Before counseling	71.16	7.43	<0.001
After counseling	74.63	4.85	
Control			
Before counseling	70.44	10.22	0.2229
After counseling	72.37	5.83	
Mother's attituded (n=30)			
Treatment			
Before counseling	75.15	7.07	<0.001
After counseling	80.30	4.85	
Control			
Before counseling	69.33	9.41	0.038
After counseling	71.47	6.02	

DISCUSSION

The role of parents in nurturing and fostering child development from an early age (0-6 years) or the golden period is very important and strategic to prepare the quality of human resources in the future. The approach to the family of toddlers is through the education of parents, especially mothers and other family members. Family counseling for toddlers can continuously instill in parents to pay attention to the development of children comprehensively, namely being able to care for, nurture, and educate their children in the right way, so that these children can grow and develop into family pride as expected.

Counseling for Toddler Families is one of the media for health services. Counseling aims to increase knowledge about the awareness of mothers and other family members about the importance of the process of growth and development of toddlers and improve the skills of mothers and other family members in seeking optimal child development.

Based on the results of the statistical test shows that there is an influence of counseling on the growth of the child against the knowledge of mothers in the treatment group in Talang Jambe Village, Palembang. This suggests that counseling about the growth and development conducted by the Integrated Healthcare Center cadres influential improves the knowledge of the mother. So show a significant difference between the knowledge of mothers before and after counseling about the growth. While Based on the results of statistical tests using the Wilcoxon show that there is no difference in the level of knowledge of mothers about the growth on the measurement of the initial and final measurements in the control group in Talang Jambe Village, Palembang. Although there was no difference in knowledge of mothers in the control group in some mothers experience an increase in value.

The increase that occurs in some of the samples in the control group caused some mothers to claim to have received information from the Integrated Healthcare Center cadres. Integrated Healthcare Center cadres to be a source of information for moms of toddlers who did not receive treatment in the form of counseling about the growth in Talang Jambe Village, but the increase that occurred was not too significant. The results of this study were influenced by the level of mother's knowledge that the majority (60%) at the high school level. Then there is also a college graduate. While the level of education that is most low is a Junior high school. With the knowledge and understanding, it will be easy to receive all information, especially all the requirements needed for the child to be able to develop optimally. Such information includes how the attitude of the mother in providing parental care to the child, keep the child's health and stimulate the development of the child. Knowledge and a good understanding are obtained from a good education through the process and certain methods so that mothers acquire the knowledge, understanding, and attitudes following the needs.¹⁴

The results of this study are in line with research Windiyati mention that There is the influence of nutrition counseling against the knowledge of mothers in the provision of complementary feeding in North Matan Hilir Village, Ketapang in 2010 (p-value = 0,0001 t = 13,051) and there is the influence of nutrition counseling against the attitude of the mother in the provision of complementary feeding in North Matan Hilir Village, Ketapang in 2010 (p-value = 0,0001 t = 4,893).¹⁵

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CONCLUSION

The results of this study show the influence of counseling on growth against the knowledge of mothers in the treatment group in Talang Jambe Village with a p-value $(0,000) < 0,05$. And there is the influence of counseling on growth against the attitude of the mothers in the treatment group in Talang Jambe Village, Palembang was with p-value $(0,000) < 0,05$. In the control group statistical test results obtained a p-value of $(0,229) > 0,05$, which means that there is no difference of knowledge at the beginning of the study and the end of the study. Whereas in the control group, statistical test results obtained p-value (of 0.038) $< 0,05$ means that there is a difference in the attitude of the mother at the beginning of the measurement and the final measurement.

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Relationship of Dietary Abstinence and Healing Time for *Sectio Caesarea* Wounds (A Systematic Review Approach)

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ABSTRACT

The myth of dietary abstinence is believed by certain groups of people. They believe if they do not have dietary abstinence the wound will not heal soon. This study aims to see the relations between dietary abstinence and the duration of *sectio caesarea* wounds. The study was conducted by having a systematic review approach and the article selection conducted through the google scholar database, EBSCO, Proquest, Oxford based on the criteria related to the published dietary abstinence and the duration of *sectio caesarea* wounds. The journals were published from 2015 to 2020. Ethical clearance at STIKES Mitra Adiguna. The results of the study showed that 10 journals wrote that the duration of wound healing was influenced by nutrition. Good nutrition for the wound healing is fat, protein, carbohydrates, vitamin A, zinc and vitamin C. The conclusion is dietary abstinence done by post *sectio caesarea* mothers will inhibit the *sectio caesarea* wound healing process.

Keywords: Dietary Abstinence, Wound Healing, *Sectio Caesarea*

INTRODUCTION

Sectio caesarea is a childbirth in which the fetus is born through an incision of the front wall of the abdomen and uterine wall based on the condition that the uterus is intact and the fetal weight is above 4000 grams. Medical technology advances, especially in the childbirth method, obviously bring great benefits to the safety of mothers and babies and facilitate the childbirth process. *Sectio caesarea* is the expulsion of the fetus through an incision in the abdominal wall (*laparotomy*) and uterine wall (*hysterectomy*). (Desi Ratna Sari 2019)

According to the World Health Organization (WHO) the caesarean section surgery increased 5 times of the previous year which ranged from 5-15% per 1000 births in the world. The countries having the biggest number of *sectio caesarea* happenings were Brazil (52%), Cyprus (51%), and Mexico (39%). Based on the Indonesian Health Demographic Survey (IHDS) the number of *sectio caesarea* childbirth was at 17% of the nationally total childbirth. (Yuli Suryanti 2020) The description of the presence of maternal risk factors during *sectio caesarea* childbirth was 13.4% due to premature rupture of the membranes; 5.49% due to preeclampsia; 5.14% due to bleeding; 4.40% fetal position abnormalities; 4.25% due to closed birth canal; 2.3% due to a torn uterus. (Viandika and Septiasari 2020)

Wound healing normally requires proper nutrition because the physiological process of wound healing depends on the availability of protein, vitamins (especially vitamins A and C) and minerals. Collagen is a protein formed of amino acids obtained by fibroblasts taken from ingested protein. Vitamin C is needed to synthesize the collagen. Vitamin A will reduce the negative effects of steroids on wound healing. Trace element of zinc is needed for the epithelium formation, synthesis of collagen (zinc) and the unification of collagen fibers. (Roselita 2017)

Nutrition is the main need that must be fulfilled and it must pay special attention, especially for postpartum mothers who remain having perineal wounds and *sectio cesarea* wounds. The main to be considered in nutrition is not only related to the amount of food consumed but also the nutrients contained in it. The nutrition is possibly provided through the food eaten, frequency, and feeding schedule. Substances that contain various nutrients needed by the body are usually contained in fish, eggs, meat and so on. Breastfeeding mothers usually need more nutrition because apart from being used for the healing process they are also to produce breast milk for their babies. (Tetti Solehati 2020)

Dietary abstinence is an individual behavior not to consume certain types of food because of cultural prohibitions passed down from generation to generation. (Deni Imam 2019) There are myths on certain foods that remain being shared by certain groups in the society, especially in relation with breastfeeding. The myths say that if the mothers do not avoid the food they will have festering wound. It is believed that the wound becomes wet and itchy and the breast milk will smell fishy though this belief is detrimental to society. (Yanti 2019) Based on the description above the relationship of dietary abstinence and healing time for *sectio caesarea* wounds. This can be due to

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several factors including the lack of maternal knowledge about the benefits of nutrition, and there are still many prohibitions on certain foods that are culturally acquired for generations.

RESEARCH METHODS

Article searching was conducted through databases, namely Google Scholar, EBSCO, Proquest, Oxford based on the research criteria of relations between dietary abstinence and duration of *sectio caesarea* wound healing. The articles were in the journals published from 2015 to 2020. The searching was conducted in February 09-10, 2021 using keywords dietary abstinence, duration of wound healing and *sectio caesarea* that met the inclusion and exclusion criteria. Articles that have been found later in synthesis and analyzed according to the criteria of inclusion and exclusion.

The inclusion criteria in this systematic review are:

Journal on the relationship of abstinence to the long healing wounds of Sectio Caesarea published through google scholar website.

Journals published from 2015 to 2020.

Full-text journal includes abstracts, introductions, research methods, research and discussion results, as well as conclusions and suggestions.

The exclusion criteria in this systematic review are:

Unpublished journals

Journals only display abstracts

Journals cannot be downloaded or paid

This research method used a systematic review approach with Preferred Reporting Items For Systematic Reviews and Metaanalyses (PRISMA).

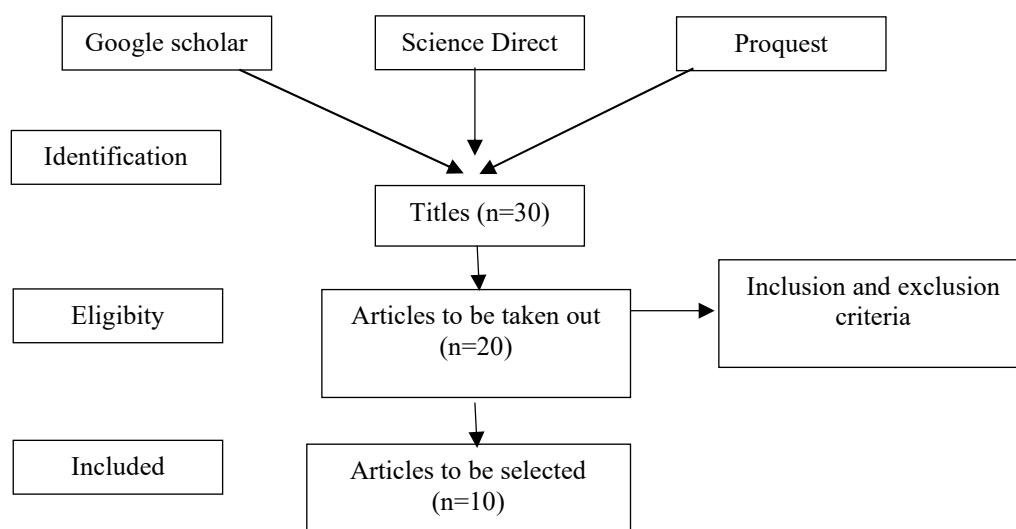


Figure 1. Flow diagram of article selection

RESULTS

In the article searching 30 articles were found and they were then screened by implementing inclusion and exclusion criteria and finally 10 articles of 10 journals that matched to the research criteria were obtained.

Research title	Method (Design and Sample)	Analysis and Results
The Relationship of Dietary Pattern and Post Sectio Caesarea Surgery Wound Healing at dr. Soewondo Regional Hospital of Kendal (Siti Nur Hidayati 2016)	The sampling technique was accidental sampling, the samples were 30 postpartum mothers Sectio Caesarea	Fisher's Exact Test showed that there was a significant relationship between dietary habits and sectio caesarea post op wound healing (p value=0.023). Nutritious food, appropriate portions and not dietary abstinence will make the mothers healthy and fresh and will speed up the post-surgery wound healing period
The Relationship of Protein Intake and Breast Milk Adequacy of the Patients of Post Sectio Caesaria Surgery at Pringsewu Regional Hospital (Yanti 2019)	Analytical method with a cross sectional approach, with a sample of 45 respondents meeting the inclusion criteria	The instruments in this study used Food Frequency Questional (FFQ) sheets and checklist sheets. This study recommends families not to do dietary abstinence, especially protein derived from animal sources for post <i>sectio caesarea</i> surgery mothers
The Influence of Postpartum Maternal Nutritional Status to Post Partum Wound Healing of Sectio Caesaria (Maesaroh, 2019)	This type of research is descriptive analytical with a cross sectional approach, a sample used by 25 respondents post sectio caesarea mothers.	There is a significant effect of postpartum maternal nutritional status to wound healing after <i>Sectio Caesaria</i> at Permata Bunda Hospital of Ciamis in 2018; p -value of 0.038
The Relationship between the Knowledge of Postpartum Mothers on Balanced Nutrition Food and Perineal Wound Healing (Jaelani, 2017)	Observational analytics with a crossectional approach. The sample number is 60 people.	There is a significant relationship between postpartum mother's knowledge on balanced nutrition and perineal wound healing; p -value <0.05 and p -value=0.038.
The Relationship between Mother's Knowledge, Nutritional Patterns and Maternal Allergy History and the Wound of Sectio Cesarean Surgery at Siloam Hospital Purwakarta (Dewi Kurniati 2017)	Analytical research with case control design, with a sample of 31 maternal maternal operative Sectio Caesarea	There is a significant relationship between maternal nutritional intake and wound healing
The Relationship between Nutritional Status and Wound Healing Process Post Sectio Caesarea at Obstetrics Clinic of Jombang Regional Hospital (Roselita, 2017)	Retrospective Correlation Analytics, with a sample of 35 people	Good nutritional status that pays attention to the wound healing process of post <i>sectio caesarea</i> while still paying attention to nutritional status
The Influence of Nutritional Status to the Duration of Wound Healing Process Post Sectio Caesarea at Dahlia Room of dr. R. Soedjati Regional Hospital of Purwodadi (Sahara 2017)	This type of research was an observational study, with 35 respondents to post Sectio Caesarea mothers.	Linear Regression test results obtained a significance value of $p = 0.000$ thus $p < 0.05$. There is an influence of nutritional status to the duration of wound healing process of Sectio Caesarea at Dahlia Room of dr. R. Soedjati Hospital of Purwodadi
Factors Affecting Wound Healing of Post Sectio Caesarea Surgery in Pnc Room of the Regional Hospital of Labuang Baji	Descriptive method of analytics, based on purposive sampling of 38 post sectio caesarea maternal respondents	Pearson Chi-Square SPSS version 16.0, obtained the value $p = 0.001$ for nutrition, the value $p = 0.001$ for mobilization, the value $p = 0.004$ with for the cleanliness of the wound. There is a relationship between nutrition, mobilization and wound

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		hygiene of the respondents and the wound healing after Sectio Caesarea.
The Effect of Steamed Egg White Consumption to the Post Sectio Caesarea Healing (Lia Dharmayanti 2019)	Pre-experiment design with static type group comparasion. With a sample of 20 respondents	Analyze the data using the chi square test. The results of the data analysis found that there was an influence of consumption of steamed egg whites on the healing of post Sectio Caesarea stitch wounds in the Maternity Home of Pasuruan City' Mother Bertha. Consumption of steamed egg whites is effective in shortening wound healing time after Sectio Caesarea.
The Effectiveness of Nutrient Intake, High Protein for Wound Healing Process of Post Sectio Caesarea at dr. Zaenal Abidin Regional Hospital of Banda Aceh (Darmawati 2019)	Experimental with post test intervention design. With a sample of 30 respondents post Mother Sectio Caesarea.	By using the spearmen rank correlation statistical test with a significant standard of 0.05 with a computerized SPSS program. There was a significant difference of the wound healing after <i>sectio caesarea</i> between the intervention group (46.7%) and the control group (6.7%) (0.000)

DISCUSSION

From some of the literature above concluded that there is a relationship of abstinence to the length of wound healing Sectio Caesarea. From the results of the study there are 10 journals related to the research topic, namely the relationship of abstinence from eating to the length of wound healing Sectio Caesarea which was reviewed there were differences in methods and samples. And Mother post partum is expected to further improve the quality of knowledge about post Sectio Caesarea wound healing. It is recommended for health workers to be able to provide understanding or explanation to the mother post surgery Sectio Caesarea to meet their nutritional needs because it will affect the healing process of sectio caesarea wounds.

Complications that can occur shortly after Sectio Caesarea surgery are infections that are widely referred to as postoperative morbidity. Approximately 90% of postoperative morbidity is caused by infection (infection of the uterus or endometritis, urinating tools, and surgical wounds). This contributes to an increase in maternal mortality (AKI). (Siti Nur Hidayati 2016) Women have Sectio Caesarea surgery will have a risk (5%-20%) of vaginal health-related infections, and the occurrence of complications of infection after undergoing Sectio Caesarea surgery is substantial and important, because it causes maternal morbidity. (Wulan Anggraeni 2019)

Normal wound healing requires proper nutrition, as the physiological process of wound healing depends on the availability of proteins, vitamins (especially vitamins A and C) and minerals. Collagen is a protein formed from amino acids that fibroblasts obtain from the proteins eaten. Vitamin C is needed to synthesize collagen. Vitamin A can reduce the negative effects of steroids on wound healing. Zinc trace elements are necessary for epithelial formation, collagen synthesis (zinc) and uniting collagen fibers. (Roselita 2017)

Post-surgery body needs proper nutrition for the wound healing process. Good nutrition for the wound healing process is fat, protein, carbohydrates, vitamin A, zinc and vitamin C. The nutrition will play an important role in the wound healing process, wound healing duration, wound tissue strengthening and to prevent the infection. (Hartini 2015) Wound healing normally requires proper nutrition because the physiological process of wound healing depends on the availability of protein, vitamins (especially vitamins A and C) and minerals.

Nutrition is the main need that must be fulfilled and it must pay special attention, especially for postpartum mothers who remain having perineal wounds and *sectio cesarea* wounds. The main to be considered in nutrition is not only related to the amount of food consumed but also the nutrients contained in it. The nutrition is possibly provided through the food eaten, frequency, and feeding schedule. Substances that contain various nutrients needed by the body are usually contained in fish, eggs, meat and so on. Breastfeeding mothers usually need more nutrition because apart from being used for the healing process they are also to produce breast milk for their babies. (Tetti Solehati 2020)

Adult women need calory 2200 kcal while breastfeeding mothers need an additional 700 kcal for the first 6 months after giving birth (Tetti Solehati 2020) Post *sectio caesarea* mothers having dietary abstinence will experience

nutritional decrease so that the food consumed should contain protein, lots of fluids, vegetables and fruits. Mothers whose nutrition is sufficient but remain following dietary abstinence custom as taught by their parents will have less good wound healing process meaning the wound healing process will be slower. Meanwhile, post *sectio caesarea* mothers whose nutrition is quite good the wound healing process will be faster (Siti Nur Hidayati 2016). Dietary abstinence itself is an individual behavior not to consume certain types of food because there are cultural prohibitions that have been passed down from generation to generation. Certain groups of society usually have myths about certain foods which are prohibited in relation to breastfeeding. There is still an assumption or belief that if a mother does not abstain from certain food she will have festering wounds beside the wounds will become wet and itchy. The breast milk will even smell fishy. Although this belief is detrimental to society it remains. (Yanti 2019) Dietary abstinence is influenced by several factors, including the mother's lack of knowledge about the benefits of nutrition and cultural prohibitions to consume certain foods that are still passed down from generation to generation.

CONCLUSION

The balanced nutritional status of postpartum mothers greatly influences the wound healing process. Nutritional status is the state of the body as a result of food consumption and nutritional intake. This nutrient serves to help the metabolic process, maintenance and creation of new tissue. (Jaelani 2017) Nutritional status is also a picture of the balance between the body's need for nutrients in order to maintain the normal body functions and to produce energy beside to get other nutrients intake. Post-surgery the body needs nutrients to help maintain health and wound healing and the nutrients will be obtained from foods containing protein, carbohydrates and fats. Nutrients can be obtained from various food sources both animal and vegetable.

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**Loving Breastfeeding for Mother on Puerperium Periode
(An android-based educational media application)**

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ABSTRACT

The Reports in 2019 of exclusive breastfeeding in Ciamis is about 46.0% with the target of national is 50%. The low report is caused by the lack of knowledge of breastfeeding techniques. One of the efforts that can be done with innovations is using audiovisual based on Android applications. The purpose of the study was to determine the feasibility of Android-based Loving Breasfeeding. This study uses research and development methods which consists of 10 stages. Sampling used purposive sampling with a total of 60 people who were included in the small group trial phase of 8 people and the large group trial of 52 people. Data analysis used quantitative and qualitative. The result of this study is an android-based application which contains material about exclusive breastfeeding, breastfeeding techniques and breastfeeding videos. The material expert's assessment has a value of 71.5% including the appropriate category. The media expert's assessment of 87% is in the very decent category. The results of the small group trial of 94% are included in the very feasible category. The results of the large group trial of 94% were included in the very feasible category. The final result of this application uploaded in the google play store.

Keywords: Android Application; Exclusive breastfeeding; Mother in postpartum periode

INTRODUCTION

Puerperium is the period that begins after the birth of the placenta and will end when the uterus returns to its normal state which lasts for 42 days after delivery. This period will also be the start of a mother breastfeeding her baby where milk begins to be produced by the mother's breast. and functions to secrete breast milk (ASI). (Kusumastuti, Qomar, and Mutoharoh, 2017). Breast milk is the best food for babies because it contains many substances and protective factors that are important for the growth and development of babies which are given exclusively for the first 6 months of life and continued for two years (Mayasari, Astutui, Rukhuwa, 2020).

The reports of infants who were exclusively breastfed in Indonesia in 2019 was 67.74%, this figure has exceeded the 2019 Strategic Plan target of 50% (Healthy Profile of Ministry of Health, 2020) West Java Province occupies the 20th position with a coverage of 63.35% and Ciamis Regency occupies the second lowest position in the coverage of exclusive breastfeeding, which is 46.0% (West Java Health Office, 2020) which is not in accordance with the 2019 Strategic Plan target. This is due to many factors, one of which is a lack of knowledge about breastfeeding techniques. Knowledge is the basis for developing one's way of thinking which in turn provides changes to one's attitudes and behavior in taking action. The ability of mothers to breastfeed correctly strongly supports the success of mothers in breastfeeding with the correct technique. Then there is a difference in the ability of postpartum mothers to breastfeed between before and after being given health education about breastfeeding techniques with a p-value of 0.001. (Astuti, Anggarawati, 2020)

If the mother breastfeeds with the wrong technique, it will cause problems such as sore nipples, the milk that comes out is not optimal so that the mother is reluctant to breastfeed her baby and the baby's milk needs are not fulfilled. This situation shows that there are still many postpartum mothers who have not been able to use the correct technique, to achieve the success of exclusive breastfeeding, it is necessary to provide knowledge about correct breastfeeding techniques so that mothers can carry out correct breastfeeding actions and provide adequate breastfeeding for babies (wardiyah A, Puspitasari R, Susmarini N, 2019).

One way to provide knowledge or information about breastfeeding techniques is to provide counseling through alternative media that is audiovisual. At the beginning of 2020, the Corona Virus spread in Indonesia, even in the world. The existence of a pandemic has resulted in the community being given social distancing advice to avoid and break the chain of the spread of COVID-19. With this social distancing, access to essential services as well as

health promotion in hospitals, health clinics or home visits will be disrupted. (Ministry of Health RI, 15 June 2020) Meanwhile, experts agree that breastfeeding mothers should still breastfeed during the COVID-19 pandemic because there is immunological protection in breast milk to protect infants and toddlers from various diseases, including during the COVID-19 outbreak. (Ministry of Health. RI, July 13, 2020). Therefore, to overcome the limitations in the current conditions, there are innovative alternative options such as mobile phone applications, telemedicine, and other digital platforms, with health applications that can be easily accessed via smartphones or tablets based on Android, which can be a choice of health promotion media for health workers to clients (Wibowo B, 2020). Android is a popular mobile operating system and provides an open platform for application developers and can be used by various mobile devices (Efendi Y, 2018). According to Kominfo, there are approximately 103 million active smartphone users in Indonesia (Rahmayani I, 2018). Then one study stated that the use of technology in the health sector can increase public knowledge about health information quickly (Yani A, 2018).

The results of a preliminary study in Cieurih Village, Cikupa District, obtained data on the coverage of exclusive breastfeeding of 44.7% (Ciamis District Health Office, 2020). The results of interviews with 10 postpartum mothers for the first 3 days to 3 months who already had a smartphone in October 2020 obtained data through questions given, namely 8 out of 10 postpartum mothers did not know and did not get information about breastfeeding techniques.

By using this android-based application, it is hoped that postpartum mothers can know about breastfeeding techniques and the importance of exclusive breastfeeding. Then here the midwife has an important role to provide midwifery care that focuses on women (woman center care) in a sustainable manner. In this case the form of implementation is by empowering postpartum mothers so that they can maintain their health independently, and also this application can be a participatory medium so that women can form concern for their lives, especially regarding exclusive breastfeeding. Based on the background that has been presented, the researcher is interested in conducting a research entitled " Loving Breastfeeding for Mother on Purperium Periode (Media Education Of Application Based on Android)"

METHODS

In this study using the Research and Development (R&D) method. This method has ten Steps in its completion which are useful for producing the product and testing the effectiveness of the product. This research was conducted in October 2020-February 2021 at the Cieurih Health Center, Ciamis Regency. The population in this study were 60 postpartum mothers for the first 3 days to 3 months. The sample used purposive sampling technique and was taken based on the inclusion and exclusion criteria. The sample was taken from 60 postpartum mothers divided by 2 for a small-scale trial of 8 people and a large-scale trial of 52 people (Arikunto, 2010). Data analysis using quantitative data obtained from questionnaires in the form of a feasibility assessment score (Likert scale) and qualitative data obtained from suggestions. The research instrument uses the Loving Breastfeeding application and validation questionnaires by material experts, media experts and postpartum mothers (Sugiyono, 2016). This research has received approval from the Health Research Ethics Committee and is declared ethically compliant with Certificate No.044/kepk-bth/III /2021.

RESULTS

This android-based Loving Breastfeeding application contains breastfeeding techniques that have passed validation by two material experts and one media expert. Furthermore, trials were conducted on small and large groups by postpartum mothers. This is done to find out the weaknesses and strengths of this application. Assessment of the Loving Breastfeeding application uses a questionnaire that has 10 questions with a rating scale using a Likert scale, namely 1-5 1 = very unfeasible, 2 = not feasible, 3 = quite feasible, 4 feasible, 5 = very feasible with a total score of 50 points.

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Tabel 1 Android-Based Educational Media Validation Results by Material Experts

No	The Aspect rated	Material Expert I		Material Expert II	
		Revision I	Revision II	Revision I	Revision II
1	Material equipment	3	4	4	4
2	Material breadth	2	4	4	4
3	Material depth	3	4	4	4
4	Suitability of media and materials	4	4	4	4
5	Concept and definition accuracy	2	4	4	4
6	Image and material accuracy	2	4	3	4
7	Accuracy of terms	3	4	3	4
8	Ease of understanding the language	3	4	4	4
9	Encourage curiosity	3	3	3	4
10	Creating the ability to ask questions	3	3	4	4
Amount		28	38	37	40
Average		2.8	3.8	3.7	4
Presenting ASI		56	76	74	80
Category		Decent enough	Worthy	Worthy	Worthy

Based on table 1, the results from the two material experts are 35.75 out of a total score of 50, if the percentage is 71.5%. So based on the Likert assessment score, the material in educational media is included in the appropriate category without revision..

Tabel 2 Android-Based Educational Media Validation Results by Media Expert

No	The Aspect rated	Media Expert	
		Revision I	Revision II
1	Input, button, and <i>output</i> layout <i>t</i>	4	4
2	Compatibility of <i>background</i> selection (<i>skins</i>)	5	5
3	The suitability of the selection of font size and type	5	5
4	Color Match	5	5
5	The attractiveness of the display button (<i>button</i>)	4	5
6	Regularity and consistency of the appearance of the button (<i>button</i>)	2	5
7	<i>Button</i> reaction constancy (<i>button</i>)	3	4
8	Ease of use of the program	5	4
9	Ease of choosing the program menu	4	4
10	Ease of entering and exiting the program	5	4
Amount		42	45
Average		4.2	4.5
Presentation		84	90
Category		Very Worthy	Very Worthy

Based on table 2, the results of the two media expert validation results have an average value of 4.35 out of a total score of 50, if the percentage is 87%. Based on the feasibility assessment on the Likert score, the media in educational media is included in the very feasible category

Tabel 3 Android-Based Educational Media Validation Results by Mother in Purperium

No	Responden	Result of questioner of respondents										Amount	Presentation (%)	Category
		1	2	3	4	5	6	7	8	9	10			
1	1	5	5	5	4	5	4	5	5	5	5	48	96	Very Worthy
2	2	5	5	5	5	4	5	5	5	5	5	49	98	Very Worthy
3	3	5	5	5	4	4	5	5	5	5	5	48	96	Very Worthy
4	4	5	5	5	5	4	5	4	5	5	5	48	96	Very Worthy
5	5	4	4	4	4	4	5	4	4	4	4	41	82	Very Worthy
6	6	5	5	5	5	4	5	5	5	5	5	49	98	Very Worthy
7	7	4	4	4	5	5	4	4	4	4	4	42	84	Very Worthy
8	8	5	5	5	5	5	5	5	5	5	5	50	100	Very Worthy
Amount												375		
Average												47	94	Very Worthy

Based on table 3, it can be seen that 8 postpartum mothers rate the product with the final result obtained an average of 47 if the percentage is 94% and judging from the feasibility assessment reference, the Likert score is included in the very feasible category. Furthermore, a large-scale trial was carried out on 52 postpartum mothers, the average result was 47 if the percentage was 94% or the category was very feasible and could be used without revision

DISCUSSION

This study has received ethical approval with the number 044/kepk-bth/III/2021. Based on the results of the research conducted, the results of the development of an android-based application, namely Loving Breastfeeding education media, were designed through ten stages including: The first step is the potential and problems by conducting a preliminary study of the interview results obtained data, namely 8 out of 10 postpartum mothers have not received health information or counseling in particular regarding breastfeeding techniques and the coverage of exclusive breastfeeding there is still below the strategic plan target of 44.7%. So that researchers are interested in dealing with it by making an android application regarding breastfeeding techniques, especially there is the potential for postpartum mothers to have a smartphone so that it can be used to overcome their health problems Then data collection is to determine the material discussed in this application, namely breast anatomy, lactation physiology, understanding exclusive breastfeeding, benefits of exclusive breastfeeding for babies, mothers and the social environment, videos on breastfeeding steps, lactation management during the covid-19 pandemic, breastfeeding techniques include; the position when the mother is breastfeeding, the attachment of the baby, the frequency and duration of breastfeeding, signs of sufficient breast milk and how to burp the baby, then breastfeeding problems and breastfeeding myths and facts.

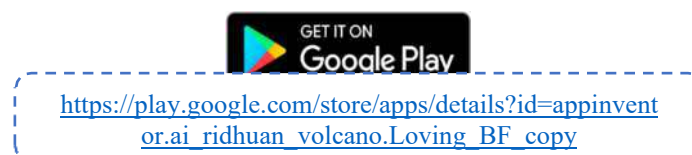
The third step is designing the product using App Inventor, Corel Draw, and Adobe Photoshop, then for the background color using two colors, namely yellow and green to give a sense of enthusiasm and relaxation when using this application, then according to (Sasongko NM, Suyanto M, Kurniawan PM, 2020) yellow means giving a feeling of happiness and enthusiasm then green is able to give a relaxed atmosphere and openness in communication so that these two colors are suitable for use in educational media applications. Then there is a backsound that sounds when the application is opened, this is supported because the use of music can attract users' attention, especially in providing health promotion so that users do not feel bored (Jatmika DE, et al., 2019) The fourth step is design validation by two material experts, namely Mrs. Nurul Fadilah, SST as staff of the Family Health and Nutrition section of the District Health Office. Tasikmalaya and Mrs. Siti Saadah M, SSiT, MPH as lecturers of Midwifery Poltekkes Kemenkes Tasikmalaya, from the results of both obtained a score of 35.75 out

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of a total score of 50, if the percentage is 71.5% then it is included in the appropriate category. Then validation from media experts, namely Mr. Fadil Ahmad J, SKM, MPH as a lecturer at RMIK Poltekkes Kemenkes Tasikmalaya obtained an average validation result of 4.35 out of a total score of 50, if the percentage is 87%, it is included in the very feasible category.

The fifth step is the first design revision by a material expert, there are suggestions such as material using renewable sources then images that are not personal results include the source. The existence of references or library sources is a must in scientific works and becomes a reference material used by authors to strengthen support for the arguments presented (Djuandi, 2017) then the image in the application uses the researcher's own photo and uses original images instead of animations. This opinion is supported because the use of these images can avoid misunderstanding/understanding or misinterpretation and can clarify what is explained and can be more easily captured (Jatmika DE, et al., 2019). Then from media experts, namely the existence of a home button on the application, this is supported by research that the addition of a home button makes it easier for users to return to the initial menu (Samartono, Astuti H, 2018) after that the color in the background of the sub menu is distinguished by using yellow and red. According to research, the characteristics of the color red are strength, love, and affection. And yellow shows happiness, then using this color can make it easier for users (Ghiffary E N M, et al., 2018)

The sixth step is testing the product on 8 postpartum mothers and it is obtained with an average final result of 47 if the percentage is 94%, it is included in the very feasible category. Then the seventh step is product revision, namely suggestions from small group trials, namely explanations that are not accompanied by icon images. According to one researcher, the icon is a sign that can describe the main characteristics to make it easier for users and provide an overview of the existing explanations (Samartono, Astuti H, 2018). The eighth step is the use trial which was carried out on 52 postpartum mothers. The average result was 47, if the percentage was 94%, it was included in the very feasible category and could be used without revision. The ninth step of design revision is because at the large-scale trial stage there is no revision so this stage is not carried out in this study, the last is the tenth step of mass production of the Loving Breastfeeding Application which is suitable for use. Here's the link to access the Loving Breastfeeding application on the Google PlayStore as follows:



CONCLUSION

This research produces a product through ten steps of Research and Development of an Android-based Loving Breastfeeding application to provide information about breastfeeding techniques and the importance of exclusive breastfeeding for postpartum mothers. Then this research has limitations, namely the absence of two-way communication, and the material experts such as breastfeeding consultant. This Loving Breastfeeding android-based educational media application, in the future, will be developed in the addition of materials or other educational features, the existence of two-way communication in the application by involving breastfeeding consultants

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THE FACTORS RELATED TO STUNTING IN TODDLERS AGED 24-59 MONTHS IN BERASANG VILLAGE, KISAM TINGGI DISTRICT, OKU SELATAN IN 2020

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ABSTRACT

*Indonesia occupied the fifth peringkat world for the number of children with stunting condition. According to Riskesdas 2013, it shows that the prevalence of stunting under five in Indonesia reaches 37% (consisting of 18% very short and 19.2% short) which means that it has increased in 2010 (35.6%) and 2007 (36.8%). **The purpose** of this research was to determine the factors related to stunting in children aged 24-59 months in Berasang Village, Kisam Tinggi District, OKU Selatan in 2020. **The research method** used is analytical method with cross sectional approach. The results of the statistical test showed that there was a significant correlation between maternal height (p value = 0.026), a history of exclusive breastfeeding (p value = 0.001) and there was no significant correlation between a history of BBLR (p value = 0.983) and stunting in children aged 24- 59 months in Berasang Village, Kisam Tinggi District, Oku Selatan in 2020. **The results and discussion**, it was found that there are still many mothers who have children with stunting (57.5%). This is because mothers do not understand the importance of nutritional intake during pregnancy, in the early days after the newborn, and the first 1000 days of life. This is what causes the high incidence of stunting. In addition, height and exclusive breastfeeding also correlate with stunting, while a history of BBLR does not correlate with stunting. **Suggestions are expected** that health workers, especially midwives in Berasang Village, Kisam Tinggi District, OKU Selatan, to further improve in providing information to the community through a persuasive approach by explaining to the community that stunting must or can be prevented starting from fulfilling the nutrition of pregnant women, nutrition of newborns and the first 1000 days of life.*

Keywords: *Stunting, Maternal Height, Exclusive Breastfeeding History, BBLR History*

INTRODUCTION

Malnutrition is one of the most common nutritional problems among toddlers in the world. UNICEF data from 2018 shows that almost half of all deaths in children under 5 years are caused by malnutrition, which causes 3 million children to die per year. Malnutrition problems include wasting and stunting, while overweight is another aspect of malnutrition. In 2016, 52 million children under five or 7.7% experienced wasting and 22.9% or one in four children under the age of 5 years worldwide experienced stunted growth (WHO, 2018).

Indonesia ranks fifth in the world for the number of children with stunting conditions. According to Riskesdas in 2013, the prevalence of stunting under five in Indonesia reached 37% (consisting of 18% very short and 19.2% short) which means that it has increased in 2010 (35.6%) and in 2007 (36.8%). Nearly 9 million children under five in Indonesia are included in the stunting category. The prevalence of stunting under five becomes a public health problem if the prevalence is 20% or more (RI, 2018).

The prevalence of stunting under five is a public health problem if the prevalence is 20% or more. The prevalence of stunted toddlers in Indonesia is still very high and is a health problem that must be addressed. The prevalence of stunting in Indonesia is also high compared to Myanmar (35%), Vietnam (23%), Malaysia (17%), Thailand (16%), and Singapore (4%) (Asih, 2018).

Stunting or shortness is a condition of failure to thrive in infants (0-11 months) and children under five (12-59 months) as a result of chronic malnutrition, especially in the first 1000 days of life so that children are too short for their age. Malnutrition occurs since the baby is in the womb and in the early days after the newborn, but the stunting condition only appears after the age of 2 years. Toddlers are said to be short if the z-score value for body length for age (PB/U) or height for age (TB/U) is less than -2D/standard deviation (stunted) and less than -3SD

(severely stunted). Stunted toddlers will have a low level of intelligence, become more susceptible to disease and in the future can be at risk of decreasing productivity levels. In the end, broadly speaking, stunting will be able to inhibit economic growth and increase poverty (Rahmayulis, 2018)

The state of malnutrition as measured by the index of height for age (TB/U) compared to the standard is usually used in toddlers. Stunting or also called chronic malnutrition, where there is linear growth in children. If the TB/U z-score is below -2.00 SD is classified as acutely malnourished, if the TB/U z-score is below -3.00 it is classified as severe acute malnutrition, if the TB/U z-score is above -2.00 it is classified as normal (Sandjaja and Atmarita, 2009).

Stunting is a chronic malnutrition problem caused by inadequate nutritional intake for a long time due to feeding that is not following nutritional needs. Stunting occurs when the fetus is still in the womb and only appears when the child is two years old. Malnutrition at an early age increases infant and child mortality, causes sufferers to get sick easily and have poor posture as adults. The cognitive abilities of sufferers are also reduced, resulting in long-term economic losses for Indonesia (Ahmad, 2019).

Stunting is not only a national nutritional problem, but also a global problem. This is evidenced by the number of children experiencing stunting in developing countries, namely 165 million children, around 80% of developing countries contribute to stunting cases (MCA-Indonesia, 2013). Nutritional problems, especially stunting in toddlers, are caused by inadequate food intake and diseases which are direct causes of nutritional problems in children. This situation occurs due to inappropriate feeding practices, recurrent infectious diseases, poor hygiene and caregiver behavior, use of unclean water, unhealthy environment, low income and limited access to food (WHO, 2018).

Stunting experienced by children can be caused by not being exposed to the first 1000 days of life gets special attention because it determines the level of physical growth, awareness, and productivity of a person in the future. Stunting can also be caused by not going through the golden period which begins in the first 1000 days of life which is the formation of child growth and development in the first 1000 days. During this period, the nutrients that babies receive while in the womb and breast milk have a long-term impact on life as adults. This can be too much so it will avoid the occurrence of stunting in children and poor nutritional status (Kemenkes RI, 2015).

The purpose of this study was to determine the factors related to stunting in toddlers aged 24-59 months in Berasang village, Kisam Tinggi district, South Oku in 2020. Based on data obtained from the Kisam Tinggi Health Center, in 2019 the number of toddlers experiencing stunting was 6 people (Tinggi, 2019).

Based on the background, the researcher is interested in conducting a study with the title "**Factors related to stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020**".

METHODS

Study Design

This type of research is quantitative using **analytic method with cross sectional approach**.

Study Sample & Population

The population in this study were all mothers and toddlers aged 24-59 months in the village of Berasang, Kisam Tinggi District, South Oku at the time of the study. While the samples in this study were mothers and toddlers aged 24-59 months in the village of Berasang, Kisam Tinggi District, South Oku, amounting to 40 people.

Procedure

Explain the research objectives to the respondents.

Make informed consent with the respondent.

Measuring weight the toddlers and submit questionnaire sheets to respondents.

Guide respondents to filling out the questions on the questionnaire sheet.

Recheck the questionnaire sheet that has been filled out by the respondent.

Say thanks and greetings to the respondent.

Measurement & Measuring Equipment

Data collection techniques in this study used a **questionnaire as a tool** in data collection.

Statistical Analysis

Univariate Analysis

Univariate analysis was carried out on each variable from the results of the study, namely the independent variable (mother's height, history of exclusive breastfeeding and history of BBLR) and the dependent variable (stunting) which were analyzed using a frequency distribution table.

Bivariate Analysis

Bivariate analysis is data analysis to determine the correlation between the independent variable and the dependent variable which is analyzed by **chi-square test (x²) with a significant level (α) = 0.05**.

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RESULTS

Univariate Analysis

This analysis was conducted to determine the distribution of the frequency and percentage of the independent variables (mother's height, history of exclusive breastfeeding and history of BBLR) and the dependent variable (stunting) the data presented in the form of tables and text.

Stunting

This study was conducted on 40 respondents where stunting was grouped into 2 categories, namely Yes (If TB/U < -2 standard deviations) and No (If TB/U > -2 standard deviations). The stunting frequency distribution table is as follows:

Table 1 Frequency Distribution of Respondents Based on Stunting in Berasang Village, Kisam Tinggi District, South Oku in 2020.

Stunting	Frequency	Percentage
Yes	23	57,5
No	17	42,5
Total	40	100

From table 1, it can be seen that the frequency distribution of most of the respondents experienced stunting (57.5%).

Body height of the respondents

This study was conducted on 40 respondents where the mother's height was grouped into 2 categories, namely at risk (if height <150 cm) and not at risk (if height >150cm). The table for the frequency distribution of maternal height is as follows:

Table 2 Frequency Distribution of Respondents Based on Mother's Height in Berasang Village, Kisam Tinggi District, South Oku in 2020.

Body height	Frequency	Percentage
Risky	15	37,5
Not risky	25	62,5
Total	40	100

From table 2 it can be seen that the frequency distribution of respondents is mostly not at risk (62.5%).

Exclusive breastfeeding history

This study was conducted on 40 respondents where a history of exclusive breastfeeding was grouped into 2 categories, namely No (if complementary feeding was given before the age of 6 months) Yes (if only breastfeeding was until the age of 6 months). The frequency distribution table for the history of exclusive breastfeeding is as follows:

Table 3 Frequency Distribution of Respondents Based on History of Exclusive Breastfeeding in Berasang Village, Kisam Tinggi District, South Oku in 2020

Exclusive breastfeeding history	Frequency	Percentage
No	19	47,5
Yes	21	52,5
Total	40	100

From table 3, it can be seen that the frequency distribution of respondents was mostly given exclusive breastfeeding (52.5%).

BBLR History

This study was conducted on 40 respondents where the history of low birth weight was grouped into 2 categories, namely Yes (if birth weight < 2500 grams) and No (if birth weight > 2500 grams). The frequency distribution table for the history of BBLR is as follows:

Table 4 Frequency Distribution of Respondents Based on History of BBLR in Berasang Village, Kisam Tinggi District, South Oku in 2020

BBLR History	Frequency	Percentage
Yes	7	17,5
No	33	82,5
Jumlah	40	100

From table 4, it can be seen that the frequency distribution of respondents mostly did not have a history of BBLR (82.5%).

Bivariate Analysis

This analysis was conducted to determine the correlation between the independent variables (mother's height, history of exclusive breastfeeding and history of BBLR) and the dependent variable (stunting). This study uses the Chi Square statistical test. Using a computerized system Statistical Program for Social Science (SPSS) which is a statistical package or program created to process or analyze data. The limit of significance at $\alpha = 0.05$. If $p \text{ value} < 0.05$, it means that there is a significant (significant) correlation between the independent variable and the dependent variable, if $p \text{ value} > 0.05$, it means that there is no significant (significant) correlation between the independent variable and the dependent variable.

Correlation between Mother's Height and Stunting in Toddlers Age 24-59 Months in Berasang Village, Kisam Tinggi District, South Oku

There are 40 respondents in this study. This bivariate analysis was used to determine the correlation between maternal height and stunting which can be seen in the table below.

Table 5 Correlation between Mother's Height and Stunting in Toddlers Age 24-59 Months in Berasang Village, Kisam Tinggi District, South Oku

Mother's body height	Stunting				N	%	p value	OR
	Yes		No					
	n	%	n	%				
	At risk	12	80	3				
Not at risk	11	44	14	56	25	0		
						10	0	
	23		17		40			

Based on table 5, it is known that of the 15 respondents who are at risk there are 12 respondents (80%) who have stunting children, while from the 25 respondents who are not at risk there are 11 respondents (44%) who have stunting children.

From the results of the Chi-Square test, $P \text{ Value} = 0.026 < (0.05)$ indicates that there is a significant correlation between maternal height and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku . 2020. While the OR (odds ratio) value is 1.146, this shows that mothers who are at risk will have an opportunity to have stunting children by 1.146 times compared to mothers who are not at risk.

Thus, the initial hypothesis which states that there is a significant correlation between maternal height and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 is statistically proven.

Correlation between Exclusive Breastfeeding History and Stunting in Toddlers Age 24-59 Months in Berasang Village, Kisam Tinggi District, South Oku

There are 40 respondents in this study. This bivariate analysis was used to determine the correlation between history of exclusive breastfeeding and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku , which can be seen in the table below.

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Table 6 The Correlation between Exclusive Breastfeeding History and Stunting in Toddlers Age 24-59 Months in Berasang Village, Kisam Tinggi District, South Oku in 2020

Delasang Village, Kisanan Pinger District, South Okla in 2020								
Exclusive Breastfeeding History	Stunting				N	%	P value	OR
	Yes		No					
	n	%	n	%				
No	17	84,2	3	15,8	19	10		
Yes	7	33,3	14	66,7	21	0	0,001	2,308
	23		17		40			

Based on table 6, it is known that of the 19 respondents who were not given exclusive breastfeeding, there were 16 respondents (84.2%) who were stunted, 21 respondents who were given exclusive breastfeeding, there were 7 respondents (33.3%) who were stunted.

From the results of the Chi-Square test, P Value = 0.001 < (0.05) this indicates that there is a significant correlation between history of exclusive breastfeeding and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku . 2020. While the OR (odds ratio) value is 2.308, this shows that mothers who do not give exclusive breastfeeding will have an opportunity to have stunting children by 2.308 times compared to mothers who give exclusive breastfeeding.

Thus, the initial hypothesis which states that there is a significant correlation between history of exclusive breastfeeding and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 is statistically proven.

Correlation between BBLR History and Stunting in Toddlers Age 24-59 Months in Berasang Village, Kisam Tinggi District, South Oku.

There are 40 respondents in this study. This bivariate analysis was used to determine the correlation between a history of low birth weight and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 which can be seen in the table below.

Table 7 Correlation between BBLR History and Stunting in Toddlers Age 24-59 Months in Berasang Village, Kisam Tinggi District, South Oku in 2020

BBLR History	Stunting				N	%	p value	OR
	Yes		No					
	n	%	n	%				
Yes	4	57,1	3	42,9	7	100		
No	19	57,6	14	42,4	33	100	0,983	0,189
	23		17		40			

Based on table 7, it is known that from 7 respondents who are BBLR there are 4 respondents (57.1%) who are stunted, while from 33 respondents who are not BBLR there are 19 respondents (57.6%) who are stunted.

From the results of the Chi-Square test, P Value = 0.983 > (0.05) this indicates that there is no significant correlation between the history of BBLR and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020. Meanwhile, the OR (odds ratio) value was 0.189, this shows that toddlers who have a history of BBLR have the opportunity to experience stunting by 0.189 times compared to children who are not BBLR.

Thus, the initial hypothesis which stated that there was a significant correlation between a history of BBLR and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, Oku Selatan in 2020 was not statistically proven.

DISCUSSION

Stunting

Stunting or shortness is a condition of failure to thrive in infants (0-11 months) and children under five (12-59 months) as a result of chronic malnutrition, especially in the first 1000 days of life so that children are too short for their age. Malnutrition occurs since the baby is in the womb and in the early days after the newborn, but the stunting condition only appears after the age of 2 years. Toddlers are said to be short if the z-score value for body length for age (PB/U) or height for age (TB/U) is less than -2D/standard deviation (stunted) and less than -3SD (severely stunted). Stunted toddlers will have a low level of intelligence, become more susceptible to disease and in the future can be at risk of decreasing productivity levels. In the end, broadly speaking, stunting will be able to inhibit economic growth and increase poverty (Rahmayulis, 2018).

Based on the results of univariate analysis, it is known that the frequency distribution of respondents is mostly stunted (57.5%).

The results of this study are in line with Yuliani's research (2014), entitled the correlation between maternal education level and exclusive breastfeeding with the incidence of stunting in toddlers in Sidowarno Village, Wonosari District, Klaten. The results showed that respondents who were stunted were 34 respondents (53.1%) and respondents who were not stunted were 30 respondents (46.9%).

This is in line with the research of Sri and Pradigdo (2018), entitled factors that affect stunting in toddlers aged 24-59 months at the Cepu Public Health Center, Blora. The results showed that in the 24-35 month age group, the percentage was more in the stunting toddler group (71.1%) compared to the normal toddler group (60.5%). It is different for the group of toddlers aged 36-59 months, the percentage is more in the normal toddler group (39.5%) compared to the stunting toddler group (28.9%).

According to Helmyati et al (2017) Stunting is a very short body condition, which is below -2 SD based on the TB/U indicator, based on age and sex in growth standards. Stunting is determined by measuring length or height compared to age

This is in line with the statement of Yuliana and Hakim (2019). Maternal nutritional factors before and during pregnancy are indirect causes that contribute to fetal growth and development. Pregnant women with malnutrition will cause the fetus to experience intrauterine growth retardation (IUGR), so that the baby will be born with malnutrition, and experience growth and development disorders. Children who experience inhibition in growth due to lack of food intake and recurrent infectious diseases, this situation has a high chance of stunting.

Based on the results of the research and discussion above, the researcher assumes that there are still many mothers who have stunting children (57.5%). This is because there are still many mothers who do not understand the importance of nutritional intake during pregnancy, in the early days after the newborn, and in the first 1000 days of life. This is the causes high incidence of stunting.

Correlation Between Mother's Body Height and Stunting

Based on the results of univariate analysis, it is known that the frequency distribution of respondents is mostly not at risk (62.5%). Based on table 5 above, it is known from 15 respondents who are at risk there are 12 respondents (80%) who have stunting children, while from 25 respondents who are not at risk there are 11 respondents (44%) who have stunting children. From the results of the Chi-Square test, $P \text{ Value} = 0.026 < (0.05)$ this indicates that there is a significant correlation between maternal height and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020. While the OR (odds ratio) value is 1.146, this shows that mothers who are at risk will have an opportunity to have stunting children by 1.146 times compared to mothers who are not at risk.

The initial hypothesis which states that there is a significant correlation between maternal height and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 is statistically proven. The results of this study are in line with Rochmah and Fitriahadi (2017), entitled Factors related to stunting in toddlers aged 24-59 months in the work area of the Wonosari I Health Center. The results showed that the height of the mother in the short category was 26 people (68, 4%) mothers have stunting children. The results of the statistical test used a p value of 0.000 ($p < 0.05$) so that it could be stated that there was a correlation between maternal height and stunting in toddlers aged 24-59 months in the work area of the Wonosari I Health Center.

The results of this study are also in line with Ratu's research (2018), entitled the correlation between parental height and the incidence of stunting in children aged 24-59 months in Ratahan District, Southeast Minahasa. Based on the chi-square test that has been carried out, it is found that in this study p value = 0.000, therefore, the p value < 0.05 , which means H_0 is rejected, so it can be concluded that there is a correlation between maternal height and the incidence of stunting in toddlers.

This is similar to Amin's statement in Ratu, Punuh and Malonda (2018). The mother's height factor is a risk factor for stunting in toddlers. Mother's height is grouped into short mothers ($< 150\text{cm}$) and normal mothers ($\geq 150\text{cm}$), short mothers have the possibility of giving birth to short babies, the results show that mothers with height $< 150\text{cm}$ have a higher risk of giving birth to stunting children.

According to Rahayu in Ratu, Punuh and Malonda (2018), Children born to short mothers are at risk of becoming stunted, because due to physical conditions they have an inheritor in the gene structure that can carry short traits so that children have the opportunity to inherit genes so that they grow into stunting.

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Based on the results of the research and discussion above, the researcher assumes that maternal height is associated with stunting. Mothers who are at risk of height have a higher risk of giving birth to stunted children than mothers who have no risk of height.

Correlation of Exclusive Breastfeeding History with Stunting

Based on the results of univariate analysis, it is known that the frequency distribution of respondents is mostly given exclusive breastfeeding (52.5%). Based on table 6 above, it is known that of the 19 respondents who were not given exclusive breastfeeding, there were 16 respondents (84.2%) who were stunted, 21 respondents who were given exclusive breastfeeding, there were 7 respondents (33.3%) who were stunted. From the results of the Chi-Square test, $P \text{ Value} = 0.001 < (0.05)$ this indicates that there is a significant correlation between history of exclusive breastfeeding and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020. While the OR (odds ratio) value is 2.308, this shows that mothers who do not give exclusive breastfeeding will have an opportunity to have stunting children by 2.308 times compared to mothers who give exclusive breastfeeding. The initial hypothesis which states that there is a significant correlation between history of exclusive breastfeeding and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 is statistically proven.

This is in line with Indrawati and Warsiti's research (2016), entitled the correlation between exclusive breastfeeding and the incidence of stunting in children aged 2-3 years in Karangrejek village, Wonosari Gunungkidul. The results showed that most of the respondents who were in the very short category did not receive exclusive breastfeeding, namely 10 respondents (7.7%). Respondents in the short category mostly received exclusive breastfeeding, namely 18 respondents (13.8%). Respondents in the normal category mostly received exclusive breastfeeding, namely 92 respondents (70.8%). The correlation between exclusive breastfeeding and the incidence of stunting in toddlers 2-3 years. Where obtained $p\text{-value} = 0.000$ ($0.000 < 0.05$). It was concluded that there was a correlation between exclusive breastfeeding and the incidence of stunting in toddlers 2-3 years.

The results of this study are also in line with Kusumawardhani's research (2017), entitled Exclusive Breastfeeding, birth length, low birth weight as risk factors for stunting in children aged 6-24 months at Lendah II Health Center Kulon Progo. The results of the chi square statistical test obtained a value of $p = 0.000$ ($p < 0.05$) thus it can be concluded that there is a significant correlation between the history of exclusive breastfeeding and the risk of stunting in children in the Lendah II Public Health Center, Kulon Progo.

Ariati (2019) stated that breast milk is the main nutrient needed by babies because it is a source of quality protein and contains substances that are useful for the body's immunity. Lack of breastfeeding and early complementary feeding can increase the risk of stunting in early life.

According to Fikadu, et al in ni'mah and nadhiroh (2015) another factor related to stunting is the intake of exclusive breastfeeding for toddlers. Research in Southern Ethiopia proves that toddlers who do not get exclusive breastfeeding for six months are at high risk of stunting.

Based on the results of the research and discussion above, the researcher assumes that a history of exclusive breastfeeding is associated with stunting. Toddlers who are not exclusively breastfed and given early complementary feeding are at high risk for stunting compared to those who are exclusively breastfed.

Correlation Between BBLR History and Stunting

Based on the results of univariate analysis, it can be seen from table 4 above that the frequency distribution of respondents mostly does not have a history of BBLR (82.5%). Based on table 7, it is known that from the 7 respondents who were BBLR there were 4 respondents (57.1%) who were stunted, while from the 33 respondents who were not BBLR there were 19 respondents (57.6%) who were stunted. From the results of the Chi-Square test, $P \text{ Value} = 0.983 > (0.05)$ this indicates that there is no significant correlation between the history of BBLR and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020. While the OR (odds ratio) value is 0.189, this shows that toddlers who have a history of BBLR have a 0.189 times chance of experiencing stunting compared to toddlers who are not BBLR. The initial hypothesis which stated that there was a significant correlation between a history of BBLR and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 was not statistically proven.

The results of this study are different from Rochmah and Fitriahadi (2017), entitled Factors related to stunting in toddlers aged 24-59 months in the Wonosari I Health Center work area. ,5%) while toddlers who do not have a history of BBLR and experience stunting are (32.9%). The results of statistical tests using chi-square obtained a p value of 0.045 ($p < 0.05$) so that it is stated that there is a correlation between BBLR and stunting in toddlers aged 24-59 months in the work area of the Wonosari I Health Center.

Based on the results of the Fisher Exact test with a 95% confidence level, it was found that there was a significant correlation between the history of BBLR and the incidence of stunting in toddlers. The impact of babies who have

low birth weight will last from one generation to the next. Children who are BBLR in the future will have less anthropometric measurements in adulthood. For women who are born with low weight, they have a high risk of becoming a stunted mother so they will tend to give birth to babies with low weight (Wulandari, 2018).

The results of this study are in line with the research of ni'mah and nadhiroh (2015) entitled factors related to the incidence of stunting in toddlers. The results showed that there were 4 children under five who were BBLR and stunted (11.8%) while children who were not BBLR who experienced stunting were 30 people (88.2%). The results of the Fisher Exact test with a 95% confidence level found that there was no significant correlation between BBLR and the incidence of stunting in children under five ($p=1,000$).

According to Nasution's research (2014), the title is low birth weight (BBLR) with stunting in children aged 6-24 months. The results of the analysis showed the value of OR = 5.60 (95% CI: 2.27-15.70), meaning that at the 95% confidence level it can be concluded that children born with BBLR have a 5.6 times greater risk of becoming stunted compared to those born with low birth weight. children born with normal weight.

Children born with low weight are at risk of stunting because the child's growth and development is stunted (Wulandari, 2018).

Based on the results of the study and discussion, the researchers assumed that a history of BBLR was not associated with stunting. This can be caused by many factors that have a greater influence on the incidence of stunting in toddlers such as nutritional deficiencies and a history of exclusive breastfeeding.

In carrying out this research, it cannot be separated from the limitations that occur and the possibility of unavoidable deviations. Researchers realize that in conducting research, the results are less than perfect and there are shortcomings. These limitations include:

This study uses primary data obtained from a checklist given directly to respondents, so the data obtained in this study depends on the limited answers of the informants.

Respondents do not want to cooperate and do not want to be recorded because they are busy.

CONCLUSION

There is a significant correlation between maternal height and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 with a P-Value = $0.026 < (0.05)$.

There is a significant correlation between a history of exclusive breastfeeding and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 with a P-Value = $0.001 < (0.05)$.

There is no significant correlation between a history of BBLR and stunting in toddlers aged 24-59 months in Berasang Village, Kisam Tinggi District, South Oku in 2020 with a P-Value = $0.983 > (0.05)$.

RECOMMENDATION

For Berasang Village, Kisam Tinggi, Oku Selatan

It is expected that health workers, especially midwives in Berasang Village, Kisam Tinggi District, South Oku, are expected to further improve the provision of information to the community through a persuasive approach by explaining to the public that stunting must or can be prevented starting from fulfilling the nutrition of pregnant women, newborn nutrition and 1000 first day of life.

For Researcher

Further researchers are expected to be able to conduct research on stunting using different research methods and look for other, more varied variables that are related to stunting in toddlers aged 24-59 months and by taking more samples so that research on stunting can continue to be developed.

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ANALYSIS OF INFANT FACTORS AFFECTING THE EVENT OF HYPOTHERMIA IN NEWBORN BABIES (*LITERATURE REVIEW*)

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ABSTRACT

Background: Every newborn adjusts to a transition period. In the thermogenic system, the baby tries to maintain a balance between heat loss and heat production. Hypothermia in newborns is a worldwide problem and contributes to morbidity and mortality. Early detection by health workers, especially midwives, is very important in preventing hypothermia in newborns. The purpose of this study was to conduct a systematic review in several journals of the latest research results regarding the factors that influence the incidence of hypothermia in newborns.

Methods: This study uses the Literature Review method, with the protocol and evaluation in the form of Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA). The data used is secondary data using three databases, namely PubMed and Proquest. Search using keywords, the inclusion criteria of the PICOS framework is limited to the publications of the last five years.

Results: Based on a search using keywords and inclusion criteria, there were twelve journals discussing infant factors that influence the incidence of hypothermia in newborns.

Conclusion: Hasil review dari dua belas jurnal membahas faktor bayi yang mempengaruhi kejadian hipotermia pada bayi baru lahir. Perlu penelitian lebih lanjut mengenai faktor bayi yang mempengaruhi hipotermia pada bayi baru lahir pada penelitian lain yang terbaru.

Keywords: Infant factors, Hypothermia of newborns.

INTRODUCTION

The first minute after the baby is born is an important time for the baby's survival because of the transition period from intrauterine to extrauterine life. Maintaining a normal body temperature is essential for the survival function of the newborn. Sudden changes in the newborn's ambient temperature during labor, especially in the absence of proper precautions can cause hypothermia in newborns.

According to the World Health Organization or the World Health Organization (WHO) hypothermia categorizes into three, namely: mild hypothermia (36.0°C–36.4 °C), moderate hypothermia (32.0 °C –35.9 °C) and severe hypothermia (<32.0°C). Hypothermia is a cause of morbidity and mortality in BBL. Heat loss in newborns is rapid due to a decrease of 2°C to 3°C after delivery, due to heat production which is not greater than heat lost through convection, evaporation, and radiation.

According to data from the United Nations International Children's Emergency Fund (UNICEF), the incidence of the Neonatal Mortality Rate in Indonesia in 2019 was 23.9 per 1000 live births. Hypothermia in newborns is common worldwide with a prevalence ranging from 32% to 85% with a higher incidence of neonatal hypothermia in developing countries (Rohan 2018). In Indonesia in 2018, the newborn mortality rate was 21.1 per 1,000 live births and 7% of them were due to hypothermia (IGME 2019). Most neonatal deaths in Indonesia are caused by asphyxia (37%), low birth weight (LBW) and prematurity (34%), sepsis (12%), hypothermia (7%), neonatal jaundice (6%), postmaturity (3%)), and congenital abnormalities (1%) per 1,000 live births (Ratuain' and Wahyuningsih' 2015).

Although hypothermia was not a direct cause of death, it did contribute to the death of BBL. Hypothermia has been shown to be a risk factor for neonatal sepsis, respiratory distress, intra-ventricular hemorrhage, and necrotizing enterocolitis (Medvedev et al. 2020). Hypothermia that is not immediately treated can trigger cold stress which results in hypoxemia, hypoglycemia, peripheral vasoconstriction, reduced peripheral perfusion, ischemia, metabolic acidosis and increased basal metabolic rate, damage to the brain, worsening of breathing, then causes pulmonary hemorrhage and death (CMNRP. 2013);(Praborini and Wulandari 2018).

Early detection and proper management carried out by health workers, especially midwives, are very important in preventing the incidence of hypothermia in newborn babies, so that prevention of complications due to hypothermia can be carried out and reduce mortality in newborns. This is the background for researchers to conduct a review in research journals to determine infant factors that influence the incidence of hypothermia in newborns.

METHODS

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The research method uses Literature Review, with protocol and registration in the form of Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA). The data used are secondary data searches through two databases, namely PubMed and Proquest, published in the last five years from 2016-2020. Search articles used using keywords: factor, hypothermia, newborns and Boolean operators: AND, OR and NOT. The strategy used as a reference in the search for articles using the PICOS framework: population of newborns with hypothermia, outcome analysis of factors that influence hypothermia in newborns, type of analytical observational research, Indonesian and English languages used.

RESULTS

The search results found 234 articles, then a study selection was made based on the feasibility of the inclusion and exclusion criteria, then a quality assessment was carried out so that 13 articles were obtained that were relevant and could be used in the literature review.

Table 1 Infant factors that affect the incidence of hypothermia in newborns

No	Judul	Metode	Hasil Penelitian	Database
1	Prevalence and factors associated with neonatal hypothermia on admission to neonatal intensive care units in Southwest Ethiopia (https://doi.org/10.1371/journal.pone.0218020)	D: Cross-sectional study S: Newborn Bayi V: neonatal factors, physiological factors, behavioral factors, environmental factors) I: Questionnaire A: multivariable logistic regression	LBW infants < 2500 grams are 4 times more at risk for hypothermia	Proquest
2	Neonatal hypothermia and associated factors within six hours of delivery in eastern part of Ethiopia (https://doi.org/10.1186/s12887-018-1238-0)	D: Cross-sectional study S: Newborn Bayi V: socio-demographic, neonatal, obstetric, environmental factors I: Questionnaire A: Multivariate regression test	The high incidence of hypothermia occurred in low birth weight (73.4%) and premature infants (76.7%)	Pubmed
3	Hypothermia in Preterm Infants in the First Hours after Birth: Occurrence, Course and Risk Factors (10.1371/journal.pone.0164817)	D: Case control study S: Babies born prematurely V: Characteristics of the baby, clinical procedures I: Questionnaire A: linear regression, logistic regression	LBW, premature birth, resuscitation affect the incidence of hypothermia	Proquest
4	Association of Neonatal Hypothermia with Morbidity and Mortality in a Tertiary Hospital in Malawi (10.1093/tropej/fmz086)	D: Cohort study S: Newborn Bayi V: maternal, neonatal factors I: Questionnaire A: Chi-square, logistic regression	The incidence of hypothermia in LBW, prematurity, and resuscitation at birth	Pubmed
5	Determinants of hypothermia on neonates admitted to the intensive care unit of public hospitals of Central Zone, Tigray, Ethiopia 2017 (https://doi.org/10.1186/s13104-018-3691-0)	D: case-control study S: 264 neonates V: socio-factor maternal and newborn demographics, obstetrics and environment I: questionnaire A: logistic regression Multivariable	Low birth weight, 3.7 times more preterm risk of being a risk factor for neonatal hypothermia	Proquest

6	Determinants of Neonatal Hypothermia Among Babies Born in Public Hospitals of West Shewa Zone of Oromia Regional State, Ethiopia http://doi.org/10.2147/RRN.S293123	D: Case-control study S: 226 BBL V: maternal socio-demographic factors, care of BBL I: Questionnaire, checklist A: bivariate, multivariable logistic regression	Infants weighing less than 2500 grams are 2.6 times more likely to develop hypothermia.	Pubmed
7	Magnitude and factors associated with neonatal hypothermia among neonates admitted in neonatal intensive care units (https://doi.org/10.1016/j.jnn.2020.07.010)	D: Cross-sectional study S: 356 samples BBL V: socio-demographic, neonatal, maternal, environmental factors I: questionnaire A: multivariable logistic regression	LBW infants 4.4 times, resuscitation at birth 5.9 times more likely and significantly associated with hypothermia	Proquest
8	Determinants of neonatal hypothermia among neonates admitted to neonatal intensive care unit northwest, Ethiopia. 10.1080/14767058.2020.1843153	D: Case-control study S: 129 hypothermic infants and 258 non-hypothermic infants V: socio-demographic, obstetric, neonatal, environmental and behavioral factors I: Questionnaire A: Multivariable, bivariate	Neonates with low birth weight are 3.01 times more likely to develop hypothermia	Pubmed
9	Neonatal hypothermia and associated factors within six hours of delivery in eastern part of Ethiopia https://doi.org/10.1186/s12887-019-1632-2	D: Cross sectional study S: Newborn Baby V: socio-demographic, environmental, physiological factors, obstetric complications, neonatal I: Questionnaire A: Binary logistic regression, bivariable	Infants with resuscitation at birth (CPR) had a 3.6 times greater risk, premature infants 3.4 times more risk of developing hypothermia.	Pubmed
10	Neonatal Hypothermia and Associated Factors among Newborns Admitted in the Neonatal Intensive Care Unit of Dessie Referral Hospital, Amhara Region, Northeast Ethiopia https://doi.org/10.1155/2020/3013427	D: Cross-sectional study S: Newborn Baby V: socio-demographic, neonates, obstetrics and environment I: Questionnaire A: bivariate and multivariate logistic regression	Premature infants have a 2.6 times greater risk, CPR has a 2.9 times significant risk of developing hypothermia	Pubmed
11	Body temperature at nursery admission in a cohort of healthy newborn infants https://doi.org/10.1186/s13052-020-0810-z	D: Observational-cross sectional S: BBL term or preterm healthy V: childbirth, maternal, environmental and action factors I: Questionnaire A: logistic regression	Premature babies have a higher risk of complications when exposed to hypothermia	Proquest
12	Prevalence of hypothermia in the first hour of life of premature infants weighing ≤ 1500 g https://doi.org/10.1590/1983	D: Cross Sectional Study S: 369 BBL V: premature BBL, maternal characteristics I: questionnaire	In premature babies, birth chest compressions are the prevalence of hypothermia in the	Pubmed

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-1447.2020.20190094	A: Poisson regression, Chi-square	first hours of life
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Table 2 Number of Articles by Year of Publish, Research Design, Database, Infant Factors Affecting Hypothermia Incidence in Newborns.

Category	N	%
Year		
2016	1	8%
2018	2	17%
2019	2	17%
2020	6	50%
2021	1	8%
Total	12	100 %
Research design		
<i>Cohort Study</i>	1	9%
<i>Cross Sectional study</i>	7	58%
<i>Case Control Study</i>	4	33%
Total	12	100 %
Database		
Pubmed	7	58%
Proquest	5	42%
Total	12	100%
Infant Factors Affecting the Incidence of Hypothermia in Newborns		
Low Birth Weight (LBW)	8	36%
Premature	8	36%
Resuscitation Measures	6	28%
Total	22	100%

Based on the table above, the number of articles based on the year of publication is mostly 2020. The number of articles is based on the research design, mostly using the Cross Sectional study design. Based on database searches mostly from Pubmed. Meanwhile, based on infant factors that affect the incidence of hypothermia in newborns, the factors include LBW, Prematurity, and Resuscitation Measures.

DISCUSSION

Low Birth Weight (LBW)

LBW infants have a greater risk of developing hypothermia due to: 1) larger body surface area 2) lack of subcutaneous fat and brown fat 3) incomplete thermoregulation (Beletew et al. 2020).

Research by Sharma (2020) showed a very high incidence of hypothermia almost 90% of LBW infants with a temperature <36°C during the pre-intervention period. The 2016 Ethiopia Demographic and Health Survey (EDHS) reported that in eight years a 67% high risk of low birth weight (LBW) infants with hypothermia at birth, has significantly become a global health issue.

Neonatal hypothermia is thought to contribute to morbidity and mortality in low birth weight infants. Infants who experience hypothermia have an impact on the occurrence of hypoxia where metabolic acidosis occurs causing hypoglycemia and leads to diseases such as Respiratory Distress Syndrome (RDS), chronic lung disease, coagulation defects, intraventricular hemorrhage, sepsis, fluid and electrolyte imbalances, and hypotension (Yip et al. 2017).

The incidence of hypothermia is also associated with a high probability of pulmonary hemorrhage, air leakage, bronchopulmonary dysplasia (BPD), pulmonary hypertension, seizures, high levels of intraventricular hemorrhage (IVH). A constant and more integrative approach is needed to better maintain body temperature immediately after birth in this high-risk population (Lee et al. 2019).

Premature Babies

Premature babies have several conditions such as: 1) Immature and thin skin 2) Poorly developed hypothalamic control. 3) Lacks efficient neural mechanisms 4) Body surface area is greater than body ratio. 5) Less glycogen production and storage. 6) Lack of subcutaneous fat. 7) Insufficient adipose tissue, so the baby cannot perform perfect thermogenesis and this results in hypothermia (Beletew et al. 2020); (Demissie et al. 2018); (Wilson et al. 2016).

Research by Demtse (2020) showed a statistically significant association of premature infant mortality with the degree of hypothermia and 55% of hypothermic premature infants remained hypothermic 12 hours later and one third of those who did not develop hyperthermia became hypothermic. The study by Lee (2019) showed that the majority of premature infants in Korea were hypothermic upon admission to the NICU, associated with morbidity and a high correlation with premature death before 28 days of age.

Hypothermia in infants occurs because of the high demand for oxygen. Lack of oxygen demand in the body causes less energy to be produced, causing the baby to experience hypothermia. Body temperature regulation depends on heat-producing factors and their release, while heat production is highly dependent on biological oxidation processes and body metabolism (Yu et al. 2020).

Hypothermia in preterm infants was confirmed to be significantly associated with morbidity and mortality, such as NEC, intraventricular hemorrhage (IVH) and late-onset sepsis in premature infants (Sharma et al. 2020);(Laptook et al. 2018).

Resuscitation or Action

Continuous maintenance of normothermia as a balance of heat loss and heat production prevents the baby from losing heat in four ways. Heat loss is a common problem during resuscitation. This is because the newborns who need resuscitation are those who are asphyxia at birth, there is not enough oxygen needed for mitochondrial oxidation in brown adipose tissue, to produce heat. The first step of the resuscitation algorithm in the BBL is to keep the warmth and temperature within normal limits (Lapcharoensap 2016). Keeping the baby's body temperature warm after birth, especially during resuscitation is difficult and can't be done properly, during an emergency resuscitation may be done without covering the baby and the baby on a table or a cool place (Mccall et al. 2018).

Actions that can prevent babies from developing hypothermia are DCC (Delayed Cord Clamping). This suggests several benefits of increased placental transfusion, cardiovascular stability, cerebral oxygenation, and a lower risk of severe intraventricular haemorrhage and late onset sepsis. The high duration of DCC (60–75 s) is also associated with a lower incidence of hypothermia at birth in premature infants (Song, 2015).

CONCLUSION

Thus, it can be concluded that neonatal factors are premature, low birth weight, resuscitation or medical treatment are factors that influence the incidence of hypothermia in newborns.

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Relationship between Antenatal Depression and Pre-Eclampsia (*LITERATURE REVIEW*)

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ABSTRACT

Background. *Pre-eclampsia* is a collection of symptoms with signs of hypertension, proteinuria and edema arising from pregnancy. This disease usually occurs at 20 weeks of gestation and one of the causes is psychological factors in the form of depression. . **Aim.** The purpose of this literature review is "to study the relationship between depression in pregnancy and the incidence of pre-eclampsia". **Methods.** This type of research is a Literature Review. The research design used the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) approach. The search found 144 articles, then selected 10 articles that met the inclusion criteria. Searches were performed across four electronic databases (Google Scholar, Pubmed and Proquest) published in the last five years published in Indonesian and English. The instruments used are questionnaires, medical records, interviews. This research uses descriptive analysis. **Results.** Of the 10 articles reviewed, 10 of these articles stated that there was a general relationship between Pre-Eclampsia. Of the 10 articles reviewed, 8 journals showed that there was a relationship between gestational age depression and pre-eclampsia. **Conclusion.** From the results of the review that has been carried out, it is concluded that pregnancy depression affects the incidence of pre-eclampsia. **Recommendation.** The results of this study are expected to provide health information and insight, especially regarding pregnancy depression with the incidence of pre-eclampsia medical records, interviews.

INTRODUCTION

Depression during pregnancy is a mood disorder that is the same as depression that occurs in ordinary people in general, where in the event of depression there will be chemical changes in the brain. Depression can also be caused by hormonal changes that affect the mother's mood so that the mother feels upset, bored or sad. It often appears with symptoms of anxiety. At a global level, it is estimated that more than 300 million people suffer from depression, equivalent to 4.40% of the world's population (NIH, 2016). As a result of an anxious state in a mother, it can cause blood vessel spasm to worsen, causing an increase in blood pressure (Trisiani, 2016). Pre-eclampsia is a collection of symptoms with signs of hypertension, proteinuria and edema arising from pregnancy. This disease usually occurs at 20 weeks of gestation and above. . This theory was strengthened in the research journal Isworo, et al (2012) from the results of a bivariate analysis between anxiety and the incidence of pre-eclampsia in pregnant women, which resulted in OR = 7.84; (CI=3.967– 15501); p=0.00. The interpretation is that the incidence of pre-eclampsia in pregnant women will increase 7.84 times in mothers who experience anxiety compared to mothers who do not experience anxiety, and statistically significant with p value = 0.00 anxiety can also pose a risk of pre-eclampsia. According to the Regulation of the Minister of Health of the Republic of Indonesia number 97 of 2014 that pregnant women receive health services during pregnancy at least 4 (four) times during pregnancy for early detection of complications, one of which is pre-eclampsia, WHO recommends giving routine calcium as much as 1500-2000 mg of elemental calcium per day, divided into 3 doses (recommended to be consumed with mealtimes). In addition, non-pharmacological pregnancy can be carried out with nutritional management, namely adequate vitamin E, calcium, and avoiding free radical triggers. . Stress management during pregnancy is also an effort to prevent pre-eclampsia or HDK through green color therapy, pregnancy exercise, music therapy, and aromatherapy. (Sukmariah, 2019). Despite the prevention that has been done, pre-eclampsia is the second leading cause of maternal death. Data from the Health Office of East Java Province in 2017 shows that the three highest causes of maternal death are other causes, namely 29.11% or 154 people, preeclampsia / eclampsia is 28, 92% or as many as 153 people and bleeding as many as 26.28% or as many as 139 people. From several previous studies that said that there was a relationship between antenatal depression and pre-eclampsia, the authors felt it was important to compile

a literature review which in the results of the review was expected to contribute to efforts to overcome the problem of reducing pre-eclampsia rates.

METHODS

The method used in this research is Literature River. This Rivew literature shows the relationship between writing and research statements that have been formulated. The protocol and evaluation of the literature review will use the PRISMA Checklist to determine the selection of studies that have been found and adapted to the objectives of the literature review. The purpose of this literature is to provide a complete and structured summary of previous studies using secondary data. In the initial step, 204 articles were obtained from 2015-2020 with the keywords: Depression, antepartum and pre eclampsia. This research was conducted using 3 databases, namely Pubmed, Proquest and Google Scholar.

RESULTS

	Title	Method (Design, Sample, Variable, Instrument, Analysis)	Research result
1	Relationship Between Pre-eclampsia And Risk Antenatal Depression In Puskesmas Mnokwari City In 2018	Design: retrospective cohort Sample: 50 pregnant women Variable: independent variable pre-eclampsia and pregnancy depression the dependent variable Intervention :questionnaire Analysis : Bivariate Analysis	The results showed that there was a statistical relationship between the incidence of pre-eclampsia and antenatal depression with OR= 3.77 and P= 0.026. which means that mothers with pregnancy depression have a 3.77 risk of developing pre-eclampsia.
2	Investigation of maternal psychopathological symptoms, dream anxiety and insomnia in preeclampsia.	Design : observational Sample : 158 respondents Variable : Maternal Psychopathology, anxiety and insomnia in pre eclampsia. Intervention: HADS Questionnaire (Hospital Anxiety and Depression Scale) Analysis: Person correlation	In this observational study, there was a psychopathological relationship with the incidence of pre-eclampsia. In the psychological score analysis used, the higher the eating score, the more pre-eclampsia.
3.	<i>Preeclampsia</i> and the longitudinal risk of hospitalization for depression at 28 years	Design: Longitudinal cohort study retrospective Sample: 1,210,963 pregnant women in Quebec. Variables: Preeclampsia and longitudinal risk of hospitalization for depression at 28 years. Intervention: Not using Analysis: COX . regression	There is a relationship between hospitalized depression and the incidence of preeclampsia
4	Autoimmune conditions and comorbid depression in pregnancy: examining the risk of preterm birth and preeclampsia	Design: Prospective cohort Sample :3034 pregnant women Variables: The incidence of autoimmune conditions as comorbid depression in pre-eclampsia. Intervention: screening Analysis: statistical analysis	There is a relationship between pregnancy depression and the incidence of pre-eclampsia. Pre-eclampsia in Rheumatoid Arthritis Depression (RR 1.55,

			95% CI 0.97, 2.50) which This means that there is a relationship between depression and the incidence of pre-eclampsia.
5.	Relationship between the incidence of pre-eclampsia and the risk of antenatal depression	Design : Retrospective cohort Sample: 75 pregnant women Variable: incidence of pre-eclampsia and risk of depression Intervention: Edinburgh Postnatal Depression Scale (EPDS) questionnaire Analysis : Multivariate binary logistic regression	There is a relationship between pregnancy depression and the incidence of pre-eclampsia. Pre-eclampsia in Rheumatoid Arthritis Depression (RR 1.55, 95% CI 0.97, 2.50) which This means that there is a relationship between depression and the incidence of pre-eclampsia.
6	<i>Effect of cognitive Behavioral Therapy on Anxiety, Stress, Depression and Coping Pattern among pregnancy women with pre eclampsia.</i>	Design : Quasi experimental Samples : 86 Samples Variable : Cognitive behavioral therapy, anxiety, stress and pre eclampsia. Intervention: interview measuring Beck's Anxiety Inventory. Analysis: Regression	After administering the intervention, the static results were quite significant. which means that there is a relationship between depression during pregnancy and pre-eclampsia.
.	Use of antidepressants and anxiolytics in early pregnancy and the risk of preeclampsia and gestational hypertension : prospectivestudy	Design: Prospective study Sample: 6761 studies Variables: Antidepressants, anxiolytics and pre-eclampsia. Intervention: Administration of antidepressants and anxiolytics Analysis: XLSTAT (2018.5 version, Addinsoft).	There is a relationship between pregnancy depression and the incidence of preeclampsia. Women exposed to antidepressant and/or anxiolytic drugs before the 16th week of gestation had a 3- fold increased risk for preeclampsia when compared with women not exposed to antidepressant/anxiolytic medication, depression and anxiety.

8.	Antidepressant Medication use, Depression and the risk of pre eclampsia.	Design : Study Cohort Sample : 21,589 pregnant Kaiser Permanente Northern California members between 2010 and 2012 Variable : Antidepressant Medication use, Depression and the risk of pre eclampsia Intervention: ad-hoc questionnaire Analysis: the Fisher exact test and the Wilcoxon rank-sum tests	The results showed that there was a relationship between depression in pregnancy and the incidence of pre-eclampsia. There was a significant increase in the risk of pre-eclampsia in pregnant women with depression who took antidepressant drugs during the 2nd trimester compared to pregnant women with depression without treatment. (RR= 1.6% 95% CI 1.09 2.39) and for women without depression (RR 1.70 95% CI 1.30, 2.23).
9.	Association of soft depression and depressive symptoms with pre eclampsia	Design: control case. Sample: 339 pre-eclamptic pregnancies, 337 pregnancy with normotensive. Variable: Depression, Depressive symptom and Pre eclampsia Depression, anxiety and post traumatic disorder and following hypertensive disorder of pregnancy Intervention: Patient health questionnaire (PHQ-9) Analysis : Pire T-Test	The results showed that there was a relationship between depression in pregnancy and the incidence of pre-eclampsia, which could be seen from the prevalence with non-depressed women, those with moderate depression had a 2.3-fold increased risk of pre-eclampsia.
10	The relationship of depression in the quality of life of mothers in Lumajang with the incidence of pre-eclampsia	Design: cross sectional Sample: 54 pregnant women with pre-eclampsia in Lumajang Variable : Depression and quality of life of pregnant women with pre-eclampsia Intervention: questionnaire Analysis: Descriptive and correlative	There is a significant relationship between depression and quality of life of pregnant women with pre-eclampsia in Lumajang.

DISCUSSION

Research on Yuni Subhi Isnain There is a relationship between depression in pregnancy and the incidence of pre-eclampsia. An overview of the number of respondents at the Manokwari Health Center in 2018. In this study, based on pregnant women with pre-eclampsia as many as 26 respondents (52%) and non-preeclampsia 24 respondents (48%) of the total there were 50 respondents. In the results of the bivariate test, it was found that 8 respondents (32%) of mothers with non-pre-eclampsia experienced depression and those who did not experience depression were 16 respondents (64%), while in pre-eclampsia with depression there were 17 respondents (72%) and 9 respondents (36%). From the research above, it can be concluded that one of the causes of pre-eclampsia is depression. From research Orkun there is a relationship between depression of pregnancy and the incidence of pre-eclampsia. There were a total of 158 respondents taken from hospitals in

Turkey. divided based on mothers without pre-eclampsia 45 respondents (28%), mothers with mild pre-eclampsia 41 respondents (26%) and mothers with severe pre-eclampsia 44 respondents (28%) there were 28 respondents who did not meet the qualifications (18%). In the bivariate analysis of pathopsychological and pre-eclampsia, significant results were obtained from 3 groups of respondents reaping different results. Group1 ($P=0.006$), group 2 ($p=0.005$) and group 3 ($p=0.004$) thus the higher the VDAS Global SCL score or the more severe the depression, the more severe the pre-eclampsia.

From the research of Nathalie Auger There is a relationship between pregnancy depression who is hospitalized with the incidence of pre-eclampsia. This study obtained pregnant women with pregnancy depression and hospitalized without pre-eclampsia as many as 20,911 respondents and with pre-eclampsia as many as 1190 respondents. Pregnant women with pregnancy depression and hospitalized with onset of pre-eclampsia with gestational age less than 34 weeks were 119 respondents and pregnant women with pregnancy depression and hospitalized with gestational age more than 34 weeks were 1071 respondents. Pregnant women with depression in pregnancy and hospitalized with degrees of pre-eclampsia were 758 respondents and pregnant women with depression during pregnancy and hospitalized with degrees of severe pre-eclampsia were 361 respondents. With results (HR 1.15, 95% CI 1.07-1,

From the results of Gretchen Bandoli's research, there is a relationship between depression in pregnancy and the incidence of pre-eclampsia. There are 3034 respondents Rheumatoid (RA), Chorn Disease and psoriasis. With 1703 respondents without an autoimmune diagnosis, 1331 with an autoimmune diagnosis. Respondents with *Rheumatoid Arthritis* Depression, Chorn Disease and Psoriasis Depression without pre-eclampsia were 1403 respondents. And Respondents with *Rheumatoid Arthritis* Depression, Chorn Disease and Psoriasis Depression with Pre-eclampsia were 81 respondents. and from Respondents with *Rheumatoid Arthritis Depression*, *Chorn Disease* and *Psoriasis Depression* in this study only Rheumatoid Arthritis Depression was independently associated with Pre-eclampsia (42 respondents) for Chorn Disease (18 respondents) and Psoriasis (24 respondents) had a relationship but in the statistical test it did not reach statistical significance. Thus, according to the authors, there is an increased risk of pre-eclampsia in Rheumatoid Arthritis Depression (RA). RR 1.55, 95% CI 0.97, 2.50) which means that there is a relationship between depression and the incidence of pre-eclampsia.

Samia Hasan is available Relationship of pregnancy depression with the incidence of preeclampsia. After giving cognitive behavioral therapy intervention to pregnant women with depression, it can reduce symptoms of depression in mothers. Mothers with depression during pregnancy and suffering from pre-eclampsia before the intervention had a value in the intervention group ($P \leq 0.001$) with a large effect size ($\eta^2 = 0.7$). In contrast, in the group of pregnant women without pregnancy depression there was no statistical difference in scores of depression, anxiety, and stress before and after routine care ($P > 0.05$) that caused pre-eclampsia.

Tiara Fatma Kumala's Research From the results of this study, there is a relationship between pregnancy depression and the incidence of pre-eclampsia. With a total of 75 respondents who are pregnant women, for mothers with normal pregnancies 50 respondents (66.7%) and mothers with pre-eclampsia pregnancy 25 respondents (33.3%). Mothers with depression 49 respondents (65.3%) and pregnant women without depression 26 respondents (34.7%). After bivariate analysis, the results showed that normal pregnant women with depression were 33 respondents (66%) and without depression as many as 17 respondents (33%) while mothers with pre-eclampsia pregnancy were accompanied by pregnancy depression as many as 16 respondents (64%) and without depression as many as 9 respondents. (36%). Judging from the Odds Ratio value of 0.91 means pregnant women with pre-eclampsia, the risk of antenatal depression is 0.91 times lower than pregnant women with normal pregnancies.

Study Nathalie Bernard The number of women who agreed to participate in this large prospective study was very high, with a recruitment rate of 86%. From 7,866 prospective study participants. 6878 pregnant women met the inclusion criteria for this study, of whom 335 (4.9%) were exposed to antidepressants or anxiolytic drugs during pregnancy and 218 of whom were exposed before the 16th week of gestation. There were 218 respondents who were exposed to pregnancy depression and received antidepressant drug intervention before 16 weeks of gestation and had an OR 3.16 value, which means that they have a risk level of 3.16 times for pre-eclampsia. Mothers who were affected by depression during pregnancy and received an antidepressant drug intervention after 16 weeks were 167 respondents with an OR of 3.80, which means that they had a risk level of 3.80 times for pre-eclampsia. Mothers who were affected by pregnancy depression and received an anti-depressant drug intervention were then dismissed before 16 weeks of gestation as many as 51 respondents with an OR of 1.19 which means that they have a risk level of 1.19 times for pre-eclampsia. From this study, it was concluded that women who were depressed and received antidepressant intervention before 16 weeks of gestation or less than 16 weeks and continued until the 3rd trimester had a 3x more risk of exposure to pre-eclampsia than pregnant women with depression without antidepressant intervention.

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Lyndsay Amon Avalos . Research From the results of this study, there is a relationship between pregnancy depression and the incidence of pre-eclampsia. Overall this study involved 21,589 women as respondents. Mothers experiencing depression during pregnancy and treated with anti-depressant drugs as many as 1,732 (8%) respondents, mothers not experiencing depression but taking antidepressant drugs during pregnancy 149 (<1%) respondents, mothers experiencing depression and receiving psychotherapy 1961 (9%) respondents, pregnant women with depression without treatment 1345 (6%) respondents. From the analysis test, the results obtained RR 1.6, 95% CI: 1.06, 2.39 which means a significant increase in the risk of pre- eclampsia appears in women diagnosed with depression taking anti-depressant drugs.

The Sixto Sances study found a relationship between depression in pregnancy and the incidence of pre-eclampsia. Pregnant women with depression scores below 4 (minimum depression) experienced pre-eclampsia as many as 180 respondents (53.1%) and did not occur pre-eclampsia as many as 213 respondents (63.2%). Mothers with mild depression had pre-eclampsia as many as 106 respondents (31.3%) and did not have pre-eclampsia in 98 respondents (29.%). Pregnant women with moderate depression have pre-eclampsia 39 respondents (11.5%) and not pre-eclampsia 18 respondents (5.3%). Pregnant women with severe depression had pre-eclampsia as many as 2 respondents (0.6%) and there were no pre-eclampsia as many as 0 respondents.

Lyndsay Amon Avalos . Research From the results of this study, there is a relationship between pregnancy depression and the incidence of pre-eclampsia. Overall this study involved 21,589 women as respondents. Mothers experiencing depression during pregnancy and treated with anti-depressant drugs as many as 1,732 (8%) respondents, mothers not experiencing depression but taking antidepressant drugs during pregnancy 149 (<1%) respondents, mothers experiencing depression and receiving psychotherapy 1961 (9%) respondents, pregnant women with depression without treatment 1345 (6%) respondents. From the analysis test, the results obtained RR 1.6, 95% CI: 1.06, 2.39 which means a significant increase in the risk of pre- eclampsia appears in women diagnosed with depression taking anti-depressant drugs.

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Andrita Asida's research used a total of 54 respondents and then divided into pre-eclampsia pregnant women with depression as many as 42 respondents and pre-eclampsia pregnant women without depression as many as 12 respondents who were taken in Lumajang district. in the results of the study, some respondents experienced symptoms of depression, namely as many as 37 respondents (77.8%) and half of the respondents experienced poor quality of life, namely 37 respondents (68.5%). The results of bivariate analysis using Spearman Rank, it was found that there was a significant relationship between depression and quality of life of pregnant women with preeclampsia in Lumajang Regency with a value ($p\text{-value} \leq 0.0001$) less than 0.05, so H_0 was rejected and H_a was accepted. Thus, there is a relationship between depression and the quality of life of pregnant women with pre-eclampsia in several sub-districts of Lumajang district.

The 10 articles, there are 5 articles that discuss depression factors in the relationship of depression with the incidence of pre-eclampsia without depression levels. Five articles show that pregnancy depression factors have a significant relationship with pre-eclampsia without classifying the level of depression. Among them are Yuni Subhi Isnain (2019), Nathaline Auge (2020), Gritchen Bandouli (2017), Samia Hassan (2020) and Tiara (2015). Pregnant women with antenatal depression have a risk of developing pre-eclampsia by 72%, this figure is greater than pregnant women without antenatal depression and is exposed to pre-eclampsia by 28% (Yuni, 2019). Two of the 10 articles that discuss the factors of depression in pregnancy on pre-eclampsia, are articles whose intervention is giving anti-depressants. Among them are Nathaline Bernard (2019) and Lyndsay Ammon (2015). In these two articles, it is explained that mothers who experience pregnancy depression with antidepressant administration have a greater risk of pre-eclampsia than mothers who experience pregnancy depression without antidepressant administration. And mothers without depression and without antidepressant medication had the lowest risk of pre-eclampsia. Three of the 10 articles that discuss pregnancy depression factors for pre-eclampsia with depression levels. Among them are Orkun Cetin (2016), Sixto Sancez (2017) and Andrita Asida (2019). In the article, it is explained that the higher the level of depression,

the higher the risk of pre-eclampsia. The results of the previously mentioned research are in accordance with the theory expressed by Faramarzi (2015) that stress to depression is a psychological state that predicts pregnancy depression,

CONCLUSION

Ten out of 10 articles discuss the factors of pregnancy depression on the relationship of pregnancy depression with the incidence of pre-eclampsia. Overall, it is consistent to say that there is a relationship between depression in pregnancy and the incidence of pre-eclampsia. So it can be concluded that pregnancy depression factor can be realized as a factor that influences the relationship between pregnancy depression and the incidence of pre-eclampsia. In these 10 journals five out of ten articles showed that pregnancy depression had a significant relationship with pre-eclampsia without classifying the level of depression, three out of ten articles.

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The analysis of the causes of PCOS (*Polycystic Ovary Syndrome*)

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ABSTRACT

Introduction. PCOS (Polycystic Ovary Syndrome) is an ovulation disorder that causes infertility in women of childbearing age. As many as 4-18% of them have PCOS which causes 5-10% of women of childbearing age to become infertile. The purpose of this literature review is to explain and analyze the factors that cause the incidence of PCOS based on empirical studies of the last five years. **Method.** This type of research is a literature review with a research design using the PRISMA approach. The search was conducted in five electronic databases (Google Scholar, PubMed, Willey, Cochrane, Elsevier and ProQuest) published in the last five years, from 2015- 2020 published in English and according to keywords. In the journal search, 4496 articles were found, then duplication was selected, the inclusion and exclusion criteria were eligible, and the full text was left, leaving 12 articles. **Result.** General characteristics in study selection were obtained mostly from PubMed (75%). The study design was almost partially Cross-Sectional (41.6%). Most (33.3%) years of publication were 2016 and 2018 and most (100%) journals were English. While the factors causing PCOS such as hyperinsulinemia/insulin resistance (n=7), obesity (n=5), and hyperandrogenism factors (n=3). **Analysis.** The results of this review state that hyperinsulinemia/insulin resistance, obesity, and hyperandrogenism can cause the incidence of PCOS. **Discussion.** Further research is needed on the factors that influence the incidence of PCOS.

Keywords: factors, PCOS, polycystic ovary syndrome.

INTRODUCTION

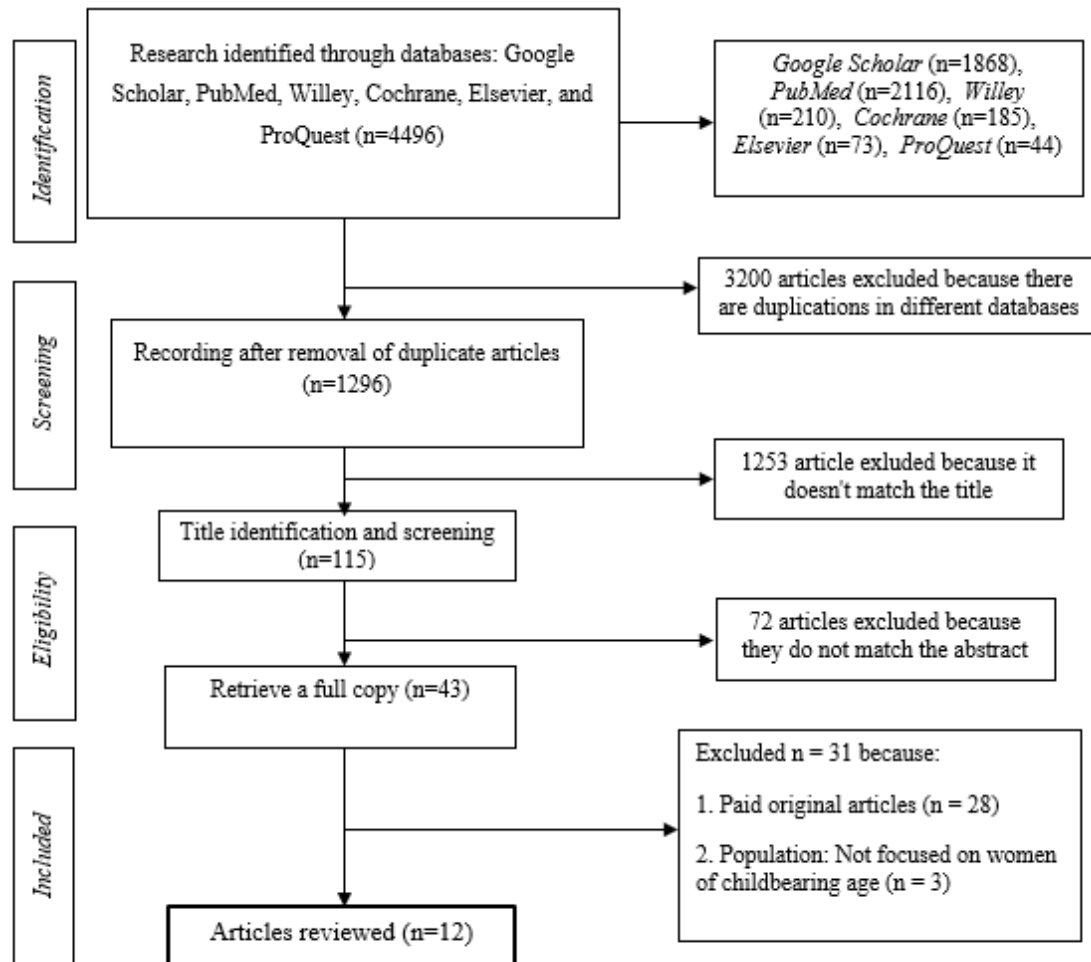
Infertility is the inability to produce offspring. Infertility cases that occur in women occur in 40% -50% of cases while men are 30% and other causes are about 20% -30% of couples¹ (Henriyanita, 2019). In 1990 the incidence of infertility reached 42 million and increased in 2010 as many as 48.5 million cases^{2,3}. According to WHO (World Health Organization) the incidence of Infertility cases are increasing every year⁴. The cause of infertility in men is easier to know by checking their sperm. In women, it is necessary to examine the eggs and the number of eggs produced, to check the fallopian tubes, the condition of the uterus, the ability of the cervix to distribute sperm cells, and ovulation disorders or PCOS (Polycystic Ovary Syndrome)¹. Syndrome is caused by hyperandrogenemia (HA), hyperinsulinemia/insulin resistance (IR), hormonal imbalance, cardiovascular disease, obesity, and other health problems⁴. PCOS develops when the ovaries are stimulated to produce too many androgens, especially testosterone, which releases large amounts of the hormone LH in the anterior pituitary gland⁷. Increased growth factors cause an increase in ovarian response to Luteinizing Hormone (LH) and Follicle Stimulating Hormone (FSH), so that ovarian follicle development increases and androgen production also increases. Excessive follicle development will have an impact on the number of cystic follicles. There is a relationship between obesity and an increased risk of polycystic ovaries, from increased insulin resistance which causes theca cells to produce androgens and inhibits Sex Hormone Binding Globulin (SHBG) so that free androgens increase. This causes many androgens to be aromatized into estrogen which then produces LH and triggers follicular maturation⁶. The prevalence of PCOS varies widely from 2.2% to 26% globally. In some Asian countries, prevalence rates range from 2% to 7.5% in China and 6.3% in Sri Lanka⁷. A total of 8,612 women between the ages of 28-33 years, 5.8% of them experienced PCOS and 309 or 72% of women with PCOS experienced infertility⁸. In dealing with PCOS, pharmacological therapies can be used, including ovulatory dysfunction-related infertility (clomiphene citrate, aromatase inhibitors, and glucocorticoids, metformin), menstrual cycle disorders (cyclic progestins and combined oral contraceptives such as estrogen and progestins), androgen related symptoms (anti-androgens), glucocorticoids, gonadotropin-releasing hormone agonists, oral contraceptives such as ethinyl estradiol) and vitamin D therapy^{9,21}.

METHODS

The method used in this research is Literature Review. This Rivew literature shows the relationship between writing and research statements that have been formulated. The protocol and evaluation of the literature review will use the PRISMA Checklist to determine the selection of studies that have been found and adapted to the objectives of the literature review. The purpose of this literature is to provide a complete and structured summary of previous research using secondary data. In the initial step, 4496 articles were obtained from 2015-2020 with the

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keywords: factors, polycystic ovary syndrome, women of childbearing age, causes of PCOS in women, factors of polycystic ovary syndrome in women, analysis of factors for PCOS reproductive aged women. This research was conducted using 5 databases, namely Google Scholar, PubMed, Willey, Cochrane, Elsevier,



RESULTS

No	Judul, Author, Tahun, Volume	Metode (Desain, Sampel, Variabel, Instrumen, Analisis)	Hasil Penelitian	Database
1	<p><i>Inter-related effects of insulin resistance, hyperandrogenism, sympathetic dysfunction and chronic inflammation in PCOS</i></p> <p>Article type: 3 Original Article-Australia, Japan, SE Asia</p> <p>doi: 10.1111 / cen.13808</p> <p>https://onlinelibrary.wiley.com/doi/abs/10.1111/cen.13808</p> <p>Tahun 2018</p>	<p>D : Cross sectional</p> <p>S : 49 women with PCOS and 23 controls total 72</p> <p>V: insulin resistance, hyperandrogenism, sympathetic dysfunction and chronic inflammation</p> <p>I : community data</p> <p>A : Pearson test</p>	<p>Testosterone stages had been most importantly related to PCOS, after adjustment for age and BMI. In women with PCOS, testosterone and FAI had been each good sized with insulin resistance in PCOS women.</p>	PubMed
2	<p><i>Association between Insulin Resistance and Cardiovascular Risk Factors in Polycystic Ovary Syndrome Patients</i></p> <p>Rev Bras Ginecol Obstet Vol. 40 No. 4/2018</p> <p>DOI https://doi.org/10.1055/s-0038-1642634.</p> <p>ISSN 0100-7203.</p> <p>https://pubmed.ncbi.nlm.nih.gov/29747212/</p> <p>Tahun 2018</p>	<p>D : Cross sectional</p> <p>S : 83 PCOS patients</p> <p>V : age, weight, height, Ferriman-Gallwey score, body mass index, waist circumference, systolic, diastolic, cholesterol, high density lipoprotein, low density lipoprotein, Non-HDL lipoprotein, triglycerides, glucose (fasting)</p> <p>I: medical record</p> <p>A : Proportion test, Chisquare test, and Fisher's exact test</p>	<p>IR turned into statistically better in overweight women and consequently extra susceptible to growing PCOS than women with everyday BMI. No affiliation turned into discovered among IR and WC, BMI, LAP.</p>	PubMed
3	<p><i>Polycystic Ovary Morphology Is Associated with Insulin Resistance in Women with Polycystic Ovary Syndrome</i></p> <p>DR SO-HYEON HONG (Orcid ID : 0000-0001-5194-8924). Article type : 3 Original Article - Australia, Japan, SE Asia</p> <p>doi: 10.1111/cen.13380</p> <p>https://pubmed.ncbi.nlm.nih.gov/28543550/#:~:text=Results%3A%20Polycystic%20ovary%20morphology%20was,01).</p> <p>Tahun 2017</p>	<p>D : Cross sectional</p> <p>S : 679 women with PCOS and 272 control women, a total of 951</p> <p>V: glucose and insulin levels, testosterone levels, ovarian volume, and follicle number</p> <p>I: medical record</p> <p>A : Multiple regression</p>	<p>PCOS women had drastically better overall testosterone stages and decrease wide variety of menstrual durations according to 12 months and ovarian follicle rely related to IR in women with PCOS after adjusting for age, BMI, and overall testosterone.</p>	PubMed
4	<p><i>Association of leptin and insulin resistance in PCOS: a case-controlled study</i></p> <p><i>Int J Reprod BioMed Vol. 15. No. 7. pp: 423-428, July 2017</i></p> <p>https://pubmed.ncbi.nlm.nih.gov/29177243/</p> <p>Tahun 2017</p>	<p>D : Case control</p> <p>S : 378 women</p> <p>V : Serum leptin, body mass index (BMI), several hormones,</p> <p>I: medical record</p> <p>A: Pearson's test</p>	<p>Leptin degrees had been substantially correlated with frame weight and BMI in women, suggest FSH degrees had been substantially decrease in PCOS patients, LH and testosterone degrees had been generally better in PCOS women.</p>	PubMed
5	<p><i>Insulin resistance and obesity among infertile women with different polycystic ovary syndrome phenotypes</i></p> <p><i>Scientific RepoRts 7: 5339 DOI:10.1038/s41598-017-05717-y</i></p> <p>https://www.nature.com/articles/s41598-017-05717-y</p> <p>Tahun 2017</p>	<p>D : Cross sectional</p> <p>S : 213 women</p> <p>V : age, age of menarche, IR</p> <p>I : database</p> <p>A : Chi-square tests, ANOVA, t-test</p>	<p>No relationship was observed between BMI and waist circumference, women had a significant phenotype of PCOS with insulin resistance, and age and menstrual age were not significant for PCOS.</p>	Proquest

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6	<p><i>Insulin resistance and oxidative marker in women with PCOS</i></p> <p>ARCHIVES OF PHYSIOLOGY AND BIOCHEMISTRY</p> <p>DOI:10.1080/13813455.2018.1499120</p> <p>https://pubmed.ncbi.nlm.nih.gov/30450993/#:~:text=Conclusion%3A%20Our%20study%20suggests%20that,grade%20inflammation%20and%20cardiovascular%20diseases.</p> <p>Tahun 2018</p>	<p>D : case control study</p> <p>S : 200 women</p> <p>V : BMI, insulin levels, PCOS</p> <p>I : measurement of weight and TB then calculate BMI, measurement of glucose levels in fasting and non-fasting conditions</p> <p>A : t-test, Kruskal-Wallis test</p>	<p>Fasting blood glucose, serum insulin, and IR are elevated in overweight and non-obese women with PCOS; Obese women with PCOS have an increased risk of moderate inflammatory and cardiovascular diseases.</p>	PubMed
7	<p><i>A case-control observational study of insulin resistance and metabolic syndrome among the four phenotypes of polycystic ovary syndrome based on Rotterdam criteria</i></p> <p>Jamil et al. Reproductive Health 2015, 12:7 http://www.reproductive-health-journal.com/content/12/1/7</p>	<p>D : Case control</p> <p>S : 526 women</p> <p>V : IR, Oligo-anovulation, Hyperandrogenism</p> <p>I: medical record</p> <p>A : t-test, post-hoc test</p>	<p>In women with oligoanovulation (O) and PCO (P) morphology, levels were significantly lower than in women with OP and HA phenotypes. BMI, waist circumference, triglycerides (cardiovascular risk), HOMAIR, and type 2 diabetes are associated with an increased risk of metabolic disorders.</p>	PubMed
8	<p><i>Overweight and obese but not normal weight women with PCOS are at increased risk of Type 2 diabetes mellitus a prospective, population-based cohort study</i></p> <p>Human Reproduction, pp. 1–9, 2016</p> <p>doi:10.1093/humrep/dew329</p> <p>https://pubmed.ncbi.nlm.nih.gov/28031324</p> <p>Tahun 2016</p>	<p>D: cohort study</p> <p>S: 1836 women</p> <p>V: PCOS, obesity, overweight</p> <p>I: questionnaire</p> <p>A: t-test, Mann–Whitney U-test</p>	<p>Polycystic ovary syndrome significantly increases the risk of DMT2 in obese and overweight women; Normal weight women with PCOS are not at increased risk of prediabetes or type 2 diabetes.</p>	Google scholar
9	<p>Relationship between hyperandrogenism, obesity, inflammation and polycystic ovary syndrome</p> <p>Asli Nehir Aytan, Ercan Bastu, Irem Demiral, Huri Bulut, Murat Dogan & Faruk Buyru (2016):</p> <p>Gynecological Endocrinology,</p> <p>DOI:10.3109/09513590.2016.1155208</p> <p>https://pubmed.ncbi.nlm.nih.gov/26951881/#:~:text=Body%20mass%20index%20had%20a,the%20inflammatory%20status%20and%20hyperandrogenism.</p> <p>Tahun 2016</p>	<p>D : prospective study</p> <p>S : 88 women</p> <p>V: hyperandrogenism, obesity, inflammation and polycystic ovary syndrome</p> <p>I: medical record</p> <p>A : t test, ANOVA</p>	<p>FAI values were significantly higher in PCOS patients, inflammation and hyperandrogenism increased in obese PCOS patients, weight gain in women with a genetic predisposition to PCOS.</p>	PubMed
10	<p><i>Association of obesity and overweight with the prevalence of insulin resistance, pre-diabetes and clinical biochemical characteristics among infertile Mexican women with polycystic ovary syndrome</i></p> <p>BMJ Open 2016;6:e012107.</p> <p>doi:10.1136/bmjopen-2016-012107</p> <p>https://bmjopen.bmj.com/content/6/7/e012107</p> <p>Tahun 2016</p>	<p>D : Cross sectional</p> <p>S : 20,906 women</p> <p>V : infertile with PCOS diagnosis, normal weight (body mass index (BMI) (18.5 - 24.9), overweight (BMI 25 - 29.9), and obesity (BMI 30)</p> <p>I: medical record</p> <p>A : Kruskal-Wallis test, Fisher's exact test</p>	<p>Infertile women with PCOS who are obese or overweight are dominated by IR and prediabetes.</p>	PubMed
11	<p><i>Vitamin D in polycystic ovary syndrome: Relationship to obesity and insulin resistance</i></p> <p>DOI 10.1002/mnfr.201500259 Mol.</p> <p>Nutr. Food Res. 2016, 60, 110–118</p>	<p>D : Cross sectional</p> <p>S : 76 women</p> <p>V : PCOS, obesity, IR, vitamin D</p>	<p>Vitamin D levels were lower in obese women with PCOS than in overweight controls, and vitamin D was associated with IR in the PCOS group.</p>	PubMed

	https://pubmed.ncbi.nlm.nih.gov/26255991/ Tahun 2016	I: medical record A : linear multivariate analysis		
12	<i>Close correlation between hyperandrogenism and insulin resistance in women with polycystic ovary syndrome-Basedmon liquid chromatography with tandem mass spectrometry measurements</i> <i>J Clin Lab Anal.</i> 2018;e22699 DOI: 10.1002/jcla.22699 https://onlinelibrary.wiley.com/doi/epdf/10.1002/jcla.22699 Tahun 2018	D: cohort study S: 671 women V: hyperandrogenism, insulin resistance, PCOS I: medical record A: Kolmogorov- Smirnov test, chi square, ANOVA	Higher IR and risk of HA elevation among PCOS women	Wiley

DISCUSSION

The 12 related articles, then analyze the factors that cause PCOS (Polycystic Ovary Syndrome). These factors were found to be hyperinsulinemia/insulin resistance, obesity, and hyperandrogen. There are 7 articles that have been reviewed in which hyperinsulinemia/insulin resistance is the cause of PCOS. This result is in line with the opinion of several researchers, which states that respondents who have hyperinsulinemia/insulin resistance cause PCOS¹⁰. Insulin resistance affects the ovulatory cycle of women of reproductive age. Insulin resistance can cause insulin levels to rise in the blood (hyperinsulinemia). In a study conducted by Wanderley (2018), 50-80% of PCOS women with hyperinsulinemia/insulin resistance experienced menstrual cycle disturbances of more than 35 days (55.43%), women who experienced amenorrhea (40.96%), and most PCOS patients suffer from this condition with the severity of PCOS related to the IR condition¹². According to other research that women with PCOS are overweight and have high fasting glucose and insulin levels and higher total testosterone levels and the number of menstruations is less frequent during the year this affects the number of ovarian follicles associated with IR in women with PCOS^{13,14}. Al-Jefout's research showed that 133 or 83.6% of PCOS women experienced insulin resistance in 159 samples and showed a high FAI (Free Androgen Index), namely abnormal testosterone levels in PCOS women's bodies¹⁵. According to research (Jamil et al., 2015) high insulin resistance is found in women with PCOS which can cause Metabolic Syndrome, namely hyperinsulinemia and hyperandrogens¹⁶. Research conducted by (Joham et al., 2016) BMI and IR are positively related to serum leptin in infertile PCOS women, in the PCOS group, 9 out of 99 women were obese with a BMI 30 and 31 women were overweight with $25 \leq \text{BMI} 29.9$ ¹⁷.

There are 5 articles discussed about obesity factors, it was found that respondents who were obese were the cause of PCOS. The results of the study are in line with several researchers, according to Al-Jefout (2017) measurement of BMI in the obesity category of 39.9% and waist circumference in the obese category of 25.9% in the study experiencing insulin resistance and hyperandrogen, which causes hirutism symptoms. According to Ollila's research (2017), it shows that the risk of T2DM in women with PCOS is mainly due to being overweight/obese and normal weight women with PCOS do not experience an increased risk¹⁸. According to research by Nehir Aytan (2016) obese PCOS women have higher androgen levels than lean PCOS women¹⁹. According to research by Reyes-Muñoz (2016), it was found that obese women found high glucose and insulin hormone levels which had an impact on increasing FAI (Free Androgen Index)²⁰. Research conducted by Joham (2016) low vitamin D levels in women with PCOS with obesity around 27-56%²¹.

There are 3 articles that discuss hyperandrogen factors, all of which state that hyperandrogen factors affect the incidence of PCOS. These results are in line with the other studies in women with PCOS who are obese with low FSH hormones, increased LH, and increased FAI due to impaired production of Sex hormone binding globulin (SHGB) in the liver^{10,19}. Research conducted by Yang (2019) that women with PCOS experienced hyperandrogen as much as 80.99%, IR with HA was strongly associated in this case because FAI levels increased¹⁴.

CONCLUSION

The results of this review reported 7 out of 12 journals discussing the PCOS incident factor, namely hyperinsulinemia/insulin resistance, the review results reported 5 out of 12 journals discussing the PCOS incident factor, namely obesity, and the review results reported 3 out of 12 journals discussing the PCOS incident factor, namely hyperandrogen.

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ASSOCIATION BETWEEN SOCIO ECONOMIC AND ENVIRONMENTAL SANITATION WITH STUNTING IN TODDLERS IN THE WORK AREA OF DOMBUSOI HEALTH CENTER

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ABSTRACT

Stunting is one of the global health problems and is closely related to the quality of a nation's human resources in the future. Stunting in Indonesia is a significant problem affecting children under five with multidimensional, not just lack of food but related to determinants such as poverty and environmental sanitation. The Dombusoi Public Health Center, Marawola Barat District, is the first stunting in Sigi Regency with a stunting incidence of 45.9% in 2020. This study aims to determine the association between socio-economic and environmental sanitation with the incidence of stunting in children under five in the Work Area of the Dombusoi Health Center. This research is using an analytical observational with a cross-sectional design study. The population is toddlers aged 25-59 months and parents of toddlers in the working area of the Dombusoi Health Center. The sample in this study amounted to 70 people. The results of the statistical using Chi-Square test show a significant association between socio-economic (p-value:0.00, OR:7.71) and environmental sanitation (p-value:0.04, OR:3.01) with the incidence of stunting. Education on the empowerment of local food sources and improving environmental hygiene needs to be done to prevent stunting.

Keywords: socio-economic, environmental sanitation, stunting.

INTRODUCTION

The future of a nation is determined by the quality of its human resources. Children who are born in good health, grow well, and receive a quality education, will become the next generation of a healthy, intelligent, creative and productive nation (1)(2). The quality of a nation's human resources in the future is closely related to the problem of stunting. Stunting is one of the global health problems experienced by many countries in the world. Stunting is a chronic nutritional problem experienced by toddlers, which can be seen by the difference in height that is shorter than children their age (2)(3).

Even though the incidence of stunting among children under five globally is decreasing, stunting remains a serious health problem. As many as 150.8 million children under five in the world are stunted, and most of them (55%) are from Asia. Of the 83.6 million stunted children under five, the highest proportion of stunted children in Asia is in South Asia, namely 58.7%, Southeast Asia 14.9%, East Asia 4.8%, West Asia 4.2%, and Central Asia 0.9 %. The prevalence of stunting in Southeast Asia based on the 2018 World Health Organization (WHO) report states that Indonesia is in the third-highest position (36.4%) after Timor Leste (50.5%) and India (38.4%). Looking at the current trend of stunting, WHO projects that in 2025 there will be 127 million children under five will experience stunting (2)(1).

The Indonesia's stunting prevalence based on the 2018 Basic Health Research (Riskesdas) showed a decrease of 6.4% in the last 5 years, from 37.2% in 2013 to 30.8% in 2018. This shows that the prevalence of stunting in Indonesia is still at above 20%, has not reached the target set by WHO, which is below 20%. Central Sulawesi Province is ranked 14th with 32.3% stunting under five (4)(1)(5).

According to the 2019 Central Sulawesi Health Profile, stunting data based on districts/cities in Central Sulawesi Province, Donggala Regency is the district with the highest stunting case (34.9%) and Buol Regency as the district with the lowest stunting case (9.4%). The highest prevalence of stunting in Central Sulawesi Province is in Donggala Regency, of 34.9%, and the lowest is in Buol Regency, 9.4%. Sigi Regency is in the 3rd place in the prevalence of stunting in Central Sulawesi Province (6).

The problem of stunting is multidimensional, meaning that it is not just a lack of food but there are many determinants such as poverty, education, parenting, and even sanitation, including clean water. Directly stunting is caused by lack of nutritional intake for a long time from conception to children aged 2 years, lack of exclusive breastfeeding, and infectious diseases. Indirect socio-economic factors refer to work, family income, and environmental sanitation that cause a person to have differences in accessing health services, increasing the risk of stunting. Economic conditions are closely related to the ability to meet nutritious intake and health services for

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pregnant women and children under five, while environmental sanitation and food safety can increase the risk of infectious diseases ⁽³⁾⁽⁴⁾⁽⁷⁾⁽⁸⁾⁽⁹⁾.

According to the 2020 Sigi Health Service Report, the highest stunting prevalence was at the Biromaru Health Center with a stunting prevalence of 337 stunting toddlers (11.8%) and the lowest was at Kantewu Health Center, namely 13 stunting toddlers (0.45%). The Dombusoi Health Center, Marawola Barat Sub-district, is in the eighth rank of the highest stunting sequence out of 19 health centers and the first place for stunting in Sigi Regency with 199 stunting toddlers (45.9%) in 2020. The purpose of this study is to determine the association between socio economic and environmental sanitation with the incidence of stunting in children under five in the Work Area of the Dombusoi Health Center.

METHODS

This type of research is a quantitative research using an observational approach. The design used in this study was cross-sectional, namely research conducted at the same time to observe socio-economic, environmental sanitation, and stunting at the Dombusoi Health Center. The population in this study were all toddlers aged 25-59 months and parents of toddlers who were in the working area of the Dombusoi Health Center. The samples of this study were toddlers aged 25-59 months and parents of toddlers who were in the working area of the Dombusoi Health Center as many as 70 people. The sampling technique in this study used proportional random sampling and simple random sampling.

The instruments used to measured stunting as a dependent variable in this study were digital scales to measure toddlers' weight and microtoises to measure toddlers' heights. The independent variable in this study was measured using a questionnaire for socio-economic and checklist sheets environmental sanitation. The research was conducted on 70 toddlers aged 25-59 months and parents of toddlers in the Dombusoi Community Health Center Working Area. In this study, measurements of body length and weight were carried out in toddlers and followed by interviews with mothers of toddlers according to the contents of the data collection format or questionnaire.

The data collected will be analyzed descriptively and analytically on all research variables with univariable and bivariable. Univariable analysis was carried out to obtain the frequency distribution of the measurement results for the independent and dependent variables studied, presented in the frequency distribution table. Bivariable analysis was carried out through analysis of variable which association (independent variable) with the incidence of disease (dependent variable). Hypothesis testing has been made using the *Chi-Square* at a significance level of 95% and α 0.05, as well as assessing the amount of risk from exposure by calculating the Odds Ratio (OR).

This research was approved by the Institution Member of the Ethical Review Board Committee at the Poltekkes Kemenkes Palu. Before undertaking the study, prospective participants were informed orally and in writing of a description of the procedure and that they could withdraw from the study. Participants who agreed to participate in the study gave their informed consent before measurement.

RESULTS

Table 1. Distribution of the Frequency of Stunting, Socio-Economic and Environmental Sanitation in the Dombusoi Community Health Center Working Area

Variable	F	%
Stunting		
Stunting	31	44.3
Not stunting	39	55.7
Total	70	100
Socio Economic		
Less	36	51.4
Good	34	48.6
Total	70	100
Environmental Sanitation		
Poor	37	52.9
Good	33	47.1
Total	70	100

Source: Data Primer 2021

Based on Table 1, it can be seen that of the 70 respondents, the group in the stunting category was 44.3%, the socio-economic group with the highest family income that less was 51.4%, and the environmental sanitation with the highest category in the field which is not good as much as 52.9%.

Table 2. Association between Social Economic with Stunting in the Work Area of the Dombusoi Health Center

Socio Economic	Stunting				Total		OR	p-Value
	Stunting		Not Stunting					
	F	%	F	%	F	%		
Less	24	66.7	12	33.3	36	100	7.71	0.00
Good	7	20.6	27	79.4	34	100		

Source: Data Primer 2021

Table 2 shows that respondents who have an average monthly income in the LESS Category have stunting children under five. The results of the Chi-Square analysis obtained a p-value of 0.00 ($\alpha < 0.05$), which means that there is a significant association between less socio-economic status and stunting. The OR value indicates that toddlers with less economic status are at risk of suffering from stunting 7.71 times greater than toddlers with good socio-economic status. This also means that less socio-economic status is one of the factors causing stunting in children.

Table 3. Association between Environmental Sanitation with Stunting in the Work Area of the Dombusoi Health Center

Environmental Sanitation	Stunting				Total		OR	p-Value
	Stunting		Not Stunting					
	F	%	F	%	F	%		
Poor	21	56.8	16	43.2	37	100	3.01	0.04
Good	10	30.3	23	69.7	33	100		

Source: Data Primer 2021

Based on table 3 shows that respondents with poor environmental sanitation experience stunting (56.8%). The results of the Chi-Square analysis obtained a p-value of 0.04 ($\alpha < 0.05$), which means that there is a significant association between poor environmental sanitation status and stunting. The OR value indicates that toddlers with poor environmental sanitation status are at risk of suffering from stunting 3.01 times greater than toddlers with good environmental sanitation status. This also means that poor environmental sanitation status is one of the factors causing stunting in children.

DISCUSSION

Socio-Economic

The incidence of stunting is one indicator of chronic nutritional status that describes overall socio-economic problems both in the past and in the early 2 years of a child's life. Inadequate consumption results in the problem of undernutrition which is currently seen as an ecological problem that is not only caused by insufficient availability of food and certain nutrients but is also influenced by poverty, poor environmental sanitation, and ignorance about nutrition⁽⁸⁾⁽¹⁰⁾⁽¹¹⁾. The family's ability to meet the nutritional needs of toddlers, the choice of types of complementary foods and the timing of their feeding as well as healthy living habits are strongly influenced by the socio-economic status of the family.⁽¹²⁾⁽¹³⁾⁽¹⁴⁾

Family income will affect the socio-economic status, which in turn will affect the family's ability to meet sufficient quality food for the family. If access to food at the household level is disrupted due to poverty, it will result in under-five children experiencing malnutrition and stunting⁽¹⁵⁾⁽⁹⁾⁽¹⁶⁾. This is because the family's income is less, causing the purchasing power of food to be not good so that children's eating patterns become irregular, and the provision of side dishes lacks with less quality and quantity as well⁽¹¹⁾⁽¹⁷⁾⁽¹⁸⁾.

Adequate nutritional intake is an essential requirement for toddlers because it is very useful in helping the growth and development process in children, as well as preventing the occurrence of various diseases due to malnutrition, such as stunting. Considering the benefits of nutrition in the body can help the process of growth and development of children, as well as prevent the occurrence of various diseases due to malnutrition in the body⁽¹⁹⁾⁽²⁰⁾⁽²¹⁾. Adequately fulfilled nutritional needs in children are expected to help children grow rapidly according to their growing age and can increase morbidity and mortality⁽²²⁾⁽²³⁾⁽²⁴⁾.

Environmental Sanitation

Based on the data obtained through filling out questionnaires and direct observation, most of the respondents did not have a family latrine and the availability of clean water. In addition, household liquid waste and liquid waste

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from public latrines also pollute the ground surface and the respondent's house located in disaster-prone areas such as landslides. This shows that the respondent's environmental sanitation condition is not good.

Although the relationship that occurs indirectly impacts toddlers, the factor of waste disposal facilities (feces) is very important to consider. In theory, the existence of latrines that do not meet the standards has the potential to trigger infectious diseases (diarrhea and worms), which can interfere with the absorption of nutrients in the digestive process due to poor hygiene and sanitation. Babies who suffer from infectious diseases can cause baby weight loss ⁽²⁵⁾⁽³⁾⁽²⁶⁾⁽²⁷⁾. If this condition lasts for a long time and is not accompanied by adequate intake, it can lead to stunting. Several studies suggest that clean water facilities are the dominant factor influencing the incidence of diarrhea in toddlers. Good water sources (protected/uncontaminated) can prevent diarrhea. Children with families who use unprotected water sources and types of latrines that do not meet standards will be more at risk of stunting. ⁽¹¹⁾⁽²⁸⁾⁽¹⁷⁾⁽²⁹⁾.

Poor environmental sanitation will affect the health of children under five and can affect the nutritional status of these toddlers. Unprotected water sources and poor hygiene behavior due to the unavailability of healthy latrines can increase the risk of toddlers experiencing stunting ⁽²²⁾⁽³⁰⁾. Toddlers are very susceptible to infectious diseases; therefore, if toddlers cannot access water that meets the requirements, the baby's growth and development will be hampered and cause stunting. Good environmental conditions will be able to support a dynamic ecological balance between humans and their environment to achieve a healthy and happy quality of human life ⁽³¹⁾⁽³²⁾⁽³³⁾⁽²⁵⁾⁽¹³⁾. The weakness of this study is the small number of samples due to the pandemic conditions, which limit the implementation of this research.

CONCLUSION

Based on the study results, it can be concluded that the socio-economic conditions and environmental sanitation in the Dombusoi Health Center Work Area are still lacking. There is a significant association between socio-economic factors and environmental sanitation with stunting in children under five in the Dombusoi Community Health Center Work Area.

Education about empowering local natural resources by utilizing locally available food ingredients for nutrition and the importance of environmental sanitation to the community needs to be carried out intensively and sustainably to prevent and minimize stunting in children in the future.

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Factors Of History Of Curettage, Age And History Of C-Section In The Incidence Of Placenta Previa (Literature Review)

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ABSTRACT

Background. Placenta previa is the position where the placenta is not where it should be. Placental bleeding begins to actively occur at 20 weeks gestation, where the placenta has begun to widen and thin to expand the tissues in absorbing food juices. Risk factors that cause the occurrence of placenta previa are age, history of cesarean section and history of aborted with curettage action. **Objectives.** Knowing the relationship of the history of curettage, age and history of surgery cesarean section on the incidence of placenta previa based on the latest research relevant in collecting supporting data **Methods.** This research is literature review research. Search journals with the Boolean strategic method by filtering journals using Flow diagrams. Database used pubmed, Science direct, Google Scholar and Garuda. The journals are indexed by SINTA and Scopus, so that the journals used are reputable, with the search for journals 5 years back. **Results and conclusion.** Of the 14 journals that have been filtered, the following are reviewed the results of each journal's research in accordance with the relationship of curettage history factors, maternal age and cesarean surgery history to the incidence of placenta previa. As a result of the review, curettage history has a relationship to the incidence of placenta previa. The maternal age factor for placental events in most journals states that there is a relationship between the two. Meanwhile, the historical factors of cesarean section surgery on placenta previa events most of his journals revealed the results there is a relationship regarding the two variables. **Suggestion.** Therefore, further research is needed on the results of the review that has been made by the author to reduce the risk of maternal pain and death.

Keywords: Placenta previa, curettage, maternal age, caesarean section.

INTRODUCTION

One of the causes of AKI (Maternal Mortality Rate) and IMR (Infant Mortality Rate) has not decreased according to the desired target is the problem of antepartum bleeding. Placenta previa is one of the most common antepartum bleeding events. Placenta previa is the position of the attachment of the placenta not in the right place. The phenomenon of events in Surabaya based on research data taken at Dr. Soetomo Hospital in 2015 found reports of antepartum bleeding reaching 25.57% of all pregnant women in Surabaya with 3% of them experiencing placenta previa. Fortunately, there was a decrease in the number in 2018, the incidence of antepartum bleeding in Surabaya reached 22.8% of all pregnant women in Surabaya and 3.2% of them experienced placenta previa (Riskesdas, 2018). Based on data from the WHO, in 2015 it was reported that the maternal mortality rate worldwide was 303,000 people. The calculation of maternal deaths per day is 830 people caused by pregnancy and childbirth. The percentage of deaths between developed and developing countries has a ratio of 1:99 percent (Asih et al., 2017). The MMR in Indonesia in 2018 reached 305 per 100,000 live births, while the MMR in East Java in 2018 reached 91.45 per 100,000 live births. While in Surabaya alone, the MMR is 72.99 per 100,000 live births. AKI is caused by several causes, namely other causes 32, 57% or about 170 people. The causes of preeclampsia/eclampsia were

31.32% or 163 people and bleeding was 22.8% or about 119 people, while the lowest cause of death was infection incidence of 3.64% or 19 people (Riskseddas, 2018). According to the results of research conducted by ulviyatulillah, pregnant women with placenta previa have different historical backgrounds and then the distribution of the results of pregnant women with a history of cesarean section experienced an incidence of placenta previa of up to 35.2%. Mothers with a history of abortion with curettage have an incidence of placenta previa up to 29.6% and mothers with a risk age (<20 and >35) have an incidence of up to 42.2% (Kuswadi & Ulviyatulillah, 2016). Another study stated that pregnant women with an age risk of experiencing the incidence of up to 52.8%. Mothers with multiparity experienced an incidence of 54.2%. Mothers with a history of cesarean section experienced up to 54.2% the highest percentage had mothers with a history of curettage up to 91.7%. Based on two different research results, it was concluded that the most risky factors were a history of curettage, age at risk and a history of cesarean section (Husain et al., 2019). The author wants to know more about the history of curettage, age and history of cesarean section is true as a cause of placenta previa, then the preparation of a Literature Review and collection of the latest journals is carried out relevant to support data based on facts.

METHODS

This article was created and compiled using the literature review method, using various research data sources whose results will be compared with each other, and compared with the existing facts. In conducting a journal search by looking for articles found on Google Scholar, Garuda, Pubmed, and Science Direct. Search articles or journals using the Boolean method with the keywords Placenta Previa, maternal age, curettage and caesarean section. Journals used both nationally and internationally are indexed by SINTA, Scopus. The literature is carried out with a range of journals published at least 5 years back, starting from 2016 to 2020. A total of 14 journals passed the inclusion criteria.

Based on the search results of published literature from several databases using keywords. These keywords use MeSH (Medical Subject Heading) in conducting the search. The keywords are Placenta Previa, curettage, maternal age and caesarean section. The assessment of the quality of the studies used in the preparation of this literature review refers to the theory of risk of bias which is sourced from the literature review book by Prof. Nursalam 2020.

1. Inclusion Criteria

Pregnant women with placenta previa and mothers with a history of placenta previa with a history of curettage, age and history of cesarean section.

The range of journals used is a maximum of 5 years back, in the 2016-2020 vulnerable year of publication.

Journals are selected journals with the title relationship or risk factor.

The selected journal is a research journal.

2. Exclusion Criteria

Pregnant women with placenta previa and mothers with a history of placenta previa with a background of spontaneous birth, high parity, history of tumor tissue surgery, history of alcohol, history of smoking, history of gemeli.

The range of journals used is 2016 and below.

Journal with the title of the impact or effect on the mother or baby.

Journals used are the results of research reviews.

In conducting journal analysis, use flowcharts. The first step was to search for data using keywords in various databases, where 113 journals were found, then duplicate checks were carried out for the remaining 81 journals. screening of titles and abstracts got the remaining 22 journals. Full text screening of 14 journals. So that used as many as 14 journals.

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RESULTS

No	Title Author, year, Volume	Method (Design, Sample, Variable, Instrument, Analysis)	Result	Database
1.	<p>Title : Maternal risk factors associated with persistent placenta previa</p> <p>Author: Luke J. King</p> <p>Year : 2020</p> <p>Volume : Volume : Vol. 99 (2020) 189–192</p>	<p>D: retrospective cohort study</p> <p>S: 705 pregnant women with placenta previa between 17 and 24 weeks of gestation were identified from one institution, spanning 2003 to 2017.</p> <p>V: one institution, spanning 2003 to 2017.</p> <p>I: Placenta previa, riwayat sesar, riwayat kuretase.</p> <p>A: The data collection used is checklist sheet.</p> <p>Chi-square Test.</p>	<p>There is a relationship between a history of curettage and a history of cesarean section on the incidence of placenta previa.</p>	<p>Science Direct indexed by Scopus</p>
2.	<p>Title : Neonatal and Maternal Complications of Placenta Praevia and Its Risk Factors in Tikur Anbessa Specialized and Gandhi Memorial</p> <p>Author: Ashete Adere, et al</p> <p>Year : 2019</p> <p>Volume : Volume 2020, Article ID 5630296, 9 pages</p>	<p>D: case-control study</p> <p>S: A total of 303 placenta previa patients at Gandhi Memorial Hospital from September 2015 to January 2018</p> <p>V: to January 2018</p> <p>I: Placenta previa, obstetric factors, sociodemographic factors (maternal age)</p> <p>A: Using checklists and questionnaires as well as secondary data in the form of patient medical record data Logistic regression test</p>	<p>There is a relationship between maternal age and history of cesarean section on the incidence of placenta previa.</p>	<p>Pubmed indexed by scopus</p>

3.	Title :	Faktor-Faktor yang Berhubungan dengan Plasenta Previa di RSUP H. Adam Malik Medan Tahun 2018	D: S: V: I: A:	cross sectional 306 mothers with placenta previa, grouped to 153 cases and 153 controls. placenta previa, maternal age, parity, history of curettage, history of cesarean section, history of gemeli, history of tumor. observation sheet or check list filled in based on the patient's medical record data Chi-Square, Logistic regression test.	There is an influence of history of curettage, maternal age and history of cesarean section on the incidence of placenta previa	Garuda indexed by Sinta
	Author:	Endryani Syafitri dan Suyanti Suwardi				
	Year :	2019				
	Volume	Volume 7, Nomor 2, Agustus 2020, hlm. 182–189				
4.	Title :	Factors Related to the Event Placenta Previa	D: S: V: I: A:	Case control Study The sample was 74 people who were divided into 37 case groups and 37 control groups with mothers with a history of placenta previa. Pregnancy interval, Curettage, Parity, Placenta previa, Sectio Caesarea, Age observation sheet or check list and direct discussion with the patient Chi-Square	There is a significant relationship between maternal age, history of Sectio Caesarea, history of curettage with placental events previa.	Google Scholar
	Author:	Haifa Wahyu				
	Year :	2019				
	Volume	Volume 07, Nomor 02, Oktober 2019				
5.	Title :	Frequency of multiparity and previous caesarean section in patients with placenta previa	D S:	cross sectional study A total of 254 women of childbearing age with a history of primigravida and multigravida diagnosed with	There is a relationship between maternal age and history of cesarean section on the risk of placenta previa	Google Scholar

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	Author:	Afia Rabbani		placenta previa in this study.		
	Year :	2018		Plasenta previa, multiparitas dan		
	Volume	Vol.42, 2018	V:	riwayat sesar Using secondary data from patient medical records.		
			I:	Chi-square Test		
			A:			
6.	Title :	Frequency Of Uterine Curettage In Patients With Placenta Previa At A Tertiary Care Hospital	D:	Cross-sectional study	There is a relationship between curettage factors and the incidence of placenta previa.	Google Scholar
			S:	96 women with a history of placenta previa		
			V:	Placenta previa, maternal age, past and present delivery history (primigravida, multigravida, breech, abortion with history of curettage, spontaneous abortion)		
	Author:	Shidra Liaqat, et al				
	Year :	2018				
	Volume	Vol.49, 2018				
			I:	Based on patient history data at Nistar Hospital, Mulan department of obstetrics and gynecology		
			A:	<i>Chi-square test</i>		
7.	Title :	Relationship between Age and Pregnancy Distance with Incidence Placenta Previa At Dr. Hospital. H.Abdul Moeloek Lampung Province 2018	D:	case control study	There is no relationship between maternal age and the incidence of placenta previa	Google Scholar indexed by Sinta
			S:	Sample of 87 cases of mothers giving birth with placenta previa and 87 maternal controls who do not have placenta previa by using a ratio (1:1).		
	Author:	Tri Susanti		So the total sample in this study are 174		
	Year :	2018				
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Volume	Volume 4 no 2, September 2018	V:	mothers giving birth.		
		I:	Placenta previa, history of curettage and history of cesarean		
		A:	Retrospective data collection from the medical records of the status of the Adam Malik General Hospital		
			Logistic regression test.		
8.	Title : The Relationship between Parity and Age on the Occurrence of Placenta Previa at Syekh Hospital Yusuf Gowa 2018	D:	Cross Sectional Study	There is a relationship between maternal age and the incidence of placenta previa	Garuda
	Author: Noviyanti Hartuti	S:	Part of pregnant women who have been hospitalized in hospitals Sheikh Yusuf Gowa in 2018 as many as 115 people by using Isaac's table.		
	Year : 2018	V:	Placenta previa, parity, Age		
	Volume Vol.2, No.1, September 2018	I:	Secondary data is data taken from the Medical Records of the Sheikh Yusuf Hospital Gowa		
		A:	Chi-square test		
9.	Title : Advanced Maternal Age And Placenta Previa For Women Giving Birth In Finland; A Register-Based Cohort Study	D:	cohort study	There is a relationship between maternal age and the incidence of placenta previa.	Pubmed
	Author: Roustaei. Zahra	S:	283,324 women who had given birth from 2004 to 2008, were then grouped based on women under 35 years and women over 35 years.		
	Year : 2017	V:	Placenta previa, maternal age		
	Volume	I:			

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			A:	Secondary data from patient medical records sourced from the Finnish Medical Birth Register		
				Chi-square test		
10.	Title :	The Relationship between Parity and History of Sectio Cesarean with the Incidence of Placenta Previa at Arifin Achmad Hospital Pekanbaru	D:	cross sectional study	There is no relationship between a history of cesarean section and the incidence of placenta previa.	Garuda indexed by Sinta
			S:	Maternal women who experienced placenta previa in 2013 which amounted to 135 cases.		
			V:	Placenta previa, parity and history of cesarean		
	Author:	Wan Anita				
	Year :	2017	I:	The data collection used is checklist.		
	Volume	(1) February 2017 (68-73)	A:	<i>Chi-square Test</i>		
11.	Title :	Relationship between abortion history and curettage history With Placenta Previa Kejadian	D:	Case control study	There is no relationship between a history of cesarean section and the incidence of placenta previa.	Garuda indexed by Sinta
			S:	2736 all mothers good delivery with placenta previa and those without placenta previa.		
			V:	Placenta previa, parity and curettage		
	Author:	Ulviyatulillah dan Kadar Kuswandi				
	Year :	2017	I:	Using secondary data from the medical records of dr. Adjidarmo Rangkasbitung 2014		
	Volume	Vol. 4 No. 1 (2016-2017)	A:	<i>Chi-square Test</i>		

12.	Title :	Predictors for Emergency Cesarean Delivery in Women with Placenta Previa	D:	<i>Retrospective cohort study</i>	There is a relationship history of cesarean section to the incidence of placenta previa.	Pubmed
			S:	243 women who had a birth with a history of placenta previa		
	Author:	Laura Ruiter, et al	V:	Placenta previa, history of cesarean.		
	Year :	2016				
	Volume	33:1407–1414.	I:	Retrospective data collection from data on patients who gave birth with a history of placenta from 2001-2010		
			A:	<i>Chi-square test T-test.</i>		
13.	Title :	History of Curettage and Caesarean Section Patient With Placenta Previa In Hospital Lampung province	D:	case control study	There is a relationship between curettage factors and a history of cesarean section on the incidence of placenta previa.	Garuda indexed by Sinta
			S:	83 people with a history of placenta previa with systematic random sampling with multiples of 5 as control.		
	Author:	Yusari Asih dan Idawati	V:	Placenta previa, maternal age and gestational interval.		
	Year :	2016				
	Volume	Volume XII, No. 2, Oktober 2016	I :	Secondary data from medical record documentation		
			A:	Chi-square Test		
14.	Title :	The Effect of Age of Pregnant Women on the Incidence of Placenta Previa at RSUP Soeradji Tirtonegoro	D:	expost facto research with a prospective cohort study study design	There is a relationship between maternal age and the incidence of placenta previa	Garuda indexed by Sinta
			S:	A total of 122 mothers who gave birth with placenta previa in 2010		
	Author:	Yeni Tutu Rohimah	V:	Placenta previa and maternal age		
	Year :	2016				

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Volume	Volume 1, No2, Desember 2016 hlm 55-103	I: Checklist A: Linear regression test
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DISCUSSION

Literature study was carried out so that the author could find out the relationship between placenta previa and history factors curettage and cesarean history based on relevant research. The research used is the latest research with a range of 2016-2020. Thus reducing the gap too far with the current facts.

Based on the results of the Journal criteria table of the contents of the journal criteria in chapter 3, it can be seen that an article from a hospital study in Multan, Pakistan by Husain et al (2019), at Nishtar Hospital, Multan, Pakistan, explained the results of his research that there was a relationship between curettage and the incidence of placenta previa. The same study was conducted by King et al (2020) with the results of his research which stated that there was a relationship between curettage and the incidence of placenta previa. The results of this study have results that are in line with research conducted by Asih and Asih & Idawati, (2016) at Abdoel Moeloek Hospital in 2015, the results of the study explain that there is a relationship between a history of curettage and the incidence of placenta previa.

There is a study conducted by Adere et al (2020) at Gandhi Hospital in Ethiopia. The result of their research is that advanced maternal age is one of the risk factors for placenta previa. The results of research conducted by Afia Rabbani et al. (2018) at Nistar Hospital Multan, Pakistan. Stating the age of the mother over 30 years is a high risk of causing placenta previa. The same thing also came from research by Roustaei, (2017), namely the results of the study showed that advanced maternal age was a risk factor for the occurrence of placenta previa. A similar study conducted at H. Adam Malik Hospital Medan, by Syafitri & Suwardi (2018), showed the results that there was a relationship between maternal age history and the incidence of placenta previa. Research by Rohimah (2016) at RSUP Soeradji Tirtonegoro, mentions the results of his research that there is an influence of maternal age with the incidence of placenta previa, the risk of increasing each year is up to 1.3 times the incidence

In a study conducted by Ruiter et al. (2016) stated the results that a history of cesarean section led to an increased risk of placenta previa. A study with similar results was conducted by Adere et al. (2020), conducted at Gandhi Hospital, Ethiopia. The results of the study they got from the study were a history of cesarean section was a risk factor for causing placenta previa. Likewise with the results of research by with research at Nishtar Hospital Multan, Pakistan. Stating a history of cesarean section is a high risk group for experiencing placenta previa in subsequent pregnancies. Research by have the result that a history of cesarean section has a relationship with the incidence of placenta previa with a risk level of 7 times. The same results were found in a study at Abdoel Moeloek Hospital in 2015 by Asih & Idawati (2016) which stated that there was a relationship between a history of cesarean section and the incidence of placenta previa.

CONCLUSION

Of the 14 journals that passed the inclusion criteria and were reviewed in the discussion chapter, regarding the factors of history of curettage, maternal age and history of cesarean section on the incidence of placenta previa, it can be concluded There is a relationship between the history of curettage, maternal age and history of cesarean section.

In the future, further research is needed on other supporting factors that can cause mothers to experience placenta previa. It is also necessary to expand the database in the search for journals so that more references are obtained. for health facilities, by determining this factor, it can improve its view in updating equipment and patient care flow. For health workers, it can be used as a point of view in conducting early screening of pregnant patients.

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BACK MASSAGE USING FRANGIPANI AROMATHERAPY OIL TO REDUCE THE LEVEL OF TUMOR NECROSIS FACTOR ALPHA AND THE INTENSITY OF LABOR PAIN

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ABSTRACT

Spontaneous labor is characterized by simultaneous uterine contractions that can cause labor pain complaint as an inflammatory reaction that triggers the release of cytokines. The more severe labor pain, the more stress that can reduce immunity, so that the increasingly heavy inflammatory reaction is characterized by increase in expression of TNF α . The purpose of this study was to prove that back massage using frangipani aromatherapy oil reduced levels of tumor necrosis factor alpha (TNF α) and labor pain intensity. Method: *True Experiment (Randomized Clinical Trial/RCT)* with *Pretest Posttest Control Group* design. The research was carried out in inpatient public health centers in Badung Regency and Denpasar City. The *research subject is nulliparous*, cervical dilatation is 6-8 cm. The sample sizes are 40 people, the number of samples are 2 group, namely control (C) and intervention (I). Sample selected with simple random sampling technique. The pain intensity observed using numeric rating scale (NRS). Data analysis includes Univariate, Bivariate (Paired T Test and Independent T Test), and Multivariate (Manova). Data analysis with the help of the SPSS program. Ethical clearance from the Ethic Commission of the Sanglah Central General Hospital. Results: the average pain intensity and TNF α levels before treatment in both groups were $p > 0.05$. After had been given the intervention, the mean difference between the two groups were $p < 0.05$. The contribution of the intervention to pain intensity was 16.3%; TNF α levels 23%. Conclusion: there is an effect of back massage using Frangipani aromatherapy oil on decreasing labor pain intensity and TNF α levels

Keywords: Back massage, Frangipani aromatherapy oil, labor pain, TNF α

INTRODUCTION

Spontaneous labor is characterized by simultaneous uterine contractions. Contractions cause stretching of the lower uterine segment, resulting in flattening, effacement and dilatation of the cervix. This event causes complaints of labor pain as an inflammatory reaction that triggers the release of cytokines. Labor pain consists of two patterns, namely visceral and somatic pain. Visceral pain is caused by the cervix stretching and opening, which triggers the activity of nociceptive afferents that innervate the endocervix and lower segments from Thoracic 10 to lumbar I. The nature of this pain is dull and difficult to localize. The more the lower part of the fetus is descending because of adequate uterine contractions, can cause stretching and distension of the pelvic floor, vaginal, and perineal muscles. This event causes ischemia and tissue injury that triggers the inflammatory process and stimulates the nerves in sacral 2 to sacral 4 (S2-S4), resulting in somatic pain. This pain occurs at the end of the I to the II stage, the nature of the pain, sharp and easily localized (Bonapace, J., *et al.*, 2018).

Study on 70 nulliparous people was conducted by Sriasih, *et al* (2019). It was found that almost all respondents (95.72%) experienced moderate pain (score 4-6). Small portion of respondents (4.28%) experienced mild pain (score 0-3). Cevik and Karaduman (2020) described the average labor pain intensity in the active phase (cervical dilatation 5-7 cm) is 8.43 ± 1.17 , while in the transition phase (cervical dilatation 8-10 cm) is 9.7 ± 0.53 .

Labor pain tends to be more severe in Nulliparas because they do not have experience in childbirth. Labor pain felt by parturient can trigger stress that can affect the hypothalamic-pituitary-adrenal (HPA) axis. Cortisol secretion causes increased gluconeogenesis and decreased immunity. Cortisol release can trigger cytokine activity. In normal conditions, cytokines are almost not produced. The lower of the body's immunity, the more TNF α is expressed (Cierny *et al.*, 2014). TNF α can increase the sensitivity of sensorics neurons to excitation produced by

capsaicin and this increase is probably mediated by the production of prostaglandin neurons. Prostaglandins can increase the sensitivity of nociceptors, which can reduce the threshold for receptor activation so that the sensation of pain is felt to be greater (Neal, J.L. *et al.*, 2015).

Neal, J.L., *et al.* (2015) found that TNF α levels were higher until near the end of the pre-active phase, while the active phase showed the opposite. TNF α levels were lower until the end of the active phase. TNF α activates coagulation, stimulates the expression or release of adhesion molecules, PGE₂, platelet activating factor, glucocorticoids and eicosanoids, and affects apoptosis (Neal *et al.*, 2015; Rejeki *et al.*, 2014).

Pain stimulates afferent pain fibers to secrete P substance which activates ascending pathways that transmit nociceptive signals to the thalamus and reticular formation. The interconnection of these two organs leads to the hypothalamus and limbic system which elicits behavioral and emotional responses to pain. Mothers in labor respond to pain by crying and screaming (Sherwood, 2010). Maternal mothers who are unable to tolerate the pain, tend to propose termination of pregnancy by cesarean section. To anticipate this problem, labor pain management is needed.

The goal of labor pain management is to maintain the balance of body functions, reduce or eliminate labor pain, and parturient discomfort with minimal side effects. Non-pharmacological pain management has been chosen recently because it has almost no side effects. Some alternatives that can be chosen include hypnobirthing, acupuncture, water birth, massage (Czech *et al.*, 2018).

Back massage is a touch or stroke by applying light pressure using the fingers. The massage aims to reduce or eliminate pain and facilitate relaxation. Back massage is useful in reducing labor pain (Mehdi, R., *et al.*, 2017; Zaghloul and Mossad, 2018; Smith, C.H., *et al.*, 2018; Imron, R., 2019), as well as reducing anxiety (Mansour, L, 2016; Cevik and Karaduman, 2020; Tabatabaeichehr and Mortazavi, 2020). Essential oil containing Frangipani aromatherapy, absorbed through smell can inhibit cortisol secretion and increase serotonin secretion. During massage, aromatherapy is absorbed through the skin, it can help reduce parturient anxiety (Karlina, *et al.*, 2014; Kaviani *et al.*, 2014; Raju, 2014; Makvandi, 2016; Mansour, L, 2016; Yazdkhasti and Pirak, 2016; Tabatabaeichehr and Mortazavi, 2020). Linalool found in frangipani are able to inhibit the release of acetylcholine and make changes in the function of ion channels at the neuromuscular junction. Linalool also functions as a sedative (Shinde, *et al.*, 2014; Goswani, *et al.*, 2016; Nurcahyo and Puriyanti, 2017).

Although several studies have proven the benefits of frangipani aromatherapy, there is no standard on the duration of the intervention carried out yet. The duration of the intervention still varies, so that further research still needs to be done to determine the efficacy of back massage using Frangipani aromatherapy oil on parturient. This study aims to prove the efficacy of back massage using frangipani aromatherapy oil on pain intensity and TNF α levels in the active phase of labor.

METHODS

This research is a *True Experiment (Randomized Clinical Trial / RCT)* with a *Pretest Posttest Control Group* design. This research was conducted for eight months. The research locations are in Denpasar City and Badung Regency, each of which is four public health centers that have inpatient facilities. The sample of this study was normal parturient, nulliparous, cervical dilatation 6-8 cm, cooperative, and never or currently suffering from allergies. The sample size is 40 people, divided into 2 groups, namely the control group (C) and the intervention group (I), selected by *simple random sampling* technique.

Pain intensity was measured using a numerical rating scale (NRS). The number 0 indicates no pain; the number 10 indicates severe (very severe) pain. The NRS instrument has a validity value of $r = 0.941$ and a reliability of 0.95 (Alghadir *et al.*, 2018). The measurement results are recorded on the observation sheet.

The research material consisted of original (non-scented) virgin coconut oil (VCO) and VCO with the aroma of Frangipani (Plumeria) 10%. Original VCO and VCO with aromatherapy frangipani produced by Bali Usada. Frangipani contains 3.86% Tannins; Total phenol 18.94 mg GAE/g; vitamin C 2.28 mg/100 g (Wrasiati and Hartati, 2011). Frangipani of which contain Linalool 8% (India) and 20.7% (China) (Goswani, *et al.*, 2016).

The taking of TNF α examination materials, are using blood taken from the median cubital vein using a disposable 3 mL syringe. Examination of Human TNF- α using ELISA Kit, catalog number: cat.E00082Hu, BT-Lab. The TNF α examination, according to the factory inspection procedure, was carried out at the Clinical Pathology Laboratory, Sanglah Central General Hospital, Denpasar. Data analysis includes univariate, bivariate (Paired T test and Independent T Test), and multivariate (Manova) analysis. Paired T Test for test the pretest with posttest data in both group. Independent T Test for test Pretest and posttest data between control (C) with intervention group (I). Data analysis with SPSS program.

Back massage was done by rubbing and pressing gently on the back starting from the thoracic X region to the sacral II for 10 minutes (four cycles of uterine contractions) in both groups. The treatment in the intervention group (I) was using frangipani aromatherapy, while the control group was using original VCO. Massage technique was according to standard operating procedures.

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Ethical considerations

Data collection was carried out after obtaining approval from the Ethic Commission of the Sanglah Central General Hospital and obtaining research permits from the Bali Province One Stop Licensing and Investment Service, Denpasar City Health Office and Badung District Health Office.

RESULTS

Characteristics of Subjects

The study was conducted in eight public health centers. Characteristics of the research subjects are described below.

Table 1 Characteristics of Research Subjects

Characteristics		Group				<i>p</i>
		Control (C) n = 20		Intervention n = 20		
		f	%	f	%	
Age						0,404
	20-25 years	16	80	15	75	
	26-30 years	4	20	5	25	
Amount		20	100	20	100	
Education						0,567
	Basic	1	5	1	5	
	Middle	14	70	13	65	
	Higher	5	25	6	30	
Amount		20	100	20	100	
Childbirth companion						0,643
	Husband	18	90	17	85	
	Parents	2	10	3	15	
Amount		20	100	20	100	

Description: Control group (C) = back massage using original VCO; Intervention group (I) = back massage using VCO with Frangipani aromatherapy

Table 1 shows that the data on age, education level, and birth attendants in the two groups were not different ($p > 0.05$). This confirms that the characteristics of the research subjects of the two groups are equivalent. The effect of the intervention on the dependent variable was tested with Independent t test, Paired T test, and Manova. Prerequisite analysis carried out for the analysis of data normality and homogeneity of variance. Data on labor pain intensity and TNF α levels pretest and posttest in both groups were normally distributed ($p > 0.05$) and all variances were homogeneous ($p > 0.05$).

Labor Pain Intensity

Table 2 Differences in Pain Intensity Before and after Intervention

Group	Pain Labor Intensity		<i>p</i>
	Mean \pm SD Pretest	Mean \pm SD Posttest	
Control (C)	7,10 \pm 1,25	6,75 \pm 1,29	0,232
Intervention (I)	6,90 \pm 1,44	5,75 \pm 1,02	0,000
<i>p</i>	0.643	0.01	

Table 2 illustrates, the intensity of pain before being given treatment (pretest) was the same in both groups ($P > 0.05$). Pain intensity in the two groups was significantly different ($p < 0.05$) after the intervention (posttest). The average intensity of labor pain before and after treatment, it appears that in the control group there is a decrease in

the intensity of labor pain, but not significantly different ($p > 0.05$). In the intervention group, it appeared that there was a significant decrease in pain intensity ($p < 0.01$). This shows that back massage with Frangipani aromatherapy oil is able to reduce the intensity of pain in the active phase of the first stage of labor.

Tumor Necrosis Factor Alpha (TNF α)

Table 3 shows that the levels of TNF α before being given treatment (pretest) in the two groups were not different ($P > 0.05$). After being given treatment (posttest), the levels of TNF α in the two groups were significantly different ($p < 0.01$).

Table 3 Differences in TNF α Levels Before and after Intervention

Group	Levels of TNF α (ng/L)		<i>p</i>
	Mean \pm SD Pretest	Mean \pm SD Posttest	
Control (C)	32.12 \pm 6.44	31.71 \pm 5.62	0.225
Intervention (I)	30.29 \pm 6.25	25.94 \pm 5.18	0.000
<i>p</i>	0.366	0.002	

The average TNF α level of the control group after being given treatment was lower than before the treatment. However, it was not significantly different ($p > 0.05$). In the intervention group, it appeared that there was a significant decrease in pain intensity ($p < 0.01$) after being given treatment. This shows that back massage with Frangipani aromatherapy is able to reduce TNF α levels in active phase I labor.

The Effect of Back Massage with Frangipani Aromatherapy Oil on Pain Intensity and Levels of Tumor Necrosis Factor Alpha (TNF α)

Table 4 Results of Analysis of the Effect of Back Massage with Frangipani Aromatherapy Oil on Pain Intensity and Levels of Tumor Necrosis Factor Alpha (TNF α)

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Observed Power ^c
Intercept	Pillai's Trace	.983	1075.102 ^b	2,000	37,0	.000	.983	1,000
	Wilks' Lambda	.017	1075.102 ^b	2,000	37,0	.000	.983	1,000
	Hotelling's Trace	58.114	1075.102 ^b	2,000	37,0	.000	114.983.983	1,000
	Roy's Largest Root	58.114	1075.102 ^b	.000 .983	37,0		2,000	1,000
ID	Pillai's Trace	.322	8,801 ^b	.959	37,0	.001	.322	2,000
	Wilks' Lambda	.678	8,801 ^b	.959	37,0	.001	.322	2,000
	Hotelling's Trace	.476	8,801 ^b	2,000	37,0	.001	.322	.959
	Roy's Largest Root	.476	8,801 ^b	2,000	37,0	.001	.322	.959

Table 4 provides information that back massage using Frangipani aromatherapy oil has an effect on decreasing TNF α levels and labor pain intensity ($p < 0.01$).

To further explore the effect of treatment, an effect test was carried out between research subjects.

Table 5 Results of the analysis of Between-Subjects Effect

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power ^c
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Corrected Model	Pain Labor intensity	10,000 ^a	1	10,000	7,379	0.010	163	.754
	TNF α level	331.949 ^b	1	331.95	11,344	.002	.230	.907
Intercept	Pain Labor intensity	1562,500	1	1562,50	1152,913	.000	968	1,000
	TNF α level	33245,026	1	33245,03	1136,078	.000	968	1,000
Interventions	Pain Labor intensity	10,000	1	10,000	7,379 ,	.010	.163	.754
	TNF α level	331,949	1	331,949	11,344	.002	.230	.907
Error	Pain Labor intensity	51,500	38	1,355				
	TNF α level	1111,993	38	29,263				
Total	Pain Labor intensity	1624,000	40					
	TNF α level	34688,968	40					
Corrected Total	Pain Labor intensity	61,500	39					
	TNF α level	1443,942	39					

a. R Squared = ,163 (Adjusted R Squared = ,141)

b. R Squared = ,230 (Adjusted R Squared = ,210)

c. Computed using alpha = ,05

Table 5 shows that back massage using frangipani aromatherapy has an effect on reducing pain intensity and TNF α levels ($p < 0.01$). The contribution of the intervention to pain intensity was 16.3%; while the level of TNF α as much as 23%. This shows that there are other factors that influence the decrease in labor pain intensity and TNF α levels.

DISCUSSION

Normal labor is labor at term pregnancy, without complications for both mother and baby. This labor is characterized by adequate uterine contractions, bloody show discharge, and cervical dilatation. Normal labor does not require special measures, Intervention is required when maternal and/or fetal well-being is at risk (Bonapace, et.al., 2018)

Cytokines are produced by endometrial stromal cells, decidual cells, and macrophages in response to inflammation. TNF α stimulates the production of prostaglandins which trigger an increase in metalloprotease which further causes cervical ripening and effacement (Takayuki, et.al., 2019). The stretching of the lower uterine segment and compression of the sacral flexus trigger the secretion of the hormone oxytocin which causes the uterus to contract. This condition triggers the activity of nociceptive afferents that innervate the endocervical and lower segments from Thoracic 10 to lumbar I (T10-L1). The more frequent uterine contractions occur, the more the lower part of the fetus descends, resulting in stretching and distension of the pelvic floor, vagina, and perineum, which can trigger nerve fiber activity in sacral 2 to sacral 4 (S2-S4). These events cause ischemia and tissue injury that trigger the inflammatory process. As a result, pregnant women feel pain (Canavero *et al.*, 2018; Bonapace *et al.*, 2018). Stretching of the cervix triggers proinflammatory activity. There was a significant increase in pro-inflammatory cytokines, such as IL-6, IL-8, CCL-2 and TNF- α , compared to the inflammatory response observed in PTL human twins (Sivarajasingam, et.al., 2016)

Labor pain is an emotionally related experience. Pain perceived by parturient women can be measured using a numeric rating scale (NRS). The average intensity of labor pain in this study before the intervention was in the moderate to severe degree range (range 5-9). Similar results were found by Sriasih, et.al. (2019) most of the subjects experienced moderate pain. Azizah, et.al (2020) found an average labor pain of 6.33. Labor pain is unique and different from other pains. Pain intensity is influenced by several factors, including age, parity, education, and support from people around the mother (Maryuni, 2020). In this study, all subjects were nulliparous, with age of 20 - 30 years old, most of them were at the middle level of education, all subjects were accompanied by their families, especially their husbands. The results of the different test in the two groups showed that there

was no difference. Age, education, and delivery assistance were equal ($p > 0.05$) in both groups, indicating that changes that occurred in one group were not fully influenced by the characteristics identified in this study.

TNF α levels and labor pain intensity in the intervention group after being given back massage with frangipani aromatherapy (posttest) were lower than pretest and lower than TNF α levels in the control group. The results of the independent t test and paired t test showed a significant difference ($p < 0.05$). The results of the manova test also showed that back massage with frangipani aromatherapy had an effect on reducing TNF α levels and the intensity of labor pain. The older the gestational age, the greater the synthesis of CRH by the placenta. CRH triggers the formation of proinflammatory cytokines and chemokines in the myometrium. This condition triggers the synthesis of prostaglandins and suppresses the secretion of serotonin and endorphins. The impact is uterine contractions accompanied by pain (Sivarajasingam, et.al., 2016). Back massage using Frangipani aromatherapy provides efficacy through two pathways, namely skin and smell. Touch with gentle pressure on the skin provides a sense of comfort that triggers the secretion of endorphins, which is useful in reducing pain during the birth process of the baby (Wulandari, et.al., 2017; Fitriana and Antarsih, 2019; Darmawan and Waslia, 2019; Simpi and Sarkar, 2019; Gönenç and Terzioğlu, 2020; Azizi, M., 2020) as well, as reducing anxiety (Tabatabaeichehr and Mortazavi, 2020).

Frangipani aromatherapy oil contains Linalool which is able to inhibit the release of acetylcholine and make changes in the function of ion channels at the neuromuscular junction. Linalool also works as a sedative. When someone inhales the aromatherapy released by Frangipani, it will stimulate the olfactory nerve cilia receptors which are transmitted to the olfactory bulb via the olfactory nerve. The olfactory bulb is associated with the limbic system (Nurcahyo and Purgiyanti, 2017). When the mother gives birth calmly, it can increase anti-inflammatory activity, so that TNF α decrease, prostaglandins decrease and increase endorphin secretion so that pain decreases. This triggers the secretion of oxytocin (the love hormone) which is able to regulate uterine contractions and relaxation so as to facilitate the birth of a baby (Takayuki, et.al., 2019; Saha, et.al, 2017; Tabatabaeichehr and Mortazavi, 2020)

CONCLUSIONS

Back massage using Frangipani aromatherapy oil affects the intensity of labor pain and reduces TNF α levels. The intervention contribution was 16.3% to the decrease in pain intensity and 23% to the decrease in TNF α levels. Therefore, the recommendation for the next researcher is to find other factors that contribute to reducing pain intensity and TNF α

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**GREEN BETEL LEAF DECOCTION FOR DISCHARGE COMPLAINTS OF
TEENAGE GIRLS IN HIDAYATULLAH ISLAMIC BOARDING SCHOOL
TERNATE CITY**

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ABSTRACT

One of the problems related to reproductive health is the risk of vaginal discharge. Vaginal discharge is an abnormal vaginal secretion in women. Excessive and abnormal can be an early symptoms of cervical cancer. the reality in society is that there are still many women who are reluctant to seek treatment because of prudence and consider it taboo to keep it secret. So, an alternative in the treatment of abnormal vaginal discharge would be to use traditional medicines that are cheaper and easier to find. The purpose of this study was to determine the effect of green betel leaf stew on complaints of vaginal discharge in adolescent girls at the Hidayatullah Islamic Boarding School, Ternate City. This type of research used an experimental Quasy design with One Group Pretest Posttest design. The sampling technique used was a total sample of 32 young women. The research was carried out from September to November 2019. The statistical test was non-parametric (Wilcoxon test). The Wilcoxon sign rank test statistic results obtained a p-value of 0.000 ($p < 0.05$). Conclusion: there is a significant difference before and after administration of green betel leaf decoction on pathological vaginal discharge in teenage girls.

Keywords: Betel Leaf; Discharge; Teenage Girls.

INTRODUCTION

In the development of the human life cycle, puberty is a very important period after passing childhood to adulthood which occurs between the ages of 10-19 years. During this period, many problems arise such as reproductive health. This is because adolescence is a period of rapid growth and development both physically, biologically, psychologically, and intellectually.¹

Discharge (leukorrhea/fluor albus/vaginal discharge) is the secretion of non-blood liquid from the female genitals (vagina). Pathological vaginal discharge happens due to infection mostly caused by *bacterial vaginosis*, *Trichomonas vaginalis* and *Candidiasis*.² Excessive and abnormal vaginal discharge can be an early symptom of cervical cancer. Data obtained from the IMS Clinic of the Kalumata Health Center, Ternate City, from January to December 2018, found 198 cases of candidiasis. This infection can lead to infertility, ectopic pregnancy, and cervical cancer which is the number one killer for women. The incidence of cervical cancer is estimated at 100 per 100,000 population per year, which can lead to death.

The vaginal discharge tends to occur due to the lack of awareness to maintain health, especially the health of the genital organs. In addition, vaginal discharge is often associated with acidity in the area around the vagina, which can occur due to an unbalanced vaginal pH. External factors include lack of personal hygiene, tight underwear, and the use of public toilets that are contaminated with bacteria.³

The boarding school usually prioritizes simplicity for students so that it can be one of the factors that influence health behavior habits such as lacking personal hygiene and can cause the low quality of adolescent health. On other hand, students have a very hectic activity. These activities start from before dawn until they go back to sleep, causing the students to be less concerned about their personal hygiene, especially their genitalia which results in vaginal discharge.⁴

Abnormal vaginal discharge can be treated with the use of medicines that effectively can against antifungals. However, there are still many women who are reluctant to seek treatment for reasons of shame and it is taboo so that it must be kept secret. Thus, an alternative in the treatment of candida vulvovaginal fungus would be to use traditional medicines that are easier to find and cheaper so that it is necessary to extract alternative medicines from traditional medicinal plants which are empirically often used by the community.

The diversity of plants in Indonesia has been used as a source of traditional medicine. One of them is Green Betel Leaf. Green betel leaf contains essential oils that consist of betlephenol, kavikol, sesquiterpene, hydroxycavinol,

cavibetol, estragole, eugenol, and carvanol. Literature states that green betel leaf also contains diastase enzymes, sugars, and tannins. While tannin is an astringent that reduces the secretion of fluid in the vaginal canal. The purpose of this study was to determine the effect of green betel leaf decoction on complaints of vaginal discharge in teenage girls at the Hidayatullah Islamic Boarding School, Ternate City.

METHODS

This study used an experimental Quasy research design with the type of One Group Pretest Posttest design, where the researchers conducted research on only one intervention group which was measured before and after being treated with green betel leaf decoction, there was no comparison group (control). The design in this study aimed to identify the effect of green betel leaf decoction on complaints of vaginal discharge in teenage girls before and after treatment. The study was carried out at the Hidayatullah Islamic Boarding School, Ternate City from September to November 2019. The population was all young women who had complaints of pathological vaginal discharge. The sampling technique used a total sampling method of 32 respondents. Data collection was obtained through observation sheets and structured interviews, the intervention of green betel leaf decoction was given for 7 days, used in the morning and evening by rinsing on the genitalia. Beforehand, respondents were explained about the benefits, objectives, research processes and guarantees of data confidentiality. Then, respondents who wanted to participate were asked to sign an informed consent.

RESULTS

Table 1. Distribution of Respondents by Age in Islamic Boarding Schools Hidayatullah

Respondent Age	n	%
14 years old	7	21.9
15 years old	13	40.6
16 years old	8	25.0
17 years old	3	9.4
18 years old	1	3.1
Total	32	100

Table 1, it shows that the age distribution of the most respondents is 15 years old which is 13 people (40.6%) while the age distribution of the least respondents is 18 years that is only 1 person (3.1%).

Table 2 Frequency Distribution of Respondents based on complaints of vaginal discharge before treatment at the Hidayatullah Islamic Boarding School

Discharge Complaints	n	%
Itching	30	93.8
Unpleasant Odor	27	48.4
Excessive Liquid	31	96.9
Colored Liquid (Yellow/Green/Grey)	17	53.1
Painful and Heat	18	56.3
Thick Liquid	30	93.8
Disturbing the activities	25	78.1
Complaints more than 7 days	24	75
Sticky and Spotting	30	93.8
Irritation	18	56.3

Table 2 shows that before the treatment, all respondents had complaints of vaginal discharge, and most of the respondents complained of a lot of discharge from the vagina (96%), itching (93.8%), thickened liquid (93.8%) and sticky and left spots on the underwear. (93.8%).

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Table 3 Frequency Distribution of Respondents based on complaints of vaginal discharge after treatment at the Hidayatullah Islamic Boarding School

Discharge Complaints	n	%
Itching	4	12.5
Unpleasant Odor	0	0
Excessive Liquid	2	6.3
Colored Liquid (Yellow/Green/Grey)	0	0
Painful and Heat	0	0
Thick Liquid	3	9.4
Disturbing the activities	2	6.3
Complaints more than 7 days	3	9.4
Sticky and Spotting	4	12.5
Irritation	2	6.3

From table 3 it can be explained that after the treatment, almost most of the respondents stated that the complaints of vaginal discharge were reduced and there were no complaints at all. This is shown in the disappearance of complaints, namely the genital organs are odorless (0%), no yellow/greenish/grey (0%), and no longer feel pain and heat (0%).

Table 4 Distribution of Respondents based on the comparison before and after being given treatment along with the value of the Wilcoxon Test at the Hidayatullah Islamic Boarding School

Discharge Complaints	Before		After		p
	N	%	N	%	
Itching	30	93.8	4	12.5	0.000
Unpleasant Odor	27	48.4	0	0	
Excessive Liquid	31	96.9	2	6.3	
Colored Liquid (Yellow/Green/Grey)	17	53.1	0	0	
Painful and Heat	18	56.3	0	0	
Thick Liquid	30	93.8	3	9.4	
Disturbing the activities	25	78.1	2	6.3	
Complaints more than 7 days	24	75	3	9.4	
Sticky and Spotting	30	93.8	4	12.5	
Irritation	18	56.3	2	6.3	

Table 4 above provides an overview of the changes in the number of respondents who experience complaints of vaginal discharge, this can be seen from the comparison of the percentage before and after the respondents were treated. To test whether the changes were significant, a statistical test (Wilcoxon sign sitest) was performed. The results showed a significance level (p) of 0.000, then compared with an alpha value (α) of 0.05. The decision making criteria was rejected to $H_0 : p < \alpha$. H_0 : The change was not significant, while H_a : The change was significant and meaningful.

Thus, it can be decided that by looking at the comparison of the *Wilcoxon sign sitest* value with an alpha value of $0.000 < 0.05$, the decision was rejecting H_0 and accepting H_a or it can be explained that the change after being given treatment with decoction of betel leaf was significant and it reduces the symptoms of vaginal discharge.

DISCUSSION

Frequency of tenaage girls age at Hidayatullah Islamic Boarding School Ternate

In this study, it was found that the age distribution of the majority of respondents was 15 years old who were categorized as middle teens and underwent education in grade 1 Madrasah Aliyah Ulul Albaab (Hidayatullah Putri Islamic Boarding School). According to the Indonesian Ministry of Health (2015), the age factor in early and middle adolescents can influence a person to gain knowledge because it is caused by the cognitive maturity factor which is still lacking compared to late adolescence. Statistical data in Indonesia in 2011, from 43.3 million adolescents aged 15-24 years behaved unhealthy, which is one of the causes of vaginal discharge. This is in line with research conducted by Nana & Erry (2013) at the Hasanatul Barokah Islamic Boarding School, Tambusai District regarding vaginal discharge, that the majority of middle-aged adolescents have less knowledge and only a few have good knowledge. The knowledge in question is certainly correlated with personal hygiene behavior, where the incidence of pathological vaginal discharge is more common in women who have poor hygiene behavior.

Complaints of vaginal discharge before giving the decoction of green betel leaves

The fact shows that all women experience vaginal discharge at certain times, such as during pregnancy, before menstruation, after menstruation, during the postpartum period (after giving birth), being fertile (less than 2 weeks before the next menstruation), and after intercourse. This is normal vaginal discharge. Vaginal discharge is considered to be abnormal if the discharge have excessive liquid and continuously produced by vagina, the color of the liquid is not clear like yellow or green, itching, unpleasant odor that interfere with daily activities.⁵

According to the results of interviews, from the 32 respondents before being treated by the decoction of green betel leaf, there are 30 respondents experienced itching, 31 respondents had excessive liquid, 27 respondents had odor complaints, 17 respondents had yellowish discharge, 18 respondents felt painful, 30 respondents complained of thick discharge, 25 respondents complained of disturbing activities, 24 respondents experienced discharge for more than 7 days, and 18 respondents complained of irritation. This State occurred because many respondents do not understand the importance of maintaining the cleanliness of their female organs. Besides that, respondents said they rarely get information and knowledge about reproductive health, especially the problem of vaginal discharge, even some respondents said that they are ashamed to submit complaints and ignore these complaints because they consider vaginal discharge as a problem which is normal for women. Whereas the symptoms of vaginal discharge if not handled properly will cause reproductive health problems.⁶

Poor hygiene behavior is one of the triggers for pathological or abnormal vaginal discharge. This is in line with Sari's research (2012) showing that there is a relationship between hygiene behavior and the incidence of pathological vaginal discharge. The results of the interview with researchers, respondents said that they did not get used to drying the vagina after urinating or defecating, they also did not apply the way to clean the vagina from front to back, rarely changed panties twice a day. A part of that, the condition of the washroom in school was inadequate which can be a source of bacteria and fungi. Also, the routine activities carried out by students are very dense. This activity starts before dawn until you go back to sleep, causing a tired body condition. These inappropriate behaviors and unhygienic washroom can cause someone to get infected by fungi easily so that abnormal discharge may happened in those states.⁷

According to Kuncoro (2012), another factor that can affect vaginal discharge is physical fatigue where the condition experienced by a person is due to the increased energy expenditure because the body have to work excessively which results in suppression of the hormone estrogen, decreased secretion of the hormone estrogen causes a decrease in glycogen levels. Glycogen is used by *Lactobacillus doderlein* for metabolism, the by-product of this metabolism is lactic acid which is used to maintain vaginal acidity. If a small amount of lactic acid is produced, bacteria, fungi, and parasites can easily grow and cause vaginal discharge. Furthermore, an exhausted body physically and psychologically stress due to the density of daily activities can affect the work of hormones in a woman's body, including triggering an increase in the hormone estrogen, the influence of the hormone can trigger vaginal discharge in women. In addition, the nutritional adequacy factor also plays a role, because a person's lack of nutrition makes the immune system weak and will be more susceptible to disease. Therefore, researchers also provide education about vaginal discharge including signs and symptoms of vaginal discharge, its causes and consequences as well as prevention efforts and can distinguish between physiological and pathological vaginal discharge in addition to helping the problems experienced by respondents to deal with the problem of vaginal discharge, one of which is alternative or non-pharmacological methods, by using decoction of green betel leaves to rinse directly into the female organs.⁸ According to (Andareto, 2015) green betel leaf is often used as an alternative medicine because of the minimal side effects, easy to obtain and economical.⁹

Complaints of vaginal discharge after being given a rinse of the green betel leaf decoction

Based on the results of interviews in this study that after being given a rinse of betel leaves decoction for 7 days, teenage girls stated that the complaints of vaginal discharge they experienced could be reduced and some even said that they had disappeared altogether. From the 32 respondents, there were 30 respondents (93.8%) who previously experienced symptoms of itching and after treatment only 4 (12.5%) felt complaints of itching. 27 respondents (48.4%) who previously experienced symptoms of smelly vaginal discharge and the treatment the respondents no longer felt a smelly complaint. Then, 31 respondents (96.9%) previously experienced complaints

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of a lot of discharge and after treatment only 2 (6.3%) complained of a lot of discharge. 17 respondents (53.1%) who previously experienced complaints of yellowish/green/grey discharge and after treatment no longer felt these complaints. 18 of respondents (56.3%) who previously experienced symptoms of pain/heat and after treatment no longer felt any complaints of pain/heat. 30 respondents (93.8%) previously experienced thick discharge and after treatment only 3 (9.4%) felt the same complaint. 25 respondents (78.1%) previously complained about the disruption of their activities and after treatment only 2 (6.3%) felt these complaints. 24 respondents (75%) who previously experienced symptoms of vaginal discharge for more than 7 days and after treatment only 3 (9.4%) felt the same complaint. 30 respondents (93.8%) who previously experienced sticky vaginal discharge on underwear and after treatment only 4 (12.5%) felt it. 18 respondents (56.3%) previously experienced irritation and after treatment only 2 (6.3%) experienced irritation complaints.

In this study, discharge can be cured. There is a significant difference between before and after using green betel leaf because it has a chemical content of very strong antiseptic power so that it can overcome vaginal discharge. There are various substances contained in betel leaf including essential oils, hydroxykavicol, kavicol, cavibetol, allylprokatekol, eugenol, caryofelen, phenyl propada, tannins, sugar and tanning substances that have germicidal, anti-oxidation and fungicidal, anti-fungal properties.¹⁰

Effectiveness after being given a decoction of green betel leaves

The results of the Wilcoxon sign rank test statistic obtained a p value of 0.000 (Table 4), these results indicate Ha is accepted and Ho is rejected, which means that there are differences between pre and post giving the decoction of green betel leaf.

Syahrinastiti reported that betel leaf is one of the natural ingredients that contains 12 substances that can treat vaginal discharge. Green betel leaf contains essential oils whose constituent components are phenolic compounds that are capable of being anti bactericidal, fungicidal, and germicidal compounds. Betel leaf essential oil and ethanol extract were reported to have anti-fungal activity against *Candida albicans*. Thus, betel leaf can be used as an alternative in the treatment of diseases caused by *Candida albicans*. The use of betel leaf extract (*Piper betle* L.) with concentrations of 80% and 100% was proven to greatly affect the growth of *Candida albicans*. Betel leaf contains phenol, which has a role as a poison for microbes by inhibiting their enzyme activity. Catechol, pyrogallol, quinone, eugenol, flavones and flavonoids are included in the phenol group and have some antimicrobial properties.¹¹

Kustanti's research (2017), also showed that the efficacy of betel leaf is used to reduce vaginal discharge and maintain female organs, because one of the properties of betel leaf is as an antiseptic.¹² Adi's research showed that the ethanol extract of betel leaf has antibacterial ability against gram-positive and gram-negative bacteria, especially *Staphylococcus aureus* and *Escherichia coli*. Flavonoids work by forming complex compounds against extracellular proteins that disrupt the integrity of the bacterial cell membrane. Likewise, the alkaloids have the ability as an antibacterial. The suspected mechanism is by disrupting the peptidoglycan constituent components in bacterial cells, so that the cell wall layer is not fully formed and causes the death of the cell.¹³

Tannins have anti-bacterial activity with the estimated mechanism that the toxicity of tannins can damage bacterial cell membranes, astringent tannin compounds can induce the formation of complex compounds bonding to enzymes or microbial substrates and the formation of a complex bonding tannins to metal ions which can increase the toxicity of tannins. itself. Tannins also work by shrinking the cell wall or cell membrane, thereby disrupting the permeability of the cell itself. Due to the disruption of permeability, cells cannot carry out living activities so that their growth is inhibited or even dies. Essential oils act as antibacterial by interfering with the process of forming membranes or cell walls so that they are not formed or formed imperfectly.¹⁴

The results of the research conducted prove that the alternative hypothesis (Ha) is acceptable, which describes a significant difference between before and after administration of green betel leaf decoction against pathological vaginal discharge in adolescent girls at the Hidayatullah Islamic Boarding School, Ternate City in 2019. In another word, betel leaf is an effective non-pharmacological medicine in dealing with vaginal discharge.

CONCLUSION

According to the results and discussion, it can be concluded that there is an effect of giving green betel leaf decoction on complaints of vaginal discharge in the teenage girls at the Hidayatullah Islamic Boarding School, Ternate City. By giving green betel leaf decoction, most of the respondents reported that the complaints were reduced and some of them completely recovered from complaints of vaginal discharge. This means that treatment with green betel leaf decoction has a significant impact and can reduce the symptoms of vaginal discharge. Further research needs to be carried out by considering other factors that affect vaginal discharge, such as a history of

gynecological disease. Specific and measurable detection of pathological fluor albus is necessary, such as using laboratory tests so that the expected diagnosis can be more objective. As for teenagers, it is necessary to take better care of their reproductive health, especially the cleanliness of the genitalia.

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A Sociodemographic outlook for commissioning exclusive breastfeeding during Covid-19 pandemic in Palangkaraya, Central Kalimantan

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ABSTRACT

The community activities restriction issuances, so-called PPKM, are expected to minimize the positive cases. The covid-19 pandemic has profound economic losses throughout the country, including Palangkaraya municipality. speculation has been arising, in terms of whether or not breastfeeding should be delivered to new-borns during the pandemic. The research was aimed to analyse the readiness among mothers in Jekan Raya Sub-District, from a socio-demographic to persistently breastfeed their infant during the pandemic, derived from our previous studies in Jekan Raya, Palangka Raya. It is a cross-sectional study design. The samples were the breastfeeding mother, total sample is 60 individuals, purposively sampled. Data were collected using questionnaire. Data was reviewed, re-analysed, graded and grouped. The study finding that the enhancing variable education and occupation, could increase the chance raised more income as well as knowledge. Given the facts that reflecting on international organizations and WHO recommendations, sociodemographic condition in research area is far to meet the criteria. The most preferred way to cope the pandemic regarding breastfeeding mother is to minimize the risk of transmission during breastfeeding were mask wearing, handwashing, routine cleaning and disinfection of all surfaces touched. These preliminary results highlight the need for further research into the association between COVID-19 and breastfeeding expectations. Furthermore, put into practices on how midwives' intervention will support mothers experiencing the obstacles of COVID-19 pandemic.

Keywords: Socio-demographic, breastfeeding, Palangka Raya, COVID19

INTRODUCTION

Previous study was designated to reach the mother regarding breastfeeding assistance, through android-based applications, called ASI-Mobile. The study was aimed to cope discontinuity of mother visit to the nearest midwives as well as nutritionist, yet can effectively having their consultation session through the app, in Palangka Raya Municipality (Oktaviani & Heriteluna, 2021). We've found that the application has promised impacted to the mother attitudes and behaviour. However, as Covid-19 officially declared as global pandemic by the World Health Organization (WHO) in March 2020, the following work was designated to align the previous work. As we may already concern, the covid-19 pandemic has profound economic losses throughout the country, including Palangka Raya municipality, Central Kalimantan Indonesia. It is estimated that during one and a half years, a total economic loss in Central Kalimantan has reached billions of Indonesian rupiah. Moreover, variant delta virulence significantly increases the total positive case, consequently burdened hospitals due to its over-capacity, not to mention the death tolls increment in the last few months. The community activities restriction issuances, so-called PPKM, are expected to minimize the positive cases, while on the other hand, the increased number of covid vaccination national coverage.

Indeed, speculation has been arising, in terms of whether or not breastfeeding should be delivered to new-borns during the pandemic (Dimopoulou et al., 2020; Goris & Health, 2020; Martín, 2020; Pacheco et al., 2021; Vu Hoang et al., 2020). Despite these speculations, breastfeeding enhances both maternal and infant health, with a dynamic, bidirectional exchange between the mother and the infant, which constitutes the cornerstone of infant and child well-being. Despite concerns of transmission from the infected mother to the infant, global and national health stakeholders have so far univocally encouraged breastfeeding during the COVID-19 pandemic (Vassilopoulou et al., 2021). Furthermore, they have suggested that during the current COVID-19 pandemic, although the guidelines of the relevant international and national agencies recommend breastfeeding by SARS-CoV-2-infected mothers, considerable insecurity persists in daily clinical practice regarding the safety of the infants and the perceived advantages and disadvantages of discontinuation of breastfeeding. Nevertheless, (Egom et al., 2020) has suggested that infected woman, should consider breastfeeding their infant, with a special breast pump or by another healthy caregiver to feed the infant, until the mother recovered.

We assumed that there is no significance change in terms of socio-demography as per July 2021, so that we reviewed our existing data, re-construct new hypothesis as well as new analysis technique. We hypothesized that the income, factors can be elevated their knowledge, however did not cope the standard for breastfeeding manner in Covid-19 pandemic situation. Based on this situation, reflecting the economic loss in Palangkaraya, this research was aimed to analyse the readiness among mothers in Jekan Raya Sub-District, from a socio-demographic overview, to persistently breastfeed their infant during the pandemic.

METHODS

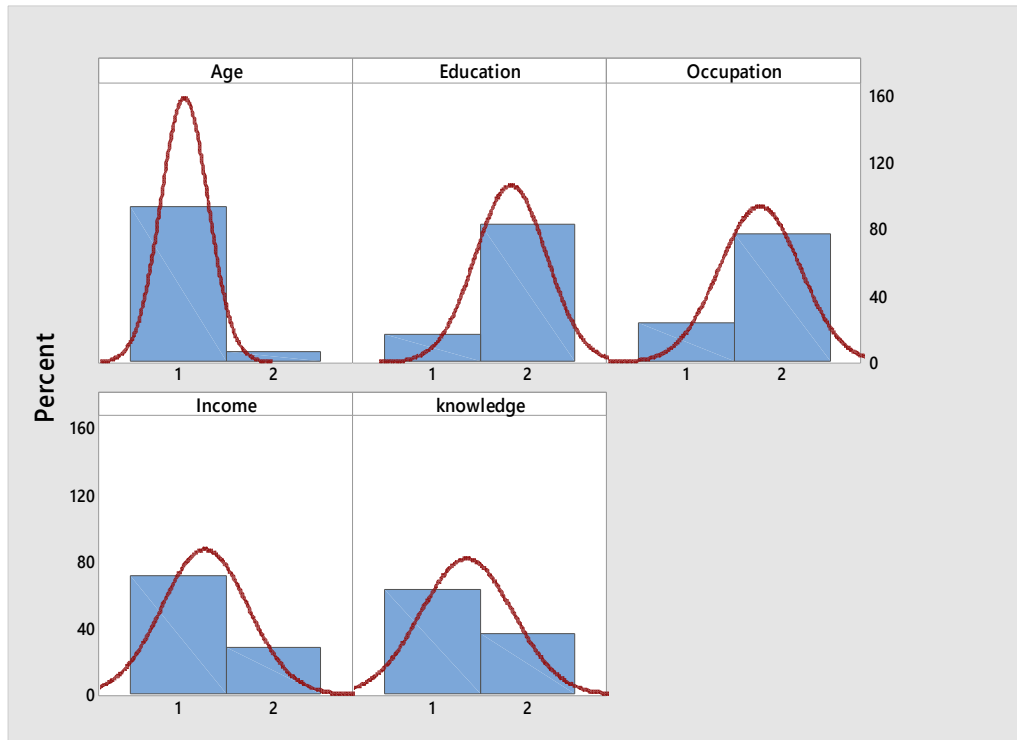
The study was conducted in Jekan Raya Sub-district, Palangka Raya Municipality, Central Kalimantan, Indonesia. The ethical clearance approval through ethic approval, issuance by ethic committee of Poltekkes Kemenkes Palangkaraya. It is a cross-sectional study design. The samples were the breastfeeding mother. Based on the formula, after Hermina et al., 2011, total sample is 60 individuals, purposively sampled. Data were collected using questionnaire. For this purpose, socio-demographic data was reviewed, re-analysed, graded and grouped. Socio-demographic data were collected to draw the characteristics of the study. They are four major socio-demographic variables, coded as

follow: age (1= 20-35 years; 2 = > 35 years), education (1: S1/S2; 2:SD/SMP/SMA/SMK), occupation (1= PNS/Swasta/Dagang; 2 = Housewives, IRT) and income (1: > IDR 3 million/mo.; 2: <IDR 3 million/mo.). As for knowledge, the criteria follow good (1) and poor (2). Parities data were excluded from analysis since it contains string variables. Descriptive statistics were run using Minitab v. 18 for Windows and principal component analysis using SPSS v. 18 for Windows.

RESULTS AND DISCUSSIONS

The data has revealed great variations among variables. Figure 1a has demonstrated variable age was dominated by 20-35 years of age, basic education, housewives, more than IDR 3 million income per month respectively. Based on post-test scores on mother knowledge to the critical breastfeeding, this group yielded good knowledge (63,3%).

(a)



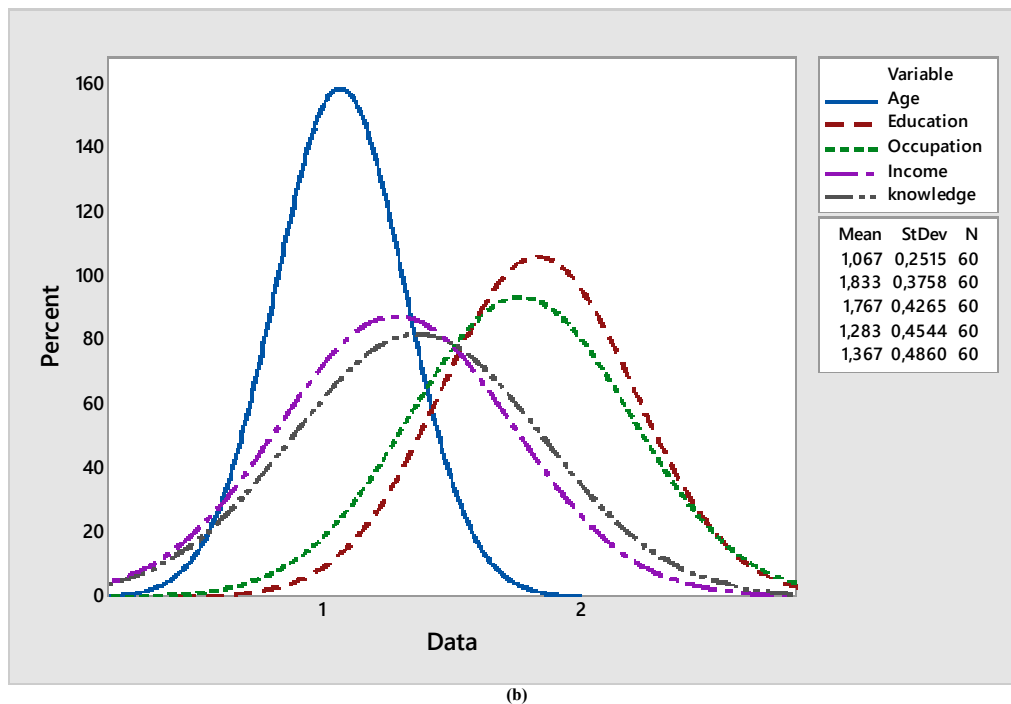


Figure 1. (a) Individual histogram plot as per variable data; (b) Overlay histogram plot as per variable data in percentage

On the other hand, Fig 1b confirmed that age variable has displayed fitted line merely on the first classification, while other variables more likely equally distributed fitted line on both classifications. Based on the pattern, put variable age in cross-tabulation versus other variables.

As we proceed to further engage in-depth analysis, we have found an interesting fact, based-on principal component analysis. Below is the simple bi-plot (Figure 2), showing that in facts, the data configured three cluster, which was stand-alone knowledge, occupation-education, and income-age. As we know, PCA visualized those variables contributing similar information are grouped together. In other words, they are correlated. Table 1 showed the total variance explained by the datasets. First component (PC1), there is 28,992% variance explained, eigen-values: 1.450. On the other hands, second component (PC2), there is 26.226% variance explained, eigen-values: 1.311. Looking at the cumulative percentage, those PC1 and PC2 contributed 55,218% the variance explained.

Table 1. Total Variance Explained by datasets

Total Variance Explained by datasets							
Components		Initial Eigenvalues			Extraction Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
dimension	1	1.450	28.992	28.992	1.450	28.992	28.992
	2	1.311	26.226	55.218	1.311	26.226	55.218
	3	.905	18.100	73.318			
	4	.777	15.533	88.851			
	5	.557	11.149	100.000			

Extraction Method: Principal Component Analysis.

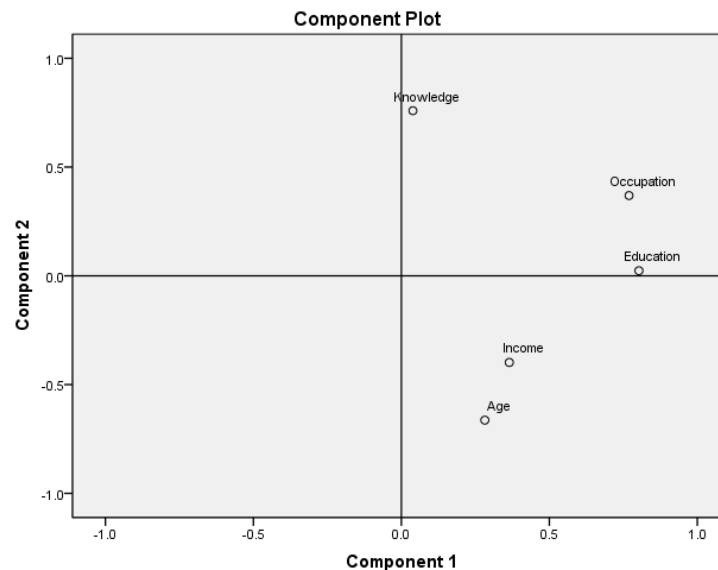


Figure 2. Bi-Plot generated from the data, showing component 1 (PC1) and component 2 (PC2) and clustering.

Table 2 showed the variables that correlate (*) the most with the first principal component (PC1) are education (eigen-vectors: 0,554) and occupation (eigen-vectors: 0,531). The first principal component is positively correlated with all five of these variables. However, although variable age, income and knowledge, are positive their component score are expressed low correlated. From PC2 standpoint, the eigen-vectors are ranging from positive (0,579) to negative (-0,506). In the PC2, the only variable that correlated with, is knowledge (eigen-vectors: 0,579).

Table 2. Component Score Coefficient Matrix

Variables	Component	
	1	2
Age	.195	-.506
Education	.554*	.018
Occupation	.531*	.281
Income	.252	-.304
Knowledge	.027	.579

Extraction Method: Principal Component Analysis.

Based-on the PC1 result, we can extract the finding that the enhancing variable education and occupation, could increase the chance raised more income as well as knowledge. Herein, supposed we are following current research suggestions, with two possible outcome 1) mothers claimed to covid-19 positive and 2) negative, with precautionary for health protocols. In Case 1, positive mothers are suggested to rooming-in is allowable without any other patients in that room with the infant kept in a bassinet two meters from the mother's bed and taking measures to prevent spreading the virus to her infant, or there should be another healthy adult who cares for the new born in the room. It is recommended to temporarily separate the infant from the mother because the mother severe COVID-19 infection requiring medical care in the hospital. This requires special treatments from healthy caregiver (Pacheco et al., 2021; Vassilopoulou et al., 2021).

Align to our data, the main question arise, will there an adequate financial to provide such things. Especially, today's hospital is over-capacity, limited caregiver, not to mentioned the caregiver also experience positive for covid19. Furthermore, none of mothers separate from their infant, more specific, in case on primigravids. Away from family, is also thing to consider. Given the facts, that most mothers in low and middle-income countries are at high ranked for breastfeeding, compare with Western Europe, Australia, and North America, who most prefer to give formula (Pacheco et al., 2021). In case 2, according to Interim guidelines from international agencies and different countries, as per scenarios, there also been underlined term "hygiene" breast pump and milk bottle (Vu Hoang et al., 2020). Again, one will look the data, and question remains. These are the facts that urgently seek for a way out. Midwives are in the frontline, especially in remote areas, who will be first contacted regarding neonatal and maternal care. To date, the most effective way, or most prefer for breastfeed is to minimize the risk of transmission during breastfeeding were mask wearing, handwashing, routine cleaning and disinfection of all surfaces touched. Furthermore, thorough cleaning and sterilization of infant feeding equipment before and after

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use, breast washing with gauze saturated with soap and water, and avoidance of falling asleep with the baby (Dimopoulou et al., 2020; Egom et al., 2020; Gabriel et al., 2020). Further research is needed into the association between COVID-19 and breastfeeding expectations. Furthermore, put into practices on how midwives' intervention will support mothers experiencing the obstacles of COVID-19 pandemic.

CONCLUSIONS

Based-on the research finding, we can conclude that reflecting on international organizations and WHO recommendations, sociodemographic condition in research area is far to meet the criteria. The most preferred way to cope the pandemic regarding breastfeeding mother is to minimize the risk of transmission during breastfeeding were mask wearing, handwashing, routine cleaning and disinfection of all surfaces touched.

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The Use of Belly Bengkung on Uterine Fundal Height In Postpartum Mother

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ABSTRACT

The purpose of this study was to determine the effect of the use of bengkung belly on uterine fundal height in postpartum mothers at Permata Bunda Purwodadi Hospital. This research method uses a quasi-experiment with a control group. The research was carried out by conducting home visits at the hospital in February-April 2020. The population was 166 spontaneous postpartum mothers, with a sample of five treatments and five controls. The sampling technique was done by random sampling, data analysis using the Mann Whitney Test. The results showed there was an effect of using belly bengkung on the uterine fundal Height in postpartum mothers at the hospital in the 2nd week with p-value = 0.029 ($p < 0.05$), while at the 6th week, there was no effect with p-value = 0.053 ($p > 0.05$). From the results of this study, postpartum mothers can use belly bengkung until the second week to provide benefits, namely to accelerate the process of uterine involution. For optimal comfort and function, the size of the bengkung can be customized to the client's body shape, such as the jumbo size 15m x 25cm and the average size 8m x 25cm.

Keywords: Abdominal belly; high fundus uteri; puerperal mother.

INTRODUCTION

The postpartum period is a period of recovery, after the completion of labor until the uterus returns to its pre-pregnancy state. The length of the puerperium is 6-8 weeks. This postpartum period begins 1 hour after the placenta is born until six weeks or 42 days after (Wiknosastro, 2009). Theoretically, what is expected within six weeks of giving birth is that all of the mother's body systems will recover from the various effects of pregnancy and return to their pre-pregnancy state. One of the changes the uterus gradually returns to its pre-pregnancy state is called uterine involution (Sukarni and ZH, 2015).

Uterine involution is the process of restoring the uterus to its pre-pregnancy state. Restoring reproductive organs during the puerperium (involution) is very beneficial for mothers after giving birth because this process is the basis for health workers (doctors, nurses, midwives, and others). If this does not usually run, it will cause a condition called uterine subinvolution, which will cause bleeding. Bleeding can increase maternal mortality during the puerperium (Sukarni and ZH, 2015). At this time, postpartum care is vital because it is a critical period for both mother and baby. Estimating that 60% of maternal deaths due to pregnancy occur after delivery (postpartum period) and 50% of postpartum deaths occur within the first 24 hours. It is caused by bleeding if the uterine involution was failed cause not treated immediately (Harianja *et al.*, 2017).

Researchers do much research to help speed up uterine involution, one of which is by doing endorphin massage. Although it did not show significant results, this massage can still reduce maternal anxiety during postpartum. So that with a stable mental health condition, it is expected that physiological processes during the puerperium, such as uterine involution, can be carried out correctly (Rahayu, Widyawati and Dewi, 2018).

During the postpartum period, many postpartum women use bengkung or stagen to recover or flatten the stomach quickly. One of the habits of using bengkung in Bugis is known as bekkeng. Although this bekkeng culture is still a pro and con for health practitioners, some people in Indonesia still believe it is a way to take care of mothers after giving birth (Rahayu, Mudatsir and Hasballah, 2017). Bengkung is a medium or fabric that wraps around the abdomen at the waist (Sajar, Aziz and Aris, 2018). People usually apply pilis or boreh on the surface of their abdominal skin before applying bengkung (Andhikatis, Maretta and Andriani, 2021).

As many as 75.5% of postpartum mothers agree with the use of bengkung. Respondents stated that bengkung could accelerate the return of the size of the stomach as before pregnancy, so that they express their agreement to use bengkung during the puerperium. That study shows that the use of bengkung is widespread in the community (Rahayu, 2017). Mothers who give birth more normally and do not experience complications during labor and postpartum are more advised to use the bengkung because the bengkung requires the ability to use it properly (Widaryanti and Riska, 2019).

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There are many benefits of using a bengkung, including maximizing uterine involution, restoring abdominal tone, reducing back pain, and supporting the postpartum mother's back, thus helping to form a faster posture. With a bengkung, pressure on the abdomen can support the abdominal in the lumbopelvic area by putting pressure on the transverse abdominis muscle (Benjamin, van de Water and Peiris, 2014).

Based on a preliminary study at Permata Bunda Hospital, Purwodadi, Grobogan Regency, from data on maternity room visits by type of service, during 2018 there were 4,841 deliveries, and the most spontaneous services were 1,938 deliveries (40.03%), Caesarean section 1,723 (35.59%) and the rest were as follows: curettage, extirpation, biopsy, vacuum extraction, manual cervical, and placental binding services. The results of initial observations on ten spontaneous postpartum mothers, most of whom were nine people who used stagen or bengkung after giving birth to get the stomach back quickly or flat. The purpose of this study was to determine the effect of the use of bengkung belly on uterine fundal height in postpartum mothers at Permata Bunda Purwodadi Hospital.

METHODS

This research is quantitative research using a quasi-experimental post-test only with a control group design. The population of this study was all spontaneous postpartum mothers at Permata Bunda Purwodadi Hospital in August 2019, with 166 people. The sample only consisted of 5 belly bengkung treatments, and five controls had been discontinued due to the covid-19 pandemic. The research variables consisted of the independent variable (belly bengkung), the dependent variable (uterine fundal height). The research instrument used was the uterine fundal height (UFH) observation sheet for the first, second, and sixth weeks. The data analysis used was univariate and bivariate analysis. The normality test of the data used the Shapiro Wilk test because the data distribution was not expected. Bivariate analysis used the Mann-Whitney test to determine the effect of using Belly Bengkung on uterine fundal height in postpartum mothers at the Permata Bunda Hospital in Purwodadi Regency.

RESULTS

Uterine fundal height in postpartum mothers who were treated with bengkung belly at Permata Bunda Purwodadi Hospital

Uterine fundal height (UFH) in postpartum mothers was measured in centimeters. The data presentation used the median as intermediate values and maximum-minimum values as the distribution values because the number of samples was small and the data distribution was not expected, $p < 0.05$ (Results attached).

Table 1. Uterine fundal height in postpartum mothers who were treated with bengkung belly at Permata Bunda Purwodadi Hospital

UFH	Median	Min	Max
1 st week	20	18	20
2 nd week	12	12	15
6 th week	8	8	10

Source: Primary Data, 2020.

Based on table 1 above, the uterine fundal height in postpartum mothers treated with bengkung belly at Permata Bunda Purwodadi Hospital in the 1st week had a median of 20cm, a minimum of 18, and a maximum of 20cm. The second week of uterine fundal height had a median of 12cm, a minimum of 12cm, a maximum of 15cm. While the sixth week of uterine fundal height with a median of 8cm, a minimum of 8cm, and a maximum of 10cm.

Uterine fundal height in postpartum women not treated at Permata Bunda Purwodadi Hospital

Table 2. Uterine fundal height in postpartum mothers not treated with bengkung belly (control) at Permata Bunda Purwodadi Hospital.

UFH	Median	Min	Max
1 st week	18	18	24
2 nd week	15	15	22
6 th week	10	8	15

Source: Primary Data, 2020.

Based on table 2 above, the height of the uterine fundus in postpartum women who were not treated with bengkung belly (control group) at Permata Bunda Purwodadi Hospital in the first week with a median of 18 a minimum of 18 cm, a maximum of 24 cm. Second-week TFU with median 15cm, minimum 15cm, maximum 22cm. Sixth-week TFU with a median of 10cm, minimum 8cm, maximum 15cm.

Belly Bengkung Effect on uterine fundal height in postpartum mothers at Permata Bunda Purwodadi Hospital.

Bivariate analysis was conducted to determine the effect of belly bengkung on uterine fundal height in postpartum mothers at Permata Bunda Purwodadi Hospital. Data analysis was carried out by performing statistical tests using the Mann-Whitney Test because the sample was small, and the data distribution was not expected. The results of the bivariate analysis are presented in the table below:

Table 3. The effect of using Belly Bengkung on the height of the uterine fundus in postpartum mothers at the Permata Bunda Purwodadi Hospital

UFH	Median Difference	P
2 nd week		
Treatment	20-12=8	0,029
Control	18-15=3	
6 th week		
Treatment	20-18=12	0,053
Control	18-10=8	

Source: Primary Data, 2020.

Based on table 3, it can be interpreted that there is an effect of using Belly Bengkung on uterine fundal height in postpartum mothers at Permata Bunda Purwodadi Hospital in the second week with a p-value = 0.029 ($p < 0.05$), while in the sixth week there is no effect with a p-value = 0.053 ($p > 0.05$). That is supported by data from the difference in the median TFU value in the second week with the first week in the 8cm treatment group and 3cm control group, while the difference in the TFU median value in the 6th week with the first week in the 12cm treatment group and 8cm control group.

DISCUSSION

In the initial stage before the implementation of the study, the researchers determined respondents according to predetermined criteria, namely primiparous postpartum mothers, aged between 20-35 years, spontaneous or average delivery at Permata Bunda Purwodadi Hospital, and postpartum mothers who were willing to become research respondents. The research was conducted at the respondent's house. The intervention group used Bengkung, and the control group did not use Bengkung. The post-test of UFH measurements was carried out in both study groups in the first week, the second week, and the sixth week.

The distribution of respondents in this study is still within the scope of Grobogan Regency, namely Purwodadi city or around Permata Bunda Purwodadi Hospital, and those who are a bit far away are respondents in Toroh District such as Tambirejo, Gendingan, and Depok Villages. In addition, there were respondents from Nambuhan Village in the Purwodadi II Health Center Area. The treatment group in this study were postpartum mothers who were treated with the use of belly bengkung. Previously, the treatment group was given an explanation about the Standard Operating Procedure (SOP) for the use of belly bengkung. The implementation practice in this study was through a series of stages, including asking the respondent's consent, explaining the purpose and benefits of using bengkung belly, and how to use bengkung. Here is how to use bengkung belly, firstly make sure the short fabric on the left and the long fabric is on the right, then tying the knot in the middle and pulling the bengkung fabric firmly, make sure the bengkung fabric is placed on the hips. Secondly, the short fabric is carried over the shoulders, and the long fabric is wrapped around the waist; make sure the fabric is pulled firmly. Last, repeat all the twists and the knot of the bengkung fabric to chest level, knot, and tuck the excess bengkung fabric on the sides of the body for a neater look.

On the first day of the home visit, the treatment group was trained to use Bengkung until they could use it properly. The researcher also taught the respondent's family how to use the bengkung to help or assist respondents in using it correctly. Researchers checked every day by reminding the respondents whether they had used bengkung or not. When the respondent is using the bengkung, the researcher will contact via video call to ensure that the use of the bengkung is under the SOPs that have been taught.

Practically in its implementation, overall, respondents can easily understand and practice using the bengkung correctly according to the SOP that has been given. This is because of respondents' carrying capacity of internal factors such as education level; most of the respondents are 60% junior high school graduates and SMA 40%. The higher a person's education, the better the level of knowledge and the easier it is to adopt good behavior. (Notoatmodjo, 2012) Respondents in this study as a whole were primiparous mothers. Primiparous was chosen because they had the same physiological ability in uterine involution, so that the datum would have been homogenous.

Results of the study show that the height of the uterine fundus in postpartum mothers who were treated with bengkung belly in the Permata Bunda Purwodadi Hospital in the first week with a median of 20cm, minimum 18cm, maximum 20cm. Second-week uterine fundal height (UFH) with median 12cm, minimum 12cm, maximum 15cm. Sixth-week UFH with a median of 8cm, minimum 8cm, maximum 10cm. Meanwhile, uterine fundal height in postpartum mothers who were not treated with bengkung belly or called the control group at the Permata Bunda Purwodadi Hospital in the first week with a median of 18cm, minimum 18cm, maximum 24cm. Second-week

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UFH with median 15cm, minimum 15cm, maximum 22cm. Sixth-week UFH with a median of 10cm, minimum 8cm, maximum 15cm.

Based on the results of bivariate analysis using the Mann Whitney Test, it was found that there was an effect of using Bengkung Belly on uterine fundal height in postpartum mothers at Permata Bunda Purwodadi Hospital in the second week with a value of $p = 0.029$ ($p < 0.05$), while in the sixth week there was no effect with $p\text{-value} = 0.053$ ($p > 0.05$). It is supported by data from the difference of the median UFH value in the second week with the first week in the 8cm treatment group and 3cm control group, while the difference in the median uterine fundal height value in the sixth week with the first week in the treatment group was 12cm and 8cm, respectively.

In the control group who was not treated with belly bengkung, uterine involution would occur physiologically. In other words, if the bengkung were not applied, the UFH would decrease. It is in line with the theory that a mother in postpartum will experience involution, which is a process of returning the uterus to its pre-pregnancy condition. With this uterine involution, the outer layer of the decidua surrounding the placental site will become neurotic (with/without). These changes can be detected by performing a palpation examination to feel the height of the uterine fundus.

Meanwhile, in the treatment group with bengkung belly, there was a significant difference in the decrease in uterine fundal height in the first week (week 1 to week 2). Because there is a physiological process (uterine involution) in the treatment group respondents and because it is assisted by the use of belly bengkung, which gives a comfortable emphasis on the abdomen. This comfort arises because Bengkung Belly is a bandage cloth wrapped around the mother's belly from a comfortable woven fabric that can absorb sweat. Bengkung is different from the stagen, which is wrapped around the mother's stomach will feel stiff and less able to absorb sweat so that the mother will feel uncomfortable. For the sake of optimal comfort and function, the size of the bengkung is also adjusted to the client's body shape, such as the jumbo size 15m x 25cm and the standard size 8m x 25cm. However, at the time after the second week to the sixth week between the treatment group and the control group, there was no statistically significant difference in UFH reduction, but when viewed from the median value of UFH in the sixth weeks' treatment group with a median value of 8cm and the treatment group with a median value of 10 cm. Seeing the difference in the median value, the researchers still recommend postpartum mothers to continue to wear belly bengkung until the 6th week to help the process of uterine involution.

The results of this study are supported by the theory that postpartum mothers who use bengkung belly, which functions as a support fabric, will get compression or pressure on the abdomen. This pressure will help to support the abdomen and lumbopelvic area by putting a little pressure on the transversus abdominis muscle. (Benjamin, van de Water and Peiris, 2014) Anatomically, the abdominal muscles consist of three layers; the deepest layer is the transversus abdominis, which functions as a bodice girdle to hold and maintain stability and play an essential role in exhaling and coughing. The next layer is the rectus abdominis which is the abdominal muscle to flex the spine. The last and closest layer to the surface is the internal and external obliques, the abdominal muscles that rotate the torso and give the body rotation and sideways movement (Hall, 2018)

There has been no publication of previous scientific research that discusses the effect of using Bengkung Belly on the height of the uterine fundus. However, several related journals are based on a research journal entitled the effectiveness of bengkung and octopus on uterine involution and lochea expenditure at the Keling Health Center, Kediri Regency. The study result stated that there was no effectiveness against uterine involution but recommended that postpartum women use the bengkung correctly to help restore their health. (Rahayu, 2017)

Physiologically, bengkung can support the abdomen and help the function of the transversus abdominis. Transversus abdominis has functioned as a body girdle, as a barrier and maintain stability, and helps the abdominal muscles to flex the spine. Belly bengkung can tighten the abdominal muscles and help speed up the recovery of the uterus to its original shape. In the end, it will help the abdominal muscles work more perfectly. (Rahayu, 2018)

Another related research is about "Belief in the Ability of Bengkung Culture in Increasing Breast Milk Production in the Bulukumba Community." The results showed that Bengkung could increase hormones in the postpartum mother's body so that it also indirectly stimulates milk production during the postpartum period. (Kamaruddin *et al.*, 2019) It is different from Siyoto's research (2019) entitled "Analysis of Uterus Involution, Lochea Expenditures and Back Pains on the Post Partum Mother Using Bengkung and Octopus." The result is that there is no significant relationship between the uterus, lochea discharge, and back pain in postpartum mothers using bengkung and octopus. (Siyoto, 2019)

CONCLUSION

There is an effect of using belly bengkung on uterine fundus height in postpartum mothers in the Permata Bunda Purwodadi Hospital in the 2nd week with $p\text{-value} = 0.029$ ($p < 0.05$), while at the 6th week, there was no effect with $p\text{-value} = 0.053$ ($p > 0.05$). It is hoped that further research will be able to conduct further research on

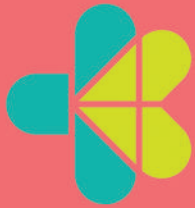
the effect of using Bengkung Belly on uterine fundal height in postpartum women by increasing the number of samples of postpartum women.

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Cadmium (Cd) Levels With Kidney Function Examination As An Indication Of Kidney Damage In Petrol Station Operators In North Surabaya with Atomic Absorption Spectrofotometry

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ABSTRACT

Motor vehicle smoke contains several heavy metals that are harmful to humans, the one is cadmium. Petrol station operator workers in direct contact with motor vehicles are at risk of being exposed to the metal cadmium, which can accumulate in the kidneys, leading to decreased kidney function. Decreased kidney function can be seen from the value of creatinine and urea in bloods. This research aims to analyze the relationship between cadmium levels, creatinine and urea values of petrol station operator workers in North Surabaya. This research used a correlational method with a cross-sectional design conducted at the Surabaya Health Laboratory and Clinical Laboratory of Health Analyst Department of Health Polytechnic of Ministry of Health Surabaya from November 2020 - June 2021. The sample of this study was 30 gas station operators using purposive sampling technique. Cadmium level examination used Atomic Absorption Spectrophotometry (AAS), then creatinine and urea values were examined using photometry. The results showed that the average cadmium levels 0.32 µg/L; the mean creatinine value 3.2 mg/L and the mean urea value 31 mg/L. From the research result, it can be concluded that there is a relationship between cadmium levels and urea value of gas station operator workers, but there was no relationship between cadmium levels and creatinine values of gas station operators. For further research, may include other variables such as a history of other diseases (diabetes, hypertension, gout) that can affect value of cadmium levels and kidney function examination.

Keywords: cadmium; creatinine; ureum; petrol stations operator; Atomic Absorption Spectrofotometry (AAS).

INTRODUCTION

Air pollution due to vehicle fumes has increased, especially in big cities in Indonesia, one of them is Surabaya. It can be seen from APSI data (air pollution standards index) in August 2019 indicates the index 67 with moderate status and value of PM 2.5 exceeds the quality standards that are harmful air pollutants⁽¹⁾. Exposure to the fumes may result in heavy metal poisoning one of which was cadmium. In North Surabaya region is an area that is quite impassable for trucks and buses and fueling at the gas station, so workers are at risk due to exposure to cadmium poisoning from the fumes.

Cadmium is a heavy metal that is highly toxic to humans. Cadmium into the human body can be through inhalation or from foods and beverages contaminated by cadmium. Cadmium into the body can cause itai-itai disease, which occurs softening of the bones until kidney failure⁽²⁾. Cadmium into the body will enter the blood circulation and binds to specific metal-binding proteins, namely metallothionein, or circulate freely and combine with molecules, such as albumin, amino acids, sulfhydryl compounds, glutathione and cysteine⁽³⁾. In all tissues, approximately 80-90% of cadmium will bind to metallothionein proteins to form CdMT, this bond has a strong affinity so it is difficult for most tissues to capture but can be captured by the kidneys⁽⁴⁾. So, CdMT bonds will accumulate in the kidney. Cadmium levels in the blood represent recent or ongoing cadmium exposures, while urine cadmium levels indicate total levels of cadmium in the body⁽⁵⁾.

Research conducted by O & Edna⁽⁶⁾ said that there was an increase in blood cadmium levels in gas station workers when compared to controls, so there was exposure to cadmium at gas stations. Meanwhile, research by Iyanda⁽⁷⁾ stated that there was an increase in blood cadmium levels in adolescents who worked less than 6 months is 0.29; less than 20 months is 0.44 and who has worked at a gas station is 0.29 compared to the control is 0.20.

The kidney is the main target organ due to cadmium exposure. Kidney damage may result from exposure by inhalation or ingestion. Chronic cadmium exposure is associated with progressive renal tubular dysfunction. High amounts of cadmium can cause various damage to the body. Low cadmium exposure can cause hepatotoxic effects, chronic renal failure, blood pressure changes, and changes in bone structure. High cadmium exposure can cause itai - itai disease, namely cadmium poisoning, which causes softening of the kidneys and damage to the kidneys, as in postmenopausal women who consume low vitamin D and calcium in Japan⁽⁸⁾.

Laboratory tests conducted for the initial screening of the kidneys are the examination of creatinine and urea values in the blood called kidney faal examination. Creatinine and urea are the results of the renal excretion out with urine. Examination of creatinine in blood presents as Glomerulus Filtration Rate (GFR). Meanwhile, urea examination can be used as a diagnosis of acute kidney failure⁽⁹⁾.

Research on welding workers conducted by Hernayanti⁽¹⁰⁾ stated there was an increase in cadmium levels of 1.092 ppm compared to control of 0.12 ppm. And an increase in creatinine value of 1.58 mg/dL compared to the control of 0.76 mg/dL. So there is a relationship between increased levels of cadmium in serum with creatinine values in welding workshop workers.

Cadmium levels in gas station workers can increase due to fumes around gas stations and can cause damage to the kidneys. Then the purpose of this study was to analyze cadmium levels with the value of kidney function examinations in petrol station workers in the North Surabaya region.

METHODS

This research used a correlation method with a cross-sectional design implemented from November 2020 until June 2021. The cadmium level examination used Atomic Absorption Spectrophotometry (AAS) conducted at Surabaya Health Laboratory. Creatinine value and urea value were examined using photometry conducted at Clinical Laboratory of Health Analyst Department of Health Polytechnic of Ministry of Health Surabaya. The research respondents were 30 petrol station operators whose blood was drawn as research material using the purposive sampling technique. Respondents have criteria including male operators with a minimum term of two years, no kidney disease history, do not smoke, do not drink alcohol, do not take drugs, and willing to become respondents.

This research received a description of ethical exemption from Health Research Ethics Committee of Health Polytechnic of Ministry of Health Surabaya with ethical clearance number No.EA/448/KEPK-Poltekkes_Sby/V/2021 was approved on May 10, 2021.

Sampling

Blood specimens were taken was about 3 mL of venous blood. Placed in a tube containing 2 mL of EDTA anti-coagulant and 1 mL in a plain tube, and given the patient's identity on the tube. Then, carried out the destruction of the EDTA tube for cadmium examination and centrifugation on the plain tube for kidney function examination.

Cadmium Levels Examination

Blood specimens in EDTA tubes were subjected to wet digestion using concentrated HNO₃ first to separate metal elements from organic compounds so that they could be read by Atomic Absorption Spectrophotometry (AAS). 10 mL of blood in the Nessler tube was put into the microwave, then added 10 mL of concentrated HNO₃ and put back in the microwave for 30 minutes at a temperature of $\pm 130^{\circ}\text{C}$ and left overnight to disintegrate, which was marked by the solution entirely becomes clear. Then added aquadest free of heavy metals and put it into a volumetric flask and added aquadest up to the mark.

Absorbance measurements were conducted using Atomic Absorption Spectrophotometer at a wavelength of 228,8 nm. Before measuring the absorbance of the sample, be measured standard solution with various concentrations first and the absorbance value of the standard solution was used to create a calibration curve. Then the sample solution can be measured absorbance with a wavelength of 228,8 nm.

Creatinine Levels Examination

Creatinine examination used the Jaffe method without deproteination. The working principle of this test is that creatinine in an alkaline environment will form a red-orange complex with picric acid. The absorbance of this complex is equivalent to the level of creatinine in the sample. Blood in plain tube specimens that have been centrifuged serum taken. Serum was added working reagent and then homogenized. Then read the creatinine value using photometry with a wavelength of 492 nm.

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Urea Levels Examination

Urea examination used the colorimetric enzymatic Berthelot method. The working principle of this test is that urease hydrolyzes urea into ammonia and carbon dioxide ions. Modifications Berthelot reaction with ammonium ions reacts with hypochlorite and salicylate form a green color. The intensity of the color formed is equivalent to the level of urea contained in the sample.

Serum in blood specimens that have been centrifuged homogenized with the first reagent and incubated for 5 minutes at 20-25°C. Then the second reagent was added and incubated for 10 minutes at 20-25°C. Then the sample was read using photometry with a wavelength of 578 nm.

Data Analysis

Data obtained by the normality test using Kolmogorov test then correlation test using Pearson correlation (r-Pearson) to determine the relationship of blood cadmium levels to the value of serum creatinine and urea values of petrol station operator workers in North Surabaya.

RESULTS

Based on the research results conducted on the analysis of cadmium levels by examining kidney function in gas station operator workers in the North Surabaya area, the data obtained can be seen in table 1.

In this study, respondents were 30 workers filling station operators in the North Surabaya region with an age range of 21-60 years and working period produce levels of cadmium and kidney examination value varies.

There is levels of cadmium are found in sample code 25 with a working period of 14 years producing cadmium levels of 0.52 g/L and there is levels of cadmium are found in sample code 2 with a working period of 14 years producing cadmium levels of 0.16 g/L. The average value of cadmium content is 0.32 g/L.

Then the creatinine value is found in sample code 16 with 14 years working periods and sample code 22 with 14 working periods produces a creatinine value of 3.7 mg/L, and there is creatinine value is in sample code 8 with 5 years working periods produces a creatinine value of 2.4 mg/L. The mean value of creatinine value is 3.2 mg/L.

On the urea value, the value is found in sample code 6 with a working period of 6 years produces a urea value of 41 mg/L and there is the value of urea is found in sample code 8 with a working period of 5 years produces a urea value of 23 mg/L. The mean value of urea value is 31 mg/L.

Table 1. Data analysis of cadmium levels with kidney function examination at gas station operators

No	Sample Code	Age (years)	Working period (years)	Cadmium Levels (µg/L)	Cretinine Levels (mg/L)	Urea Levels (mg/L)
1	1	40	14	0,23	3,2	25
2	2	40	14	0,16	3,1	32
3	3	39	13	0,27	3,3	35
4	4	33	14	0,42	3,6	30
5	5	29	12	0,25	3,4	28
6	6	50	6	0,19	3,3	41
7	7	38	14	0,24	3,1	36
8	8	32	5	0,33	2,4	23
9	9	51	14	0,28	3,1	34
10	10	41	14	0,48	3,4	31
11	11	35	14	0,22	3,1	37
12	12	23	4	0,37	3,2	26
13	13	40	12	0,26	3,4	27
14	14	41	14	0,21	3,5	32
15	15	39	14	0,32	3,2	34
16	16	32	14	0,48	3,7	29
17	17	30	13	0,28	3,2	24
18	18	49	5	0,22	3,6	38
19	19	37	12	0,29	3,1	29
20	20	38	14	0,37	3,1	32
21	21	50	13	0,24	3,4	37
22	22	41	14	0,43	3,7	34
23	23	35	14	0,28	3,2	34

No	Sample Code	Age (years)	Working period (years)	Cadmium Levels (µg/L)	Cretinine Levels (mg/L)	Urea Levels (mg/L)
24	24	21	5	0,34	3,0	27
25	25	53	15	0,52	2,5	29
26	26	33	8	0,41	2,9	31
27	27	26	5	0,38	2,6	28
28	28	28	3	0,29	2,9	31
29	29	24	7	0,46	2,6	27
30	30	29	12	0,51	2,6	24
Total				9,73	94,4	925
Average values				0,32	3,15	30,8

Table 2. Characteristics of gas station workers with cadmium levels above the cadmium level threshold

No	Sample Code	Age	Working Periods	Cadmium Levels
1	4	33 years old	14 years	0,42 µg/L
2	10	41 years old	14 years	0,48 µg/L
3	16	32 years old	14 years	0,48 µg/L
4	22	41 years old	14 years	0,43 µg/L
5	25	53 years old	15 years	0,52 µg/L
6	26	33 years old	8 years	0,41 µg/L
7	27	26 years old	5 years	0,38 µg/L
8	29	24 years old	7 years	0,46 µg/L
9	30	29 years old	12 years	0,51 µg/L

There are data on operator workers as many as 9 people with cadmium levels that exceed the threshold of 0.38 g/L(11). There is level of cadmium is found in sample code 25, which is 53 years old with a working period of 15 years, which is 0.52 g/L.

Based on age, sample code 29 is the youngest age at 24 years old with cadmium level of 0.46 g/L and sample code 25 is the oldest age at 53 years old with cadmium level of 0.52 g/L.

Then according to the working period, sample code 25 has the most extended working period of 15 years with a cadmium level of 0.52 g/L, while sample code 27 has the shortest working period of 5 years with cadmium level of 0.38 g/L.

DISCUSSION

The research was conducted at a gas station in the North Surabaya region with 30 respondents as operator workers at the gas station. Respondents obtained according to the sample criteria are male, have worked for more than two years, use PPE when working, in good health, do not smoke and do not take drugs, and have no history of kidney disease. History of diseases into the criteria only kidney disease, other diseases such as diabetes and hypertension that can affect kidney function are not included as sample criteria. Then there is no initial screening to checking the values of uric acid, blood sugar, and cholesterol using a test strip. These three values can also affect kidney function that may affect the values of creatinine and urea.

Age is one of the variables in analyzing cadmium levels in gas station operator workers. Generally, older people are more sensitive to cadmium activity in the body than young people because the activity of the biotransformase enzyme is reduced and the resistance of certain organs is reduced to the effects of cadmium. However, at a young age, high levels of cadmium can also be detected in the body because cadmium levels can come from foods consumed that contain cadmium, such as vegetables, rice, marine fish, and other foods contaminated with cadmium metal⁽¹²⁾. This study did not show a significant relationship between age and cadmium levels. This may be caused by several supporting factors such as lifestyle, consumption of food and drinks, and different outdoor activities.

This study explains that there is no significant relationship between cadmium levels and the working period. This study is similar to research conducted by Ayuda⁽⁸⁾ which explains that there is no significant relationship between groups of the duration of exposure to cadmium less than ten years and more than ten years on the difference between the duration of work and cadmium levels in cadmium parking workers. A study conducted by Ghazali⁽¹³⁾

showed no significant relationship between years of service and levels of cadmium. However, there was a significant relationship between years of service and levels of lead and arsenic.

Cadmium levels in this study showed results that exceeded the threshold only 9 out of 30 respondents so was no significant increase in cadmium levels with increasing age and working period. This is not following the study conducted by Iyanda⁽⁷⁾, which explained an increase in cadmium according to the length of exposure to cadmium in gas station workers. Cadmium in the blood is a biomarker of recent exposure and engages with acute symptoms. This study respondents, 70% of operator workers have worked for more than ten years resulting in cadmium in the body has accumulated high in the target organs, which can interfere with the function of these organs. In addition, according to a field survey conducted during sampling, operator workers have been wearing Personal Protective Equipment (PPE) in the form of masks regularly in the past year due to the Covid-19 pandemic. So may reduce the level of cadmium metal exposure from vehicle fumes that into through inhalation.

The creatinine value in all respondents in this study showed a value above normal (0.7 – 1.3 mg/L). The creatinine values increased may occur due to cadmium in the body which accumulates in kidneys by 30% and in the liver by 30%. Cadmium in the body will bind to metallothionein proteins in the liver and kidneys, leading to increased free radicals in the body. This can cause a chain reaction of lipid peroxidation leading to decreased Glomerulus Filtration Rate (GFR), which increased blood creatinine values may mark. Creatinine is a product of creatine and phosphocreatine metabolism which is filtered and reabsorbed in the renal tubules. If there is damage to the kidneys and a decrease in GFR, the ability of the kidneys to filter creatinine will decrease that creatinine levels in urine will decrease may caused creatinine levels in serum to increase⁽¹⁴⁾. Research conducted by Yakubu⁽¹⁵⁾ stated that a significant increase in creatinine and urea values in gas station operators compared to controls. There was an increase in creatinine value in all respondents in this study, but it did not significantly affect age and years of service. An increase in blood cadmium levels does not accompany increased creatinine value. This can occur because cadmium into the body accumulates in the kidney, leading to impaired renal function. In addition to the cadmium accumulates in the kidneys, increased creatinine values may occur due to an increase in muscle mass of the body, which in muscle mass associated with the level of protein intake.

The urea value in operator workers who became respondents showed 26 out of 30 respondents had urea levels exceeded the normal value (7-25 mg/L). The value of urea in serum reflects the balance of production and excretion. The value of urea is obtained by measuring the value of nitrogen in urea. Nitrogen in urea has a small but stable value. Urea is a waste product of protein metabolism excreted by the kidneys through urine. If the function of kidneys is damaged, the kidneys are not able to excrete urea, which can make urea circulate in the blood, resulting in the blood urea value becoming high. Heavy metals that enter the body will accumulate in the kidneys and cause damage to the nephrons, especially the tubular epithelial cells. This is marked by the Glomerular Filtration Rate (GFR) decreased, which can cause metabolic waste products such as urea that should be removed, resulting in a decrease in the value of urea in the urine and an increase in the blood. The effects of heavy metal exposure can cause cells to be unable to maintain their homeostasis so that certain types of cellular proteins are damaged and tissue apoptosis will increase. Cadmium can cause damage to cell membrane function by damaging the lipid composition of cell membranes. In an experiment conducted by Fadhilla⁽¹⁶⁾ on male rats exposed to cadmium, there was a significant increase in blood urea and creatinine values. In this study, urea value increased, but have not a significant relationship with age and years of service. Increased levels of urea can be caused by several factors other than exposure to heavy metals, such as a history of diabetes, high blood pressure, lifestyle, body obesity level, and body mass index.

The results of statistical tests using Pearson's correlation on cadmium levels with creatinine values shows a p-value is higher than α value (0.05), this indicates that there is no significant correlation between cadmium levels and creatinine values. This is not comparable to the research conducted by Hernayanti⁽¹⁰⁾ that there is a significant relationship between cadmium levels and creatinine values in welding workshop workers. However, it is comparable to Sugiharto⁽¹⁷⁾ research that there is no significant relationship between cadmium levels and creatinine values in exhaust welding workers.

Statistical results of the Pearson test of cadmium levels with urea values showed p-value is lower than the value of α (0.05), which means that there is a significant relationship between cadmium levels and urea values in gas station operator workers. This is comparable to a study conducted by Yakubu⁽¹³⁾ which stated that the increase in cadmium values in gas station workers was proportional to the increase in blood urea and creatinine values. From this research, it can be concluded that blood cadmium levels in gas station operator workers are not related to blood creatinine values but are related to blood urea values. The relationship of cadmium levels that do not exceed the maximum threshold in the body with serum urea values that exceed average values can occur because cadmium levels in the body have accumulated in the target organ is the kidneys. The kidneys have decreased function in excreting urea which should be excreted through urine but remains in the blood circulation, causing the blood urea value to increase.

CONCLUSION

Based on this research can be concluded that there is no relationship between blood cadmium levels and blood creatinine values. However, there is a relationship between blood cadmium levels and blood urea values of gas station workers in the North Surabaya region, with an average value of cadmium levels of 0.32 g/L; the mean value of creatinine value is 3.2 mg/L, and the mean value of urea is 31 mg/L.

There is a suggestion for gas station workers to be more alert to vehicle fumes around gas station by using PPE while working. And for further research, may include other variables such as a history of other diseases (diabetes, hypertension, gout) that can affect cadmium levels and kidney function examination.

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Cadmium (Cd) Levels In The Blood Of Communities Consuming *Mystus Gulilo* Around The Kenjeran Beach Area Of Surabaya With Atomic Absorption Spectrophotometry Method

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ABSTRACT

Cadmium is heavy metal with a toxic effect in the body, which is found in the environment of soil, air and water. *Mystus Gulilo* is one type of fish that can survive in polluted water such as Kenjeran Beach Surabaya, which is contaminated the heavy metal, cadmium. *Mystus Gulilo* that is consumed by humans accumulates in blood, settles for 75-128 days, and binds low molecular weight proteins that causing health problems, nerve damage, kidney damage, and red blood cell damage. This research is a descriptive study. The population in this research is the people who consume fish. The research specimens is blood, which taken by *purposive sampling*, requires people who consume *Mystus Gulilo* regularly for the last 1-3 months and aged 25-60 years. The research was carried out at the Surabaya Health Laboratory Center by using Atomic Absorption Spectrophotometry (AAS) apparatus. The results showed 3 respondents had a cadmium level exceeding the normal value with an average of 0.186 µg/dL. The age factor and the level of consumption affect the value of cadmium levels. The higher a person's age and the consumption levels of *Mystus Gulilo* they have, the higher the value of cadmium levels in their body and can cause chronic poisoning because the poison contained in the metal is carried to the body and accumulates over a long period of time, having an impact on the body's health, causing organ damage to death.

Keywords: Cadmium, *Mystus Gulilo*, Atomic Absorption Spectrophotometry (AAS)

INTRODUCTION

Kenjeran Beach Surabaya is a location of waters and fishing that direct and indirectly polluted by heavy metals including lead (Pb), arsenic (Ar), mercury (Hg), cooper (Cu), chromium (Cr) and cadmium (Cd) ⁽¹⁾. Based on research ⁽²⁾, the overall average stated content of cadmium in Kenjeran Coastal water Surabaya is 0.0076 ppm. Fishes that obtained from polluted water, that in any way the bioaccumulation of the fish body contains heavy metal that exceeds the limit set by Food and Drug Supervisory Agency Regulation number 23 of 2017, will be dangerous if consumed continuously as it can endanger human's health ⁽³⁾.

Mystus Gulilo is one of the freshwater fish can survive in polluted water without dying. At the current time being, *Mystus Gulilo* still can be found around the Kenjeran Beach Surabaya and they will soon endanger the local communities' health if the fish are still consumed by them ⁽⁴⁾. ⁽⁵⁾ stated in his study that *Mystus Gulilo*'s meat contains levels of cadmium with a range of 0.01 to 0.005 ppm. Meanwhile, the Regulation of the Food and Drug Supervisory Agency number 23 of 2017 states that the maximum limit of cadmium (Cd) heavy metals contamination in fish food or fishery products is 0.10 mg/kg.

Heavy metals can enter the body of marine biota and accumulate from the food chain processes contained in the water. The more complex the level of a food chain, the higher the accumulation of heavy metals in the body. Bioaccumulation in fish causes humans to experience a process of bioaccumulation of heavy metals that enter the body and through absorption in the blood. Cadmium (Cd) that enters the body's bioaccumulation can potentially

become toxic, which can provide potential hazards in the human tissues, including poisoning, nerve damage, hypertension, red blood cell damage and kidney damage to death ⁽⁶⁾.

The habit of consuming fish obtained from polluted waters by wastewater allows the presence of heavy metal cadmium (Cd) in the human body. This can have a toxic effect and have an impact on the health of the human body. By this, a research is needed to analyze exposure to cadmium in the blood of people who consume *Mystus Gulilo*, specifically around Kenjeran Beach, Surabaya. This research is supported by using the AAS (Atomic Absorption Spectrometry) methods.

METHODS

This type of research is an analytical descriptive study with the aim of analysing the levels of cadmium (Cd) in the blood of people who consume *Mystus Gulilo* around the Kenjeran Beach Area of Surabaya that makes them also the population in this study. The research is the community taken by purposive sampling with the criteria of people who consume *Mystus Gulilo* regularly for the last 1-3 months and are 25-60 years old. The number of samples are 22. The sample size is obtained from questionnaires that have been distributed to the public and have signed a consent form to be used as research's respondent. The variable of this study is the level of cadmium (Cd) in the blood of people who consumed *Mystus Gulilo* around the Kenjeran Beach Area of Surabaya. This study uses primary data, which is obtained directly after conducting research in the laboratory. Data collections are done by taking the test material to its examination. This research protocol is ethically complaint with certificate number No. EA/412/KEPK-Poltekkes_Sby/V/2021. It is declared ethically complaint in accordance with 7 WHO 2011 standard.

Materials

This research requires an EDTA Vacutainer tube, tourniquet, alcohol swab, sterile cotton, syringe, plaster, safety box, and handscoon.

Preparation of 1000 ppm cadmium metal mother liquor cadmium

Prepare the main solution which contain cadmium chloride monohydrate $C_2Cl_2H_2O$ by performing the following calculations:

Molecular Weight $C_2Cl_2H_2O$: 201,32 g/mol
Molecular Weight Cd : 112,4 g/mol

$$M = \frac{\text{Molecular Weight } (CdCl_2H_2O) \text{ g/mol}}{B \text{Molecular Weight Cd g/mol}} \times 1000 \text{ g/mol}$$

$$M = \frac{201,32 \text{ g/mol}}{112,4 \text{ g/mol}} \times 1000 \text{ mg/L}$$

$$M(g) = 1,7911 \text{ gram}$$

Add 1.7911 grams of $C_2Cl_2H_2O$ to flask, 4 ml HNO_3 of concentrated to dissolve, distilled water up to the mark, and then homogenize ⁽⁸⁾.

Preparation of 100 ppm standard solution

Prepare 10 ml pipette from 1000 ppm main solution, then put it into a 100 ml volumetric flask, and add distilled water up to the mark, then homogenize ⁽⁸⁾.

Preparation of 100 ppm standard solution

Prepare 10 ml pipette from a standard solution 100 ppm, then put it into a 100 ml volumetric flask, and add distilled water up to the mark, then homogenize ⁽⁸⁾.

Preparation of standard solution 1 ppm ; 2 ppm ; 3 ppm ; 4 ppm ; 5 ppm ; 6 ppm ; 7 ppm dan 8 ppm

Prepare 0,1 mL, 0.2 mL, 0.3 mL, 0.4 mL, 0.5mL, 0.6 mL, 0,7 mL and 0,8 mL pipettes of the 10 ppm standard solution and then put into a 100 mL volumetric flask with distilled water add up to the mark, then homogenize. Then obtain a standard solution of 1 ppm ; 2 ppm ; 3 ppm ; 4 ppm ; 5 ppm ; 6 ppm ; 7 ppm and 8 ppm ⁽⁸⁾.

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Making Blanks

The blanks solution that is used in this examination of cadmium metal is distilled water ⁽⁷⁾.

Sample Preparation Wet Destruction

Prepare blood sample contained in a vacutainer tube, then homogenize blood sample by shaking the tube, after it mixed well, prepare pipette 1 mL of blood and insert it into the tube Nesler 50 mL, add 10 mL of concentrated nitric acid, then put it in the microwave that the temperature has been set below 150°C for about 20 minutes. After the solution is clear, add heavy metal-free aquadest to the 50 mL mark, then read in AAS ⁽⁹⁾

Measurement of Standard Solution in AAS

Determination of the maximum wavelength can be done by installing a cadmium hollow cathode first, then turning of the AAS power button, and setting the AAS lamp to match the metal to be analysed via software. Set the wavelength to 228.8 nm. The wavelength obtained on the standard curve is used to determine a concentration of cadmium metal that are contained in the sample.

Sample Examination in AAS

Select the cathode lamp according to the analysis, then set the parameters to be analysed. Enter the blank first with a standard of 1 ppm; 2 ppm; 3 ppm; 4 ppm; 5 ppm; 6 ppm; 7 ppm; and 8 ppm. Insert the sample until the curve rises, and perform a sample check on the next sample by reinserting the blank. Then the instrument will read and record the absorbance ⁽⁷⁾.

Analysis Technique

Data obtained were analysed descriptively, quantitatively in the form of table and analysed by describing a situation that are occurred and connected the age factor, consumption level, and drawing conclusions. The data obtained were calculated as a whole by using the average and percentage to determine the number of samples exposed to cadmium in blood.

RESULTS

The examination of cadmium levels in the blood of people who consume *Mystus Gulilo* around The Kenjeran Beach Area of Surabaya that was conducted in this research at the Surabaya Health Laboratory Center, was done with the total of 11 respondents. The examination was carried out in duplicated number of samples, to wit 22 samples. The sample used in this study was 3 cc of EDTA blood. The data is presented in tabular form with the respondent's cadmium level checked in duplicate, so that the average value of the respondent's blood cadmium level is µg/dL.

Table 1 Examination Cadmium Levels in the Community Blood

No	Material Code	Age	Consumption Levels	Cadmium Value (Cd)	Mean
1.	BHN 1A	52 Years	3 times a month	0,087 µg/dL	0,089 µg/dL
2.	BHN 1B			0,092 µg/dL	
3.	BHN 2A	42 Years	≥ 3 times a month	0,164 µg/dL	0,168 µg/dL
4.	BHN 2B			0,173 µg/dL	
5.	BHN 3A	31 Years	3 times a month	0,094 µg/dL	0,090 µg/dL
6.	BHN 3B			0,087 µg/dL	
7.	BHN 4A	25 Years	3 times a month	0,068 µg/dL	0,071 µg/dL

8.	BHN 4B			0,074 µg/dL	
9.	BHN 5A	42 Years	≥ 3 times a month	0,207 µg/dL	0,232 µg/dL
10.	BHN 5B			0,257 µg/dL	
11.	BHN 6A	44 Years	3 times a month	0,059 µg/dL	0,055 µg/dL
12.	BHN 6B			0,052 µg/dL	
13.	BHN 7A	53 Years	3 times a month	0,047 µg/L	0,051 µg/dL
14.	BHN 7B			0,056 µg/dL	
15.	BHN 8A	40 Years	3 times a month	0,035 µg/dL	0,029 µg/dL
16.	BHN 8B			0,024 µg/dL	
17.	BHN 9A	60 Years	3 times a month	0,196 µg/dL	0,160 µg/dL
18.	BHN 9B			0,125 µg/dL	
19.	BHN 10A	46 Years	3 times a month	0,074 µg/dL	0,091 µg/dL
20.	BHN 10B			0,108 µg/dL	
21.	BHN 11A	41 Years	≥ 3 times a month	0,109 µg/dL	0,106 µg/dL
22.	BHN 11B			0,104 µg/dL	
Average					0,103 µg/dL

Table 1 shows that the average value of cadmium levels in the blood of people who consume *Mystus Gulilo* as a whole is 0.103 µg/dL. In a small number of respondent, the value of cadmium levels exceeds the normal value, it is more than or equal to 0,12 µg/dL. In this result, the h value of cadmium levels was 0,232 µg/dL with consumption rate of more than or equal to 3 times a month and value of cadmium levels was 0,029 µg/dL with consumption level 3 times a month.

DISCUSSION

In this study, people's age affects the value of cadmium levels contained in people's blood. It can be seen in table 1 that respondents aged 60 years have an average value of 0.160 g/dL cadmium levels which are higher than those aged 25 years who have an average value of 0.071 g/dL cadmium levels with the same level of consumption, which is 3 times during one month. The results of this study are in accordance with ⁽³⁾ that the average intake of cadmium by the community for 30 years is 0.0000129 mg/kgxday and for 50 years is 0.00000215 mg/kgxday, where the intake for 50 years is greater than the intake for 30 years. The nature of the heavy metal cadmium that accumulates in the body, especially in the blood, will have the health impact after 10 - 30 years. A person's age will affect the body's immune system against exposure of toxic substances because the higher a person's age, the more susceptible they are to their low immune system. At old age or adulthood, the activity of the bio transform enzyme will decrease, while at a young age the level of sensitivity is higher for the activation of heavy metal cadmium ⁽¹⁰⁾.

Based on table 4.3, the highest value of cadmium levels is - with an average of - 0.232 g/dL in respondents aged 42 years and consumption levels 3 times in one month. The high value is caused by the level of consumption of respondents in consuming *Mystus Gulilo* obtained in the waters of Kenjeran Beach, Surabaya. This result is in accordance with research ⁽¹¹⁾ that the greater the value of the intake rate or the level of community consumption, the greater the risk of health disorders in the community. The higher the level of consumption, the higher the exposure to cadmium in the body, and if the level of consumption is high, it can cause chronic poisoning because

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the toxins contained in the metal are carried to the body and accumulate over a long period of time, so that the body's immune system cannot tolerate the presence of toxins heavy metals and impact the healthiness of the body⁽³⁾. The amount of cadmium that enters the body that exceeds the normal value will damage organs to death due to the presence of metal beat cadmium⁽¹²⁾.

The results of this study indicate that a small proportion of respondents who participated in this study, had a cadmium level value that exceeded the normal value 0.12. That 3 out of 11 respondents were exposed to cadmium with a percentage of 27.27% having an average value of 0.186 g/dL. Respondents with normal cadmium levels are 7 of 11 with a percentage of 63.63% and have an average value of cadmium levels of 0.079 g/dL. While only one respondent with a percentage of 9.09% has a value of cadmium levels below normal, which is 0.029 g/dL. Cadmium that enters the blood is caused by the presence of heavy metal, cadmium, in *Mystus Gulilo* that was consumed by the local communities, which is obtained directly from the waters of Kenjeran Beach, Surabaya. This result is in accordance with research⁽¹³⁾ that *Mystus Gulilo* in the Ketingan river area of Sidoarjo that is also has a value that exceeds the normal of the quality standard, which is 0.1 mg/kg. Fishes that are found in Kenjeran Coastal Surabaya waters are polluted by heavy metals, one of which is cadmium. This result is in accordance with research⁽¹⁴⁾ that the level of cadmium around the Kenjeran estuary in seawater is 0.0327 ppm and the sediment is 0.481 ppm which exceeds the normal limit value.

Cadmium that is contained in water and waste can enter the bioaccumulation of fish through the gills which are the main point of entrance of cadmium in fish. The cadmium is then absorbed by the gastro-intestinal tract and distributed into fish body tissues. From that, the cadmium can then also accumulates from the food chain process until it gets to humans, absorbs into blood and then binds to proteins that have low molecular weight values. The absorption process will increase, if there is a deficiency of Ca, Fe, and low protein in food. The deficiency of Ca contained in food will stimulate Ca-protein so that it will increase the absorption of cadmium⁽¹⁵⁾. Cadmium has toxic effect on the body and affects the healthiness, among others, by increasing the risk of breast cancer, cardiovascular disease, and heart disease⁽¹⁶⁾. Prevention that can be done to anticipate the dangers of heavy metals that can enter the body is to be careful in consuming food and pay more attention to food. This research protocol is ethically complaint with certificate number No. EA/412/KEPK-Poltekkes_Sby/V/2021. It is declared ethically complaint in accordance with 7 WHO 2011 standard.

CONCLUSION

The results of the study with cadmium levels are based on age with the lowest level values in people aged 40 years and the highest levels of cadmium in people aged 42 years and based on the level of consumption. The cadmium rate of consumption levels is as much as 3 times in one month, and that is also shows the highest levels of cadmium rate. The higher the age of a person, the higher the value of cadmium levels, because the levels of cadmium deposited in the body are higher. By that, the conclusion is the higher the consumption level of *Mystus Gulilo*, the higher the value of cadmium levels that accumulate in the body.

Referring to the results of research, discussion, and conclusions, suggestions can be made for the community to be more careful in consuming food and pay attention to eating patterns.

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Difference of Body Posture for Venous Blood Collection on Hemoglobin Levels

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ABSTRACT

The posture of body during phlebotomy is a critical factor for a successful blood collection. Lying down or sitting during blood draw contributes to a small but significant alteration in the plasma volume. The hemoglobin increases by about 5% as the posture changes from lying to sitting. This study investigated the difference in hemoglobin levels between venous blood collected from lying down and sitting positions. This study was an observational analytical study with a cross-sectional approach conducted in July 2021 on thirty medical laboratory students in Palembang. The samples were selected using proportional random sampling. The blood of research subjects was drawn in a lying position and a sitting position. The hemoglobin levels between the two positions were analyzed using the dependent t-test. The results showed the mean hemoglobin level in the lying position was 13.623 gr/dL and that in the sitting position was 13.663 gr/dL with the p-value of 0.720 > $\alpha = 0.05$). It indicated that there was no significant difference in the hemoglobin levels between the two groups. The patient's posture during venipuncture does not affect the hemoglobin levels. Therefore, a blood draw can be performed in either a lying or sitting position without giving different results in hemoglobin levels.

Keywords: body posture, blood collection, hemoglobin levels

INTRODUCTION

The World Health Organization (WHO) defines anemia as a hemoglobin value less than 12 g/dL in women and less than 13 g/dL in men.¹ Hemoglobin concentration can be determined through venous blood collected through phlebotomy procedure. In hospitals, body posture for blood collection can be in a supine position, the patient lying on the back and face upward, in a hospital bed for inpatients, or in sitting down upright on a phlebotomy chair in a clinical laboratory for outpatients.²

There are some factors affecting hemoglobin concentration during pre-analytical phase in laboratory. The change of body posture during phlebotomy from supine to lying position can increase blood volume.³ The body posture change from lying to sitting causes a small but significant alteration in the plasma volume with an increase in hemoglobin as the posture changes, especially in women. Thus, subjects should rest for 5–10 min before their blood is collected.² The changes in hemoglobin levels resulted from the alteration in body posture occur temporarily. In the sitting position, the hemoglobin level is higher than the lying one because there is an increase in oxygen levels. Microcirculation increases blood flow, and hemoglobin concentration elevates. Whereas, in lying position, blood viscosity decreases but perfusion increases. Microcirculation decreases blood flow, and hemoglobin level decreases.⁴

Jacob et al. (2005) demonstrated the effect of posture on hemoglobin concentrations in healthy volunteers, showing an average 11% relative increase in hemoglobin when going from lying to standing. This increase was attributed to shifts in plasma volume to the vascular space with recumbence. They hypothesized that the initial hemoglobin on admission is measured when patients are upright or recently upright, whereas, after admission, patients are more likely to be supine, resulting in lower hemoglobin concentrations.⁵ Others have also demonstrated similar effects of patient posture on hemoglobin concentration.

Derakhshan et al. (2021) found that going from supine to a seated position resulted in significant increases in hemoglobin of 0.6 g/dL and a more than 1 g/dL increase in 29% of the patients.⁶ The increase in hemoglobin of about 5% from lying to sitting occurs in women, particularly. The drop from walking about to lie down is by 5–

10% and occurs within 20 min, and then is stable.⁷ A study of Lippi (2015) found meaningful increases in hemoglobin levels when the patient went from supine for 25 min to sitting for 20 min.⁸ Lima-Oliveira et al. (2017) investigated the effects of postural changes during phlebotomy and proved the change from supine to sitting position caused clinically significant increases in the hemoglobin.⁹ Similar studies by Sapta (2014) found no significant difference in hemoglobin levels between sitting and lying positions for blood collection.¹⁰

The study aimed to investigate whether postural changes, upright in a chair or recumbent in a bed, can affect hemoglobin concentrations in venous blood. We hypothesized that going from supine to upright in a chair would result in a relative increase in hemoglobin concentration of 5%, approximately half the value of going from supine to standing. To investigate this, we conducted a comparative analytical study exploring the effect of position (supine or sitting in a chair) on hemoglobin concentrations in healthy individuals.

METHODS

Research subjects enrolled in this study were healthy individuals, female students of the medical laboratory department, aged 18-21 years old, and had submitted informed consent. The participants enrolled in this observational analytical study were asked to take a lying position in a bed. The phlebotomist took venous blood from all participants while they remained supine. After the phlebotomy process, they moved to a chair and sat comfortably for about 15 minutes; the blood draw was then repeated. All blood samples were acquired by venipuncture using pink-top evacuated tubes. Prior to each blood draw, a tourniquet was placed over the upper arm below the axilla. The tubes of blood were immediately inverted after blood collection. Hemoglobin assays for blood taken in lying position and those in sitting position were processed and analyzed using Sysmex XN-10 analyzer (Sysmex Corporation). The reference range for hemoglobin according to this cell counter was 11.7 – 15.5 gr/dL for women. Laboratory technicians were blinded to and uninvolved in the study. The dependent t-test was used to know the difference in hemoglobin levels between the blood drawn in lying position and that in sitting position. The analyses were conducted using *Statistical Package for the Social Sciences (SPSS)* Statistics 25. Significance value was defined at $p < 0.05$.

RESULTS

Thirty participants had enrolled and completed the study. The median age of them was 20 years (range, 18-21 years). The mean hemoglobin concentration for supine in the samples was 13.623 g/dL (range, 11.7-17.0 g/dL) with a standard deviation (SD) of 1.4908. The mean hemoglobin concentration for the sitting position was 13.663 g/dL (range, 11.6-17.5 g/dL) with an SD of 1.3952 (Table 1). There was almost no changes in hemoglobin concentrations between the two positions.

Table 1. Statistical Distribution of Hemoglobin Levels in Two Body Postures

Body Posture	N	Min (g/dL)	Max (g/dL)	Mean (g/dL)	SD
Supine	30	11.7	17.0	13.623	1.4908
Sitting	30	11.6	17.5	13.663	1.3952

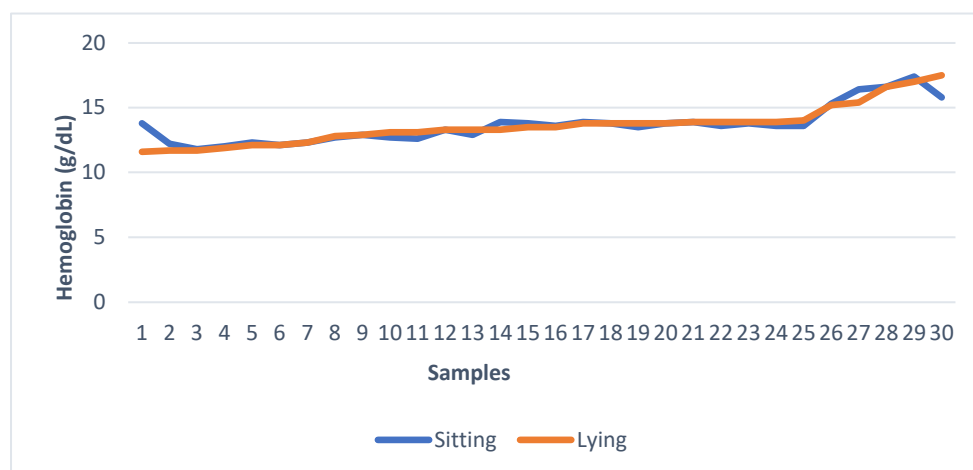


Figure 1. Distribution of Hemoglobin Levels in Sitting and Lying Positions of Blood Collection

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The next step is to analyze the difference in hemoglobin levels between the two groups of data using a dependent t-test. Before the analysis, all data both in supine and lying positions must be normally distributed. The analysis of normality test using the One-Sample Kolmogorov-Smirnov Test showed a significance value of 0.024 for sitting position and 0.064 for supine position. From the probability test, these significance values were > 0.05 . It meant that the data were normally distributed (Table 2).

Table 2. Normality Test for Hemoglobin Levels in Two Body Postures			
One-Sample Kolmogorov-Smirnov Test			
		Hemoglobin- sitting	Hemoglobin - supine
N		30	30
Normal Parameters ^{a,b}	Mean	13.663	13.623
	Std. Deviation	1.3952	1.4908
Most Extreme Differences	Absolute	.266	.234
	Positive	.266	.234
	Negative	-.091	-.087
Test Statistic		.266	.234
Monte Carlo Sig. (2- tailed)	Sig.	.024 ^d	.064 ^d
	99% Confidence Interval	Lower Bound .020	.058
		Upper Bound .028	.070

The statistical analysis used to determine whether the two groups of data were different or not was the dependent t-test was used. The results of the data analysis is presented in Table 3.

Table 3. Differences in Hemoglobin Levels between Sitting and Lying						
Paired Samples Test						
	Paired Differences					
	Mean	Std. Deviation	Std. Error Mean	t	df	Sig.(2 tailed)
Hemoglobin Sitting - Lying	.0400	.6061	.1107	.361	29	.720

As seen in Table 3, the statistical analysis results revealed that the significance value was 0.720 (> 0.05). It indicated no significant difference in hemoglobin levels between specimens collected by sitting and that by lying.

DISCUSSION

International blood collection guidelines acknowledge postural changes in laboratory values and recommend standardization of patient position to either sitting in a chair or lying flat in a bed, without changes in position for 15 minutes prior to the blood draw.¹⁰ Body posture for blood draw in hospitals or clinical laboratories has been applied in sitting-upright position for outpatients and supine or lying down in a hospital bed for inpatients. There has been no standardized body position for phlebotomy procedures, especially for venous blood collection. Based on previous studies and theories, there is a significant change in hemoglobin levels if a patient goes from sitting upright to lying down. This present study found no difference in hemoglobin levels in venous blood drawn in sitting and lying positions.

CONCLUSION

Posture can significantly influence hemoglobin levels in hospitalized patients in general medicine wards. The change of body posture from sitting to supine decreases blood volume. On the other hand, the posture change from supine to sitting increases blood volume. These changes potentially affect hemoglobin levels. The results of this study suggests the need of standardizing patient's position and during phlebotomy

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The Effect Of Drinking Calcareous Water On The Image Of Renal Function And Calcium In Kesan Eastern Mountain Residents, Ketapang Madura

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ABSTRACT

According to observations made in the hamlet of Gunung Kesan Timur, Paopale Laok Village, Ketapang, Sampang, Madura, locals in general continue to use well water. People drink calcareous well water without first filtering it. It can be seen in the well water container that the water includes lime, which results in a white crust. Objective: The goal of this research was to find out how residents in the Gunung Ketapang Madura sub-village described their renal function and calcium levels. Methods: The type of research used was descriptive research, The villagers of Gunung Kesan Timur Hamlet, Paopale Laok Village, Ketapang District, Sampang Madura, who drank calcareous well water were the subjects of this study. The samples were gathered from up to 30 people utilizing observational and questionnaire sampling approaches. Result : The creatinine results from 30 samples revealed that 25 (83%) samples had normal creatinine levels and 5 (17%) samples had abnormal creatinine levels, while the BUN results for 30 samples were declared to be 100percent normal, and the calcium results revealed that 13 samples (43%) were declared abnormal and 17 samples (57%) were declared normal. High creatinine and calcium levels have consequences.

Keywords: Calcium; Calcareous Water; Renal Function

INTRODUCTION

Water is a critical need for people, whether directly or indirectly. Water is an absolute necessity for survival. Humans cannot survive for lengthy periods of time without drinking water. Meanwhile, water that is directly drank has certain needs, particularly in terms of health. Humans can identify the type and amount of clean water that is helpful for daily life in order to meet water needs, because if both quality and quantity are not met, it can have a negative influence on socioeconomic health (Munfiah and Setiani, 2015)

Water is a basic need for humans with all kinds of activities which can be used for purposes household activities such as drinking, bathing and other. so effort is needed supply of clean water that meets clean water quality requirements (Yunus, 2016). Where it is set in Regulation of the Minister of Health of the Republic of Indonesia No.416/Menkes/Per/XI/1990, regarding quality clean water in hilly areas or in the limestone mountain area causes condition of polluted clean water sources especially in the dug wells around. Limestone mountains contain lime, thus causing the water to become hard. Parameters used for measuring the low quality of ground water caused by rock structure and the type of soil, one of which is hardness, maximum level of hardness which is regulated in the Permenkes, namely in above 500 mg/L. Water usage excessive or repeated pain can have a detrimental impact for the body, one of which is disease kidney stones (Astrini, 2016).

Water containing lime or having a high hardness level might induce renal difficulties over time due to the formation of CaCO₃ (Krisna, 2011). Creatinine levels, urea levels, or BUN (Blood Urea Nitrogen), and creatinine clients are all common tests for renal function. Creatinine is an endogenous metabolic product that can be used to evaluate glomerular function. Urea is a nitrogen compound secreted by the kidneys as a result of protein and food. Every day, the same quantity of creatinine is created and eliminated in the urine (Saputri *et al.*, 2019). DEPKES RI states that the maximum calcium content in drinking water is 75 mg / liter of drinking water and there is no minimum requirement. Water quality requirements as one of the chemical parameters, namely the amount of mineral content such as calcium and magnesium. Consuming drinking water with a mineral composition in water that contains a lot of calcium ions is thought to cause hyperexcretion of calcium and affect health (Umboh, 2016). Calcium ions are really needed in the body, generally calcium levels in the blood must be carefully controlled. In a day consumption of calcium should not exceed 2500 mg. Hypercalcemia is a condition caused by excessive levels of calcium in the blood. In this situation, the serum calcium level is >10.4 mg/dl (Hidayat, *et.al*, 2017). Dusun Gunung Kesan Timur, Paopale Laok is a village located in Ketapang District,

Sampang Regency, Madura, East Java Province, Indonesia. Based on its geology, Sampang Regency consists of several types of rock, one of which is limestone (chalk). Observations made in the Dusun Gunung Kesan Timur, Paopale Laok Village, Ketapang, Sampang, Madura, it was found that the villagers generally still use well water as a source of clean water for household purposes, both for washing, bathing, and even being consumed as drinking water. It has become a habit every day, the people consume calcareous well water without being processed first. It can be seen from the well water reservoir that causes a white crust which is a feature or sign that the water contains lime. Based on the above background, the research on the habit of consuming calcareous well water on the description of kidney function and calcium levels in the people of Dusun Gunung Kesan Timur, Ketapang Madura, especially in the village of Paopale Laok. The results of the study are expected to provide information to the public about drinking water containing lime for health.

METHODS

The type of research used was descriptive research, which is research that aims to observe and explain a situation or occurrence, in this case, the effects of drinking calcareous well water on kidney function and calcium levels in the people of Dusun Gunung Kesan Timur, Paopale Laok Village, Sampang Madura. The inhabitants of Dusun Gunung Kesan Timur, Paopale Laok Village, Ketapang District, Sampang Madura, who drank calcareous well water were the subjects of this study. The samples were gathered from up to 30 people utilizing observational and questionnaire sampling approaches.

RESULTS

Results of Creatinine Levels in People Consuming Calcareous Water

Tabel 1. Percentage of Creatinine Levels in People Consuming Calcareous Water in Dusun Gunung Kesan Timur

Area	Frequency	Percentage
Normal	25	83
Abnormal	5	17
Total	30	100

According to table 1, the results of creatinine levels in 30 samples showed that 25 persons (83%) had normal creatinine levels and 5 people (17%) had abnormal creatinine levels.

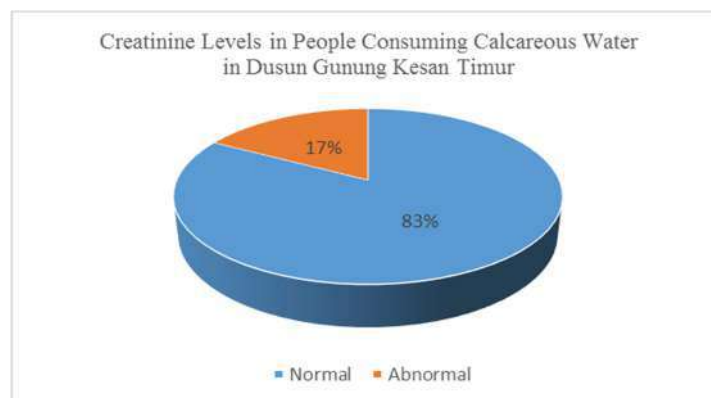


Figure 1. Creatinine Levels in People Consuming Calcareous Water in Dusun Gunung Kesan Timur

Results of Creatinine Levels in People Consuming Calcareous Water

Table 2. Percentage of BUN Levels in People Consuming Calcareous Water in Dusun Gunung Kesan Timur

Area	Frequency	Percentage
Normal	30	100
Abnormal	0	0
Total	30	100

According to table 2, the results of BUN levels in 30 samples showed that 30 persons (100%) had normal BUN levels.



Figure 2. BUN Levels in People Consuming Calcareous Water in Dusun Gunung Kesan Timur

Results of Calcium Levels in People Consuming Calcareous Water

Table 3. Percentage of Calcium Levels in People Consuming Calcareous Water in Dusun Gunung Kesan Timur

Area	Frequency	Percentage
Normal	17	57
Abnormal	13	33
Total	30	100

According to table 3, the results of calcium levels in 30 samples showed that 17 persons (57%) had normal calcium levels and 13 people (33%) had abnormal calcium levels.

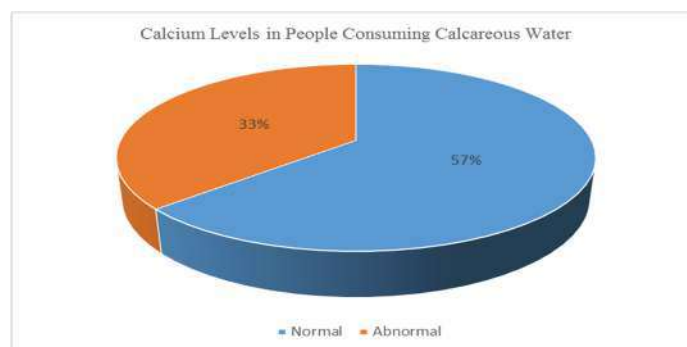


Figure 3. Calcium Levels in People Consuming Calcareous Water in Dusun Gunung Kesan Timur

Analysis of Creatinin, BUN and Calcium Based on gender

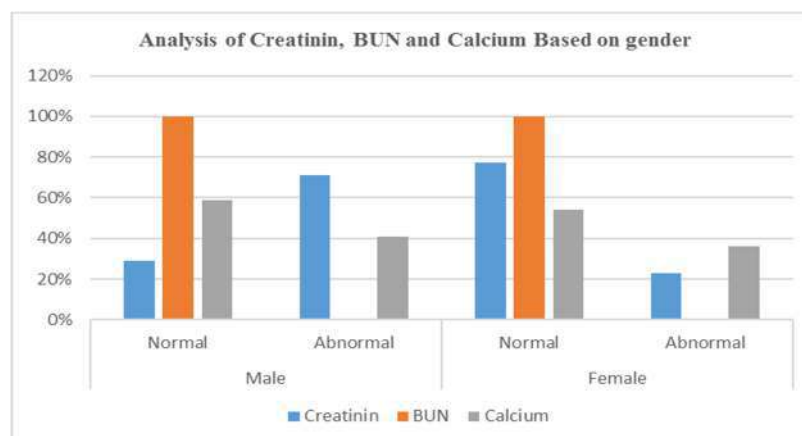


Figure 4. Analysis of Creatinin, BUN and Calcium Based on gender in Dusun Gunung Kesan Timur Based on

figure 4 shows the results of creatinine, BUN, and calcium by gender. Males had normal creatinine levels of 5 (29%) and abnormal creatinine levels of 12 (71 percent). Normal creatinine levels were

found in 10 (77%) of females, while abnormal creatinine levels were found in 3 (23 percent). Both men and women had normal BUN levels is 100 percent, in the BUN results. The calcium levels in guys with normal calcium levels are 10 (59%) and those with abnormal calcium levels are 7 (41 percent). Normal calcium levels were 7 (54%) in the female sex, while aberrant calcium levels were 6 (36 percent).

DISCUSSION

Based on the results of a study of 30 residents in Gunung Kesan Timur Hamlet who drank calcareous well water. The purpose of this study was to define the definitions of creatinine, BUN, and calcium levels. There are three indicators used to measure renal function in this study: creatinine, BUN, and calcium levels.

In figure 4 research, high creatinine levels are mostly found in men, this is in accordance with which states that gender can affect creatinine levels in the blood. Where men are more susceptible to increased creatinine levels caused by several factors, such as excessive physical activity, resulting in changes in muscle mass and is influenced by lifestyle, one of which is food. Women usually have lower creatinine levels than men, because women usually have less muscle mass. Creatinine is a metabolic waste of muscle protein, the amount of creatinine per unit of muscle mass is consistent and the level of creatinine breakdown is also consistent. Thus, the serum creatinine concentration is very stable and is a direct reflection of muscle mass. This is also in accordance with the statement of (Saputri *et al.*, 2019) which states that age and gender in older people have much higher creatinine levels than young people, while in men creatinine levels are higher than women.

In table 3, normal calcium levels were obtained as many as 17 people (57%) respondents. According to Getas, et.al (2015) normal blood calcium levels are influenced by the lifestyle and physical activity of each individual, so that reducing the level of calcium absorption in the kidneys can reduce the rate of kidney stone formation. This is in line with (Ida Bagus Rai Wiadnya, 2018) that normal blood calcium is caused because calcium metabolism in the body runs normally and there are no disturbances in the factors that affect blood calcium levels. Calcium levels are controlled by various factors including the intake of nutrients received by the body. In addition, control was also carried out by 1,25-dehydroxycholecalciferol, parathyroid hormone, calcitonin, phosphorus, protein, and estrogen. As many as 13 people (43%) of respondents had calcium levels above normal, this was due to the drinking water used by the people of Dusun Gunung Kesan Timur, namely well water containing lime which was consumed without prior processing. In addition, excessive intake of calcium-containing foods also affects calcium levels in the blood. An increase in blood calcium in serum is a condition in which the body absorbs more calcium than it needs. In the formation of calcium stones there is an increase in the serum calcium concentration. This suggests that calcium stone formation is a manifestation of altered regulation of Ca and vitamin D (Ketha *et al.*, 2015).

According to research (Sumampouw, 2010) said that although it is not known the amount of exposure and the time it takes calcium intake into the human body can increase the risk of kidney stones. It must be admitted that the occurrence of kidney stones is not only due to calcium intake but is caused by many factors such as intake of phosphate, fluids, fiber and so on. In addition, life behavior, age, parental disease history and weight also affect the occurrence of kidney stones.

In general, the homeland has a high level of hardness. The cause of hardness is because groundwater is in direct contact with Calcareous Water which is classified as having soft to high hardness. The hardness of this well water is temporary hardness so that it can be reduced by heating and deposited, resulting in the formation of insoluble and precipitated calcium carbonate salts (Astuti *et al.*, 2016).

Based on the survey results, respondents drink their well water directly without boiling it. According to Sumantri's research cited by Yazid & Afda'u (2016), it is often said that the hardness obtained in the air is used as a raw source of clean water sourced from the soil or whose soil contains lime and mineral salt deposits. Hard water is not very good for domestic use and industrial use.

CONCLUSION

Conclusion:

Based on the results of the study, it can be concluded that creatinine from 30 samples was known that 25 (83%) samples had normal creatinine levels and 5 (17%) samples had abnormal creatinine levels, while the BUN results for 30 samples were stated to be 100 percent normal, and calcium results were obtained. namely 13 samples (43%) were declared abnormal and 17 samples (57%) were declared normal.

Recommendation:

It is preferable for Paleo Laok villagers to drink water from taps or low-calcium water, or to purify well water before consuming it.

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Identification of Intestinal Nematodes and Cestodes in Cows (*Boss Sp.*) With The Saturated NaCl Method in Tegalbanteng Village of Lumajang Regency

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ABSTRACT

The high number of cases worms infection in cattles in East Java in 2015, especially Lumajang Regency, showed that 16.5% of cattles tested positive for worm infection. Contamination of worm parasites in farm animals when inedible by humans can cause serious diseases that attack the intestines and lungs. This is the background of researchers conducting this study. In the study conducted by researchers, 30 samples were taken randomly in cows in Tegalbanteng Village of Lumajang Regency and then examined for the presence of intestinal nematode and Cestoda worm parasites using the saturated NaCl method or flotation. Showed that of the 30 samples examined, 14 samples with a percentage of 46.7% positive were adirithetic to the Gut Nematodes, especially the species *Ascaris lumbricoides* and 16 samples with a percentage of 53.3% negatively infected with both the Intestinal Nematodes and Cestoda groups. From the results of this study it can be concluded that the high number of abuses in Tegalbanteng Village of Lumajang Regency of 46.7% shows a lack of concern for diseases that can infect livestock by livestock owners.

Keywords: Intestinal Nematodes, Cestoda, Kecacingan, Cow (*Boss Sp.*).

INTRODUCTION

Quoted from the official website of the East Java provincial Animal Husbandry Office, in Lumajang regency in 2015 it was obtained that 16.5% of calves tested positive for kecacingan or helminthiasis (DisNak JaTim, 2015). This shows that disease in livestock is a problem that needs special attention so that the quality of livestock can continue to increase. If the infected cow is consumed by humans in large quantities and continues continuously, it can cause health problems in humans themselves, including the onset of worm infections in humans. Worms in cattle are usually caused by infection with a class of gastrointestinal worms that includes the intestinal Nematode and Cestoda classes. Several types of nematodes were found, namely *Haemonchus*, *Strongylides*, *Charbetia*, *Trichuris*, *Ostergia*, *Bunostonium*, *Tricotrongylides* and *Ascaris*. Meanwhile, from the cestodes class, *Taenia*, *Avitellina*, *Moniezia benedeni* and *M. expansa* were found (CC, et al., 2018). According to Chairunnisa (2018), there are many factors that cause cows to be infected with worms including high rainfall, temperature, humidity and poorly maintained cage sanitation (Chairunnisa, (2018) in (Arimurti, et al., 2020)). Against the background of these data and conditions, the authors wanted to conduct research to find out how the picture of intestinal nematode worms and Cestoda in cows (*Boss Sp.*) with the saturated NaCl method in the village of Tegalbanteng Lumajang district.

METHODS

In this study, ethical clearance was not carried out because researchers did not treat animals, but researchers only took feces that had come out of animals. This study was conducted using the saturated NaCl test method and conducted secondary data collection to farm animal owners through interviews and questionnaires related to cow breed, cow age, cow sex, vaccination, etc. The principle of examination of this study is to take advantage of differences in the weight of the type of parasite, in this case intestinal nematodes and cestodes, with the weight of the medium type that is saturated NaCl. The weight of the type of parasite is smaller than the weight of the medium type, so the parasite will float on the surface of the medium and attach to the coverglass. This

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method is also known as the buoyancy method or flotation method. After the research, the data obtained will be calculated to look for a percentage of positive and negative results using the formula:

$$P = \frac{F}{N} \times 100\%$$

Information:

P = Percentage of positive or negative samples

F = Number of positive or negative samples

N = Total number of samples

RESULTS

Based on the research that has been done, the data is presented in the following table:

**Table 1. Tabulation Data Results of examination of Intestinal Nematodes and Cestodes
in Cow Feces (*Boss Sp.*)**

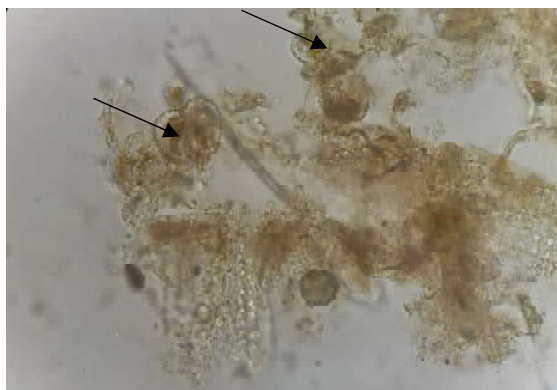
Sample code	Results of Identification of Parasites Intestinal Nematodes		Results of Identification of Parasites Cestodes	
	Positive(+)	Negative (-)	Positive (+)	Negative (-)
1.	(+)			(-)
2.		(-)		(-)
3.	(+)			(-)
4.		(-)		(-)
5.	(+)			(-)
6.	(+)			(-)
7.		(-)		(-)
8.		(-)		(-)
9.		(-)		(-)
10.	(+)			(-)
11.	(+)			(-)
12.		(-)		(-)
13.		(-)		(-)
14.		(-)		(-)
15.		(-)		(-)
16.	(+)			(-)
17.		(-)		(-)
18.	(+)			(-)
19.	(+)			(-)
20.		(-)		(-)
21.		(-)		(-)
22.		(-)		(-)
23.	(+)			(-)
24.	(+)			(-)
25.		(-)		(-)
26.	(+)			(-)
27.	(+)			(-)
28.		(-)		(-)
29.		(-)		(-)
30.	(+)			(-)

Jumlah	14	16	0	30
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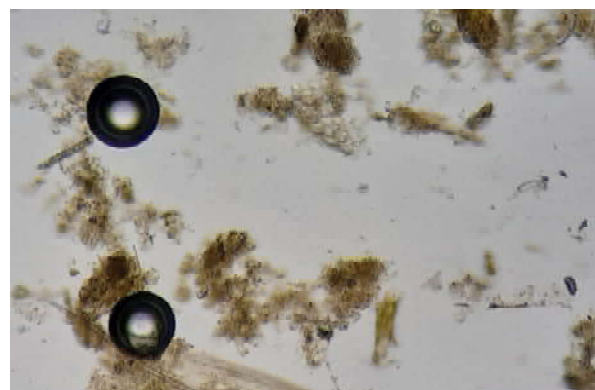
Information:

- a. Positive sign (+): Indicates the presence of eggs or larvae or worms of the Intestinal Nematodes or Cestoda
- b. Negative signs (-) : Does not indicate the presence of eggs or larvae or worms of the Intestinal Nematodes or Cestoda

From the table above obtained the results that from 30 samples examined by researchers, showed a number of 16 positive samples and 14 other samples negatively infected with intestinal nematode group worms. And 0 positive samples and 30 negative samples infected with the disease of dwarfism from the Intestinal Nematodes and Cestoda groups.



Sample Number 2
Positive: there are *Ascaris lumbricoides* eggs
Magnification 40x



Sample Number 12
Negative : there is no parasite
Magnification 40x

DISCUSSION

A. Identification of Eggs, Larvae, and Intestinal Nematodes Worms

Of the 30 samples examined by researchers, 14 samples with a percentage of 46.7% tested positive for intestinal nematode worms, especially the species *Ascaris lumbricoides* (roundworms). And 16 samples with a percentage of 53.3% negative or not infected with intestinal nematode group worms. The results obtained are in line with secondary data that has been collected by the author with the method of questionnaire to the owners of livestock related to the type of cow, age of the cow, gender of the cow, vaccination, cage management etc. Where all cattle owners state that cows are only injected or vaccinated when the female cow is pregnant and there is no vaccination or worm medicine.

In addition, other factors that support a considerable percentage of disreidies are the pattern of cage management and poor livestock care. Cow owners clean the cage every day in the morning or evening, but only bathe the cow twice a week or even not at all. The high percentage of livestock, especially cows in Tegalbanteng Village, Lumajang Regency, is also due to the lack of knowledge of livestock owners about the importance of giving worm medicine.

In research conducted by Cahirunnisa (2018), it was explained that in disre berating in farm animals can be caused by environmental factors such as temperature, humidity, rainfall, and poor levels of cage hygiene can cause farm animals to contract kecacingan (Chairunnisa (2018) in (Arimurti, et al., 2020)). In addition, the lack of knowledge of farm animal owners related to diatribes, symptoms of kinis, preventive or preventive efforts and treatment is also a factor in causing farm animals to be infected by worms (Nuraini, et al., 2020).

B. Identification of Eggs, Larvae, and Cestoda Worms

In this study, 30 samples examined showed that none of the samples were infected with Cestoda infection. So that the percentage of both positive and negative results is 0%. Although no infection was found due to the Cestoda group, prevention efforts need to be done so as not to appear new cases or an increase in cases of abuse.

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Some efforts that can be made to prevent infection in livestock are by giving worms periodically every 3-6 months for general prevention even though the animal does not show symptoms. Good application of sanitation and hygiene of the cage: cleaning with disinfectant once every 2 weeks, maintaining the cleanliness of livestock by preventing excrement. Increase the endurance of farm animals by giving multivitamins regularly with the supervision of veterinarians or animal mantri. Provide knowledge about diatribes, symptoms, prevention, and treatment in breeders (Nuraini, et al., 2020).

CONCLUSION

Based on research that has been conducted on cow feces in Tegalbanteng Village of Lumajang Regency conducted by saturated NaCl method, it can be concluded that from 30 samples examined obtained results: The Gut Nematodes group was found in 14 samples by 46.7% especially *ascaris lumbricoides* species and 16 negative samples by 53.3%. The Cestoda group was not found in the 30 samples, so the percentage of diatribes was 0% positive and 0% negative.

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Differences of Erythrocyte Index in Patients With Diabetes Mellitus Given The Criteria for Prediabetes And Diabetes at Kedungdoro Public Health Center Surabaya

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ABSTRACT

Diabetes Mellitus is a metabolic disease characterized by high blood glucose levels due to impaired insulin secretion, decreased insulin action, or both. Diabetes mellitus is divided into prediabetes criteria, namely when fasting blood sugar levels are 100-125 mg/dL and diabetes criteria when fasting blood sugar levels are 126 mg/dL. Elevated blood sugar levels are associated with a deficiency of *Erythropoietic Stimulating Factors* (ESF) which can affect the process of erythrocyte formation to have an impressive effect on the erythrocyte index (MCV, MCH, and MCHC). This study aims to determine the difference in index of erythrocytes in patients with prediabetes and diabetes in Puskesmas Kedungdoro Surabaya. This research was observational analytic with *crosssection* conducted from January to April 2021 in 15 patients with prediabetes and 15 diabetic patients at the health center Kedungdoro Surabaya using materials EDTA blood test. Complete blood counts were carried out at the Bakti Analytical Clinical Laboratory using the *ABX Micros 60 Hematology Analyzer*. The results showed the average MCV value of prediabetic patients was 86.80 m³ while in diabetic patients it was 82.00 m³, the average MCH of prediabetic patients was 29.48 pg and in diabetic patients is 27.25 pg, and the average MCHC of prediabetes is 33.94 g/dL while in diabetic patients it is 33.20 g/dL. So that further research is needed on risk factors that can increase the value of the erythrocyte index in people with diabetes mellitus.

Keywords: Diabetes, Prediabetes, Erythrocyte Index

INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disease characterized by high levels of glucose in the blood (hyperglycemia), which occurs due to impaired insulin secretion, decreased insulin action, or the result of both. Several pathological processes are involved in the development of diabetes, ranging from destruction of cells in the pancreas with consequent insulin deficiency, to abnormalities leading to insulin resistance.⁽¹⁾ Diabetes is one of the most important public health problems and is categorized into four non-communicable diseases. This is due to the increasing number of cases and prevalence of diabetes over the last few decades. The World Health Association (WHO) predicts that the number of people with diabetes in Indonesia will increase from 8.4 million in 2000 to 21.3 million in 2030.⁽²⁾

Increase in the prevalence of diabetes in Indonesia from 5.7% in 2007 increased to 6.9% or around 9.1 million in 2013. Based on a preliminary survey conducted by researchers at the Kedungdoro Health Center Jl. Kaliasin Pump Gang No. 79-81, Tegalsari, Surabaya, it is known that the number of type 2 diabetes mellitus patients from 2019 to 2020 was 1,426 patients and the period from September to November was 120 patients. Data from the International Diabetes Federation in 2015 shows the estimated number of people with diabetes in Indonesia is estimated at 10 million. The increase in the prevalence and control of Diabetes Mellitus shows the importance of preventing and controlling Diabetes Mellitus.⁽³⁾

Examination of the diagnosis of diabetes mellitus is very necessary by being enforced on the basis of examination of blood glucose levels. The results of laboratory tests for diagnosing diabetes mellitus can be divided into several criteria, namely the criteria for prediabetes where the results of blood sugar levels do not meet the normal criteria and the criteria for diabetes mellitus, namely with fasting blood sugar levels of 100-125 mg/dL,

while the results of the examination show a diagnosis of diabetes when the blood sugar levels are high. fasting blood 126 mg/dL.⁽⁴⁾ In connection with the higher blood sugar levels that affect the criteria for the incidence of diabetes mellitus, it can inhibit the formation of the hormone erythropoietin (HPO) which functions to regulate the production of red blood cells in the bone marrow.⁽⁵⁾ In patients with Diabetes Mellitus, bone marrow is one of the body's tissues with a high proliferation rate that produces all types of blood cells every day, one of which is red blood cells through the erythropoiesis system by erythropoietin (EPO).

The persistent increase in blood sugar levels associated with diabetes is associated with a deficiency of *Erythropoietic Stimulating Factors* (ESF) which can affect the process of erythrocyte formation to have an impressive effect on one of the red blood cell indices, which include mean corpuscular volume (MCV), corpuscular hemoglobin (MCH), means the corpuscular hemoglobin concentration (MCHC).⁽⁶⁾ According to research, cases of Diabetes Mellitus are often found to have disturbances in various systems, one of which is interference with erythrocytes. Disorders of erythrocytes are closely related to the mean erythrocyte index which consists of the mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC) which are important indicators to reflect the condition of erythrocytes.⁽⁷⁾

Alamri's research (2019), on the effect of hyperglycemia on red blood cell (erythrocyte) index, showed that hyperglycemia was proven to reduce corpuscular volume (MCV), average corpuscular hemoglobin (MCH), and corpuscular hemoglobin concentration (MCHC). According to research conducted by Jaman (2018), regarding diabetes and red blood cell parameters, it shows that in diabetics, glycemic control affects the RBC count, RDW, and erythrocyte index consisting of MCV, MCH, and MCHC. MCH values were lower in patients with high glycemic levels than in patients with low glycemic control. In patients with diabetes mellitus, disorders are often found in various systems, one of which is in erythrocytes. An important indicator that can reflect the state of erythrocytes is the erythrocyte index (MCV, MCH, and MCHC).⁽⁸⁾

Therefore, researchers want to know the characteristics of the erythrocyte index that can be used as an indicator to see the presence of erythrocyte disorders in people with diabetes mellitus with prediabetes and diabetes criteria.

Research Objectives and Benefits

This study aims to determine the difference in erythrocyte index in patients with diabetes mellitus with prediabetes and diabetes criteria through hematological examination, namely erythrocyte index.

This study is expected to be an alternative examination in determining the diagnosis of diabetes mellitus by providing information about the criteria for prediabetes and diabetes through the erythrocyte index which includes MCV, MCH, and MCHC.

METHODS

This research is an analytical observational study, comparing two groups, namely the prediabetes group and the diabetes group. With approach *cross section*, that is each subject will be examined for the erythrocyte index at one time and the research design is *the post control group design*, namely the study uses the results of the final examination with limitations on the research group. Research This research was conducted at the UPTD of the Kedungdoro Health Center, Surabaya City and laboratory examination tests were carried out at the Bakti Analysis laboratory from October 2020 to April 2021. Sample in this study was 30 samples taken according to the population with inclusion criteria, namely patients categorized as prediabetes with fasting blood glucose levels of 100-125 mg/dL and categorized as diabetes with fasting blood glucose levels 126 mg/dL. The sampling technique used primary data from blood sugar examination and erythrocyte index obtained by *purposive consecutive sampling technique*, sampling namely is done by selecting samples that meet the research criteria for a certain period of time.

Data Collection Techniques

Using primary data from the results of examination of blood glucose levels, erythrocyte index and the results of the respondent's questionnaire in accordance with the consent *informed*. research data is quantitative data, then normality test is carried out using the Kolmogorov Smirnov test. Because the data were normally distributed ($p > 0.05$), performed *Independent Samples T-Test* was to determine the difference in erythrocyte index in prediabetes and diabetic patients.

Research Stages

DM patients were measured blood glucose levels then conducted interviews, filled out questionnaires, and *informed consent* in DM patients who had blood sugar levels according to the sample criteria, namely 100-125 mg/dL (prediabetes) and 126 mg/dL (diabetes). Perform venous blood collection then complete blood examination with Horiba ABX Micros 60 Hematology Analyzer (MCV, MCH, and MCHC). Data is collected and analyzed statistically to obtain results and conclusions in the study.

RESULTS

Based on the results of the study in the form of examining the erythrocyte index in patients with diabetes mellitus with prediabetes and diabetes criteria using the Horiba ABX Micros 60 Hematology Analyzer, the following results were obtained:

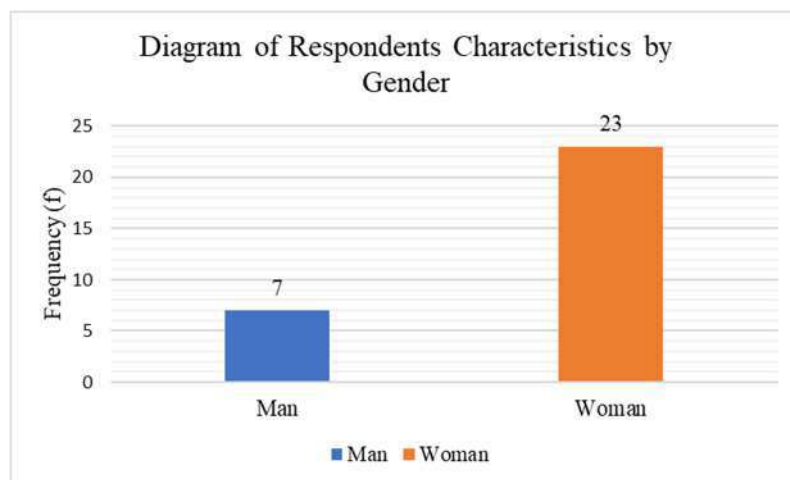


Figure 1. Diagram of Respondents Characteristics by Gender

Based on the gender distribution, it shows that there are more female respondents than male respondents, namely 23 samples (76%), while 7 samples are male (24%).

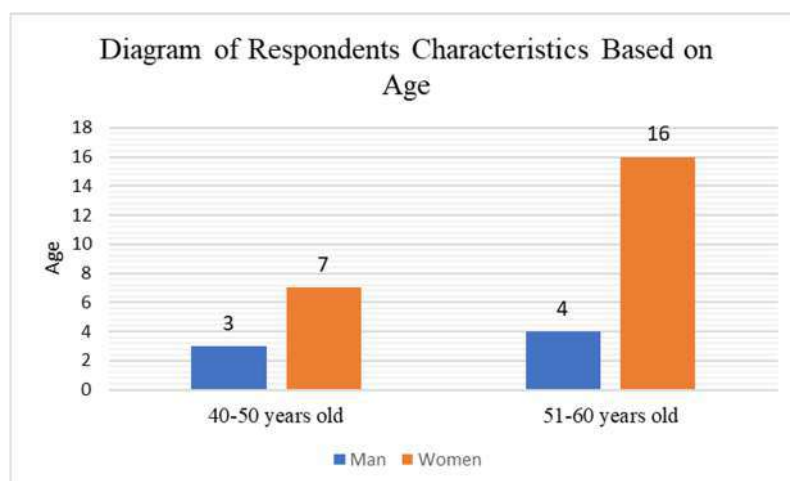


Figure 2. Diagram of Respondents Characteristics Based on Age

Based on Figure 4.2 above, there are respondents with an age range of 40-50 years as many as 10 samples (34%) consisting of 3 samples of men and 7 samples of women. While the age range of 51-60 years was 20 samples (66%) consisting of 4 male samples and 16 female samples. So it can be seen that DM is more at risk of being suffered by the 51-60 year age group.

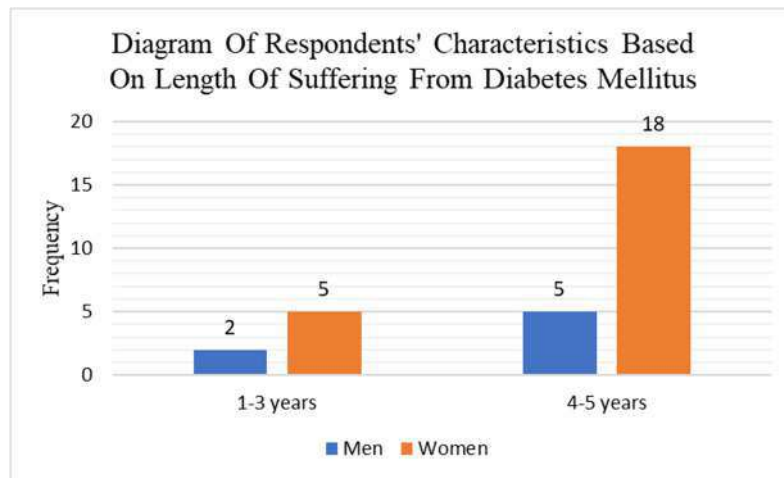


Figure 3. Diagram Of Respondents' Characteristics Based On Length Of Suffering From Diabetes Mellitus

Based on Figure 4.3, as many as 2 samples of men and 5 women experienced Diabetes Mellitus for 1-3 years. A total of 5 samples of men and 18 women had experienced Diabetes Mellitus 4-5 years. The period of time the respondent has diabetes mellitus can be an influencing factor for the formation of erythrocytes which is reflected in the erythrocyte index value.

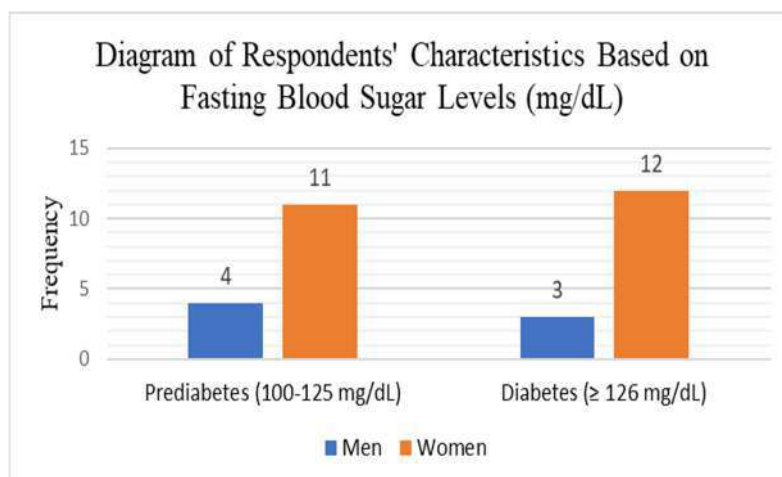


Figure 4. Diagram of Respondents' Characteristics Based on Fasting Blood Sugar Levels (mg/dL)

Based on fasting blood sugar levels, respondents with prediabetes criteria (100-125 mg/dL) were 15 samples, namely 4 men and 11 women. And the criteria for diabetes (≥ 126 mg/dL) were 15 samples consisting of 3 men and 12 women

Table 1 Results of Erythrocytes Index In Patients With Pre-Diabetes Index

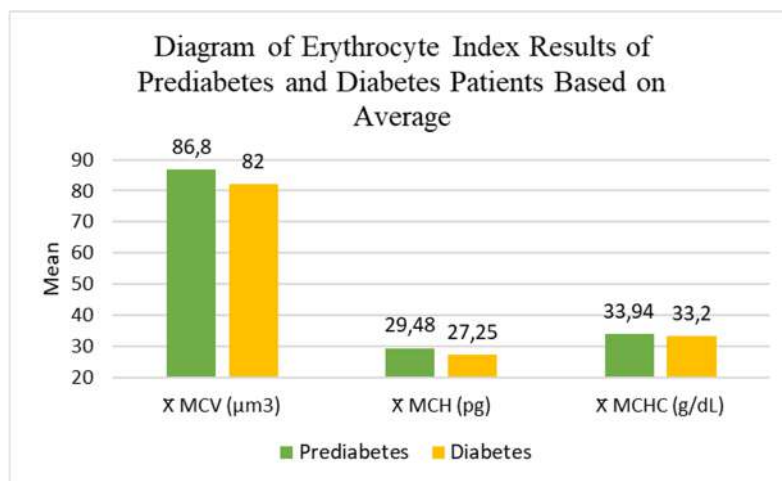
Erythrocyte Index	Normal Value	Minimal	Maximum	Mean
Erythrocyte Index in Prediabetes				
MCV	80-97	83	92	86,80
MCH	26,5-33,5	27,9	31,6	29,48
MCHC	31,5-35,0	32,8	35,4	33,94

Based on the index of erythrocytes in patients with prediabetes, MCV value of at least 83 μm^3 a maximum of 93 μm^3 and an average of 86.8 μm^3 . The minimum MCH value is 27.9 pg, the maximum is 31.6 pg and the average is 29.48 pg. The minimum MCHC value is 32.8 g/dL, the maximum is 35.4g/dL, and the average is 33.94 g/dL.

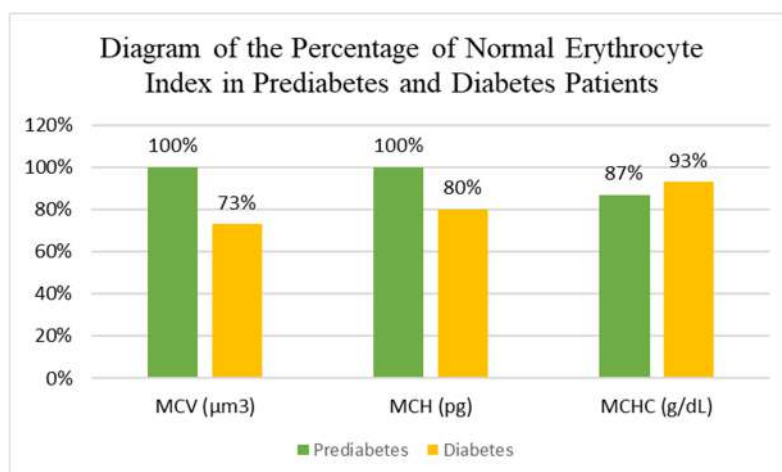
Table 2 Results of Erythrocyte Index in Diabetic Patients

Erythrocyte Index	Normal Value	Minimal	Maximum	Mean
Erythrocyte Index in Diabetes				
MCV	80-97	65	89	82,00
MCH	26,5-33,5	20,1	30,0	27,25
MCHC	31,5-35,0	31.0	34,7	33,20

Based on the results of the erythrocyte index in diabetic patients, the minimum MCV value is 65 m³, the maximum is 89 m³, and the average is 82.00 m³. The minimum MCH value is 20.1 pg, the maximum is 30.0 pg and the average is 27.25 pg. The minimum MCHC value is 31.0 g/dL, the maximum is 34.7 g/dL, and the average is 33.20 g/dL.

**Figure 5.** Diagram of Erythrocyte Index Results of Prediabetes and Diabetes Patients Based on Average

Based on Figure 4.5, it can be seen that the average MCV, MCH, and MCHC in patients with glycemic levels included in the prediabetes criteria is higher than respondents with diabetes criteria.

**Figure 6.** Diagram of the Percentage of Normal Erythrocyte Index in Prediabetes and Diabetes Patients

Based on the results table above, it is known that the MCV and MCH values of prediabetic patients are normal (100%), normal MCHC with a percentage of 87% and an increase of 13%. Whereas in diabetic patients, MCV was 73% normal, MCH 80% normal, and MCHC 93% normal. The normal percentage of prediabetes patients is higher than diabetes

DISCUSSION

From the research that has been conducted on the blood of prediabetic and diabetic patients at the Kedungdoro Public Health Center, Surabaya, the results showed that the mean MCV value of prediabetic patients and diabetic patients was in the normal range but the MCV in prediabetic patients was higher, namely 86.80 m³ while in diabetic patients of 82.00 m³. The decrease in MCV values at higher glucose levels can be caused because hyperglycemia is able to affect serum sodium levels which are extracellular cations through the mechanism of increasing and moving solutes from the intracellular to extracellular compartments, the increase in glucose will cause an osmotic gradient that causes a decrease in sodium levels, so that the volume of blood cells decreases and affects changes in cell size. ⁽⁹⁾

Based on table 4.5 regarding the results of the erythrocyte index in prediabetic patients, it can be seen that the average number of MCH values in patients with prediabetes category is higher than patients with diabetes category, which is 29.48 pg while in diabetic patients is 27.25 pg. There were 3 diabetic patients who were below the normal MCH value (26.5-33.5 pg), while the MCH value of prediabetic patients was in the normal range. Chronic hyperglycemia can cause hypoxia in the renal interstitium so that it affects the glomerular filtration rate (GFR) and indicates that there are fewer nephrons that function in the production of erythropoietin produced by peritubular fibroblast cells in stimulating the bone marrow to produce erythrocytes so that the formation of hemoglobin is not optimal. ⁽¹⁰⁾

The average MCHC in prediabetic patients was 33.94 g/dL while in diabetic patients it was 33.2 g/dL so it was found that the average MCHC value in prediabetic patients was higher than in diabetic patients. A consistent increase in sugar levels can cause functional and structural changes in the hemoglobin molecule including the hemoglobin concentration and the cytoplasmic environment inside each red blood cell. ⁽¹¹⁾

Based on the results of questionnaires and interviews, it can be seen that most of the respondents have an uncontrolled lifestyle, respondents routinely consume oral antidiabetic drugs (OAD) such as metformin and glimepiride obtained from the Puskesmas or insulin obtained from a referral hospital, but most of the respondents not exercising regularly, especially during the Covid-19 pandemic. Uncontrolled diabetes can occur if a diabetic takes medication or insulin not according to the doctor's instructions accompanied by eating too little food and or too much physical exercise and as a result of diabetes' response to excessive anti-diabetic drugs so that blood glucose levels drop too low. ⁽¹²⁾ The number of female respondents was 76% more than male respondents which was 24%. The female sex tends to be more at risk of developing diabetes mellitus than men, this is related to the body mass index that women have which tends to be greater so that there will be a buildup of fat that inhibits the transport of glucose to enter the cells and there is a phase of pregnancy that can increase insulin resistance. ⁽¹³⁾

The majority of respondents were in the age range of 51-60 years (20 samples) while the age group of 40-50 years consisted of 10 samples, so that it can be seen that DM is more at risk of being suffered by the 51-60 year age group. This can be caused by the increasing age of a person, the higher the risk of the body experiencing physiological changes that can reduce body functions. ⁽¹⁴⁾ Based on the duration of suffering from diabetes mellitus, it is known that 60% of respondents had diabetes mellitus for 4-5 years and 40% of respondents had diabetes for 1-3 years. The results of this study are in line with research conducted by Mildawati (2019), that the length of time suffering from diabetes can affect the occurrence of complications where the longer you have diabetes, the higher the risk of complications. ⁽¹⁵⁾

Based on the reference values used by the Bakti Analysis Surabaya clinical laboratory, the MCV values of 15 prediabetic patients were in the normal range (80-97 m³) and a total of 4 patients with diabetes criteria were below the normal range of 65 m³, 76 m³, 78 m³, and 79 m³. MCH values from 15 prediabetic patients were in the normal range (26.5-33.5 pg) and 3 patients with diabetes criteria were below the normal range of 20.1 pg; 26.0 pg; and 26.2 pg. As for the MCHC value, there were 2 samples of prediabetes patients who were above the normal value (31.5-35 g/dL) which was 35.4 pg and 35.3 pg, there was one sample of patients with diabetes criteria who were below normal, namely 31, 0 g/dL. From the distribution of the results of the examination, it can be seen that the MCV, MCH and MCHC values of prediabetic patients have higher values than patients with diabetes category.

The results of this study are in accordance with the theory that has been described previously. According to Wijaya, Kusnadi, & Zen, in connection with the higher blood sugar levels that affect the criteria for the incidence of diabetes mellitus, it can inhibit the formation of the hormone erythropoietin (HPO) which functions to regulate the production of red blood cells in the bone marrow. ⁽¹⁶⁾ Erythropoietin affects erythrocyte production by stimulating the proliferation, differentiation and maturation of erythrocyte precursors. The hormone erythropoietin

is used to stimulate erythropoiesis by increasing the number of progenitor cells bound to the process of erythropoiesis.⁽¹⁷⁾

Statistical tests conducted in this study on the results of the erythrocyte index examination which included MCV, MCH, and MCHC in diabetes mellitus patients with prediabetes and diabetes criteria showed that the Asymp value. Sign (2-tailed) < 0.05 then H_a is accepted and H_o is rejected. Thus, it can be concluded that there is a significant difference between the MCV, MCV, and MCHC values of prediabetic patients and diabetic patients. This is in line with another study conducted by BN Alamri (2019) which stated that the MCV and MCH values in hyperglycemia conditions would decrease. Research conducted by Jaman also states that in diabetics, glycemic control affects the number of RBC, RDW, and erythrocyte index consisting of MCV, MCH, and MCHC. MCHC values were lower in patients with high glycemic levels than in patients with low glycemic control.⁽¹⁸⁾ In patients with diabetes mellitus, disorders of various systems are often found, one of which is in erythrocytes. An important indicator that can reflect the state of erythrocytes is the erythrocyte index (MCV, MCH, and MCHC)⁽¹⁹⁾

Based on the results of statistical tests carried out, it can be concluded that there are differences in the erythrocyte index which includes MCV, MCV, and MCHC between patients with diabetes mellitus with prediabetes criteria and patients with diabetes mellitus with diabetes criteria at the UPTD Puskesmas Kedungdoro Surabaya City.

CONCLUSION

1. Fasting blood sugar levels in patients with diabetes mellitus with prediabetes criteria are 100-125 mg/dL, and diabetic patients are 126 mg/dL.
2. Erythrocyte index (MCV, MCH, MCHC) in diabetes mellitus patients with prediabetes criteria obtained
MCV (*Mean Corpuscular Volume*) of 86.80 m³
MCH (*Mean Corpuscular Hemoglobin*) of 29.48 pg
MCHC (*Mean Corpuscular Hemoglobin Concentration*) of 33, 94 g/dL
3. Erythrocyte index (MCV, MCH, MCHC) in patients with diabetes mellitus with diabetes criteria obtained:
MCV (*Mean Corpuscular Volume*) of 82.00 m³
MCH (*Mean Corpuscular Hemoglobin*) of 27.25 pg
MCHC (*Mean Corpuscular Hemoglobin Concentration*) of 33, 20 g/dL
4. There is a difference between the erythrocyte index in patients with diabetes mellitus with prediabetes criteria and diabetes criteria at the UPTD Public Health Center Kedungdoro Surabaya City.

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ACCURACY AND PRECISION OF URIC ACID EXAMINATION POINT OF CARE TESTING METHOD AND URICASE ENZYMATIC COLORIMETRIC METHOD

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ABSTRACT

The method that often used in clinical chemistry examinations in laboratory such as analysis of blood glucose, uric acid, cholesterol, triglycerides, bilirubin, and albumin are POCT method and the uricase enzymatic colorimetric method. The POCT method is a automatic method that quickly obtains result. While the uricase enzymatic colorimetric method is a manual method that still requires special treatments to obtain result. In this study, the parameters of uric acid examination were chosen because uric acid is a rheumatic disease that ranks third after arthrosis and rheumatoid arthritis. It was estimated that almost 80% of the population aged 40 years or older have gout sufferers in Indonesia. Therefore, a study was conducted on the accuracy and precision of the POCT method and the uricase enzymatic colorimetric method, which aims to determine the accuracy and precision of uric acid examination POCT method and uricase enzymatic colorimetric method. The data analysis used is descriptive analysis to analyze the value of accuracy and precision. As the results of this research, 12.30% of bias value and 110.88% of recovery value were generated. While the coefficient of variation from the POCT method were 3.5% and the uricase enzymatic colorimetric method were 5.37%. Based on these results, it could be concluded that the accuracy and precision of uric acid examination using the POCT method and the uricase enzymatic colorimetric method were equally good and both method provided trusted results.

Keywords: Accuracy, Precision, uric acid, POCT, Uricase Enzymatic Colorimetry.

INTRODUCTION

Quality assurance of laboratory examinations is very important to do to establish a diagnosis of a disease so as to obtain the right results. There are two main things that are important to consider in the quality assurance of laboratory examination results, namely accuracy and precision ⁽¹⁾. Accuracy is that which shows the accuracy of the measurement results with the actual value, while precision is the accuracy of repeating the analysis by providing the same data ⁽²⁾.

Accuracy and precision are included in the verification or validation of methods. The results of the data from a method carried out can be in the form of good precision but not necessarily a guarantee that the data can be said to be accurate. Vice versa, if a method that produces data with high precision or accuracy is not necessarily good precision. In addition, it can also produce accuracy and precision that are both good or poor ⁽³⁾.

From the possible results of the data that are not good, it can be reviewed because of an error in the implementation of the pre-analytic stage, the analytical stage or the post-analytic stage. If this error occurs, it will be very detrimental to the patient. Currently, a tool that allows it to be used as an examination with the advantage of getting fast results is the POCT (Point-of-care testing) method. The method can be defined as a diagnostic test tool that is carried out near the patient or examination facility with a short processing time and the results are immediately available ⁽⁴⁾.

Therefore, many people have a very high level of trust in the use of automated tools, but do not know that this sophisticated examination method does not guarantee the accuracy of the diagnosis ⁽⁵⁾. In addition, it can be seen that for several examinations the POCT method and the uricase enzymatic colorimetric method can be carried out, among others, namely blood glucose examination, hemoglobin examination, total cholesterol examination or uric acid examination. In this study, the parameters of uric acid examination will be chosen because uric acid is a rheumatic disease that ranks third after arthrosis and rheumatoid arthritis. It can be estimated that almost 80% of the population aged 40 years or over have gout sufferers in Indonesia ⁽⁶⁾.

Based on the above statement, it can be seen that the need for quality control on the accuracy and precision of a tool with the POCT method to find out the results of the examination issued or submitted to a person are truly

valid according to their sick or normal health condition and to make a solution to the demands for the results of the examination. fast. Thus, a tool with an automated method not only provides fast results but also provides accurate results. Therefore, a study was conducted on the accuracy and precision of uric acid examination using the POCT method and the uricase enzymatic colorimetric method.

METHODS

The used research type was descriptive analytic method. It was to analyze the percentage value of accuracy and precision of uric acid examination in the POCT method and the uricase enzymatic colorimetric method as well as a cross sectional approach. Cross sectional was a type of research in which the measurement of the variables was carried out at one time. Respondents that was used as many as 10 people obtained by random sampling technique and repeated examination of uric acid in each person 3 times. The research was carried out from November 2020 to May 2021 at the Kadur Health Center, Kadur District, Pamekasan Regency. The method of data collection in this study was used primary data obtained from the respondents' consent to obtain the results of the examination of uric acid levels using the POCT method and the uricase enzymatic colorimetric method. This research has been ethical exemption with the certificate number was NO.EA/473/KEPK-Poltekkes_Sby/V/2021.

This study begins with taking capillary blood samples and venous blood for examination of uric acid levels. The first capillary blood obtained by piercing the middle or ring finger using a lancet then capillary blood appears. The blood is then dripped on the instrument and then the results are automatically read by waiting a few seconds so that the results can be obtained immediately while the venous blood is obtained in the folds of the arm using a syringe. The blood that has been obtained is processed on a uricase enzymatic colorimetric method. Prior to that, the blood obtained was first centrifuged so that the blood components were separated to obtain serum, then 20 µL of serum was pipetted as much as 1000 µL of uric acid reagent and incubated for 10 minutes at 25°C. After that, the readings were carried out on the uricase enzymatic colorimetric method. The results of the exits are then recorded. Data from the results of the examination of uric acid levels will be analyzed using descriptive methods presented in tabular form and interpreted in percentages.

RESULTS

Table 1 and table 2 below were the results of uric acid examination using the POCT method and the uricase enzymatic colorimetric method which were repeated 3 times for each examination carried out on the community in Kadur District, Pamekasan Regency. The normal value for uric acid examination for man was 3.4 – 7.2 mg/dL, while for women was 2.6 – 6.6 mg/dL.

Table 1. Results of uric acid examination used the POCT method

Number	Code names	Uric acid test results (mg/dL)		
		1	2	3
1.	MK	6,5	6,2	6,4
2.	MS	11,2	11,8	11,5
3.	UF	3,7	3,9	4,0
4.	SM	5,3	5,3	5,6
5.	FM	3,6	3,7	3,7
6.	OC	4,7	4,8	4,4
7.	NS	4,4	4,7	4,6
8.	MR	4,4	4,1	4,1
9.	NH	5,3	5,0	5,9
10	EH	7,2	6,9	7,0

Repeated POCT method of uric acid examination gave results that were not much different. The maximum was not more than 1.0 mg/dL. All of the respondents had normal uric acid values and some were up to normal. Based on table 1, only one person have a up normal value while the others are within normal values.

Table 2. Results of uric acid examination used the enzymatic colorimetric method

Number	Code names	Uric acid test results (mg/dL)		
		1	2	3
1.	MK	4,9	4,9	5,0
2.	MS	9,9	9,9	9,8
3.	UF	4,0	4,7	5,0
4.	SM	4,9	5,2	5,1
5.	FM	3,0	3,5	3,2
6.	OC	3,9	4,4	4,5
7.	NS	3,9	4,6	4,4
8.	MR	2,9	2,8	2,6
9.	NH	4,5	5,7	5,4
10	EH	6,6	7,1	6,9

Based on table 2 when using the uricase enzymatic colorimetric method, the repetition results obtained were both not much different from the POCT method. The maximum distance obtained was 1.2 mg/dL. As well as only one only one person have a up normal value while the others were within normal values for uric acid examination. It was same as the poct method.

Table 3 below was a table for calculating the accuracy value. Accuracy was presented in the form of inaccuracy which was expressed in terms of bias (%) and recovery (%). The calculation required is average results of the POCT method were considered as the calculation of examination value and the average results of the uricase enzymatic colorimetric examination are considered the correct values.

Table 3. Accuracy of uric acid examination for POCT method against uricase enzymatic colorimetric method

Number	POCT method average (mg/dL)	<i>Uricase</i> enzymatic colorimetric method average (mg/dL)	Bias value (d%)	<i>Recovery</i> value (R%)
1.	6,37	4,93	29,21	129,21
2.	11,50	9,87	16,51	116,51
3.	3,87	4,57	15,32	84,68
4.	5,40	5,07	6,51	106,51
5.	3,67	3,23	13,62	113,62
6.	4,63	4,27	8,43	108,43
7.	4,57	4,30	6,28	106,28
8.	4,20	2,77	51,62	151,62
9.	5,40	5,20	3,85	103,85
10	7,03	6,87	2,33	102,33
Average	5,66	5,11	12,30	110,88

According to table 3 that the accuracy of the POCT method of uric acid examination against the uricase enzymatic colorimetric method, the average result of the POCT method of uric acid examination was 5.66 mg/dl, the average result of the colorimetric uricase enzymatic examination was 5.11 mg/dl. dL. While the bias value obtained was 12.30% and the Recovery value was 110.88%.

Table 4 was calculation of the precision POCT method. Precision was expressed in terms of impressions which were expressed in terms of the coefficient variation. The calculation required was average results POCT method of uric acid examination and the standard deviation and then multiplied by one hundred. The precision value was expressed in percentage units.

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Table 4. Precision for examination of uric acid used the POCT method

Number	POCT method average (mg/dL)	Standart deviation	Coefficient variation (%)
1.	6,37	0,15	2,40
2.	11,50	0,30	2,61
3.	3,87	0,15	3,95
4.	5,40	0,17	3,21
5.	3,67	0,06	1,57
6.	4,63	0,21	4,49
7.	4,57	0,15	3,34
8.	4,20	0,17	4,12
9.	5,40	0,46	8,49
10	7,03	0,15	2,17
Average	5,66	0,20	3,50

According to Table 4, it was known that the examination of uric acid in the POCT method which was carried out in the laboratory of the Kadur Health Center, Pamekasan Regency, the average result of uric acid was 5.66 mg/dl and the standard deviation was 0.20. While the coefficient of variation of uric acid was 3,50 %.

Table 5 below was calculation of the precision uricase enzymatic colorimetric method. The calculation needed was average results uricase enzymatic colorimetric method of the uric acid examination and the standard deviation then multiply by one hundred to be expressed in percentage units.

Table 5. Precision for uric acid examination used uricase enzymatic colorimetric Method

Number	Uricase enzymatic colorimetric method average (mg/dL)	Standart deviation	Coefficient variation (%)
1.	4,93	0,06	1,17 %
2.	9,87	0,06	0,59 %
3.	4,57	0,51	11,24 %
4.	5,07	0,15	3,01 %
5.	3,23	0,25	7,78 %
6.	4,27	0,32	7,53 %
7.	4,30	0,36	8,39 %
8.	2,77	0,15	5,52 %
9.	5,20	0,62	12,01 %
10	6,87	0,25	3,66 %
Average	5,11	0,27	5,37 %

According to Table 5, it was known that the examination of uric acid in the uricase enzymatic colorimetric method was carried out in the laboratory of the Kadur Health Center, Pamekasan Regency with average uric acid result was 5.11 mg/dl and a standard deviation was 0.27. While the coefficient variation of uric acid obtained results was 5.37%.

DISCUSSION

Based on table 1 and table 2, the results of research that have been carried out on 10 respondents, the average results of the POCT method of uric acid examination was 5.66 mg/dL and the average results of uric acid examinations using the Uricase enzymatic colorimetric method was 5.11 mg /dL. Then proceed to determine the accuracy and precision of the two methods. In table 3, the refractive values and recovery values for the POCT method of uric acid examination against the uricase enzymatic colorimetric method were 12.30% and 110.88%.

The bias value can be positive or negative. If the bias value was 12.30%, it was showed that the measurement results obtained was higher than the results of the control material. Meanwhile, if the negative value indicates the measurement results obtained was lower the results of the control material. The recovery value obtained includes a good criterion value, which is between 85% - 115%. So it can saw that the accuracy of uric

acid examination in the POCT method against the uricase enzymatic colorimetric method is high. This high accuracy indicates that the accuracy of the examination values obtained from the POCT method against the examination values of the uricase enzymatic colorimetric method was good.

In table 4, the coefficient of variation was 3.50%, while in table 5, the coefficient of variation was 5.37%. The value of the coefficient of variation was used to determine precision. The maximum limit value that has been determined on the coefficient of variation for uric acid examination is 6%. The smaller the value of the coefficient of variation, the higher the accuracy or said to be very good ⁽⁷⁾. Therefore, it can be seen that the coefficient of variation in the POCT method of uric acid examination is below the maximum limit which indicates that the POCT method has good precision.

According to previous research conducted by (karyaty & Rosdarni, 2018) about the analysis of internal quality stabilization of blood glucose examinations at the regional health laboratory in the Southeast Sulawesi province, the results of the level of accuracy (d%) in the preliminary period were 1.56% and the control period was 1.62% which showed accuracy. which was good, while the level of accuracy (KV%) in the preliminary period was 4.05% and the control period is 4.63% shows good accuracy. In addition, in research (Ketrina et al, 2017) on the description of internal quality stabilization of blood glucose examinations at the Laboratory of RSU GMIM Pancaran Kasih Manado, the results of the test of accuracy and precision were d% value of 0.05% and the coefficient of variation value was 1.81 %. This value indicates good accuracy and precision. Based on the results of these previous studied that research on the accuracy and precision of uric acid examination point of care testing method and the uricase enzymatic colorimetric method were accordance with previous research.

CONCLUSION

Based on these results, it could be concluded that the accuracy of uric acid examination using the POCT method against the uricase enzymatic colorimetric method was good with a bias value of 12.30% and a recovery value of 110.88%. As well as the precision of uric acid examination using the POCT method and the uricase enzymatic colorimetric method was good with the coefficients variation were 3.50% and 5.37%, respectively.

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Overview of Covid-19 Case in Lumajang Regency on 2020

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ABSTRACT

Phenomenon of a new outbreak called Covid-19 originating from Wuhan, China, the victims continued to increase as well as in Lumajang Regency, Covid-19 cases increased dramatically in September until December. The purpose of this study is to describe Covid-19 cases in Lumajang Regency based on age factors, regional factors, time factors, and factors as health workers. This type of research is descriptive with a cross sectional approach. The number of Covid-19 cases in Lumajang Regency as of December 31, 2020 was recorded at 2412 cases. Cases based on the patient's age factor were reported to be the highest infecting the age of 31-45 years. The most cases based on regional factors were in the Lumajang sub-district with 557 confirmed cases. Cases based on time factor, the largest addition of cases occurred in December with an additional 1046 cases. Cases based on the positive factor of health workers at Djatiroto Hospital were 54 healthworkers. The high number of deaths at the age above 60 years occurs because that age range has a congenital disease. The factor as health workers with the largest number is because these health workers are dealing directly with Covid-19 patients every day. Describing Covid-19 cases is needed for handling to reduce the high number of Covid-19 cases.

Keywords: Coronavirus Disease 2019, Lumajang District, Case description

INTRODUCTION

Coronavirus Diseases-19 (COVID-19) first appeared in Wuhan, China at the end of 2019. The virus was originally thought to have been caused by exposure to a seafood market that sells many species of wild and live animals. . On December 18 – 29 2019, there were five patients who were treated with Acute Respiratory Distress Syndrome (ARDS). From March 11, 2020 until now, the *World Health Organization* (WHO) has declared the status of the COVID-19 pandemic due to its rapid global spread accompanied by clinical symptoms. According to WHO, a pandemic is the spread of a new disease throughout the world. Patients with COVID-19 have symptoms that are almost the same as *Severe Acute Respiratory Syndrome* (SARS) infection, namely acute respiratory disorders such as fever, cough, shortness of breath with an average incubation period of 5-6 days and the longest incubation period of 14 days. In addition, people with COVID-19 experience disturbances in the sense of smell (nose) and sense of taste.

In Indonesia, the first COVID-19 case was reported in early March 2020. Until now (November, 2020) there have been 471,000 positive cases of COVID-19, 395,000 patients have recovered and 15 thousand patients have died. The highest cases were in the capital Jakarta, with 120 thousand cases, followed by East Java with 56 thousand cases, West Java with 45 thousand cases, Central Java with 44 thousand cases and South Sulawesi with the highest number 5 with 19 thousand cases. In Lumajang Regency, East Java, the first case was reported on March 27, 2020, then since then the spread of COVID-19 transmission has fluctuated based on the monthly trend of cases and has continued to increase from time to time, thus potentially causing more casualties.

The spread of the virus occurs quickly. The main transmission occurs through droplets from the respiratory tract, but it can also occur due to close contact with sufferers. Several factors that influence the importance of describing the high number of COVID-19 cases in Lumajang Regency include age, region, time and as a health worker.

The presence of acute inflammation and decreased organ function in chronic cardiovascular and metabolic diseases (heart, kidney, liver, and hematology) experienced by patients at the beginning of treatment can increase the risk of death due to COVID-19 infection (Yang & Yan, 2020). It is estimated that 1 in 5–10 adults have a disease of severity and sufficient criteria for hospitalization. Most of the patients were admitted with severe acute respiratory infection or severe acute respiratory syndrome according to the WHO case definition. Criteria for intensive care also vary from country to country. Old age, chronic disease, and male sex are consistently associated with increased mortality (Docherty et al., 2020).

The spread of the corona virus itself varies from region to region. This is because the factors that accelerate the spread of the virus are not the same. These factors include the age of the population, the habit of washing hands properly, the type and mobility of workers, and travel habits (Purnama and Susanna 2020). Based on the description of cases that occurred in Lumajang Regency 2020, this study aims to obtain preventive measures that are expected to reduce the risk of COVID-19 transmission.

METHOD

Type of research is a *cross-sectional cross* study, which is a type of research conducted by observing population data or samples once at the same time. While the design used is a descriptive design.

The mechanism used is as follows:

1. Each new case can be identified, reported and analyzed in less than 24 hours. The discovery of new cases was reported to the Lumajang District Health Office.
2. The development of the Covid-19 situation will be reported to the Provincial Health Office and the Ministry of Health in accordance with the aggregate daily report (form 4) which includes the number of suspects, the number of probable, the number of confirmations, the number of deaths, the number of close contacts, the number of hospitalized cases and the number of cases taken by specimens. . The surveillance system is then implemented and strengthened in closed facilities (such as prisons, nursing homes, rehabilitation homes, dormitories, Islamic boarding schools, etc.) as well as in vulnerable groups. Surveillance of Covid-19 deaths is carried out in hospitals and the community.
3. Each patient who is confirmed to be reactive through a rapid examination but is negative on the swab result is expected to continue to self-isolate for 14 days.
4. Officers in the field who take pharyngeal and nasopharyngeal swabs will send samples to the Center for Environmental Health Engineering in Surabaya for further diagnostic laboratory testing.

RESULTS

This study aims to provide an overview of the Covid-19 cases that occurred in Lumajang Regency. The data used is case data for 2020. The results of the study are expected to be a reference for obtaining preventive measures to reduce the risk of Covid-19 transmission in Lumajang Regency.

In the presentation of the results of this study, a description of Covid-19 cases will be explained based on gender, age, region, time sequence, and cases in health workers.

Cases by Gender

The number of COVID-19 cases in Lumajang Regency as of December 31, 2020 was recorded at 2412 cases, with the percentage of males being 51.3% (1237 people) compared to the percentage of females as much as 48.7% or as many as 1175 people. . The data on the percentage of COVID-19 cases in Lumajang Regency during 2020 is shown in Figure 1.

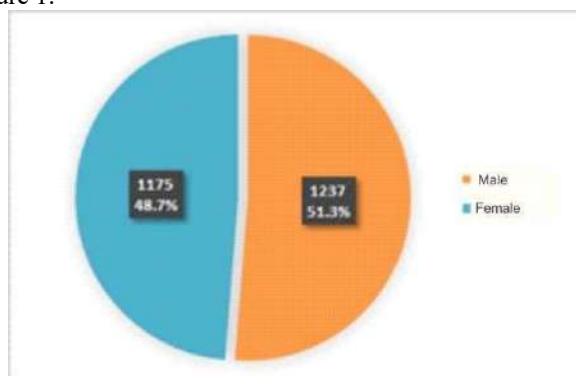


Figure 1. Percentage of COVID-19 Cases by Gender

Figure 1 shows the number of Covid-19 cases in Lumajang Regency as of December 31, 2020 was 2412 with a percentage of men and women are relatively equal, namely 51.3% of men compared to 48.7% of women. This information shows that men are slightly more susceptible to Covid-19 than women.

Furthermore, Covid-19 will be described in Lumajang Regency during 2020 according to gender in each case, namely confirmed cases (*confirmed*), dead cases, recovered cases, and active cases (*suspect*). The description of the data is presented in Figure 2 below:

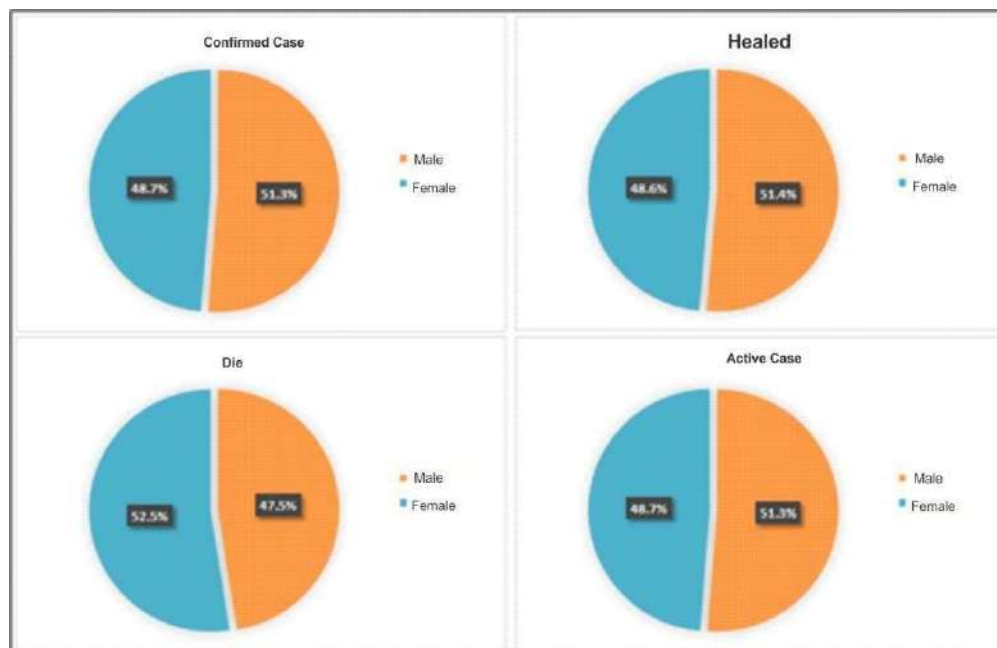


Figure 2. Percentage of COVID-19 Cases by Gender in Each Case

Figure 2 shows in general the number of confirmed cases of Covid-19 in Lumajang Regency during the year was slightly dominated by men, the same thing also happened in cured and active cases. Different conditions in cases of death, women have a higher risk of dying from Covid-19 than men, namely 84 women (52.5%) compared to 76 men (47.5%).

Cases Based on Age

The high number of Covid-19 cases in the Lumajang Regency area was also reported based on the patient's age. Patients' ages were grouped into 6 categories, namely 0-5 years, 6-18 years, 19-30 years, 31-45 years, 46-59 years, and 60 years or more. Description of Covid-19 cases in Lumajang Regency in 2020 based on age is presented in Figure 3.

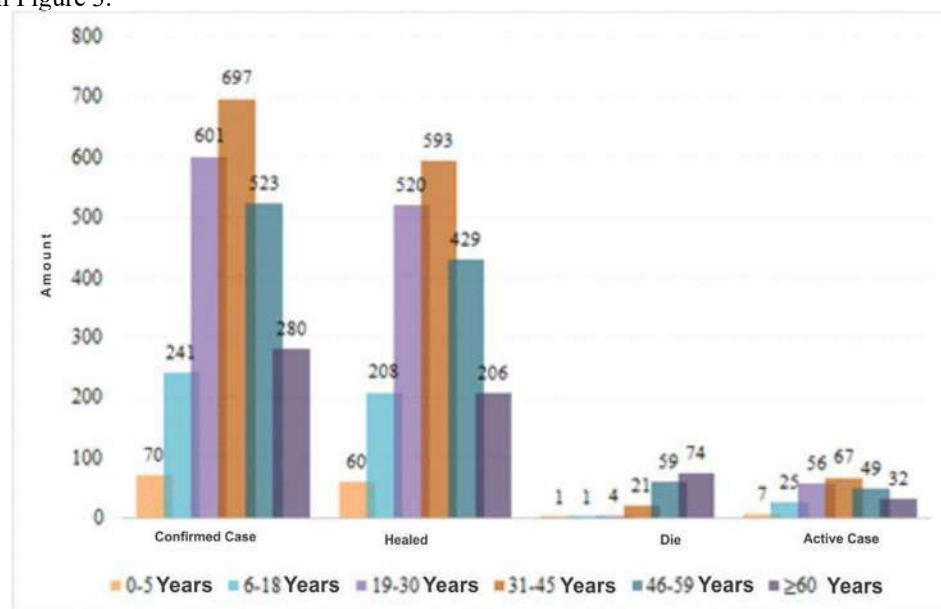


Figure 3. Number of Covid-19 Cases in Lumajang Regency in 2020 Based on Age

Figure 3 shows the number of confirmed cases of Covid-19 in Lumajang Regency during 2020

dominated by patients with the age of 31-45 years, as many as 697 people. The cases of recovered and active patients were also the same, dominated by patients with an age range of 31-45 years. A slightly different pattern occurred in cases of death, mostly dominated by patients aged over 60 years.

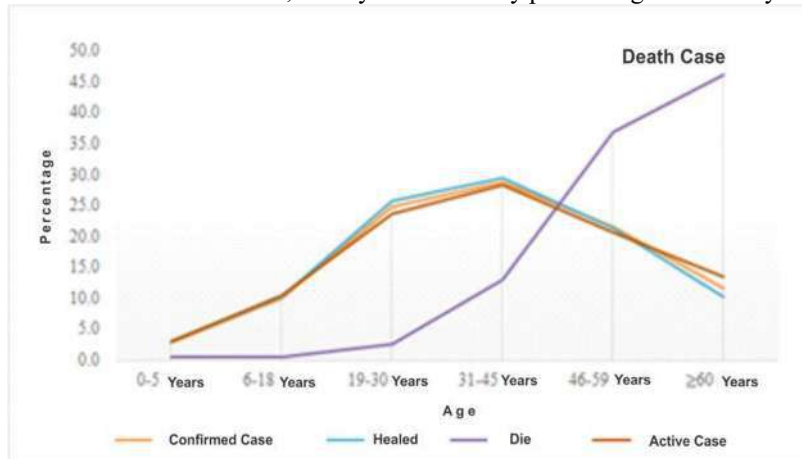


Figure 4. Percentage of Covid-19 Cases by Age in Lumajang Regency in 2020

Figure 4 explains the pattern of Covid-19 cases based on patient age that the pattern of the number of confirmed cases of Covid-19 in Lumajang Regency during 2020 was dominated by patients aged 31-45 years, while patients with the age range below and above have a smaller number. However, when viewed from the movement pattern of patients who died, patients aged over 60 years had a higher risk of dying than patients with age ranges below.

Cases Based on Regional

Covid-19 cases in Lumajang Regency apart from being categorized by gender and age, these Covid-19 cases are also categorized by region, namely sub-districts in Lumajang Regency, which can be seen in Table 1 below.

Table 1. Number of Cases Covid-19 in Lumajang 2020 By Region

No	District	Number of Cases			
		Confirmed	Cured	Died	CasesOn
1	Candipuro	109	94	5	10
2	Gucialit	16	13	0	3
3	Jatiroto	190	162	14	14
4	Kedungjajang	55	42	6	7
5	Klakah	69	54	7	8
6	Kunir	145	124	10	11
7	Lumajang	557	468	45	44
8	Padang	49	41	1	7
9	Pasirian	172	144	11	17
10	Pasrujambe	31	22	1	8
11	Pronojiwo	16	13	1	2
12	Randuagung	54	40	4	10
13	Ranuyoso	20	19	0	1
14	Rowokangkung	60	51	3	6
15	Senduro	42	32	2	8
16	Sukodono	255	216	13	26
17	Sumbersuko	112	90	8	14
18	Tekung	95	85	7	3
19	Tempeh	241	207	14	20
20	Tempursari	19	17	1	1
21	Yosowilangun	105	82	7	16
TOTAL		2412	2016	160	236

To further clarify the distribution of Covid-19 cases in Lumajang Regency by region, it can be presented in Figure 5 below.

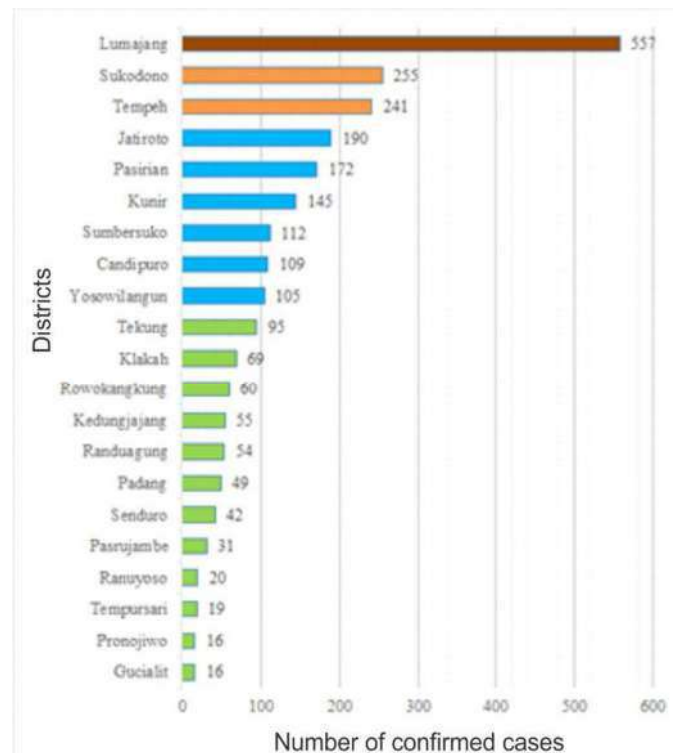


Figure 5. Quantity Covid-19 Cases in Lumajang Regency in 2020 by Region

Figure 5 shows the number of Covid-19 cases in Lumajang Regency during 2020 is as many as 2412 confirmed cases. Of these, the area with the most infections was Lumajang sub-district with 557 cases. Furthermore, there are 2 regions with cases between 200-300, and there are 6 regions with cases between 100-200. The rest, 12 regions under 100 cases.

Cases Based on the Time

Covid-19 were first reported to have entered Indonesia in March 2020, and since then, the number of cases has been increasing, including in Lumajang Regency. December 2020 was the highest case since March 2020, where there were an addition of 1046 cases, bringing the cumulative number to 2412 cases. The number of deaths also increased by 25 people, bringing the cumulative number of deaths from Covid-19 to 160 cases. More clearly, the development of Covid-19 cases in Lumajang Regency during 2020 from March to December 2020 is presented in Figure 6.

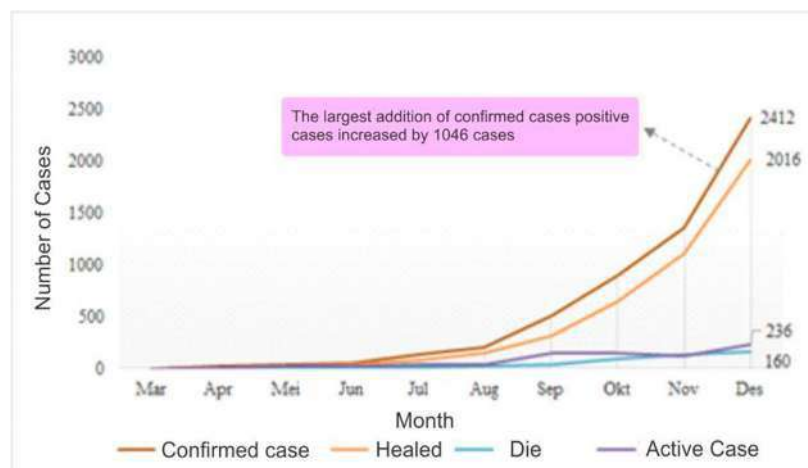


Figure 6. Development of the Number of Covid-19 Cases in Lumajang Regency in 2020

Figure 6 shows the number of Covid-19 cases in Lumajang Regency started in March 2020 with 3

cases, then there was a continuous increase until December 2020. The largest increase in confirmed cases of Covid-19 occurred in December with the addition of 1046 cases, bringing the number of confirmed cases to 2412 cases. The recovery rate data also increased, as did the dead and active data. Until December 2020, there were 160 dead cases and 236 active cases.

Cases Based on Factors as Health Workers

The increasing number of cases in Lumajang Regency until the end of December 2020 also had an impact on the number of positive cases in hospital health care workers who were considered to have high risk with a total of 144. The following can be seen the names of hospitals in Lumajang Regency whose health workers are positive COVID-19.

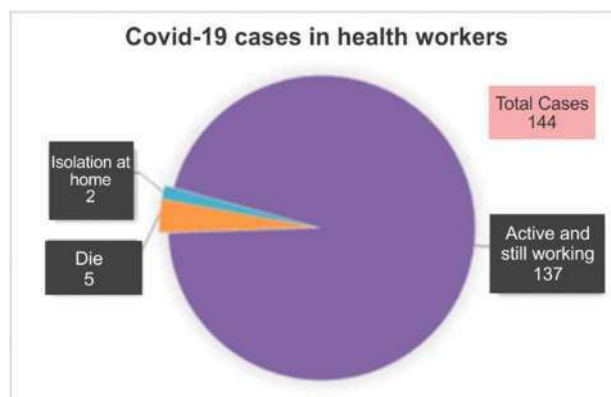


Figure 7. Covid-19 Cases in Health Workers in Lumajang Regency in 2020

Figure 7 shows the number of Covid-19 cases in health workers in Lumajang Regency during 2020 as many as 144 cases. Until the end of 2020, there were 137 people or (95.1%) health workers who had been actively working again, the remaining 5 people had died (3.5%), and 2 people were still resting or in self- isolation (1.4%).

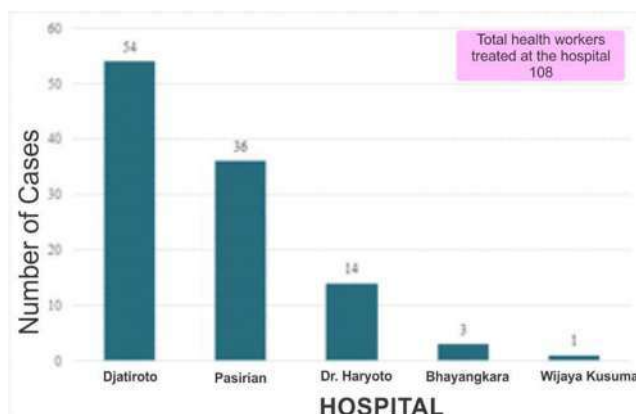


Figure 8. Covid-19 Cases in Health Workers in Lumajang Regency in 2020

Figure 8 shows that during 2020, the number of health workers who were confirmed to be Covid-19 was 144 people, but only 108 people received hospital treatment in the Lumajang Regency area. . Of the 108 health workers, the most were treated at Djatiroto Hospital, namely 54 people (50%), the rest at RSU Pasirian 36 people (33.3%), Dr. Haryoto Hospital 14 people (13%), Bhayangkara Hospital 3 people (2.9%), and only 1 person being treated at WijayaKusuma Hospital (0.9%).

DISCUSSION

Based on the data, the number of COVID-19 cases in Lumajang Regency from March 2020 to the end of December 2020 counted as many as 2412 positive cases, while the confirmed recovered were 2016 and the confirmed death was 160. In accordance with the SOP, the handling of COVID-19 is carried out on people who experience symptoms of fever 38 ° C, feel disturbances in the sense of smell, feel disturbances in the sense of taste, (Kemenkes RI, 2020), but there are also some people who are confirmed positive for the COVID-19 virus without any symptoms, called OTG (Asymptomatic People) ((CNN, 2020). According to the SOP (*Standard Operating Procedure*), patients who have tested positive for COVID-19 are those who have undergone laboratory examinations, namely swabs using the PCR method and both results were positive. Patients who are tested positive for COVID-19 will be treated for self-isolation (home

care) or in hospitals that have isolation rooms, including Dr. Hospital. Haryoto, Pasirian General Hospital, Islamic Hospital, Bhayangkara Hospital, Jatiroto Hospital, WijayaKusuma Hospital, Muhammadiyah Hospital.

Cases Based on Gender and Age

Based on Figure 1 described above, until the end of December 2020, there were 2412 cases in Lumajang Regency with a female percentage of 48.7% (a total of 1175 women) and a male percentage of 51.3% (as many as 1237 men), so it is concluded that men are slightly more susceptible to Covid-19 infection than women. The positive Covid-19 virus was found in patients with an age range between 31-45 years, namely 697 patients (28.9%), then patients with an age range between 19-30 years as many as 601 patients (24.9%), and patients with an age range of 46-45 years. 59 years as many as 523 patients (21.7%), while patients with an age range under 18 years were 311 patients (12.9%) and patients with an age range above 60 years were 280 patients (11.6%).

Although cases in patients aged over 60 years are not as many as cases in the age range below, the cases of patients who die in the age range over 60 years are considered the highest, so that the elderly are more prone to death. The high case of death in patients with an age range above 60 years occurs because these ages usually have congenital diseases such as Diabetes Mellitus, heart disease, respiratory disease, hypertension, cancer and other serious diseases. There is a relationship between age and the level of natural immunity, where elderly individuals are more likely to be infected along with decreased natural immunity. (Leng J., 2010) In addition, elderly individuals have consumed many drugs or consumed several types of drugs at the same time in an effort to treat comorbidities that resulted in decreased organ function. 15 Recent studies explain that patients with age > 50 years may experience ACE2 overexpression as a result of decreased immunity, decreased comorbid organ function and several other causes that increase the risk of death.

Caution should be exercised in interpreting the distribution of patients according to this age group. First, because we don't have any information about COVID-19 sufferers who died outside the hospital or those who died before being tested for COVID-19. It could be that the proportion of patients from the relatively old age group is very under-represented. In Italy, the proportion of sufferers from the age group above 65 years accounts for more than half of COVID-19 cases, or about 55 percent of the total cases.

Second, this age distribution may also indicate differences in access to information on COVID-19 symptoms and mobility. The relatively young group received more information about the symptoms of COVID which allowed them to identify the symptoms of COVID-19 and confirm cases to the hospital. At the same time, this age group has relatively high mobility with a history of traveling abroad which is also more frequent. When we compare it to other countries, such as China and Italy, the group with the largest COVID-19 sufferers is in the 50-59 year age group. In China, the proportion of COVID-19 sufferers from this age group reached 22.4 percent of the total COVID-19 sufferers.

Cases Based on Time and Region

Based on Figure 6, the highest cases of the Covid-19 virus occurred in December 2020 (1046 cases), bringing the cumulative cases to 2412 cases, from 1366 cases in the previous month. During March to August 2020, the number of confirmed cases ranged between 13-77 cases, but starting September 2020 the number of cases increased dramatically to 303 cases, as well as in October and November there were 386 additional cases and 472 cases, respectively. Furthermore, in December cases increased more than 2 times compared to the previous month, which was 1046 additional cases. Overall from April to December 2020, the lowest addition of cases occurred in June with the addition of 13 cases, and the highest addition of cases occurred in December with the addition of 1046 cases. The lowest case since June was caused by the implementation of the PSBB (Large-Scale Social Restrictions).

From the total 21 sub-districts in Lumajang Regency, Lumajang sub-district is ranked first with a total of 557 confirmed patients (23.1%), 468 recovered patients and 45 patients who died. The second order is Sukodono sub-district with a total of 255 confirmed patients (10.6%), 216 recovered patients, and 13 patients who died. Meanwhile, the sub-districts with the lowest cases were Gucialit sub-district and Prunojiwo sub-district with a total of 16 confirmed patients each. (0.2%), 13 patients recovered, and only 1 patient died in Pronojiwo district. Other cases spread in a pattern that cannot be concluded epidemiologically. Overall, Lumajang sub-district is an area with more than 500 cases, then there are 2 sub-districts with cases between 200-300, 6 sub-districts with cases between 100-200, and the remaining 12 sub-districts under 100 cases. The increase in cases was also caused by the start of mass rolling out of COVID-19 tests in many places. The lowest case since June was caused by the implementation of the PSBB (Large-Scale Social Restrictions), testing

patient samples which took time, while the availability of testing laboratories was relatively limited, and the distribution of test equipment centered at the Ministry of Health. There are obstacles in providing access to information (backlog) from agencies at the regional to the central level. (Philips Vermonte, 2020)

Cases Based on Factors as Health Workers

The number of health workers in Lumajang Regency is very large, with a total of 496 doctors, 1,471 nurses, 794 midwives and 95 analysts spread across health centers in Lumajang Regency, then there are 204 doctors, 761 nurses, 131 midwives and 57 Analysts are spread across several hospitals in Lumajang Regency. These health workers deal directly with Covid-19 patients and specimens (in the form of blood samples and oropharyngeal-nasopharyngeal swabs) which will be analyzed in the laboratory.

As of the end of December 2020, there were 144 confirmed cases of Covid-19 among health workers, and 108 of them received treatment at the hospital. Hospitals where the highest number of health workers are treated at Jatiroto General Hospital (54 or 50%), then at Pasirian General Hospital 36 people or 33.3%, dr. Haryoto 14 people or 13%, Bhayangkara Hospital 3 people or 2.8%, and Wijaya Kusuma Hospital 1 person or 0.9%. This brings the total number of health workers who have been confirmed to have COVID-19 and are being treated in hospitals.

Symptoms in Patients with suspected COVID-19

According to the Ministry of Health of the Republic of Indonesia (2020) in the latest official document entitled Guidelines for Prevention and Control of Coronavirus Disease (COVID)-19, there are several symptoms that may occur in patients with suspected COVID-19

1. Patients Under Supervision (PDP)
 - a. person with an Acute Respiratory Infection (ARI), i.e. fever 38°C or a history of fever accompanied by one of the symptoms of illness such as cough/shortness of breath/ sore throat/ runny nose/ mild to severe pneumonia.
 - b. People with fever 38°C or a history of fever of ARI and in the last 14 days before symptoms appear have a history of contact with confirmed cases of COVID-19.
 - c. People with severe ARI/severe pneumonia who require hospitalization and have no other causes based on clinical features are convincing.
2. Person Under Monitoring (ODP)
 - a. People who have fever ($\geq 38^{\circ}\text{C}$) or symptoms of respiratory system disorders such as runny nose/sore throat/cough and no other cause based on a convincing clinical picture and in the last 14 days before the onset of symptoms have a history of travel or live in an area that reports local transmission.
 - b. People who experience symptoms of respiratory system disorders such as runny nose/sore throat/cough and in the last 14 days prior to the onset of symptoms have a history of contact with confirmed cases of COVID-19.
3. Asymptomatic person (OTG)

A person who is asymptomatic and has a risk of contracting it from a person who has confirmed COVID-19. OTG is a close contact with a confirmed case of COVID-19.

Steps in Determining Positive and Negative COVID-19 Confirmations

Surveillance activities on the status of PDP, ODP and OTG are carried out for 14 days since the last contact with a confirmed COVID-19 patient and the appearance of symptoms. For PDP, ODP specimens are taken on the 1st and 2nd days, while for OTG specimens are taken on the 1st and 14th days. Specimen collection is carried out by competent and well-experienced local laboratory personnel. Specimens will be analyzed using RT PCR. If the result is positive, then the confirmed patient must isolate in a hospital that is a place of isolation for confirmed patients, or self-isolate at home by taking drugs, vitamins and food recommended for COVID-19 sufferers.

The procedures for analyzing COVID-19 using the PCR method were carried out in BSC 2a in a negative pressure room, namely:

1. The first steps were specimen preparation, RNA extraction, cDNA synthesis and amplification using one step reverse transcriptase PCR.
2. Each of the steps in the PCR examination is carried out based on the workings of the reagents used.
3. The target of the SARS-CoV-2 gene used was different based on the available reagents and prior optimization of PCR conditions was carried out before working on patient specimens.
4. Target genes are often used as table 2 below

Table 2. Target gen

	Gen
E(Envelope)	E
N(Nucleocapsid)	N, N1, N2, N3
ORF(<i>OpenReadingFrame</i>)	ORF1, ORF1ab, ORF1a, ORF1b, RdRp

Interpretation of Results

The following shows the interpretation of the results of the Covid-19 laboratory examination using the RTPCR method.

Table 3. Interpretation and reporting of the PCR method 1

2019 nCoV- N1	2019 nCoV-N2	Interpretation RnP ofResults	Reporting	Follow-up
+	+	±	SARS-CoV-2 detected	SARS-CoV-2 positive
Only 1 positive ± concluded		±	SARS-CoV-2 detected	Reporting according to the flow Balitbangkes
		±	Results not yet available	The specimen needs to be re- examined at the COVID-19 testing laboratory that has been set by the Indonesian Ministry of Health using the RTPCR method with specific gene targets (N1, N2, ORF 1 ab, RdRp)
SARS-CoV-2 -	-	+	does not detected	SARS-CoV-2 negative
-		-	Resultsinvalid	RepeatRNA extraction and RT PCR,when the results are still invalid, it is
		-	Resultsinvalid	invalid
of the patient.		-	Resultsinvalid	advisable to request a new specimen
		-	Resultsinvalid	advisable to request a new specimen

Table 4. Interpretation and reporting of the PCR method 2

RdRp	ORF 1 a/b/ab	E	Interpretation of Results	Reporting	Follow-up
+	+	+	SARS-CoV-2 detected	SARS-CoV-2 positive	Reporting according to the flow Balitbangkes
+		+	SARS-CoV-2 detected	SARS-CoV-2 positive	Reporting according to the flow Balitbangkes
	+	+	SARS-CoV-2 detected	SARS-CoV-2 positive	Reporting according to the flow Balitbangkes
-		+	Presumptive (inconclusive)	The results Can't be concluded	Specimens need to be re-examined at the COVID- 19 testing laboratory that has been set by the Ministry Indonesian Health using
		+	Presumptive (Inconclusive)	Results Not yet concluded	the RTCPR Method with specific gene targets (N1, N2, ORF 1 ab, RdRp)
-		+	Presumptive (Inconclusive)	Results Not yet concluded	Specimens need to be re-examined in the COVID- 19 examining laboratory that has been determined by the Indonesian Ministry of Health with using the RT PCR method with specific gene targets (N1, N2, ORF 1 ab, RdRp)

-	-	-	SARS-CoV-2 was not detected	SARS-CoV-2 Negative	Not SARS-CoV-2
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Positive and negative TCM and PCR examination results Submitted to the Health Research and Development Agency as a National Referral Laboratory for Diseases *New-Emerging in accordance* with the circular letter of the Ministry of Health of the Republic of Indonesia Number HK.02.01/MENKES/234/2020 which was stipulated April 7, 2020.

CONCLUSION

Men are more easily infected with Covid-19 than women but women are more at risk of dying than men due to Covid-19. . Even so, the cases of patients who died were dominated by patients with an age range of more than 60 years. In the first five months of the pandemic (March-August), the number of confirmed cases was still low but starting in September the number of cases increased dramatically, as well as in October and November. December cases were the highest addition of cases. Lumajang sub-district is the sub-district with the most cases in Lumajang district and the lowest cases are in Gucialit sub-district and Pronojiwo sub-district. The highest number of health workers who were positively exposed to COVID-19 was at Jatiroto Hospital, and the lowest was at Wijaya Kusuma Hospital.

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ANTIMICROBIAL POTENTIAL OF KEPOK BANANA SHEATHS EXTRACT
(*Musa paradisiaca formatypica*) ON THE GROWTH OF
***Staphylococcus aureus* BACTERIA**

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ABSTRACT

Banana plant is one of the most famous and beneficial plants in the world. Almost all parts of this plant, namely fruit, leaves, flower buds, stems, pseudo stems (sheaths and flower stem) can be utilized. This study aims to identify antimicrobial active substances and the antimicrobial potential of Kepok Banana (*Musa paradisiaca formatypica*) sheaths. The study was an experimental laboratory to design a post-test only control group. The maceration method is used to extract the active substance and identify the levels of the antimicrobial active substance using the TLC Spectrophotodensitometer and the diffusion method (disc) to test the antimicrobial potential. The research data were analyzed using the Kruskal Wallis test. The positive qualitative test contains flavonoids, phenol, saponins and alkaloids. The quantitative content of Kepok Banana sheaths extract contains phenol (1,9 mg/ml) dan flavonoid (93,3 mg/ml) dan tannin (2,7 mg/ml). The results showed differences in antimicrobial potential at various concentrations (55%, 70%, 85% and 100%) of Kepok Banana sheaths extract with positive and negative controls (sig = 0.000). There are no effective concentration in inhibiting the growth of *Staphylococcus aureus* bacteria with an average inhibition range of 4.47 mm (resistant category) based on the NCCLS standard.

Keywords: Kepok Banana sheaths extract; antimicrobial potential; *Staphylococcus aureus*.

INTRODUCTION

Antibiotics are the main choice in the treatment of infectious diseases caused by *Staphylococcus aureus* bacteria. However, the problem that occurs is the existence of resistance and even multiresistance to *Staphylococcus aureus* bacteria. These microbes are resistant to penicillin oxacillin and other beta-lactam antibiotics. Therefore, it is necessary to develop traditional treatment methods using herbs that can inhibit the growth of *Staphylococcus aureus* bacteria. Banana plants are native to Asia, Indo-Malaysia and Australia which are included in the genus *Musa* (family: *Musaceae*). This plant is now widely spread in the tropics and sub-tropics, and is often used as food and traditional medicine, both parts of the fruit, leaves, stems, and roots. Previous research stated that among the different *Musa* species, *Musa paradisiaca* displayed efficient antibacterial activity followed by *Musa acuminata* against multi-drug resistant nosocomial infection causing pathogen.¹

Every region in Indonesia has a regional name for banana plants. In Bali, Kepok banana are known as "BiuKepok, Biu Gedang Sabo", which are usually processed into fried bananas, cakes, chips, etc. Bananas are traditionally used to treat diarrhea, dysentery disorders, lesions/wounds, diabetes mellitus, uremia, hypertension and heart disease.² This plant often used to treat new wounds traditionally by applying banana sap to the injured part.³ Banana plant sap contains phytochemical compounds that can accelerate the wound healing process in mice.⁴ Banana plants affect several bacteria, one of which is *Staphylococcus aureus*. Phytochemical test of KepokBanana stems showed the content of tannins, alkaloids, and saponins, but not with flavonoids and steroids. The content inside is what makes the banana plant has a role as an anti-ulcer, anti-bacterial, and plays a role in woundhealing.⁵

Basically, almost all parts of the banana plant can be used starting from the roots, stems, midribs, leaves, to flowers and fruit. The extract of the banana plant (roots, stems, midribs, leaves, to flowers and fruit) is able to inhibit the growth of *Staphylococcus aureus* bacteria (very strong category).⁶ Stem and root extracts from KepokBanana have activity in inhibiting the growth of *Staphylococcus aureus* bacteria. Methanol extract from Kepok Banana stems has greater effectiveness than root extract with concentrations of 6.25%, 12.5% and 25%.⁷ The difference in the chemical content of some parts of the banana plant and the difference in the concentration of the extract attracted the attention of the author so that the purpose of this study was to determine the phytochemical

content and antimicrobial potential of Kepok Banana sheaths against the growth of *Staphylococcus aureus* bacteria *in vitro*.

METHODS

This type of research is true-experimental, there is intervention on the treatment group and there is control over external factors that have the potential to affect the experiment. The study was an experimental laboratory with post-test only-control group design. There are two groups chosen randomly. The first group was given treatment (experimental group) and the second group that was not treated (control group). Sheaths of kepok banana were extracted and qualitative phytochemical tested in the Applied Chemistry laboratory at the Department of Medical Laboratory Technology, Polytechnic of Health, Denpasar. Antimicrobial potential test was conducted at Microbiology laboratory at the Faculty of Medicine, Udayana University. Quantitative phytochemical tests for antimicrobial active substances was conducted at Integrated Analytical Laboratory at Udayana University.

There were four treatments of kepok banana sheaths extract, namely concentrations of 55%, 70%, 85%, and 100%. The number of replications in the study was 8 times for each concentration, so the number of samples was 32 samples.

The research material used in this study is the sheath of kepok banana, aquadest, Mueller Hilton agar (MHA), McFarland standard 0.5%, *Staphylococcus aureus* 3351, Ciprofloxacin antibiotic disk, 96% EtOH, 0.5% CMC solution (Carboxy Methyl Cellulose) and 0.85% NaCl. The tools used in this study was bottle of maceration (Pyrex), rotary evaporator, the petri dish (Pyrex), test tubes (Pyrex), round ose (Pyrex), tube flask (Pyrex), incubator (wagtech mir incubator), sterile container, measuring pipette (Pyrex volume 5 ml), petri dish, micropipette (termo 10 μ L, 50 μ L, and 500 μ L), beaker glass (Pyrex volume 250 ml), sterile cotton sticks, and digital scales.

Research procedure begins with taking kepok banana sheaths, washed under running water, then drain. Then cuts into small pieces and taken each as 250 grams, then dried in the sun indirectly for \pm 5 days until the sample completely dry. After drying, followed by maceration method with 2 L of 96% ethanol solvent for 5 days (5 x 24 hours). Then re-macerated 2 times at room temperature 25°C - 30°C, filtered and the filtrate thus obtained were accommodated in the shelter container (bottle maceration). The entire filtrate that obtained concentrated by rotary evaporator at a temperature 50°C to obtain a viscous extract.

Identification of the antimicrobial active substance in sample (Total phenol determination). Total phenol was determined by Folin-Ciocalteu reagent with gallic acid as standard. A total of 0.25 mg of sample was added with 1.25 mL of Folin-Ciocalteu reagent which was diluted 10 times. Incubate for 4 minutes. Add 1 mL of 7.5% sodium carbonate. Incubation for 20 minutes at room temperature, then the absorbance was measured at a wavelength of 742 nm with routine as a standard. Results are expressed in gallic acid equivalent/mL extract (GAE/mL extract).

Identification of saponins, flavonoids and tannins by TLC-Spectrophotodensitometer. A total of 20 mg of viscous extract was dissolved in pro-analytical methanol, 10 L was spotted on a TLC plate, eluted with ethyl acetate: formic acid: water (100:15:17) as mobile phase. Scan with a spectrophotodensitometer at a wavelength of 286 nm. The obtained chromatograms were identified with peaks and spectra.

Preparation of kepok banana sheath extract with concentrations of 55%, 70%, 85% and 100% made by mixing viscous extract of kepok banana sheaths with sterile CMC solution as a diluent. Each concentration is diluted into a volume of 1 ml. Mueller Hilton order made as much as 600 ml, placed in a tube flask, then sterilized using an autoclave. Colonies of bacteria (stock culture) were taken using round Ose and suspended into a tube containing 5 mL of 0.85% physiological NaCl solution.

Inhibition test was done by using paper disc diffusion method. The results of the test power Antibacterial based on measurements Diameter Inhibitory Power (DDH) growth of bacteria that formed around the paper disc. Empty paper discs are immersed in kepok banana sheath extract at various concentrations until all the liquid seeps into the discs. Negative control used paper discs that were immersed in 1 ml of sterile 0.5% CMC solution. Positive control used Ciprofloxacin antibiotic disc. A suspension of *Staphylococcus aureus* 3351 with a concentration of 0.5% McFarland was prepared. Then the test bacteria suspension was inoculated evenly on a medium Mueller Hinton Agar (MHA), let stand until the bacterial suspension soaked into the media (5-15 min). Each disc that had been saturated with kepok banana sheath extract then affixed to the surface of Mueller Hinton Agar media which had been scratched with bacterial suspension and slightly pressed with tweezers until it adhered perfectly. Positive control and negative control were also attached to Mueller Hinton Agar media. Furthermore incubated at 37°C for 24 hours. After 24 hours, the diameter of the area that formed around the paper discs were observed and measured using a calliper.

The data obtained in the research analysis using the Kruskal Walls test to determine the potential of various concentrations of kepok banana sheaths extract. Then compared with the NCCLS table to see the most sensitive concentration of kepok banana sheaths extract.

RESULTS

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The results of the qualitative test with phytochemical screening on the antibacterial compound content of the Kepok banana sheaths extract obtained the following results:

Table 1. Results of antibacterial compounds qualitative test

Compounds	Results
Quinone Alkaloid	-
Saponin Phenol	+
Flavonoid	+
Tannin	+
	+
	+

Qualitative test results indicate a positive antibacterial compound are phenols and derivatives such as alkaloids, flavonoids, saponins, and tannins. Quantitative assay followed to determine the content of the antibacterial i.e. total phenols, flavonoids and tannins obtained the following results:

Table 2. Results of antibacterial compounds quantitative test

Compounds	Results (mg/ml)
Phenol Flavonoid	1.9
Tannin	93.3
	2.7

As previously mentioned, Kepok Banana sheaths extract made into four different concentration; 55%, 70%, 85%, and 100%. Positive control (antibiotic disk with Ciprofloxacin 30 gram) showed the presence of inhibition zones in the eight replications with the diameter of inhibition zone obtained is 15.50 mm. The negative control (96% ethanol) did not show any inhibition zone diameter (0.0 mm) in the eight replications. This is because 96% ethanol does not contain antibacterial substances that can inhibit the growth of *Staphylococcus aureus* bacteria.

Table 3. Results of inhibition zone diameter measurement

Replications	Inhibition zone diameter (mm)					
	Negative Control	Positive Control	55%	70%	85%	100%
1	0.0	15.0	0.0	5.0	6.0	7.0
2	0.0	15.0	0.0	5.0	6.0	7.0
3	0.0	16.0	0.0	5.0	6.0	7.0
4	0.0	16.0	0.0	5.0	6.0	7.0
5	0.0	15.0	0.0	5.0	6.0	7.0
6	0.0	15.0	0.0	5.0	6.0	7.0
7	0.0	16.0	0.0	5.0	6.0	7.0
8	0.0	16.0	0.0	5.0	6.0	6.0
Average	0.0	15.50	0.0	5.0	6.0	6.88



Figure 1. Colonies *Staphylococcus aureus* bacteria that have been treated

Kepok Banana sheaths extract at various concentrations (replications 1 to 8) showed the average inhibition zone diameter was 4.47 mm. The measurement results when compared with the inhibition zone diameter of Ciprofloxacin antibiotic in the NCCLS table, included in the resistant category (≤ 15 mm).

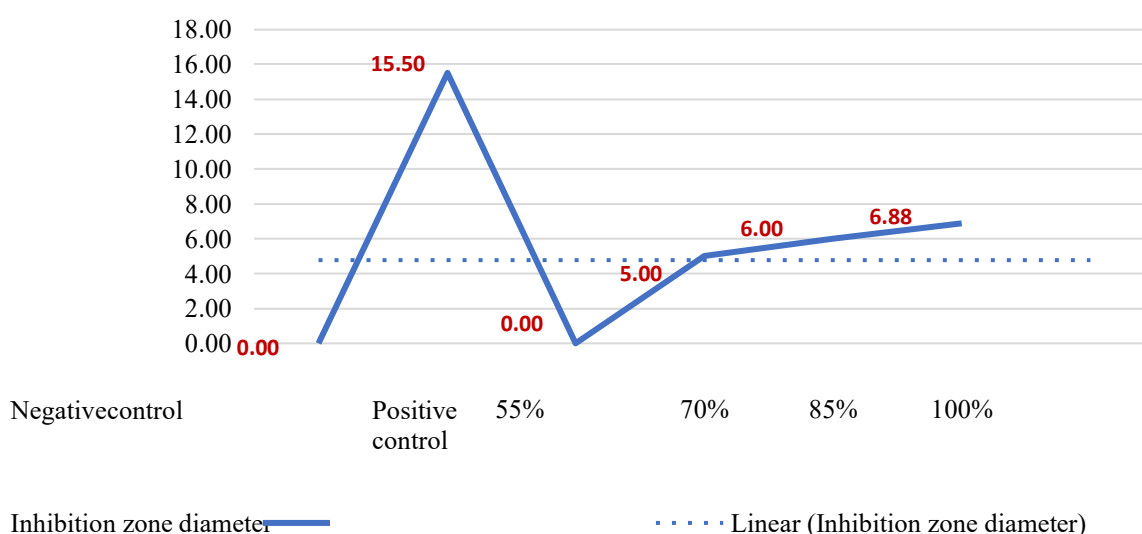


Figure 2. Inhibition zone diameter of Kepok Banana sheaths extract against the growth of *Staphylococcus aureus* bacteria *in vitro*.

The results of the Kolmogorov Smirnov statistical test, obtained a value of $0.000 < 0.05$, meaning that the data is not normally distributed, followed by the Kruskal Wallis test, the value of sig (0.002) is obtained. This value is less than the value of α (0.05). These results indicate there are differences in the antimicrobial potential of Kepok Banana sheaths extract in inhibiting the growth of *Staphylococcus aureus*. The results of the LSD (Least Significant Deference) test showed that there were differences in antimicrobial potency at various concentrations (55%, 70%, 85%, 100%) of Kepok Banana sheath extract with positive and negative controls is $0.00 < 0.05$.

DISCUSSION

The results of qualitative tests on several parameters showed that alkaloids, saponins, flavonoids, phenol and tannins were detected (quinones were not detected), and further quantitative test results showed the presence of phenolic content (1.9 mg/ml) and flavonoid (93.3 mg/ml) and tannins (2.7 mg/ml). These results are consistent with previous research which states that flavanones, flavanols, hydroxycinnamic acid, dopamine and N-Acetyl serotonin are constituents of banana plant sap.⁸ These compounds are secondary metabolites of banana plants. The content of secondary metabolites of a plant depends on the species and the level depends on the environment in which the plant lives. Active substances contained in a banana tree, such as flavonoids, saponins and tannins that work hand in hand so as to have an antibacterial effect.⁹ Flavonoids are known to function as phytoalexins, namely as antimicrobials that can inhibit the growth of bacteria and fungi, thereby helping to inhibit the spread of pathogens in plants.¹⁰ Similar studies have also stated that not only bacteria and fungi on banana plants can be inhibited, but bacteria and fungi that are pathogenic in humans can also be inhibited, such as *Staphylococcus sp* 16, 18, 24 and *Candida sp* 16.¹¹

In addition to flavonoids, tannins are also secondary metabolites that are often found in plants. Tannins are astringent, polyphenolic, have a bitter taste. Tannins are commonly used for the treatment of skin diseases, antibacterial, treatment of diarrhea, haemostatic (stops bleeding) and haemorrhoids.¹²

Based on the results of the study, the concentration of Kepok Banana sheaths extract did not show the potential for the sensitive category to the growth of *Staphylococcus aureus* (compared to the NCCLS table). The diameter of the inhibition zone formed at various concentrations of the Kepok Banana sheaths extract tested was classified into the resistant category with a small growth inhibition capacity of 4.47 mm at various concentrations. The results of this study are not in accordance with the results of previous studies that used sample stems and roots extract of kepok banana had activity in inhibiting the growth of *Staphylococcus aureus* bacteria significantly with extract concentration of 6.25%, 12.5%, 25%.⁷ There are differences in inhibition zone diameter such as different concentrations of extracts; different extract dilution, the difference of sample extract, different of bacteria strains will influence different despite coming from the same species and different varieties of plants used; influenced by the state of site, the nutrients obtained from around the area grows, etc.⁷ The small diameter inhibition zone that shown in this study caused by the low content of secondary metabolites that act as antibacterial in the plant parts used as samples, which were plant parts close to the roots (there was no significant growth in these parts). The results of secondary metabolism that are processed in the leaves will be transported to parts of the body that need it such as parts that are growing or parts that require substances from secondary metabolism.¹⁰ In previous studies, it was stated that banana plant extracts were able to inhibit the growth of fungi and several bacteria such as *Staphylococcus aureus*, *Escherichia coli*, and *Candida sp.*¹³ Histopathologically the administration of Kepok banana plant extract can provide a cosmetic effect by repairing damaged skin structures without leaving scar tissue or scar tissue and accelerating the process of re-epithelialization of epidermal tissue, the formation of new blood vessels in mice.¹⁴

CONCLUSION

The phytochemical content of Kepok Banana sheaths extract qualitatively contains antibacterial compounds, such as alkaloids, saponins, tannins, phenols, and flavonoids. Quantitative test of Kepok Banana sheaths extract showed the content of phenol, flavonoids, and tannins. There were differences in antimicrobial potency at various concentrations (55%, 70%, 85%, 100%) of Kepok banana sheaths extract with positive and negative controls. There is no effective concentration of Kepok Banana sheaths extract (sensitive category) with potential as an antimicrobial based on NCCLS standards. Further research is recommended to use samples of banana plant parts that are more diverse, different media and extract concentrations are more varied, and different growing locations.

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***INCIDENCE OF WORM INFECTION IN PRIMARY SCHOOL CHILDREN IN THE
NEW NORMAL IMPLEMENTATION OF PANDEMI COVID-19 IN THE COASTAL
AREA OF NORTH SULAWESI***

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ABSTRACT

The impact experienced by children due to the corona virus pandemic is that children have to undergo the learning process at home because the government closes schools to minimize the spread of covid-19. The new normal is a new way of life in carrying out life activities amid the unfinished Covid-19 pandemic. The new normal is needed to keep us safe from infection with viruses and other pathogens so that it keeps us from getting sick. One of the habits in implementing the new normal is the application of Clean and Healthy Behavior (PHBS). One of the infectious diseases that are closely related to the application of PHBS is worm infection. Worm infections contribute to other health problems such as diarrhea, malnutrition and anemia. Malnutrition can inhibit physical and intellectual development in children during their infancy and reduce endurance. The aim of this study was to determine the prevalence of intestinal nematode infection through several examination methods; to determine the relationship between nutritional status and PHBS with nematode infection. This research was conducted at GMIM Wori Elementary School with a total sample of 23 students. The examination method used is the native method and the Baerman test method. The results showed 45% of respondents were infected with worms through the native method examination and 5% of respondents were infected with larvae of *Strongyloides stercoralis* through the Baerman test method. There is no relationship between worm infection with nutritional status and PHBS.

Keywords : Worm infection; Primary school children; Coastal area; New normal.

INTRODUCTION

Children are a group vulnerable to viral infections. The number of cases of corona virus infection in children is rarely found. If there is positive confirmation of covid-19 infection in the child if it is acquired or transmitted by other family members. The clinical manifestations of children who are confirmed positive for Covid-19 are asymptomatic, mild or moderate illness. Children who experience severe and critical illness are experienced comorbid children with a small presentation. Several theories that explain the reasons why children have better immunity than adults are that children have higher antibody levels than adults. Another reason is that the SARS-CoV-2 binding protein is immature [1].

Another impact experienced by children due to the corona virus pandemic is that children have to undergo the learning process at home because the government closes schools to minimize the spread of covid-19. Online learning (online) has been taking place since the outbreak of the Covid-19 case. The government through the Ministry of Education and Culture has decided that online learning starts from May to December 2020 for schools that are in the red zone while schools in the green zone can adjust to the situation.

Over time, the Government announced the adoption of the "new normal (*New Normal*)". The new normal is a new way of life in carrying out life activities amid the unfinished Covid-19 pandemic. The new normal is needed to keep us safe against viral infections and other pathogens, thus keeping us from getting sick. One of the habits in implementing the new normal is the application of Clean and Healthy Living Behaviors (PHBS) [2].

Worms infection can be experienced by all age groups, but the incidence prevalence in children is higher than in adults. Children are a developmental stage that is quite susceptible to various diseases because of their immune system. Worm infection can cause various other diseases including diarrhea, anemia, malnutrition and growth disorders. Worms infection is closely related to lifestyle and sanitation. Research conducted by

Setyowatiningsih and Surati (2017) shows that improvements in hygiene reduce one hundred percent of the prevalence of worm infections [3].

Intestinal worm infection can affect the immune status or immunity of the sufferer because it can increase the body's immune cells. Research conducted by Mutiara H *et al* (2019) shows that there is a relationship between STH infection and an increase in the number of eosinophils [4].

METHODS

This type of research will be conducted using a *cross-sectional* study design. Container / pot of feces were distributed to the students with the technical explanations given collection of stool, using a container made of consumables. Stool collection is sterile and disposable; The lid of the container used is the one that fits the feces container and is tight. The spatula can be separate or attached to the lid of the stool collection container. The label on the stool collector includes a specific sample identification number, name of sample owner and time of collection. Clean paper is given to collect feces and a plastic bag as a storage place for the feces collection container.

Explained to the parents about the reasons why stool is needed in the study. It explained the materials to be used, namely a container for feces, a spatula and a plastic bag. Emphasized to the parents of research subjects the importance of using a fecal container only for their own children's feces and ensuring that the parents put their child's stool sample in a stool container that has been labeled with the child's name and identification number. Explained to parents of research subjects to follow the instructions how to collect feces. The stool is examined in the laboratory within 24 hours after the stool is received. Record the time of receipt of stool samples.

Materials and tools needed for the examination of native methods are a stool specimen, NaCl 0,9 % and 2% eosin solution. The tools needed are a microscope, object glass, stick / stick, tissue, dropper, *cover glass*. In drops 1 drop of 0.9% NaCl / eosin solution of 2% on the slide are clean and dry. With an applicator / stick, take a small amount of stool (± 2 mg) and mix it in a drop of faal / eosin salt to form a homogeneous suspension. Remove any rough parts. Place the deck glass on top of the suspension. Try not to form any air bubbles. Examine under a microscope using a low-power objective (10x), then systematically examine the entire surface area of the deck glass for parasites. If any suspicious objects are found, examine them objectively 40x.

The tool used is a modification tool Baerman test is made of the funnel, s aringan of wire, a welding gauze, s tan, k glue, l idi, l ampu table and s hawk rubber; s entrifuge; t plastic tube. The materials used are feces and distilled water. The funnel is filled with distilled water so that it can't be accommodated at the clamp boundary. Tinja an amount of ± 5 grams is placed on gauze and covered and allowed to soak. B agian plastic hose clamp toward irradiated with light and b iarkan for ± 2 hours. A ir accommodated in a tube and centrifuged at a speed of 2,500 rpm for 5 minutes and then a ir in vitro shed quickly and left in a tube placed above objects glas and examined under a microscope.

The sample collection procedure is socialized to accompanying teachers, parents and students then sample containers are distributed. Students were asked to fill out a questionnaire containing life behaviors related to worm infection in the presence of their parents. Measurement of weight and height of students was carried out to obtain data on the nutritional status of students. Sampling was carried out for three consecutive days after the sample containers were distributed by giving *rewards* in the form of healthy snacks for students who collected samples.

The analysis was carried out descriptively and statistically. Descriptive analysis was used to determine the frequency distribution of the bound measurement results. Statistical analysis was used to analyze the relationship using the Chi-Square statistical test. This research was carried out based on research ethics recommendations issued by the Health Research Ethics Commission of the Poltekkes Kemenkes Manado No.KEPK.01/03/009/2020.

RESULTS AND DISCUSSION

Sample collection was carried out during the COVID-19 pandemic so that the socialization procedure and sample collection from respondents could not be carried out simultaneously for all respondents due to the

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application of health protocols, namely maintaining distance. This also resulted in the number of respondents participating in the research not being maximized.

Table 1. Characteristics of nutritional status and demographics of SD GMIM Wori SD respondents

Variable	N (%)	Variable	N (%)
type sex		Finger sucking habit	
Male	15 (75)	Yes	5 (25)
Women	5 (25)	No	15 (75)
Nutritional Status		Finger nail hygiene	
Skinny	1 (5)	Yes	11 (55)
Normal	17 (85)	No	9 (45)
Grease	1 (5)	Income people older	
Obesity	1 (5)	>/=Regional minimum wage	3 (15)
Using footwear		< Regonal minimum wage	17 (85)
Yes	14 (70)	Work the elderly	
No	6 (30)	Civil servant	1 (5)
Wash hands with soap		Trader	5 (25)
Yes	20 (100)	Farmer	3 (15)
No	0 (0)	Fisherman	2 (10)
Soil playing habits		Odd jobs	9 (45)
Yes	12 (60)	The area where live	
No	8 (40)	Beach	14 (70)
Defecation place		Plains	4 (20)
Latrine	19 (95)	River	1 (5)
Outside the latrine	1 (5)	Mountains	1 (5)
Wash hands after defecating			
Yes	8 (40)		
No	12 (60)		

The number of samples returned by students was not the same as the sample containers that were distributed. The total number of respondents who participated in the dissemination and distribution of the sample container is a total of 37 people, but that returns the container containing the sample is as much as 23 people . In addition, there were some samples that could not be examined because they did not meet the criteria so that the final number of samples examined was 20 samples. The samples collected were examined in the Parasitology laboratory, Medical Laboratory Technology Department. The questionnaire and examination results are presented in tabular form.

Table 2. The results of examination of the stool samples of respondents at SD GMIM Wori

Examination Results	n	%
Native Method		
Positive	9	45
Negative	11	55
Total	20	100
Baerman test method		
Positive	1	5
Negative	19	95
Total	20	100

The sampling location was SD GMIM Wori, Wori District, North Minahasa Regency. The incidence of worm infections in school children is 45 % (9 people) of the 20 sample respondents who meet the criteria for examination. This figure is relatively higher than the STH infection research conducted by Annisa *et al* (2018) at 27.1% and Lalangpuling (2020) by 4% [5][6].

The high incidence rate can be caused by the inadequate implementation of PHBS and the implementation of the worming distribution program for school children that has not been implemented due to the COVID-10 pandemic conditions. Research conducted by Masniati *et al* (2018) shows that there is a statistically significant effect on the results of the STH class worm disease examination [7].

Respondents aged six to thirteen years who are able to carry out daily activities independently without help from other people. This causes respondents to adopt clean and healthy living habits independently or not. Research conducted by Pan (2019) revealed that 96,4 % of respondents infected with *Ascaris lumbricoides*. This shows that the presentation of worm infections is greater in school age children compared to toddlers [8].

Respondents who participated in the study did not take deworming medication in the last three months because there was a reinfection process. *A. lubricoides* took two months for pushing to produce eggs since ingested, *T. trichiura* take three months and *hookworm* takes thirty- five days. The collected stool is not contaminated by urine and water to maintain the consistency of the stool. In addition, the urea in the urine can damage the egg walls of the worms, resulting in a false negative test result; and prevent water-borne contamination of worm eggs that could result in false positive results.

The application of Clean and Healthy Living Behavior (PHBS) is closely related to worm infection, so it is important to analyze the relationship between worm infection and PHBS. The PHBS of the respondents analyzed included using footwear, playing with the ground, the location of defecating, washing hands after defecating, finger sucking and nail hygiene.

A total of 30% of respondents who are positive for worm infection have the habit of not using footwear. Hookworm species (*hookworm*) has a cycle of infection by penetration into the human body through the skin, especially the feet. In sandy soil is fertile, humus mixed and protected from direct sun, hookworm eggs hatch into larvae rabbitiform within 24-36 hours at the optimum temperature (*N. Americanus* : 28⁰ - 32⁰ C and *A. duodenale* : 23⁰ - 25⁰ C) then develop into infective filariform on day 5 - 8. Filariform larvae can survive 7 - 8 weeks in soil and must penetrate human skin to continue their life cycle. Larvae penetrate the blood capillaries and participate in circulation to the right heart. Then migrate to the lungs, through the bronchi and into the trachea, then into the larynx and into the small intestine. The worms develop into adults and can produce 9000 - 10,000 eggs every day [9].

Table 3. Relationship between worm infection on native examination with PHBS of SD GMIM Wori respondents

PHBS	Infection		Total	P
	Positive (n /%)	Negative (n /%)		
Using footwear				
Yes	8 (40)	6 (30)	14	0.095
Not	1 (5)	5 (25)	6	
Playing land				
Yes	5 (25)	7 (35)	12	0.714
Not	4 (20)	4 (20)	8	
BAB place				
Toilet	9 (45)	0 (0)	9	0,000 *
Outside the latrine	0 (0)	11 (55)	11	
Wash hands after defecating				
Yes	4 (20)	4 (20)	8	0.714
Not	5 (25)	7 (35)	12	
Finger sucking				
Yes	2 (10)	3 (15)	5	0.795
Not	7 (35)	8 (40)	15	
Nail hygiene				
Yes	6 (30)	5 (25)	11	0.343
Not	3 (15)	6 (30)	9	

* Significant if p value < 0.050

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The habit of playing with the soil, sucking on the fingers, clean nails and the habit of washing hands after defecating are also closely related to worm infections. As many as 60% of respondents who have a habit of playing with the earth are infected with worms, 20% of respondents who have a habit of sucking their fingers have worm infections and 45% of respondents who are infected with worms do not pay attention to nail hygiene. Research conducted by Dewi and Laksmi (2017) shows that there is a significant relationship between STH infection with hand washing and soil contact. Research conducted by Wahyuni, D (2016) shows that there is a relationship between the habit of cutting nails and STH infection. Respondents have a habit of defecating in the latrine (95%), but all of them have STH infection. This is caused by the application of PHBs response n which do not meet the standards [10].

Table 5. Relationship between worm infection on native examination and nutritional status of respondents at SD GMIM Wori

Worm infection	Nutritional Status					p
	Skinny	Normal	Fat	Obesity	Total	
	N (%)	N (%)	N (%)	N (%)	N(%)	
Positive	0 (0)	8 (40)	0 (0)	1 (5)	9 (45)	0.409
Negative	1 (5)	9 (45)	1 (5)	0 (0)	11 (55)	
Total	1 (5)	17 (85)	1 (5)	1 (5)	20 (100)	

Data nutritional status of respondents involved in this study were obtained from through measurement of weight and height. Determination of the nutritional status of children based on the processing of data using application *Excel* determination of nutritional status using anthropometric standards Kepmenkes No. 1995 / Minister of Health / sk / xl / 2010. Measurement index based on Body Mass Index (BMI) according to age (BMI / U) for measuring the nutritional status of children aged 5-18 years is divided into four categories, namely: very thin (Z-score <-3 SD), thin (-3 SD to with <-2 SD), normal (-2 SD to 1 SD), obese (> 1 SD to 2 SD) and obese (> 2 SD). From the results of laboratory examinations shows [11].

CONCLUSION

The results showed that the prevalence of intestinal nematode infection through native examination was 45 % and *Baerman's test* was 5 % . There is no relationship between nutritional status and there is no relationship between Clean and Healthy Behavior (PHBS) and worm infections in school children.

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Diagnostic Test Of Frozen Section Histopathological Preparations Against Gold Standard Histopathology Of Paraffin Block In Breast Tumor

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ABSTRACT

When it comes to examining the anatomical pathology of breast tumors, paraffin block histopathology is the gold standard. This examination has the disadvantage of taking a long time. One of the examinations that can diagnose breast tumors quickly is frozen section histopathological examinations which is often used by clinicians as a guide during surgery. In order to evaluate an examination, a diagnostic test used by comparing the results with a gold standard. This study aims to compare frozen section histopathology results with the gold standard paraffin blocks. In this study, secondary data from medical records of patients with breast tumors who underwent frozen section histopathology and paraffin block histopathology examination is used to describe the findings of the research. A 2x2 cross tabulation was used to analyze the data for sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) in comparison with paraffin block histopathology, the gold standard in histopathology. The results of frozen section diagnostic test are sensitivity is 85.71 percent, specificity is 100 percent, positive predictive value (PPV) is 100 percent, negative predictive value (NPV) is 66.67 percent, and accuracy is 88.89 percent. Frozen section histopathology has good diagnostic value and can be used to diagnose breast tumors well.

Keywords: Diagnostic Test; Frozen Section Histopathology; Breast Tumor

INTRODUCTION

Histopathology of paraffin blocks is the gold standard method in the examination of anatomical pathology of breast tumors. Gold standard is a method that has been trusted in diagnosing a disease Putra et al (2016). The disadvantage of paraffin block histopathology as a gold standard is that this examination takes a long time (2 days), expensive, and less comfortable Siswosudarmo, R (2017). Frozen section histopathology is an intra-operative examination performed by freezing tissue while the patient is still on the operating table AIPI (2015). This examination is included in a quick method that helps establish a diagnosis of the presence or absence of malignancy Asri, A., & Winarko, S. (2015). An important indication of a frozen section histopathology in the examination of breast tumors is to re-ensure the diagnosis of carcinoma if the results of FNAB are still in doubt. Frozen section histopathology is also useful for determining the boundaries of surgery and identifying tissues so that it can be used as a direction for clinicians to determine the right action in the middle of surgery. AIPI (2015). It is very important for determine the next surgical procedure. Hellyanti & Tjahjadi, (2012)

Other advantages of frozen section histopathology, namely: can ensure that the tissue taken is adequate, ensure that the mass and surrounding boundaries have been removed, diagnosis is faster than paraffin block histopathology so as to determine the action of therapy faster. Patil, (2015). Frozen section histopathology also has several shortcomings, namely: it is a difficult procedure, experienced clinicians need, and the quality of preparations is lower than paraffin block histopathology Asri, A., & Winarko, S. (2015). The doctor will continue to perform histopathology examination of paraffin blocks even though the examination of frozen section histopathology has been done because the histopathology of paraffin blocks is the gold standard in breast tumor examination. Examination of histopathology of paraffin blocks is very useful for determining neoplasm and non-neoplasm abnormalities. The incompatibility of the results between frozen section histopathology and paraffin block histopathology can be caused by the presence of false positive and false negative Asri, A., & Winarko, S. (2015).

Examination of frozen section histopathology should always be evaluated. Evaluation of an examination test can be done through a series of diagnostic tests. The results of the frozen section histopathology examination

will be compared to the histopathology of paraffin blocks that have been believed to be the gold standard in diagnosing breast tumors. The results of this diagnostic test are sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of frozen section histopathology.

The purpose of this study was to determine the diagnostic tests results of frozen section histopathology against gold standard histopathology of paraffin blocks in breast tumor specimens which include sensitivity values, specificity, positive predictive values, negative predictive values, and accuracy.

METHODS

This type of research is descriptive observational design. The data used in this study is secondary data from breast tumor sufferers medical record who underwent frozen section and paraffin blocks examination at Dr. Ramelan Naval Hospital Surabaya period January 2018 - May 2021. This study was conducted from April to May 2021 at the Anatomy Pathology Laboratory Installation Dr. Ramelan Naval Hospital Surabaya. The sampling technique used in this study is total sampling using secondary data obtained from medical record data at Dr. Ramelan Naval Hospital Surabaya Installation from January 2018 to May 2021. The results of the examination of frozen section histopathology and paraffin blocks collected from medical record data will be tabulated and classified using 2x2 cross tabulation statistics. The data is then calculated using formulas of sensitivity, specificity, positive predictive values, negative predictive values, and accuracy. The principle of frozen section histopathology is to freeze the interstitial water in the tissue so that it will go firm and the ice will act as embedding medium. This research has been declared ethical by the Health Research Ethics Committee of the Surabaya Ministry of Health through a number of ethical test flow processes on the SIM-EPK website until the issuance of The Certificate of Ethical Feasibility Number EA/ 0380 / KEPK-Poltekkes_Sby / V / 2021. This research has also been declared ethical by the Health Research Ethics Commission of The Naval Central Hospital Dr. Ramelan Surabaya after going through a number of processes on PAM, LANTAMAL, and BANGDIKLAT until the issuance of ethics letter No.19 / EC / KERS / 2021.

RESULTS

From the medical record data, there are 27 breast tumor specimens that meet the inclusion criteria. The data is then processed to get information about the number of cases, gender, age, and type of tumor.

Table 1. Distribution Number of Breast Tumor Cases conducted by Frozen Section Histopathology
Period January 2018 - May 2021

Years	Benign	Malignant	Numbers
2018	3	4	7
2019	6	9	15
2020	0	5	5
2021	0	0	0
Total	9	18	27

The highest number of breast tumor sufferers was in 2019 with 15 cases and the lowest in 2021 with 0 cases.

Table 2. Distribution Number of Breast Tumor Sufferers by Gender

Gender	Frequency	Percentage (%)
Woman	27	100,00
Man	0	0
Total	27	100,00

Breast tumor sufferers are mostly female with a total of 27 sufferers.

Table 3. Distribution Number of Breast Tumor Sufferers based on Age

Age (year)	Frequency	Percentage (%)
30 – 35	3	11,11
36 – 40	4	14,81
41 – 45	7	25,93
46 – 50	6	22,22
51 – 55	2	7,41
56 – 60	2	7,41
61 – 65	3	11,11

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Total	27	100,00
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Most of breast tumor sufferers aged 41- 45 with a total of 7 sufferers and ages 46 - 50 years with 6 sufferers. Ages 51 – 55 and 56 – 60 have the least number of sufferers, which is 2 sufferers.

Table 4. Distribution Number of Breast Tumor Sufferers based on Age

Year	Frozen Section Histopathology	Paraffin Block Histopathology	Tumor Type
2018	Benign	Benign	Fibrocystic Change
	Benign	Malignant	Apocrine Carcinoma
	Benign	Benign	Fibroadenoma Mammariae
	Malignant	Malignant	Invasive Carcinoma of No Special Type (IDC, NOS)
	Malignant	Malignant	Invasive Carcinoma of No Special Type (IDC, NOS)
	Malignant	Malignant	Invasive Carcinoma of No Special Type (IDC, NOS)
	Malignant	Malignant	Invasive Lobular Carcinoma
2019	Benign	Malignant	Extensive Lobular Carcinoma In Situ (LCIS)
	Benign	Benign	Benign Phylloides Tumor
	Malignant	Malignant	Invasive Carcinoma of No Special Type (IDC, NOS)
	Benign	Benign	Fibroadenoma Mamma
	Malignant	Malignant	Mixed Invasive Carcinoma of No Special Type with DCIS
	Malignant	Malignant	Invasive Carcinoma of No Special Type (IDC, NOS)
	Malignant	Malignant	Infiltrating Lobular Carcinoma
	Malignant	Malignant	Invasive Carcinoma of No Special Type
	Malignant	Malignant	Invasive Carcinoma of No Special Type
	Malignant	Malignant	Invasive Carcinoma of No Special Type
	Malignant	Malignant	Mixed Invasive Carcinoma of No Special Type (IDC, NOS) with Invasive Lobular Carcinoma.
	Malignant	Malignant	Invasive Carcinoma of No Special Type (IDC, NOS)
	Benign	Benign	Fibroadenoma Mamma
	Benign	Malignant	Invasive Carcinoma of No Special Type (IDC, NOS)
	Benign	Benign	Fibroadenoma Mamma
2020	Malignant	Malignant	Mixed Invasive Carcinoma of No Special Type (IDC, NOS) with Invasive Lobular Carcinoma
	Malignant	Malignant	Mixed Carcinoma of No Special Type with Invasive Lobular Carcinoma
	Malignant	Malignant	Invasive Carcinoma of No Special Type
	Malignant	Malignant	Mixed Invasive Carcinoma of No Special Type with Invasive Lobular Carcinoma
	Malignant	Malignant	Mixed Invasive Lobular Carcinoma of No Special

Fibroadenoma Mammariae is the most common type of benign breast tumor with a total of 4 cases, while the most common malignant tumor is Invasive Carcinoma of No Special Type with a total of 11 cases.

Data Analysis

Table 5. 2x2 Cross Tabulation Table

		Paraffin Block Histopathology		
		Positive	Negative	Total
Frozen Section Histopathology	Positive	(TP) 18	(FP) 0	18
	Negative	(FN) 3	(TN) 6	9
	Total	21	6	27

Note:

Positive = Malignant

Negative = Benign

$$\text{Sensitivity} = \text{TP}/(\text{TP}+\text{FN}) \times 100\% = 18/(18+3) \times 100\% = 85.71\%$$

$$\text{Specificity} = \text{TN}/(\text{FP}+\text{TN}) \times 100\% = 6/(0+ 6) \times 100\% = 100.00\%$$

$$\text{Positive Prediction Value} = \text{TP}/(\text{TP}+\text{FP}) \times 100\% = 18/(18+0) \times 100\% = 100.00\%$$

$$\text{Negative Predictive Value} = \text{TN}/(\text{FN}+\text{TN}) \times 100\% = 6/(3+6) \times 100\% = 66.67\%$$

$$\text{Diagnostic Accuracy} = (\text{TP} + \text{TN}) / \text{Total} \times 100\% = (18 + 6) / 27 \times 100\% = 88.89\%$$

DISCUSSION

Sensitivity assesses how well the ability of frozen section histopathology in identifying patients with malignant breast tumors in people who are sick. The value of sensitivity is influenced by false negatives and true positives. In this study, there were 3 false negative specimens where pathologists identified malignant specimens as benign in frozen section histopathology preparations so that the sensitivity value decreased. The first case is invasive carcinoma of no special type identified as fibrocystic change. Fibrocystic Change has large blob-shaped features on slides. The preparation of frozen section histopathology is prone to forming air bubbles with a larger visible cell nucleus Asri, A., & Winarko, S. (2015), resulting in appearances that look like Fibrocystic Change and misdiagnosis. Other false negative cases occur because the histopathology preparations folded and make it difficult to read so that pathologists identify the tissue as benign to avoid mastectomy. The specificity of this study reached 100% because there were no false positive cases so it can be said that the ability of the frozen section histopathology examination in identifying patients with benign breast tumors is very good.

The positive predictive value in this study reached 100%. The value of PPV is influenced by the results of its specificity so that the value is also high. The value of negative predictive value or NPV in this study is only 66.67%. This shows that the diagnostic value of frozen section histopathology still cannot be used as a basis diagnosis in cases of breast tumors that are predicted as benign. The accuracy of this study is 88.98% so it can be categorized well although there still has to be an evaluation to reduce the number of false negatives. Good accuracy value is one that is close to 100% Syah (2012). Compared to other researchers, Asri, A., & Winarko, S. (2015) reported in their study that the sensitivity of breast tumor frozen section reached 100%, specificity 95.65%, positive predictive value 98%, negative predictive value 100%, and accuracy 98.6%. The value are higher than this research because more sample were used and from 72 cases only 1 reported as false positive, it's mastitis or inflammation that is considered as malignancy.

Factors that affect the histopathological preparations of frozen section are divided into 3, namely Pre-analytic, Analytic, and Post-Analytic. In this study, the cause of false negatives is due to errors at the analytic stage, namely the appearance of air bubbles and folded preparations. The appearance of air bubbles can be caused because the fluid in the edema tissue freezes and expands so that it forms round ice crystals and presses on the surrounding tissues. Air bubbles can also occur due to the lack of attached glass cover to the tissue so that it gives space and filled air bubbles. Other factors that can affect the analytic process, are : tissue freezing, coloring, and interpretation of results. Cryostat temperature must be stable in order to have the right consistency. Over freezing will cause the tissue to be hard to cut while slow freezing of the tissue will form freezing artifacts that can interfere interpretation process. In the staining process, the pH of the eosin solution must remain in acidic (pH 5) so that the cytoplasm can be clearly colored. Eosin Hematoxylin solution must be replaced regularly to avoid pollutants appears on slides. Other misinterpretation, can be caused by the presence of larger-looking nuclei and air bubbles. Factors that affect pre-analytics, such as: complete data of the examination form, selection and tissue delivery. Samples used for frozen section histopathology should be fresh and should not be fixated. The selected area of tissue must contain the tumor cells so that the interpretation results is valid. Avoid sampling on hard areas such as bones and lots of fat.

The most number cases of breast tumors in frozen section histopathology and paraffin blocks was in 2019 with a total of 15 cases while the lowest was in 2021 with the number of 0 cases. Based on the data obtained, the number of breast tumor sufferers who do frozen section histopathology began to decrease since March 2020. The existence of the Covid-19 Pandemic makes people tend to isolate themselves at home and stay away from infectious places such as hospitals so that the number of patients decreases and also the number of frozen section histopathology examinations Moh, M. (2020). Based from the gender, all breast tumor sufferers who underwent frozen section histopathology at RSPAL dr. Ramelan Surabaya are women with a number of 27 sufferers. No cases with male gender have been reported. This difference can be affected by hormonal. The main sex hormone in men is testosterone so the chances of men getting breast tumors become smaller because the estrogen hormone in men is also slight Shah et al (2014).

Based on age analysis, breast tumors mostly affect women with the age range of 40-50 years. Compared to the UK and America where the average breast tumor sufferer is at the age of 65 and 70 years, then the majority of breast tumor sufferers in Indonesia are categorized in younger age range. Bagus, & Wibawa (2020) Some possibility why breast tumors come in younger age are due to brca 1/2 gene mutations. According to a study in 2015, researched by Kim, the distribution of BRCA 1/2 gene mutations in Asian women is higher when compared to Caucasian women Kim, & Goodman (2015). Another factor that may cause breast tumors appears in younger age is the environment.

Based on the type of tumor, FAM or Fibroadenoma Mammariae is the type of benign breast tumor that is mostly suffered. This tumor is one of the five types breast tumors with the highest number of sufferers, shaped

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like a lump with a chewy solid consistency and no pain. Although the incidence rate is high, FAM is easily cured with local surgery Alini, & Widya, (2018). While the most common malignant tumors suffered is the invasive carcinoma of no special type. As many as 75% of invasive breast cancers are invasive carcinoma of no special type. This type of malignant tumor is also often called Invasive Ductal Carcinoma Not Otherwise Specified (IDC-NOS) because many cases are derived from the ductal epithelium Avryna et al (2019).

CONCLUSION

The results of frozen section histopathology examination diagnostic tests researched at the RSPAL Anatomical Pathology Installation dr. Ramelan period January 2018 to May 2021 showed that the examination has sensitivity value of 85.71%, specificity of 100%, positive predictive value (PPV) of 100%, negative predictive value (NPV) of 66.67%, and accuracy of 88.89%. Frozen Section Histopathology has good diagnostic value for diagnosing breast tumors.

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Carboxyhemoglobin (CoHb) Levels In Active And Passive Smokers In Bangkalan Regency

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ABSTRACT

Carbon monoxide (CO) is a gas that has no flavor and no smell. high concentration of it harm for body. it will poison and even cause death. One of CO sources is cigarette smoke. When cigarette smoke is inhaled, the affinity of CO in the blood is higher than oxygen. The higher of CO level cause the higher of COHb (Carboxyhemoglobin) level. High COHb levels can lead to several diseases such as cancer and cardiovascular disease. This research was conducted to analyze the differences in COHb levels of active smokers and passive smokers in Lembung Paser village, Sepulu sub-district, Bangkalan regency. This is an analytic observational research by using quantitative research methods. purposive sampling use as sampling technique. COHb level was measured by using a UV-Vis spectrophotometer. Based on the results of the study on 14 respondents, the average CoHb level of active smokers was 6.6% with a standard deviation of 0.61. While in passive smokers obtained CoHb levels of 7.20% with a standard deviation of 0.78. Based on the results obtained, there is a significant difference between COHb levels in the group of active smokers and passive smokers. Based on the result it can be concluded that there is a significant difference between COHb levels in the active and passive smokers ($P < 0.05$).

Keyword: COHb, Active Smoker, Passive Smoker.

INTRODUCTION

Carbon monoxide (CO) is a gas that is harmful if inhaled and accumulates in the body (Soekamto, 2010). CO gas inhaled in the human body will block the entry of oxygen in the blood so that it will affect the body's metabolism. This is because CO gas reacts more easily with Hb because it has an affinity of 245 times so that Hb will more easily bind CO than O₂, causing the vital function of blood as a carrier to be disrupted. CO gas combines with Hb to form COHb (Dewanti, 2018). COHb was CO bounded Hb 200-300 times greater than oxygen. High COHb levels can lead to several diseases such as cancer and cardiovascular disease (Amalia et al, 2019). One source of carbon monoxide is the burning of cigarettes (Wimpy, 2020). Chemical substances contained in cigarette smoke consist of 4000 kinds and 200 of them are toxic because they contain carbon monoxide (CO), Polycyclic Aromatic Hydrocarbons (PAHs), and other cancer-causing particulates such as tar, benzo a pyrenes, vinyl chloride, nitri-sonarnicotine (Amalia, et al., 2019). CO toxicity is difficult to diagnose because symptoms are nonspecific, including headache, nausea, weakness, and altered mental status, and patients often do not report a history of exposure (Schimmel, 2017).

Based on the 2007 Riskesdas, the percentage of the population aged 10 years and over is 23.7% smoking every day, with details of 5.5% the criteria for smoking occasionally, 3.0% are ex-smokers and 67.8% are non-smokers. The prevalence of smokers in Indonesia continues to increase from year to year (Khoirotul, et al., 2014). Based on data from the Basic Health Research in 2007 – 2013 the smoking behavior of adolescents at the age of 15-17 years has not decreased at all. In fact, it tends to increase by 34.2% in 2007 and increase again in 2013 by 36.3%. Smoking is the cause of 87% of lung cancer deaths. The most active smokers were found in the age range of 30-34 years with a presentation of 33.34% (Wimpy, 2020). The level of CO poisoning is described in terms of the percentage of hemoglobin which is denoted as COHb. In general, the signs and symptoms of acute CO poisoning are when COHb levels range from 3 to 24%, while mild CO poisoning will be require medical attention when COHb levels exceed 20% (Ogunseye, 2018).

Cigarette smoke is a pollutant for humans and the surrounding environment. A person who does not smoke but inhales secondhand smoke is called a passive smoker. Passive smokers are more dangerous than active smokers, this is because cigarette smoke exhaled by active smokers and then inhaled by passive smokers has 5

times more carbon monoxide, 4 times more tar and nicotine. This causes the lungs to contain more CO than oxygen so that the O₂ level in the blood is approximately 15% than the normal O₂ level (Parwanti, 2015). Based on research conducted by (Dewanti, 2018) in the basement of the Surabaya Waterplace apartment, it was found that the levels of carbon monoxide (CO) gas in the blood of non-smokers were 1-6% and 1–14% in smokers. Increased levels of CO in the human body are associated with smoking habits and patients with chronic respiratory diseases. This indicates that exhaled CO is a marker of lung injury (Chawla, 2019). According to the 2013 Riskesdas data, it shows that the number of daily smokers is higher in rural areas (25.5%) than in urban areas (23.3%) and the prevalence of smoking is also higher among low socioeconomic groups, namely farmers, fishermen, and laborers. is with the largest proportion (44.5%) compared to other groups of workers. According to Joanne, children in rural areas are more likely to start smoking after age 12 than children in urban areas.

Lembung Paseser Village is a village located in the Bangkalan Regency, Ten District and the village is located in the east. In this village often found people who smoke. Starting from the market area, houses and public places as well. So many are exposed to cigarette smoke. Smokers range from teenagers to adults. Based on the description above, the researchers wanted to know the difference in levels of carboxyhemoglobin (COHb) in active smokers and passive smokers in Lembung Paseser Village, Sepulu District, Bangkalan Regency.

METHODS

The type of research used is Analytical Observational research with quantitative methods. The sample is COHb levels in the blood of active smokers and passive smokers of rice field workers who have been surveyed in Lembung Paseser Village, Sepulu District, Bangkalan Madura Regency. The sampling technique uses the Perposive Sampling technique, which is a technique for determining research samples with certain considerations aimed at obtaining representative data on the basis of inclusion and exclusion criteria (Anggarani, et al., 2016). The sample was taken as many as 14 active smokers and 14 passive smokers who are people who work as farmers and are located in Lembung Paseser Village, Sepulu District, Bangkalan Madura Regency. Before conducting the research, the research team submitted a certificate of ethics at the health research ethics committee of the Nahdlatul Ulama Surabaya University with certificate number No. 028/EC/KEPK/UNUSA/2021. This certificate was issued on March 20, 2021.

Equipment and materials used in measuring COHb (carboxyhemoglobin) include: forms, stationery, worksheets containing personal data, consent sheets as respondents), cameras for research documentation, syringes, tourniquets, coolboxes, Ethylene Diamine Tetra Acetate (EDTA) tubes, label sticker for blood sample stamps so as not to be confused, micropipette, yellow tip, blue tip, Ependorf tube, distilled water, 0.1% NH₄OH, Na₂S₂O₄ as reagent, sample (venous blood). For the method of data collection, the type of data collected is primary data based on examination of carboxyhemoglobin levels and filling out questionnaires by respondents obtained from several processes, as follow:

a. Pre-analysis

Venous blood sampling is done by preparing the tools and materials to be used and put it on the table. Determine the venous blood to be punctured. The area of the vein to be punctured is noted with watch out for inflammation or scars because it affects the test results. The puncture site was disinfected with 70% alcohol and let it dry. Place the tourniquet in the upper arm position proximal arm) 6-7 cm from the crease of the hand. Firm the skin above the vein with the fingers of the left hand so the veins don't move. With the eye of the needle facing up, the skin stabbed at an angle of 450 to 600 to the end needle into the lumen of the vein. The syringe is withdrawn slowly until the blood volume as much as 3cc. The tourniquet was removed, the cotton is placed over the needle and slightly pressed with the left finger, then the needle is withdrawn. The patient is instructed to press the cotton pad for 1-2 minutes and after that the puncture scars are given hansaplast plaster. The needle is closed and then released from the syringe. put blood in the test tube slowly (Amami, et al., 2017). Venous blood sample in a tube that has been given identity continues the process of work.

b. Analytical stage is the stage of testing the sample so that the results of the carboxyhemoglobin examination are obtained. Carboxyhemoglobin (COHb) levels was analyzed with two test tubes labeled R1 (reagent) and SPL (sample reagent). A total of 20 mL of 0.1% NH₄OH solution is added to erlenmeyer and added 10 L of blood sample then homogenized. The solution in the erlenmeyer is pipetted 4 mL then each is inserted into the tube R1 and SPL. A total of 20 mg of Na₂S₂O₄ was added to the SPL tube and homogenized. The mixture was incubated at 37°C for 8 minutes and measured absorbance R1 and SPL with UV-Vis spectrophotometer at wavelength 414.2 (Harningsih, 2019)

c. Post-Analytical

Sample concentration is determined based on absorption that has been obtained after measurement, then the results. The absorption can be converted into Equation 1 calculation as follows:

$$\text{CoHb Level: } (A/\text{Ar Hb}) \times 6,08\% \dots \dots \dots \text{Equation 1}$$

Information: A = reagen absorbance

Ar = standard absorbance

6,08 % = % saturation CO in Hb conversion factor

The percentage increase in COHb levels was calculated by Equation 2 where the normal value of COHb is 3.5%.

$$\text{Increased \%CoHb level: } (\text{CoHb level/Normal Value}) \times 100\% \dots \dots \dots \text{Equation 2}$$

Data analysis begins with performing calculations using statistics with the Independent t-test. Independent test is a parametric test used to determine whether there is a difference in the mean between two independent groups or two unpaired groups with the intention that the two groups of data come from different subjects using the SPSS (Statistical Package For Social Sciences) version 2 application

RESULTS

In this study, an examination of the difference in carboxyhemoglobin (COHb) levels in active and passive smokers in Lembung Paseser Village, Sepulu District, Bangkalan Regency was carried out on 28 research samples. The sample consisted of 14 active smokers and 14 passive smokers. In the active smoker group, 14 respondents were male with a percentage of 100%, while in passive smokers, 11 respondents were female with a percentage of 78.6% and 3 respondents were male with a percentage of 21.4%. In the active smoker group there were 14 respondents aged 30-40 years with a percentage of 57.1% and at the age of 41-45 years with a percentage of 42.9%, while in the passive smoking group there were 14 respondents aged 30-40 years with a percentage of 50.0% and at the age of 41-45 years with a percentage of 50.0%. There are 12 smokers who are in family members with a number of 1-2 people, which shows a percentage of 85.7%. A person's age is one of the susceptibility factors, because at the age of over 40 years there is a change and a decrease in the function of a person's organs in this case is the elasticity of the lungs and the function of enzymes to neutralize toxins. The older a person is, the more susceptible they are to CO exposure so that COHb levels will be higher (Hazsya et al, 2018)

Characteristic data based on active smokers showed that the number of cigarettes smoked in a day with a number of 1-10 cigarettes was 9 people (64.3%) and the number of cigarettes smoked in a day with a total of 11-20 cigarettes was 5 people (35.7%). . The places that are often used as smoking activities are at home 9 (64.3%) and in the work environment 5 people (35.7%). duration of smoking 1 year is 10 people (71.4%). While the characteristic data based on passive smoking shows that the number of smokers in a family of 1-2 people is 12 people (85.7%) and the number of smokers who are in family members is 3-4 people as much as 2 people (14.3%). Places that are often used as smoking activities are at home as many as 13 people (92.9%) and in the work environment as many as 1 person (7.1%). With a long exposure to cigarettes for 1 year as many as 13 people (92.9%).

Table 1. Characteristics of Research Samples on CoHb Levels in Active and Passive Smokers in Lembung Paseser Village, Sepulu District, Bangkalan Regency

Characteristics	Active Smokers		Passive Smokers	
	F	%	f	%
Age				
30-40 Years Old	8	57,1	7	50,0
41-45 Years Old	6	42,9	7	50,0
Gender				
Female	0	0	11	78,6
Male	14	100	3	21,4
Ammount of cigarettes smoked per day				

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1-10 sticks	9	64,3	0	0
11-20 sticks	5	35,7	0	0
Places that are often used as smoking activities				
Home	9	64,3	13	92,9
Rice Field	5	35,7	1	7,1
Long Consuming Cigarettes				
Less than 1 year	4	28,6	0	0
More than 1 year	10	71,4	0	0
Many Smokers in the Family				
1-2 people	-	-	12	85,7
3-4 people	-	-	2	14,3
Long Exposure to Cigarettes				
Less than 1 year	-	-	1	7,1
More than 1 year	-	-	13	92,9

Based on the results of the examination of COHb levels in active smokers, the average result was 6.60% with a standard deviation of 0.61

Table 2. Frequency Distribution of Respondents Based on COHb Levels of Active Smokers in April 2021.

Code	[COHb] in blood (%)	Level
PA-1	6.30	High
PA-2	7.12	High
PA-3	5.38	High
PA-4	7.53	High
PA-5	6.87	High
PA-6	7.20	High
PA-7	6.75	High
PA-8	5.50	High
PA-9	6.60	High
PA-10	6.79	High
PA-11	6.28	High
PA-12	6.99	High
PA-13	6.30	High
PA-14	6.91	High

(primary data)

Information:
Normal < 3.5%
High >3.5%

Table 2 shows that 0 respondents (0%) had normal COHb levels, 14 respondents (100%) had high COHb levels. Based on the results of the examination of COHb levels of passive smokers, the average result of 14 respondents was 7.20% with a standard deviation of 0.78

Table 3 Distribution of Respondents Frequency Based on COHb Levels of Passive Smokers April 2021

Code	[COHb] in blood	Level
------	-----------------	-------

	(%)	
PA-1	8.8	High
PA-2	6.76	High
PA-3	9.13	High
PA-4	6.94	High
PA-5	6.99	High
PA-6	7.17	High
PA-7	6.30	High
PA-8	6.08	High
PA-9	8.08	High
PA-10	6.72	High
PA-11	7.04	High
PA-12	7.40	High
PA-13	7.22	High
PA-14	6.79	High

(primary data)

Information:

Normal < 3.5%

High >3.5%

Table 3 shows that 0 respondents (0%) had normal COHb levels, 14 respondents (100%) had high COHb levels. The results of the bivariate analysis using the independent t test showed that the p value for active smokers and passive smokers was $p = 0.038$ ($p < 0.05$), which means that there is a difference between active smokers and passive smokers.

Table 4 Results of Independent T-Test
in the Active Smoker Group and Passive Smoker in April 2021.

Variabel	Sig (2-tailed)
Level COHb	0,038

(Primary data)

This study is in line with Siswanto's (1994) research that there is a difference between active smokers and passive smokers, because each puff of cigarette smoke contains 700-800 ppm CO. This study is also in line with Qauliyah (2017) research on COHb concentrations that passive smokers have a greater risk than active smokers. Passive smokers inhale cigarette smoke directly. This is very dangerous because the smoke that comes out in it contains thousands of chemical substances and one of them is CO.

DISCUSSION

CO is contained in cigarettes about 2-6%. The binding capacity of CO with Hb is 200 times stronger than the binding capacity of Oxygen with Hb. In heavy smokers, the concentration of COHb in the blood reaches 6.9%, this causes heavy smokers to easily get heart problems (Dewanti, 2018). People who don't smoke but are in the same room as people who are smoking have the same risk as people who smoke, because they inhale cigarette smoke so that it can increase COHb levels in the blood (Jannah&Martini, 2017). Within a half-life of 4-7 hours, as much as 10% of Hb can be filled with CO or COHb formation which causes red blood cells to lack oxygen. According to Yudha, CO gas also has a negative effect on the airways from the blood vessels so that people who are exposed to high levels of CO will have the potential to die from CO poisoning. A COHb levels that will appear between increased blood flow and mild headaches. In addition, acute CO toxicity manifestations that will appear include fatigue, dyspnea, palpitations, lethargy, vomiting, abdominal pain, headache and dizziness. Smoking can interfere with normal lung work because Hb is easier to carry carbon dioxide to form COHb than to carry oxygen. Where CO enters the body through the respiratory system. Enters through the bloodstream from the alveoli. Then CO will bind to Hb and form COHb. And this COHb will interfere with the interaction of the heme protein, which causes the breakdown of HbO_2 to experience the Haldane Effect. So that O_2 levels in the body decrease and COHb levels increase. People who smoke a lot (active smokers) and people who smoke a lot of cigarette smoke (passive

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smokers), can cause their lungs to contain more CO than oxygen so that O₂ levels in the blood are approximately 15% than normal O₂ levels. The reactions that occur in the body are:

O₂ + Hb → HbO₂ Reaction 1

CO + Hb → HbCO Reaction 2

The results of the bivariate analysis using the independent t test were obtained the p value in active smokers and passive smokers are p = 0.038 (p < 0.05), which means that there is a difference between active smokers and passive smokers. This study is in line with Siswanto's (1994) research that there is a difference between active smokers and passive smokers, because each puff of cigarette smoke contains 700-800 ppm CO. This study is also in line with Qauliyah (2017) research on COHb concentrations that passive smokers have a greater risk than active smokers. Smoker Passive inhalation of cigarette smoke through the nose directly. This is very dangerous because the smoke that comes out in it contains thousands of chemical substances and one of them is CO. According to Sukendro in Juniarti (2013) the CO content in cigarettes is around 2-6% where the binding capacity of CO with Hb is 200 times stronger than the binding capacity of Oxygen with Hb. In heavy smokers, the concentration of COHb in the blood reaches 6.9%, this is what causes heavy smokers to easily get heart problems (Dewanti, 2018). People who don't smoke but are in the same room as people who are smoking have the same risk as people who smoke, because they inhale cigarette smoke so that it can increase COHb levels in the blood (Wicaksono, 2017). Within a half-life of 4-7 hours, as much as 10% of Hb can be filled with CO or COHb formation which causes red blood cells to lack oxygen. According to Yudha, CO gas also has a negative effect on the airways from the blood vessels so that people who are exposed to high levels of CO will have the potential to die from CO poisoning.

According to Aryawan, et al (2002) with the COHb levels that will appear between increased blood flow and mild headaches. In addition, acute CO toxicity manifestations that will appear include fatigue, dyspnea, palpitations, lethargy, vomiting, abdominal pain, headache and dizziness. Smoking can interfere with normal lung work because Hb is easier to carry carbon dioxide to form COHb than to carry oxygen. Where CO enters the body through the system breathing. Enters through the bloodstream from the alveoli. Then CO will bind to Hb and form COHb. And this COHb will interfere with the interaction of heme proteins, which causes the decomposition of HbO₂ to experience the Haldane Effect. So that O₂ levels in the body decrease and COHb levels increase. People who smoke a lot (active smokers) and people who smoke a lot of cigarette smoke (passive smokers), can cause their lungs to contain more CO than oxygen so that O₂ levels in the blood are approximately 15% than normal O₂ levels. The reactions that occur in the body can be seen in reaction equation 1 and 2 above.

CONCLUSION

The results of the study on 14 samples of active smokers obtained an average CoHb level of 6.6% with a standard deviation of 0.61. Whereas in passive smokers, CoHb levels were obtained by 7.20% with a standard deviation of 0.78. CoHb levels in 14 samples of active smokers and passive smokers were less accurate, so there was a significant difference in the average CoHb levels in the active smokers and passive smokers. It is recommended for further research to examine CoHb levels using the CO-Oximeter method.

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Representation of NLR (neutrophil lymphocyte count ratio) values in coronavirus patients (Covid-19) by age group at Gatoel Mojokerto Hospital

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ABSTRACT

Currently the world is faced with the condition of the Corona virus disease pandemic 2019 (Covid-19) whose cases are still increasing over time and widespread around the world. The Covid-19 pandemic is still a health problem throughout the country, not least in Indonesia. Covid-19 is an acute respiratory disease caused by a new type of coronavirus infection or later named Severe acute respiratory syndrome 2 (SARS-CoV-2). The purpose of this study was to find out the difference in the results of neutrophil lymphocyte ratio (NLR) between Covid-19 patients with productive age and elderly age. In Covid-19 patients with elderly age has a high NLR value above ≥ 3.13 with a percentage of 83% while in Covid-19 patients of productive age also has a high NLR value above ≥ 3.13 by 75% but the value is still lower than in Covid-19 patients with elderly age. It can be concluded that Covid-19 patients with elderly age and productive age have differences in NLR values although the same has a high NLR value above ≥ 3.13 and based on the results of this study in Covid-19 patients with elderly age and productive age have low lymphocyte values or experience lymphopenia.

Keywords: Covid-19, Elderly Age, Productive Age, Neutrophil Lymphocyte Ratio

INTRODUCTION

At the end of 2019 precisely in December, the world was horrified by an event that made many people restless, namely known as the corona virus (covid-19). The incident began in China, Wuhan. At first this virus was thought to be the result of exposure to the huanan seafood wholesale market which sells many species of live animals. The disease is rapidly spreading domestically to other parts of China. From December 18 to December 29, 2019, five patients were treated with Acute Respiratory Distress Syndrome (ARDS). From December 31, 2019 to January 3, 2020 this case increased rapidly, marked by the reported number of 44 cases (Putri et al., 2020).

The death rate from the coronavirus in Indonesia is highest in Asia after China, 181 people died, the percentage of deaths 9.11%, the number of coronavirus cases 1,986 cases, cured 134 people. Until April 5, 2020 confirmed Covid-19 amounted to 2,273 people, cured 164 people and died 198 people. Considering the Covid-19 outbreak is a global problem in countries in the world including Indonesia. (Syafri et al., 2020).

The virus first carried out animal-to-human transmission at a wet market in China's Wuhan in December 2019 and eventually maintained human-to-human transmission. The way of human-to-human transmission has been identified as through droplets and direct or indirect contact through the touch of objects. (Istanto et al., 2020). People most at risk of contracting this disease are people who are in close contact with COVID-19 patients including those who treat COVID-19 patients. Common signs and symptoms of covid-19 infection include symptoms of acute respiratory distress such as fever, cough, and shortness of breath. The average incubation period is 5 - 6 days with an incubation period of fever, cough, and shortness of breath. In severe cases, covid-19 can cause pneumonia, acute respiratory syndrome, kidney failure, and even death (Putri et al., 2020)

Hematology test is one of the supporting diagnostics test to assess the severity of the disease and predict the risk in COVID-19 patients (Mus et al., 2020). The researchers concluded that some of the significantly altered hematological parameters in COVID-19 patients were leukocyte levels, lymphocyte levels, neutrophil levels, as well as neutrophil-lymphocyte ratios. Currently NLR is a powerful new inflammatory marker for detecting inflammation. NLR is superior to the total number of leukocytes, the number of neutrophils, or the number of lymphocytes as inflammatory markers, as they are less affected by a number of physiological conditions, such as

dehydration or physical activity. In addition, NLR testing has advantages over other inflammatory markers, such as CRP or interleukin, because it is easy to do and inexpensive. The ratio of neutrophils to lymphocytes can be calculated quickly from a routine complete blood test, so doctors can identify patients at high risk for COVID-19 at an early stage. In COVID-19 infection, the number of leukocytes, lymphocytes, monocytes and platelets was lower than in the non-COVID 19 group. The ratio of neutrophils to lymphocytes was significantly higher in the COVID-19 group. An increase in NLR in COVID-19 patients is associated with the severity of the disease (Widya et al., 2020).

The Neutrophil-Lymphocyte ratio used to assess the degree of inflammation in some diseases. In COVID-19 disease, NLR can be used as a predictor of disease severity in the early phases of the disease's course. In 61 COVID-19 patients in China, NLR was an independent risk factor for critical illness with half of patients aged ≥ 50 years old and $NLR \geq 3.13$ would be critically ill on care while only 9.1% of patients aged ≥ 50 and $NLR < 3.13$ would be critically ill during treatment. NLR and Absolute Lymphocyte Count are inexpensive, easy to obtain, and can predict the severity of inflammation in COVID-19 infection, so this test may be used for early detection of COVID-19 infection in health facilities with limited means. (Bunawan et al., 2020). This study aims to find out representation of NLR (neutrophil lymphocyte count ratio) value in coronavirus patients (covid-19) by age group at Gatoel Mojokerto Hospital.

METHODS

This type of research is descriptive, with the aim of knowing the representation of the NLR (*neutrophil lymphocyte ratio*) value in productive age and elderly COVID-19 patients at Gatoel Mojokerto Hospital. The study was conducted at the Laboratory Installation of Gatoel Mojokerto Hospital in April – June 2021. The population in this study were the productive age and the elderly who did a complete blood count and saw the NLR value. The sample of this study was the productive age and the elderly who were tested positive for COVID-19 at the Gatoel Mojokerto Hospital. The data was taken based on the results of the NLR testing at the Gatoel Mojokerto Hospital Laboratory which was carried out for 1 month. Data collection has been approved by the ethics committee of Gatoel Mojokerto Hospital through an ethics clearance. The variable in this study is the NLR (neutrophil lymphocyte ratio) value in productive age and elderly COVID-19 patients at Gatoel Mojokerto Hospital. The data collection technique was obtained from the laboratory based on data on the value of the neutrophil lymphocyte ratio (NLR) in productive and elderly people at Gatoel Mojokerto Hospital. The principle of NLR testing is the division of the absolute number of neutrophils by absolute number of lymphocytes which is carried out automatically using a hematological analyzer. The data obtained from the test results are then tabulated in tabular form.

RESULTS

The results of data collection conducted during April-June 2021 in Coronavirus (Covid-19) patients who conducted Complete Blood tests at Gatoel Hospital as many as 84 data, namely with the characteristics of respondents consisting of 44 patients of productive age (23 men & 21 women) and 40 elderly patients (21 men & 19 women) obtained the following data results:

Table 1. Data on The Calculation of Mean and Standard Deviation in Covid-19 Patients of Productive dan Elderly Age in April - June 2021

Age	Calculation Results		
Productive Age	Neutrophil	MEAN	68,45
		SD	12,03
	Lymphocyte	MEAN	24,2
		SD	10,8
	NLR value	MEAN	17,76
		SD	8,43
Elderly Age	Neutrophil	MEAN	73,4
		SD	10,5
	Lymphocyte	MEAN	17,5
		SD	7,5
	NLR value	MEAN	19,41
		SD	8,9

Analysis of NLR Value Data at Productive Age

Data from blood test results complete with the collection of NLR value data at Gatoel Mojokerto Hospital, then the data is analyzed by percentage. Listed results as follows:

Table 2. Test Results in Covid-19 Patients of Productive Age in April – June 2021

Age	Test Result			
Productive Age	NLR value		n	%
		<3,13	11 patient	25%
		≥3,13	33 patient	75%
Total			44 patient	100%

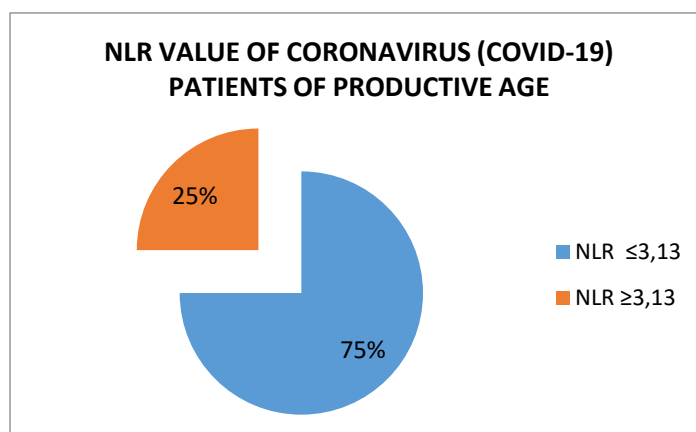


Figure 1. Diagram percentage of NLR Value Research Results in Coronavirus (Covid-19) Patients at Productive Age at Gatoel Mojokerto Hospital In April - June 2021.

Based on the percentage diagram above describes the results of blood tests complete with NLR value data in covid-19 patients at Gatoel Mojokerto Hospital, which is distinguished by two colors, namely blue and red, red indicates a normal value of 25% in 11 patients, while blue indicates a high NLR value of 75% in 33 patients.

Analysis of NLR Value Data at Elderly Age

After obtaining data from the results of blood tests complete with the collection of NLR value data at Gatoel Mojokerto Hospital, then the data is analyzed by percentage. Listed results as follows:

Table 3. Test Results in Elderly Age Covid-19 Patients in April – June 2021

Age	Test Result			
Elderly Age	NLR Value		n	%
		<3,13	7 patient	17,5%
		≥3,13	33 patient	82,5%
Total			40 patient	100%

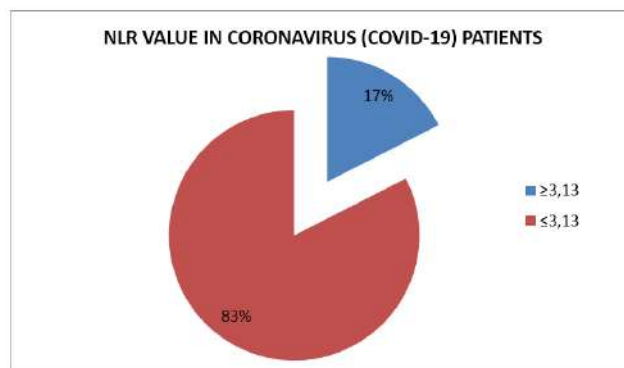


Figure 2. Diagram percentage of NLR value research results in coronavirus patients (Covid-19) in elderly age at Gatoel Mojokerto Hospital in April - June 2021.

Based on the percentage diagram above describes the results of blood tests complete with NLR value data in elderly covid-19 patients at Gatoel Mojokerto Hospital, which is distinguished by two colors, namely blue and red, blue indicates a normal value of 17% in 7 patients, while red indicates a High NLR value of 83% in 33 patients.

DISCUSSION

Scientific Research with the title of overview of NLR values in patients infected with coronavirus (Covid-19) using descriptive research design. Based on the results of data collected and collected from LIS (Laboratory Information System) in coronavirus patients (Covid-19) that has been done at Gatoel Mojokerto Hospital in April to June 2021 to obtain the results of NLR values in routine blood tests with patients infected with coronavirus (COVID-19) with RT-PCR method obtained data as many as 84 respondents consisting of two groups, namely productive age and elderly age, The productive age itself is from 20-60 years while the elderly age is over 60 years old, then the data I have obtained is 44 respondents of productive age and 40 respondents of elderly age. The overall results obtained from the data are NLR values at productive age with high scores of 33 respondents and NLR values that are below the cut off limit of 11 respondents. While NLR values in the elderly with high scores there are as many as 33 respondents and NLR values that are below the cutoff limit as many as 7 respondents.

Neutrophil lymphocyte ratio (NLR) is one component of early warning score (EWS) or an early warning parameter that is useful as a marker of inflammatory reactions in a person's body and is an indicator of complications (Rosales, 2018). NLR values can be used as an increase in evaluation capacity to assess prognosis, evaluate the degree of disease based on clinical symptoms of patients, and determine the right treatment in Covid-19 patients and also as a cheap test parameter because it is only by calculating the value of neutrophil and lymphocyte levels in patients who perform complete blood tests (Yuliana et al., 2020).

Based on the results of the study also found that the percentage of patients who experience lymphopenia in elderly Covid-19 patients is higher compared to productive age. An increase in NLR values in Covid-19 patients indicates a decrease in the number of lymphocytes as well as an inflammatory reaction caused by SARS-CoV-2 infection. The SARS-CoV-2 virus infects circulating immune cells and causes increased apoptosis or cell death and leads to decreased lymphocyte levels in the blood, especially in covid-19 patients who tend to develop lymphopenia and worsen inflammation (Xiong et al., 2020).

In this study, NLR scores were observed in the productive and elderly. Results obtained from the laboratory test NLR value in productive age increased by 75% while NLR value in the elderly age increased by 83%. Based on the results obtained in this study it is known that NLR values that are more than 3.13 (abnormal) in elderly Covid-19 patients are higher than those of Covid-19 patients of productive age even though Covid-19 patients of productive age NLR values are also high more than 3.13 with a percentage still above 50%.

While at the level of age grouping is more vulnerable at the age of the elderly than at the productive age is characterized by the productive age of the imunya system is stronger than the elderly age. And also if in the elderly age has comorbid diseases allow also the rise of NLR values. In Covid-19 patients. In the elderly population, immunosensens can occur both in hematopoietic stem cells and in the innate and adaptive immune system. The reduction and aging of the immune system accompanied by comorbid will increase the susceptibility and fatality rate of COVID-19 in old age. (Widya, et al., 2020)

Although NLR values in Covid-19 patients with elderly age are higher or exceed normal values compared to Covid-19 patients of productive age, clinical symptoms found in the field there is no significant difference in the form of symptoms commonly felt in Covid-19 patients, namely cough, fever, shortness of breath. however, the average length of hospital treatment time is longer in Covid-19 patients with comorbid (≥ 20 Days) compared to

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Covid-19 patients without comorbid (≤ 20 Days). In previous studies, high NLR value correlated with the amount of time needed for the recovery process of Covid-19 patients in the hospital there are several factors that affect the length of time patients are treated until it actually becomes negative SARS-CoV-2 virus, namely hospital treatment, hospital costs, and the severity of Covid-19 patients (Liu et al., 2020).

CONCLUSION

Based on the results of research on Representation of NLR (neutrophil lymphocyte count ratio) values in coronavirus patients (covid-19) by age group at Gatoel Mojokerto Hospital with a total of 84 patients, namely 44 patients of productive age and 40 elderly patients during April-June 2021 it can be concluded that the elderly have a high NLR value above ≥ 3.13 with a percentage of 83% while in Covid-19 patients of productive age also have high NLR values above ≥ 3 , 13 is 75% but the value is still lower than in covid-19 patients with elderly age.

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A MINI REVIEW OF NATURAL ANTIOXIDANT FOR ALZHEIMER'S DISEASE

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ABSTRACT

Alzheimer's disease (AD) is the leading cause of dementia, an estimated 5 million people in the US suffer at a cost of more than \$70 billion per year. The main theories on the causes of AD include amyloid-beta (A β), tauopathy, inflammation and oxidative stress. The purpose of writing this review article is to look at the various types of natural antioxidants and the mechanism of action of each against AD therapy. **Method:** this article reviews antioxidants to activity of action against AD. The following databases were searched from their inception: Google scholar, Science direct, PubMed. The document relevant analyzed and included in the review. Therefore, this paper mainly focuses on the recent developments of common used antioxidant therapies for AD. **Results:** Alzheimer's disease correlates with free radicals which can be minimized by consuming natural antioxidants from foods such as vitamins C and E, carotenoids (β -carotene and astaxanthin), Flavonoids, Green tea, Huperzine, Ginkgo biloba, Centella asiatica, Curcumin, Melissa officinalis, Polygala tenuifolia, Salvia miltiorrhiza and Withaniasomnifera (L), with a variety of different mechanisms of action for each of these types of natural antioxidants. **Conclusion:** The therapeutic potential of AD in natural antioxidants plays an important role in prevention and treatment

Key Words: Natural antioxidant, Alzheimers disease, Mechanism of action, Prevention and Treatment

INTRODUCTION

Alzheimer's disease is a degenerative brain disease and the most common cause of dementia¹. The number of the disease is projected to reach 106.8 million worldwide by the year 2050, therefore, the disease is a growing public health concern with major socioeconomic burden². The risk of AD varies from 12% to 19% for women over the age of 65 years and 6% to 10% for men³ and rises exponentially with age, such that up to 47% of individuals over the age of 80 develop AD⁴. Dementia is a syndrome, a group of symptoms that has a number of causes. The characteristic symptoms of dementia are difficulties with memory, language, problem-solving and other cognitive skills that affect a person's ability to perform everyday activities. These difficulties occur because nerve cells (neurons) in parts of the brain involved in cognitive function have been damaged or destroyed.

METHODS

A comprehensive literature search was performed from the inception of the study on these online databases: Google scholar, Science direct and PubMed. The search terms that were used were "natural antioxidant", and "Alzheimer's Disease". The search was limited to English articles only.

RESULTS AND DISCUSSION

Alzheimer's disease is highly correlated with free radicals and cellular redox imbalance⁵. Have become the culprit for influencing human health. In order to scavenge superfluous free radicals and maintain the balance of homeostasis in human body as well as accomplish the prevention and treatment of diseases, the consumption of antioxidants is necessary. However, synthetic antioxidants have toxic effects to some extents. Therefore, the uptake of natural antioxidants from foods is the first choice because natural antioxidants not only play an important role in the prevention and adjunctive treatment of diseases but also can avoid the adverse reactions to human health. In this article, common natural antioxidants such as vitamins (vitamin C and E), carotenoids (β -carotene and astaxanthin), flavonoids and some traditional herbal antioxidants also exhibit potential for AD therapy in foods are summarized. In the antioxidant Systems, Endogenous defense mechanisms, including enzymatic antioxidant systems and cellular molecules, protect against free radical-induced cellular damage. SOD, catalase, and glutathione peroxidase are three primary enzymes involved in direct elimination of active oxygen species (superoxide radical and H_2O_2). A number of dietary factors such as antioxidants, vitamins, polyphenols, and fish have been reported to decrease the risk of AD⁶. A summary of the natural antioxidant used to treat AD is presented in table 1, from this table are enumerated of describing natural antioxidants, foods rich in natural antioxidants and references

Table 1. The natural antioxidants in prevention and treatment of Alzheimer's disease.

Natural antioxidants	Foods rich in natural antioxidants	Reference
Vitamin E (α -tocopherol)	Corn oil, Soybean oil, Margarine, and Dressings	7
vitamin C	Citrus fruits, Broccoli, Russels sprouts, Raw bell peppers, and Strawberries	8
β -carotene	Spinach, Kale, Cantaloupe, Mangoes, Pumpkin, Papayas, Carrots and Sweet potatoes	9
Astaxanthin	Shrimp shell, Oysters and Salmons	10
Green tea	Green tea	11
Flavonoids	Plants, Berries, Honey Chinese herbs	12
Huperzine A	Extract of Huperzia serrata	13
Ginkgo biloba	The Ginkgo tree extract EGb 761	14
Curcumin	Curcumin root	15
Centella asiatica	Centella asiatica leaf	16
Melissa officinalis (Labiatae)	Melissa officinalis leaf	17
Polygala tenuifolia (Polygalaceae)	Polygala tenuifolia (Polygalaceae) root	18
Salvia miltiorrhiza bung	Salvia miltiorrhiza bung root	19
Withania somnifera (L.) Dun	Withania somnifera (Solanaceae) root	20

In the aging model mice induced by *D*-galactose, astaxanthin treatment can recover the activities of GSH-Px and SOD, enhance GSH content and reduce oxidative stress, improve pathological injury of hippocampus, and increase the expression level of BDNF, thus achieving the anti-aging role finally¹⁰. Green tea polyphenols have obvious protective effect on neurodegenerative diseases such as Alzheimer's disease. In the pathogenesis of AD, amyloid beta ($A\beta$) aggregation can lead to the generation of a large amount of free radicals such as active oxygen species and active nitrogen species, correspondingly resulting in oxidative stress and accelerating neuronal death. (–)-Epigallocatechin-3-gallate (EGCG) as the effective component in green tea polyphenols was reported to significantly reduce the $A\beta$ deposition in transgenic mice with the over-expression of $A\beta$ and increase the activity of α -secretase, suggesting that green tea polyphenols have an important role in decreasing oxidative stress in the

brain of AD patients²¹. Another study on model mice with high-fat and high-sugar diet for 4 weeks and green tea polyphenol solution instead of drinking water revealed that green tea polyphenols can result in the significant reduction in the permeability of large artery and ROS levels as well as protein expression level of NAD(P)H oxidase subunit p22^{phox} and p67^{phox} in high-fat and high-sugar diet-induced model mice. As NAD(P)H oxidase is an important source of ROS *in vivo*, the antioxidant effect of green tea polyphenols *in vivo* may implement through inhibiting the expression of NAD(P)H oxidase²². The contents of derivatives from ROS metabolites in patients with hepatocellular carcinoma reveal a significant decrease when provided with green tea tablets during the chemotherapy treatment²³. In addition, the free radical analysis system 4 (FRAS4) has shown that the potential of biological antioxidant is greatly improved. Moreover, green tea polyphenols also have an important function in inhibiting tumor and inflammation^{24,25,26}. The flavonoids extracted from some plants have an excellent antioxidant function for the protection of vascular system and the treatment of arthritis and Alzheimer's disease. In arthritis model mice treated through oral administration of *Daphne genkwa* flavonoids extract at the dose of 50 mg/kg for 15 consecutive days, the arthritis score (ACS) was decreased while the expression of SOD and GSH-Px enzymes was increased when compared with the control group^{27,28}. A study on 32 elderly people treated with fresh *G. biloba* extract revealed the improved microcirculation of skin and liver, accelerated scavenging of free radicals and the improvement of arteriosclerosis. 30 days after 270 mg *G. biloba* extract or placebo treatment, the red cell perfusion nodes and blood flow of small veins, and red blood cell volume revealed an obvious higher in the *G. biloba* extract treatment group when compared with the control group. Moreover, a significantly higher level of GSH as a radical scavenger in the *G. biloba* extract treatment group than that of the control group was also observed. Therefore, *G. biloba* has a beneficial effect on the health of the elderly population²⁹. Flavonoids from *Panaxnotoginseng* have strong antioxidant activity³⁰. *Salvia miltiorrhiza* also contains a lot of bioactive components with antioxidant and anti-inflammatory functions. Guo et al reported that tanshinol plays a protective role in apoptosis induced by γ -ray through reducing the generation of ROS, inhibiting the release of cytochrome C and blocking the activation of apoptotic factors³¹. The pretreatment of tanshinol on L-02 cells can significantly reduce the level of ROS caused by γ -ray and the activity of Caspase 3 as well as the expression of Bax. Tanshinone IIA can weaken neuronal damage induced by hydrogen peroxide³². Flavonoids in *Glycyrrhiza* such as licorice chalcone and licorice isoflavones also have strong antioxidant activity, which plays an important role in the clearance of free radicals and prevention of diseases^{12,33}. Another prescription “Suhexiang pill” can reduce A β deposition in model mice with Alzheimer's disease, enhance memory and inhibit the apoptosis caused by A β and decrease oxidative stress in brain³⁴. A natural antioxidant mechanism of action of AD reviewed are presented in Table 2

Table 2. Natural antioxidant mechanism of action of AD

Natural antioxidant	Mechanism of action /target	Reference
Vitamin E (α -tocopherol)	Suppresses brain lipid peroxidation and significantly reduces A β levels and senile plaque deposition	35
Vitamin C	Decrease high levels of isoprostanes and oxidative stress <i>in vivo</i> , enhance NO bioavailability, restore the regulation of shear stress in arterioles, and normalize systemic blood pressure	36
β -carotene	Synergistically interact against lipid peroxidation	37
Astaxanthin	The involvement of extracellular signal-regulated kinases 1 and 2 (ERK1/2) signaling and the downstream activation of HO-1 on observed neuroprotection from the amyloid beta peptides. AXT ultimately reduced apoptotic-related mediators caspase 3 and Bax	38
Green tea	EGCG The principal bioactive component found in green tea, has anti-inflammatory properties by modulating different molecular pathways. Regarding AD's syndrome, EGCG mainly induces reduction in A β accumulation, by modulating several biological mechanisms.	39
Flavonoids	Their specific interactions within the ERK and PI3-kinase/Akt signaling pathways, at the level of receptors or kinases, have been shown to increase the expression of neuroprotective and neuromodulatory proteins and increase the number of, and strength of, connections between neurons.	40
Huperzine A	Reduce glutamate-induced toxicity in neurons, possibly through modulation of glutamate-NMDA receptor interaction, or of the passage of Ca ²⁺ through associated ion channels	13

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Gingko biloba	Block Abeta1-42-induced Ca ²⁺ dyshomeostasis mediated by formation of toxic mediators such as H ₂ O ₂ and PAF	41
Curcumin	Corrected Abeta-induced caspase-3 activation, Bcl-2 downregulation and Akt phosphorylation	42
Centella asiatica	Protect cortical neurons from glutamate-induced excitotoxicity in vitro	43
Melissa officinalis (Labiatae)	Inhibitor of AChE and binding to muscarinic and nicotinic receptors	44
Polygala tenuifolia (Polygalaceae)	Upregulated choline acetyltransferase (ChAT) activity and increased nerve growth factor (NGF) secretion	44
Salvia miltiorrhiza bung	Inhibit neuronal cell death by inhibition of presynaptic glutamate release, and nitric oxide (NO) formation.	19
Withaniasomnifera (L.) Dun	Reversed the reduction in cholinergic markers (e.g. ACh, ChAT). Enhances liver LRP (low density lipoprotein receptor- related protein) and decreases β -Amyloid formation by A β - degrading protease neprilysin (NEP) in brain	45

CONCLUSION

Antioxidants play an important role in counteracting free radicals and maintaining the balance of the body. In modern life, the application of synthetic drugs for health care and disease prevention does not seem the optimal choice. The contribution of natural antioxidants plays an important role in the prevention and treatment of AD, and can meet the demands of modern society. The process of extracting and preserving natural antioxidants is a development target for the food and health care industry in the future. The following natural antioxidants have different mechanisms of action such as vitamin E and carotenoids (β -carotene) which can suppress lipid peroxidation and reduce A β levels, Vitamin C reduces isoprostane levels and oxidative stress, Astaxanthin works to suppress the apoptotic mediators caspase 3 and Bax, Flavonoids as neuroprotective, neuromodulator and synaptogenesis, Green tea has the main bioactive component EGCG as an anti-inflammatory and induces a reduction in A β accumulation, Huperzine A modulates glutamate-NMDA receptor interactions, Ginko biloba works to block Abeta1 -42, Centella asiatica works to protect cortical neurons from glutamate-induced excitotoxicity, Curcumin activates corrected Abeta-induced caspase-3 and downregulates Bcl-2 and Akt phosphorylation, Melissa officinalis inhibits AChE and binds to muscarinic and nicotinic receptors, Polygala tenuifolia activates secretion nerve growth factor (NGF), Salvia miltiorrhiza bung works to inhibit neuronal cell apoptosis by inhibiting presynaptic glutamate release and nitric oxide (NO) formation, Withaniasomnifera (L) works to reduce A β formation by the neprilysin protease (NEP). Each of these natural antioxidants has a different mechanism of action in endogenous defense, including enzymatic antioxidant systems and cellular molecules, protecting against cellular damage caused by free radicals.

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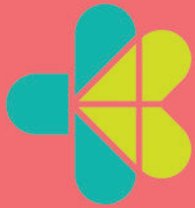
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OVERVIEW OF BEHAVIOR
AND CONTROL OF DENGUE FEVER
IN THE WORK AREA OF THE SABOKINGKING PALEMBANG HEALTH
CENTER
YEAR 2020

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ABSTRACT

Introduction : DHF, one of the infectious diseases that attacks children, is characterized by high fever and bleeding in the nose (nosebleed), bleeding in the skin. DHF is an infectious disease that attacks children characterized by high fever and nose bleeding (nosebleed) bleeding on the skin. **Purpose :** The purpose of this study was to describe the level of knowledge, attitudes and actions of mothers in the work area of the Sabokingking Health Center. **Methods :** This type of research is descriptive analytic, with a cross sectional study approach in the work area of the Sabokingking health center in Palembang in 2020. The study was conducted on 02-30 June 2020. The study population was all patients who complained of fever to the Sabokingking Health Center. The research sample was 59 samples, and data were collected by means of a questionnaire with purposive and accidental techniques. Data collection with primary and secondary data. Data is processed by editing, coding, entry. The research used is descriptive quantitative research, and analyzed by univariate analysis. **Results :** The results of this study were good knowledge of 30 people (50.8%), positive attitude of 28 people (47.5%) and good actions of 37 people (62.7%). **Conclusion :** The conclusion of this study is that the respondent's knowledge is still lacking in knowing the prevention of *Aedes aegypti* mosquitoes, the attitude of the respondents is more likely to show a negative attitude than a positive one and many actions show less good action than good action. coding, entry. The research used is descriptive quantitative research, and analyzed by univariate analysis.

Keywords : Knowledge, Attitudes, and Actions

INTRODUCTION

A. Background

Dengue Hemorrhagic Fever (DHF) is an infectious disease caused by the bite of the *Aedes aegypti* mosquito, this disease mainly affects children, but in recent years there has been an increasing number of reported cases of DHF in adults, characterized by high fever and nosebleeds (nosebleeds) on the skin, if you don't get help right away it can cause death within a few days, this disease has no cure, the first aid that can be done is to drink as much as possible (Sunarti, 2011).

The role of the community is very important in eradicating DHF because it is the people who are closest to the environment and the first person to solve community problems, without neglecting the role of an implementation of the Eradication of Mosquito Nests – Dengue Hemorrhagic Fever (PSN-DHF) which is carried out regularly and routinely. . The PSN activities are draining, closing, and burying water reservoirs (Rezeki, 2011).

Dengue Hemorrhagic Fever is caused by a virus called the Dengue Virus, which is transmitted to humans through mosquito bites, which are commonly known as *Aedes aegypti* and *Aedes albopictus*, which are mostly found in Indonesia with black and white spots all over their bodies. From this, a way to prevent / eradicate this disease was developed, namely by breaking the chain of transmission by killing the vector, namely the *Aedes aegypti* mosquito (Depkes RI, 2010).

Ministry of Health (Ministry of Health) noted that since January 2020 until now there have been 17,820 cases of Dengue Hemorrhagic Fever (DHF) in Indonesia. The three highest provinces in dengue cases are Lampung, East Nusa Tenggara (NTT), and East Java (Jatim). The details, Lampung as many as 3,431 cases, NTT 2,732 cases, and East Java 1,761 cases. Of the thousands of cases, 104 of them died. East Nusa Tenggara is the province with the highest death rate, which is 32 people. (Ministry of Health RI, 2020).

The highest transmission (transmission) of the Dengue Virus is in children under 15 years old, namely school children, especially from Kindergarten, Elementary School to Junior High School. Children over 15 years and over are usually immune. The vector of this disease is the *Aedes Aegypti* mosquito, a mosquito that only bites actively during the day. At school, children gather from various places, especially during the day, which is the same as the time of the highest biting activity of the *Aedes Aegypti* mosquito. If there is an infective *Aedes Aegypti* mosquito, meaning that there is already a Dengue virus in the salivary glands, it is possible that the virus was obtained from students who are sick at school or from people around the school. by itself the spread of the dengue virus to all school children will occur very quickly. Coupled with the nature of the *Aedes aegypti* mosquito that likes to bite around (multiple bites). School children usually come from various places, so that in a relatively short time the transmission that occurs in schools will soon be spread to all majors. (Depkes RI, 2011).

In relation to the outbreak of dengue fever, from the results of field research, it is known that the outbreak of dengue fever occurred due to the high number of dengue vector density (House index more than 10%) in the area. To prevent the occurrence of dengue outbreaks by eradicating vectors with immunization and treatment of patients, it has not been found yet. One way to eradicate mosquito nests (PSN) carried out by the community is known as 3M (draining, burying and getting rid of objects that can cause mosquito breeding grounds) (Riddamayanti, 2011).

As of January 29, 2019, based on data released by the Ministry of Health cases DHF totaling 13,683. The number of patients who died was 133 people. Director of Vector and Zoonotic Diseases of the Ministry of Health, Siti Nadia Tarmizi, said that based on provisional data compiled by the Ministry of Health from the beginning of the year to January 29, 2019, the number of DHF sufferers reported reached 13,683 people throughout Indonesia.

The increasing number of dengue cases continues to be reported. As of February 3, 2019, the number of dengue patients reached 16,692 cases. with 169 people declared dead. The Director of Vector Infectious Diseases and Zoonoses Control of the Ministry of Health, Siti Nadia Tarmizi, said that the highest number of dengue cases was in East Java with a total of 2,657. The second position in the West Java region with the number of sufferers 2,008 people. And the third largest area is in NTT and Kupang with a total of 1,169 sufferers (Riskseddas, 2019).

Data on DHF Cases Per Regency/City of South Sumatra Province, Palembang City in 2019 there were a total of 169 cases. In 2019 they are as follows: Palembang 883, Muaraenim 480, OKI 499, Prabumulih 301, Banyuasin 213, Musirawas 184, LubukLinggau 148, OganIlir 103, Pagaralam 98, Lahat 91, Muba 62, OKU 29, OKUT 12, OKUS 12 and Four Lawang Zero (P2 DBD District/City Health Office, 2019).

Dengue Hemorrhagic Fever (DHF) is still a concern in Palembang City, considering that until now the number of residents affected by DHF is still relatively high. Data from the Palembang City Health Office recorded 59 residents who were positive for DHF (Palembang City Health Office Profile, 2019).

According to Liza's research (2017), it is known that community attitudes really need to be instilled in caring for DHF disease to family members to introduce the risk of getting DHF disease (64.2%). However, the obstacle that still often occurs in the community is public ignorance about community actions for prevention and eradication programs such as lack of home care, houses with puddles of water so that mosquito larvae breed in puddles (39.0%) (Sungkar et al. , 2017).

According to research conducted by Ida Puspita (2018) in Bojonegoro, Banyuwangi Regency, the results obtained are: the number of respondents related to the knowledge of parents with the incidence of DHF is 26 people (44.83%) higher than the attitude of parents with the incidence of DHF which is 14 respondents (24.14 %), while the eradication of mosquito nests only 7 respondents (12.07%).

Several health centers located in the area of the Palembang City Health Office, the working area of the 2019 Sabokingking Health Center is an area that is endemic for dengue fever based on data for three consecutive years found the presence of dengue cases by looking at data from the Palembang City Health Office obtained data per year, i.e. there were 60 patients in In 2016, there were 73 patients and in 2017 there were 81 patients and in January 2018 there were 59 cases of DHF.

Based on the background of the problem, the number of dengue fever is still high, both in the city of Palembang and in the village. So the researcher formulated the research problem "How is the description of the behavior of dengue control in the work area of the Sabokingking Health Center Palembang in 2020"?

General purposes It is known how the description of the behavior of dengue control in the working area of the Sabokingking Health Center Palembang in 2020. Special purpose are known that the description of the knowledge of dengue prevention in the working area of the Sabokingking Health Center Palembang in 2020,

known that the description of attitudes in dealing with dengue in the working area of the Sabokingking Health Center Palembang in 2020 and known that the description of the action to control dengue fever in the work area of the Sabokingking Health Center Palembang in 2020.

The scope of this research is all patients who came to visit for treatment at the Sabokingking Health Center Palembang in March - May 2020 and natural dengue control. The results of the study can be used as input in the PSN-DHF effort in order to reduce morbidity and mortality due to Dengue Hemorrhagic Fever in the Sabokingking Health Center Palembang in 2020.

METHOD

A. Types of research

This research is descriptive research, the research used is descriptive quantitative research, namely the assessment is carried out with the main objective to make a picture or description of a situation objectively.

B. Place and time of research

1. Research time

The time of the research was carried out on 02-30 June 2020

2. Research place

The place of research was conducted in the Working Area of the Sabokingking Health Center, Palembang City.

C. Population and Sample

1. Population

Population is the whole object of research or object under study. In connection with this study, the population is all patients who come to visit for treatment at the Sabokingking Health Center Palembang in March - May 2020.

2. Sample

Samples were patients who came to visit for treatment at the Sabokingking Health Center Palembang in March-May 2020 (59 samples).

To determine the size of the sample if the subject is less than 100, it is better to take all and if the subject is more than 100, 20-25% can be taken (Arikunto, 2006).

Inclusion and Exclusion Criteria

- a. Inclusion criteria are general characteristics of research subjects in the target population and the affordable population.
- b. Exclusion criteria are some subjects who do not meet the inclusion criteria

D. Data collection technique

1. Data source

- a) Primary data: data obtained from interviews with questionnaires and observations and the data collected includes data on knowledge, attitudes and actions of the community.

- b) Secondary Data: data obtained from documents and information obtained from the Health Office and those in the Sabokingking Health Center, Palembang City.

2. Collection technique

In research, we often hear the terms data collection methods and data collection instruments. Although related, these two terms have different meanings. Data collection methods are techniques or methods used by researchers to collect data. Data collection was carried out to obtain the information needed in order to achieve the research objectives. Meanwhile, the data collection instrument is a tool used to collect data. Because it is a tool, the data collection instrument can be in the form of: *checklist*, questionnaires, interview guides, to cameras for photos or to record images. The data collection techniques. in the form of:

a. Interview

Taking and through interviews or direct oral with the data source sumber

b. Observation

It is carried out by direct observation of the sample, respondents and their environment, as well as measurements of the living environment using an observation sheet.

- c. Documentation is a method of collecting data using various written sources relating to the object of research. This method was used to collect data about the research sample from the medical records of the Sabokingking Health Center.

- d. Instrument of data collection is done with questionnaires and checklists

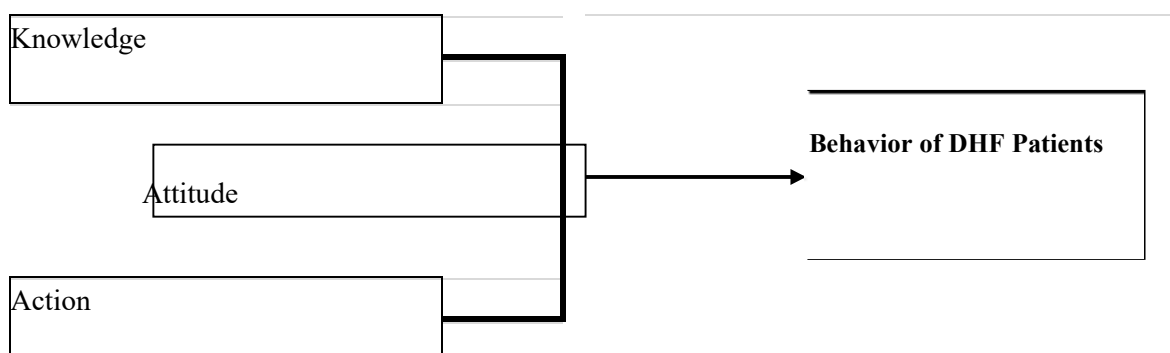
E. Operational definition

Table 1

No	Variable	Definition	How to Measure	Measuring instrument	Measurement Results	Measuring Scale
1.	Knowledge	Everything that respondents know about DHF	Interview	Questionnaire	1. Good category: 76% - 100% (if respondent correctly answered 12-15 questions) 2. Enough category: 60% - 75% (if the respondent correctly answers 9-11 questions) 3. Category less 9 questions (Arikunto, 2006)	ordinal

2.	Attitude	Response or reaction respondents about DHF	Interview	Questionnaire	1. Positive: If the respondent is able to answer the question correctly median 2. Negative : If the respondent is able to answer the question correctly <median	ordinal
3.	Action	Everything that has been done in the effort to eradicate mosquito nests	Interview	Questionnaire	1. Good category: 76% - 100% (if respondent correctly answered 12-15 questions) 2. Enough category: 60% - 75% (if the respondent correctly answers 9-11 questions) 3. Category less 9 questions (Arikunto, 2006)	ordinal

Chart Operational Framework



F. Univariate Data Analysis

Univariate Analysis This analysis was conducted to describe using a health frequency table and the concept of DHF behavior at the Sabokingking Health Center 2020.

RESULTS

A. Research result

Univariate Analysis

After conducting research on 59 samples, the results of the description of the knowledge of dengue prevention at the Sabokingking Health Center in 2020 obtained the following results:

Age Distribution of Respondents in the working area of the Sabokingking Health Center Palembang City in 2020

Table 2

Frequency distribution based on the age of respondents in the working area of the Sabokingking Health Center Palembang City in 2020

No	Age	Frequency	Percentage
1.	18-25 years old	7	11.8
2.	26-35	15	25.4
3.	36-45	25	42.3
4.	>46 years old	12	20.3
	Total	59	100

From the table above, it can be seen that there are 25 people (42.3%) aged 36–45 years old compared to 7 people aged 18-25 years (11.8%).

Distribution of Respondents' Education in the working area of the Sabokingking Health Center Palembang City in 2020

Table 3

Frequency distribution based on respondents' education in the working area of the Sabokingking Health Center Palembang City in 2020

No	Knowledge	Frequency	Percentage
1.	SD	3	5.0
2.	junior high school	17	28.8
3.	senior High School	36	61.0
4.	College	3	5.0
	Total	59	100

From the table above, it can be seen that 36 people (61.0%) have high school education compared to 3 people (5.0%).

Age Distribution of Respondents in the working area of the Sabokingking Health Center Palembang City in 2020

Table 4

Frequency distribution based on respondents' occupations in the working area of the Sabokingking Health Center Palembang City in 2020

No	Knowledge	Frequency	Percentage
1.	self-employed	10	16.9
2.	civil servant	2	3.3
3.	Housewife	38	64.4
4.	Private employees	9	15.2
	Total	59	100

From the table above, it can be seen that 38 respondents (64.4%) were housewives compared to 2 (3.3%).

Distribution of Respondents' Knowledge in the work area of the Sabokingking Health Center Palembang City in 2020

Table 5

Frequency distribution based on respondents' knowledge in the working area of the

Sabokingking Health Center Palembang City in 2020

No	Knowledge	Frequency	Percentage
1.	Good	30	50.8
2.	Less	29	49.2
	Total	59	100

From the table above, it can be seen that there are 30 people with good knowledge (50.8%) more than those with less knowledge of 29 people (49.2%).

Distribution of Respondents' Attitudes in the work area of the Sabokingking Health Center Palembang City in 2020

Table 6

Frequency distribution based on the attitude of respondents in the working area of the Sabokingking Health Center Palembang City in 2020

No	Attitude	Frequency	Percentage
1.	Positive	28	47.5
2.	Negative	31	52.5
	Total	59	100

From the table it can be seen that there are more respondents with a negative attitude, namely 52.5% compared to respondents who have a positive attitude, which is only 47.5%.

Distribution of Respondents' Actions in the work area of the Sabokingking Health Center Palembang City in 2020

Table 7

Frequency distribution based on respondents' actions in the working area of the Sabokingking Health Center Palembang City in 2020

No	Action	Frequency	Percentage
1.	Good	37	62.7
2.	Less	22	37.3
	Total	59	100.0

From the table above, it can be seen that more respondents took good action, namely 62.7% compared to respondents who took less action, only 37.3%.

B. Discussion

Discussion of Knowledge, Attitudes and Actions in Dengue Hemorrhagic Fever Management.

a. Knowledge

according to Bethem's research (2018), someone who has good knowledge about dengue disease will make efforts to prevent dengue disease compared to people who have no

knowledge. In line with Hairi's research (2019), good knowledge of DHF has a significant relationship with a person's attitude regarding the control of *Aedes aegypti* mosquitoes. Good and moderate knowledge can be influenced by factors such as sources of information from educational factors and environmental factors. People get information both from the family environment, neighbors and health workers and the print media will affect a person's level of knowledge.

From the results of the presentation of respondents about knowledge in the Good category as many as 30 people (50.8%) while those with less knowledge were 29 people (49.2%).

b. Attitude

according to Nugraningsih's research (2019) showed that the attitude or presence of the *Aedes aegypti* mosquito had a significant relationship. According to Fati (2017), the less a person's or society's attitude towards the prevention and prevention of DHF, the greater the possibility of an extraordinary event (KLB) for DHF.

The respondent's good attitude towards efforts to eradicate Mosquito Nests (PSN) in the form of the 3M movement needs to be followed by concrete practical actions. Attitudes that want to play a role and look active in efforts to eradicate mosquito nests will be very influential in actions and efforts to control dengue and dengue disease (Nugraningsih, 2019).

From the results of the presentation of respondents about attitudes with a positive attitude category as many as 28 people (47.5%), and a negative attitude as many as 31 people (52.5%).

c. Action

according to research conducted by Wicaksono (2018) which shows that good actions (60.5%) are not at risk of developing DHF compared to less actions, namely (39.5%).

Indirect action measurement can be done by interviewing activities that have been carried out several hours, days, or months ago (recall). Meanwhile, direct measurement can be done by observing the respondent's actions or activities. Suyasa's research (2018) shows that there is a relationship between the respondent's actions and the presence of the dengue vector in the work area of the Bloom Sari Public Health Center.

From the results of the presentation of respondents about actions with the category of taking good actions as many as 37 people (62.7%) and those who taking actions less as many as 22 people (37.3%)

The discussion here is covering the efforts to prevent and eradicate DHF.

A. DHF eradication with 3M

For efforts to eradicate DHF in Indonesia starting in 1998, community mobilization "month 3 AD" was held simultaneously in Indonesia. 3 M, namely: (Depkes RI, 2011).

- 1) Drain water reservoirs regularly at least once a week and sprinkle abate powder into them.
- 2) Close the water reservoir tightly.
- 3) Bury and get rid of used items that can accommodate rainwater such as: used cans, plastic and others.

B. Prevention of DHF with Natural Ingredients

Prevention of dengue fever by using natural ingredients that do not harm users and do not damage the environment. These natural ingredients include:

- 1) Marigold (*TageserectaL.*)

Marigold plants are widely used as ornamental plants that are used as insect repellent plants. Marigold leaf ethanol extract contains alkaloids, flavonoids, saponins, and tannins. Marigold plants are able to grow in lowland areas to highlands, like places that are exposed to direct sunlight and humid. Concentration of 35% repellent ethanol extract with

cleansing milk base was only able to dispel 69.4% at the sixth hour after application, which means the repellent is still not effective according to the Pesticide Commission. The repulsion of the ethanolic extract of marigold leaves may be due to the presence of bioactive compounds such as alkaloids, flavonoids, tannins and saponins which are known to be used as basic ingredients of insecticides.

2) Kaffir lime (*Citrus hystrix* D.C.)

Kaffir lime is a fruit plant that grows in the tropics and is widely planted in the yard of the house, prefers a place at an altitude of 1-400 meters above sea level with a water content of about 10 percent. Kaffir lime peel essential oil has an average repellency of 60.4% for 6 hours of testing after application. The ability of repulsion of kaffir lime peel essential oil is probably due to the active compounds citronellol and geraniol which have been studied for a long time and are thought to have repelling effects on mosquito bites.

3) Cloves (*Zysigium aromaticum*)

Clove plants like lowland areas with an altitude of 200-600 meters above sea level to get optimal flowers. Clove plants can thrive at an altitude of up to 100 meters above sea level. Clove is a tropical plant that requires a rain distribution of 150-250 mm/year. Clove leaf ethanol extract was able to repel 51.9% of mosquitoes at the sixth hour after application. The presence of repulsion in the ethanolic extract of clove leaves is probably due to the fact that the clove extract contains eugenol which has been proven to be an insect repellent.

4) Legundi (*Vitex trifolia* Linn)

Legundi plants are wild plants that live in the highlands up to an altitude of 1000 meters above sea level. Traditional use as a mosquito repellent is done by burning dry plant parts. At a concentration of 20%, legundi leaf essential oil was able to repel mosquitoes 63.3% at the sixth hour after application. The repulsion of legundi leaf extract is related to the active substances contained in it such as champhene, pinene, alkaloids, terpenoids, saponins and cineol.

5) Cinnamon (*Cinnamomum burmannii* Bl)

Cinnamon plants have a habitat that is free of shrubs and weeds, with an altitude of up to 2000 meters above sea level, evenly distributed rain throughout the year with sufficient amounts of about 200-2500 mm/year and temperatures between 18-27°C. The altitude where cinnamon is planted can affect plant growth as well as bark quality such as thickness and aroma. A concentration of 15% cinnamon bark essential oil which was formulated into a gel with the addition of patchouli oil as a fixative was able to repel mosquitoes up to 100% with a test time of 6 hours. This means that cinnamon bark essential oil gel is effective as a repellent according to the Pesticide Commission and can be developed as a new formula for repellent that is environmentally friendly and made from natural ingredients.

6) Tobacco (*Nicotiana tabacum*)

Tobacco plants are herbal plants and can thrive in lowland and highland areas. Concentration of 1% ethanol extract of tobacco leaves was able to repel mosquitoes by 66.1% at the sixth hour after smearing. The repulsion of the ethanol extract of tobacco leaves is probably due to the presence of nicotine which is used in agriculture as a pesticide.

C. Controlling DHF with Chemicals

The handling of dengue fever with chemicals is as follows:

1) **Spraying (Fogging)**

The *Aedes Aegypti* mosquito can be eradicated by spraying insect poisons including insect poisons that are used daily at home.

2) **Abatement**

Sprinkle abate powder into the water reservoir. How to do abatization: for 10 liters of water, just 1 gram of abate powder or 10 grams for 100 liters of water, if you don't have a measuring tool, use a tablespoon, one tablespoon of squeeze contains 10 grams. Then just divide it or add it according to the amount of water to be treated, the dose doesn't need to be exactly right.

D. Comparison of Natural and Chemical DHF Management.

According to the authors, it is better to use natural ingredients to control dengue fever, this is because natural materials are more environmentally friendly and do not endanger the health of the user, while the prevention of dengue fever uses chemicals by spraying (fogging) and abating the risk to the health of the user and resistance to mosquitoes.

CONCLUSION

From the observations that have been made to respondents about the knowledge, attitudes and actions of mothers in the work area of the Sabokingking Health Center in 2020, the authors conclude that knowledge, attitudes and actions in the work area of the Sabokingking Health Center 2020 with a total of 59 respondents, namely the respondent's knowledge about DHF is still lacking. to find out where the development of the *Aedes aegypti* mosquito and also how to prevent the occurrence of dengue hemorrhagic fever (DHF).

Respondents' attitudes about dengue control showed more negative attitudes compared to positive attitudes that did not close the water reservoir outside and still kept bottles or used items in the house. Respondents' actions regarding dengue control showed that there were more bad actions than good actions, namely not burying used goods, not installing mosquito nets and not folding hanging cloth.

In the prevention of dengue fever, efforts that are not harmful to users are using natural ingredients such as marigold leaves, kaffir lime, cloves, legumes, cinnamon and tobacco. These materials are environmentally friendly and do not leave a bad risk for users. (Prasetyowati, 2016)

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The Potential of Fermented Oyster Mushroom Filtrate (*Pleurotus ostreatus*) as Host-Seeking Attractant of *Aedes aegypti* Mosquito

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ABSTRACT

The fermented oyster mushrooms filtrate contains attractant chemical like octenol, lactic acid, fatty acids and CO₂ which can attract mosquitoes. The aim of this research was to analyze the potential of fermented oyster mushroom filtrate as *Aedes aegypti* mosquito attractant. This research was a pure experiment with posttest only with control group design. The concentration of oyster mushroom filtrate fermentation as independent variable; number of trapped *Aedes aegypti* mosquitoes as dependent variable; temperature, humidity, and length of exposure as control variables. The fermented oyster mushroom filtrate solution was divided into 6 treatment groups (control (0%), 20%, 30%, 40%, 50%, 60%) and was repeated 4 times. The research had been analyzed using Kruskal-Wallis test and advanced test (Mann-Whitney and Independent Sample-T test). The results showed significance difference averages ($p < 0.05$) between control group and treatment group and did not show significant difference ($p > 0.05$) between each treatment group. The highest average rank was found at a concentration of 60% with a catch of 36% mosquitoes for 24 hours. The fermented oyster mushroom filtrate has potential as *Aedes aegypti* mosquito attractant. For further researchers, may to carry out further research with variations on the length of exposure, concentration, and attractant methods.

Keywords: Mosquito Attractant, *Aedes aegypti*, Oyster Mushroom Filtrate.

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is an infectious disease which is still a public health problem in Indonesia. Dengue virus causes dengue infection. The dengue virus is transmitted by the *Aedes sp* mosquito to humans. *Aedes sp.* as carriers of dengue virus can transmit to humans regardless of age level. Of the many species of *Aedes sp.*, *Aedes aegypti* is one of the main vectors that transmit dengue to humans (1).

Based on WHO (2), the global incidence of dengue cases has increased in the last few decades. Half of the world's population is estimated to be at risk of developing dengue disease. It is also estimated that around 100-400 million of the world's population are infected with dengue fever every year. According to the Indonesian Ministry of Health (3), the incidence of dengue cases per 100 Indonesian population in 2019 has increased compared to 2018. In 2018 the incidence of cases was around 24.75 and in 2019 it increased to 51.48. Although the incidence of DHF has increased, Indonesia's CFR has decreased slightly from 0.71% in 2018 to 0.67% in 2019.

Now, people prefer to use chemical control because chemical control is considered more effective at killing adult mosquitoes. Chemicals that are used continuously can cause negative impacts such as damaging the environment and nature. Natural control is recommended as an alternative because it is environmentally friendly (4).

Mosquito attractant can be used as a control mosquito method. Mosquito attractant is a substance that attracts mosquitoes to come to the substance (5). Mosquitoes use their sense of smell to detect their hosts. The attractant substance works by emitting an odor that is adapted to the pleasure of mosquitoes. Attractant compounds such as carbon dioxide, lactic acid, ammonia, and carboxylic acids (6). One of the natural ingredients that can be used as a mosquito attractant is oyster mushroom (*Pleurotus ostreatus*) (7). In the study of Chaiphongpachara et al. (7), oyster mushroom extract at concentrations of 5%, 10%, and 20% has attractiveness to mosquitoes. This is because mushrooms contain octenol compounds. Octenol, lactic acid, CO₂, hexanoic acid are some of the compounds that can attract mosquitoes when looking for a host (8).

In another study by Suyudi et al. (9), entitled "Effectiveness of Soaking Red Chili, Straw, Jengkol Skin Powder as an Attractant Against *Aedes aegypti* Mosquitoes" it was concluded that an effective mosquito attractant contains a mixture of ammonia, CO₂, lactic acid, octenol and high in fatty acids. In a study by Lala et al. (10), entitled "Fermentation of Young Coconut Water as *Aedes aegypti* Mosquito Attractant", it was concluded that fermented young coconut water has the potential to attract *Aedes aegypti* mosquitoes because it contains CO₂, lactic acid, fatty acids, octenol, and ammonia. This study found that the concentration of 15% more attracted mosquitoes with a catch of 42%. Fermentation of young coconut water for 5 days aerobically contains attractant compounds such as CO₂ by 4.15%, lactic acid by 3.03%, fatty acids by 2.56%, octenol by 2.11%, and ammonia content by 1.08. %.

From the preliminary study, fermented oyster mushroom filtrate for 5 days contained 9.52% octenol, 9.05% CO₂, 18.98% lactic acid, 1.30% fatty acid and 0.18% ammonia. The results of the preliminary study showed that *Aedes aegypti* mosquitoes were more attracted to a 20% attractant concentration with a catch of 12% at 6 hours of exposure. Based on this, the researchers were interested in conducting experimental research using fermented oyster mushroom filtrate with variations in concentration of 0% (control), 20%, 30%, 40%, 50%, 60% in variations of 6 hours and 24 hours of observation.

METHODS

This research is a pure experimental research with posttest only design with control group. The purpose of using the type and design of the study was to see whether or not there was a potential for fermenting oyster mushroom filtrate as an attractant for the *Aedes aegypti* mosquito by comparing the results with the control group. This research using 25 *Aedes aegypti* test mosquitoes for each treatment. The criteria for the test mosquitoes were female mosquitoes that have mated, aged 3-5 days who were starved of blood and were in sugar starvation for 24 hours (11). The attractant uses white oyster mushrooms harvested from mushroom farmers. The attractant was made in a ratio of 1:1 (w/v) oyster mushroom with distilled water. Oyster mushrooms were cut into small pieces and mashed, then mixed with distilled water as much as the amount of oyster mushrooms were weighed. Add yeast as much as 1.1% of the weight of oyster mushrooms. Stir the solution until homogeneous \pm 5 minutes and covered with a lid. After 5 days, filter the mixture and use the filtrate. The mosquito trap is made from a 1.5 liter bottle which is divided into two, top, bottom (1:3) and the top is installed upside down above the bottom. The required volume of attractant is 200 ml per trap with distilled water as a solvent (12). The traps were placed in mosquito cages and exposed to 25 test mosquitoes. The expected output is the number of mosquitoes trapped for 6 hours and 24 hours (10).

The data were analyzed statistically with a significance level of 5%. The normality test of the data used the Saphiro-Wilk test, with the null hypothesis (H0) the data was normally distributed. Differences in group average were analyzed using the Kruskal Wallis test, with H0 there was no difference between groups. The analysis was continued for each pair of groups, to determine which pair of groups had a significant level of difference. The analysis was carried out using the Mann-Whitney test in the non-normally distributed group and Independent Sample T-Test in the normally distributed group, with the statement H0 that there was no difference in the average between the two groups. The H0 statement is accepted if the significance value is more than the critical limit ($p > 0.05$).

RESULTS

Temperature and Humidity Observation

Temperature and humidity were measured using a room thermohygrometer. The results of measurements of temperature and humidity during the research are in Table 1 below.

Table 1. Temperature (°C) and Humidity (%) Measurement

Hour-	1 st Replication	2 nd Replication	3 rd Replication	4 th Replication
0	29°C / 74%	27°C / 70%	27°C / 74%	27°C / 74%
1	29°C / 74%	29°C / 72%	29°C / 72%	29°C / 72%

2	29°C / 74%	29°C / 74%	29°C / 72%	29°C / 72%
3	29°C / 74%	29°C / 72%	29°C / 70%	29°C / 72%
4	30°C / 72%	29°C / 72%	29°C / 68%	30°C / 72%
5	30°C / 72%	29°C / 72%	29°C / 68%	30°C / 70%
6	30°C / 72%	29°C / 72%	29°C / 68%	30°C / 70%
24	29°C / 72%	29°C / 72%	29°C / 72%	29°C / 72%
Average	29.38°C / 73%	28.75°C / 72%	28.75°C / 70.5%	29.13°C / 71.75%

Based on the table above, the minimum room temperature during the study was 27°C and the maximum temperature was 30°C. The average room temperature during the study has a range of 28.75°C - 29.38°C. The minimum humidity in the room during the study was 68% and the maximum humidity was 74%. The average humidity of the room during the study had a range of 70.5% – 73%.

Number of *Aedes aegypti* Mosquitoes Trapped on Attractants

This study used as many as 6 kinds of concentrations as treatments, including 20%, 30%, 40%, 50%, 60%, and control (0%). The experiment was repeated 4 times. The trapped mosquitoes were observed every 60 minutes for 6 hours and 24 hours. The results of the observations are below.

Table 2. Observation Results of Average Number of *Aedes aegypti* Mosquito Trapped on Attractants for 6 Hours

Concentration	Replication				Mosquito Average for 6 hours	Percentage
	1 st	2 nd	3 rd	4 th		
0% (Control)	0	0	0	0	0	0%
20%	1	3	2	2	2	8%
30%	1	2	3	2	2	8%
40%	2	4	3	4	4	16%
50%	1	2	4	4	3	12%
60%	1	4	3	4	3	12%

The table above contains the results of the average number of *Aedes aegypti* mosquitoes trapped at each concentration of attractant fermented oyster mushroom filtrate. At concentrations of 20% and 30%, the average number of mosquitoes trapped for 6 hours after exposure was around 2 mosquitoes (8%). At concentrations of 50% and 60%, the average number of mosquitoes trapped for 6 hours after exposure was around 3 mosquitoes (12%). The 40% attractant concentration had a higher average number of trapped mosquitoes than other concentrations, which was around 4 mosquitoes (16%), while the control group had the smallest range (0%).

Table 3. Observation Results of Average Number of *Aedes aegypti* Mosquito Trapped on Attractants for 24 Hours

Concentration	Replication				Mosquito Average for 24 hours	Percentage
	1 st	2 nd	3 rd	4 th		
0% (Control)	0	1	0	0	1	4%
20%	1	6	5	6	5	20%
30%	3	6	8	7	6	24%
40%	3	9	6	7	7	28%
50%	1	9	11	10	8	32%
60%	1	13	9	11	9	36%

Based on the table above, the average number of trapped mosquitoes showed an increase in proportion to the high concentration of attractants. Attractant fermented oyster mushroom filtrate with a concentration of 60% can attract 36% of 25 mosquitoes. Concentration of 0% (control) can attract fewer mosquitoes than other concentrations (4%).

Analysis Average Differences of Number *Aedes aegypti* Mosquitoes Each Attractant Concentration

Table 4. Results of Average Number Differences of
Aedes aegypti Mosquitoes Trapped at 6 Hours and 24 Hours

Observation Lenght	Concentration	Data Total	Mean Rank	Significant Value (p)
6 Hours	0 %	4	2,50	0,025
	20 %	4	11,50	
	30 %	4	11,50	
	40 %	4	17,75	
	50 %	4	15,25	
	60%	4	16,50	
24 Hours	0 %	4	2,88	0,034
	20 %	4	10,13	
	30 %	4	13,38	
	40 %	4	13,88	
	50 %	4	17,00	
	60 %	4	17,75	

The table shows the number of mosquitoes trapped for 6 hours has a significant value (p) of 0.025 and 0.034 for 24 hours. Both significant values are less than 0.05 as the critical limit ($p < 0.05$), therefore it can be concluded that there is an average difference in two or more groups. The results of the mean rank show that for 6 hours of observation, concentrations that have an average rating from high to low are concentrations of 40% (17.75), 60% (16.50), 50% (15.25), 20 % and 30% (11.50) and 0% (2.50). Results of Mean Rank in 24 hours of observation, concentrations that have an average rating from high to low are concentrations of 60% (17.75), 50% (17.00), 40% (13.88), 30% (13, 38), 20% (10.13), and 0% (2.88).

Analysis of Optimal Attractant Concentration of Each Treatment

Advanced tests were used to analyze which concentrations had significant differences each concentrations. From the analysis, the pairs of groups that have a significant average difference are the control group with the concentration treatment group (20%, 30%, 40%, 50%, 60%). The significance value of each group is (p) < 0.05 as the critical limit, which means that there is a significant difference between the two groups. The analysis results of the average difference between each concentration group showed a significance value (p) > 0.05 as the critical limit, then H_0 was accepted. It means that there is no significant difference between each concentration group (20%, 30%, 40%, 50%, 60%). Thus, it can be interpreted that fermented oyster mushroom filtrate has the potential to attract *Aedes aegypti* mosquitoes, but further research is needed on optimal concentrations.

DISCUSSION

Number of *Aedes aegypti* Mosquitoes Trapped in Attractants

This study aims to analyze the potential of fermented oyster mushroom filtrate as an attractant for the *Aedes aegypti* mosquito. This study used 25 female *Aedes aegypti* mosquitoes as test animals. The attractant in this study was oyster mushroom filtrate which was fermented for 5 days with baker's yeast added as a catalyst. This study used 6 different concentration treatments, including concentrations of 20%, 30%, 40%, 50%, 60% and control (0%) which were replicated 4 times. Observations were every 60 minutes for 6 hours and 24 hours.

Based on Table 2 and Table 3, it shows different catches. The attractant exposed for 6 hours is less effective than 24 hours can be caused by several possibilities. In this study, it is possible that CO_2 gas is reduced when making treatment concentrations. CO_2 gas is one of the products of fermentation. The attractant is made through a fermentation process with baker's yeast. The microbe contained in baker's yeast is *Saccharomyces cerevisiae*. Bread yeast can convert glucose into ethanol and CO_2 . Fermentation using baker's yeast also produces organic acids (13).

The attractant was exposed for 24 hours attracted more mosquitoes because there was a substrate breakdown process that took place compared to 6 hours. The substrate breakdown process produces organic compounds and CO₂ gas. According to Watentena et al (14), the presence of CO₂ gas is an important component for mosquitoes so that they can find out where there are organic compounds needed by mosquitoes. The gas has a role as an attractant guide in the presence of heat or heat released. The gas is not effective if it becomes a mosquito attractant without a combination of other attractant substances. Thus, CO₂ gas is one of the factors in which exposure to fermented oyster mushroom filtrate attractants for 24 hours attracts more *Aedes aegypti* mosquitoes than exposure for 6 hours.

According to Moede et al (15), pH, temperature and duration of the fermentation process by the yeast *Saccharomyces cerevisiae* also affect the content of the resulting product. The yeast can grow well in facultative anaerobic conditions at a pH of 4.0 – 4.5 with a temperature of 30°C. Based on Nasrun et al (16), the amount of yeast and the length of fermentation also affect the results obtained. A large amount of yeast with a long fermentation process can produce large amounts of bioethanol, but if the fermentation process continues, bioethanol will tend to decrease because the microbes enter the death phase.

Based on the explanation above, the fermentation process requires optimal pH, temperature, yeast dose, and fermentation time as well as the need for sufficient fermentation media to obtain maximum product yields. Oyster mushrooms contain high carbohydrates and protein depending on the medium and how to grow it. Yeast *Saccharomyces cerevisiae* can break down carbohydrate substrates and use the breakdown product, namely glucose, for other breakdowns. This yeast can also break down proteins with protease enzymes. The largest fermentation product with *Saccharomyces cerevisiae* is converting glucose into ethanol and CO₂. The fermentation process also produces by-products including high alcohol, organic acids, esters, acetaldehyde, glycerol, phenol (17).

In this study, the oyster mushroom filtrate fermented attractant was made using yeast at a dose of 1.1% and stored for 5 days at room temperature and was facultatively anaerobic. To make maximum results on fermentation process, there must be a determination of the optimal size used. In this study, it has the disadvantage of not conducting research on the effect of the conditions of the fermentation process on the yield of attractants. Then, when making the attractant fermentation by the yeast *Saccharomyces cerevisiae*, the researchers used aquadest as a solvent. The content of distilled water is pure H₂O without any minerals, while the fermentation process runs well if it is supported by media rich in minerals, especially metal ions, which can improve fermentation performance (17). Thus, the condition of the fermentation process is possible to be one of the less influential attractants of oyster mushroom filtrate fermentation and it is hoped that further researchers will conduct further research on this matter.

Temperature and Humidity Measurement

Environmental temperature and humidity are the most important factors in the survival of adult mosquitoes. Based on the measurement of room temperature and humidity in this study, the results showed that the average room temperature ranged from 28.75°C–29.38°C and humidity ranged from 70.5%-73%. The average optimum temperature for mosquito growth is 25°C-27°C, and will stop when the temperature is <10°C or >40°C (18). Based on the literature, the room temperature in this study was not optimal for mosquito growth. In line with that concluded by Reinhold et al (19), the minimum temperature limit for *Aedes aegypti* around 10°C, the mosquito will become paralyzed and unable to move if it is below that temperature and will die at 40°C. Mosquito *Aedes aegypti* females are able to fly continuously at a temperature of 15°C-32°C with the best flight temperature <27°C and the most active sucking blood at a temperature of 28°C. The *Aedes aegypti* mosquito has the highest distribution rate in the rainy season. The preferred humidity is more than 60% with a temperature in the range of 24°C–31°C (19). Thus it can be concluded that the temperature measurement results in this study are not optimal, but are still included in the normal temperature for mosquito movement. Likewise with humidity that exceeds the optimum humidity (> 60%).

Analysis of Fermented Oyster Mushroom Filtrate as *Aedes aegypti* Mosquito Attractant

Based on the analysis in Table 4, it can be seen that the number of mosquitoes trapped with a 6-hour observation period has a significance value (p) of 0.025 and a 24-hour observation period has a value of 0.034. The two significance values are less than 0.05 as the critical limit ($p < 0.05$), therefore it can be stated that there is an average difference in two or more groups. The results of the follow-up test showed that there was no significant difference in the average of each treatment at concentrations of 20%, 30%, 40%, 50%, and 60%. Meanwhile, there was a significant average difference between the control group and each treatment group. However, the Mean Rank column in Table 4. shows that there is a group that has the highest average rating during 6 hours of exposure, which is a concentration of 40% with an average rating of 17.75. At 24 hours of exposure, the concentration that had the highest average rating was the concentration of 60% (17.75). Thus, the concentration of 40% attractant for 6 hours and 60% concentration of attractant for 24 hours had the highest rating for attracting mosquitoes compared to other concentrations, although the difference was not significant.

The results of this study are same as research by Lala et al (10) entitled "Fermentation of Young Coconut Water as an Attractant for the *Aedes aegypti* Mosquito". In this study, there were significant differences ($p < 0.05$) between the control group and the concentration group (15%, 25%, 35%) but there was no significant difference between each concentration group. The study observed the effect of attractants every 60 minutes for 6 hours with 50 mosquitoes tested in the laboratory. Based on this research, the less significant effect of each concentration is caused by the fluctuation of temperature and humidity in the research room, which affects the air flow, as well as the lack of duration of the fermentation process.

Research by Sa'adah et al., entitled "Solution of Cassava Tape (*Manihot utilissima*) as a Mosquito Attractant" has similarities because it uses an attractant from a fermented solution. In contrast to the results of the study of Sa'adah et al., the results of the study showed that there was no significant difference ($p\text{-value } 0.406 > 0.05$) from the attractant of cassava tape solution with concentrations of 0% (control), 10%, 30%, 50% and 70%. In the study of Sa'adah et al., mosquito traps were installed for 72 hours in residents' homes. According to the study, the factors that contributed to the absence of the attractant effect on the captured mosquitoes were the humidity temperature at the time of installation of the tool, the lack of sugar content in the cassava tape solution, and less than optimal in making the cassava tape solution (20).

In a study by Widya et al., with the title "Comparative Test of the Potential for Adding Tape Yeast and Bread Yeast in Sugar Solution as an *Aedes* sp Mosquito Attractant." has similarities with the research that the researchers did, namely the use of yeast in the fermentation process as an attractant. Some of the groups tested were the group with 20% sugar solution, the negative control group, the 20% sugar solution group with tape yeast, and the 20% sugar solution group with baker's yeast. From the research of Widya et al., it was found that there was a significant difference between the control group and the treatment group in the test mosquitoes in the laboratory which were observed for 6 hours of exposure. The results of this study are in line with the research conducted by the researchers, namely that there are significant differences between the control group and the treatment group. The results of the study also showed that the 20% sugar solution group with baker's yeast was thought to have greater potential as an attractant than other groups (21).

Based on research by Lala et al (10) and Sa'adah et al (20), it can be concluded that the possibility of no significant difference between concentration groups with one another is caused by temperature, humidity and less than optimal results of fermentation products. From the research of Sa'adah et al., it shows results in the field that mosquitoes have no interest in the attractant of cassava tape solution (20). From the statistic analysis of the attractant fermented oyster mushroom filtrate, it showed potential as an attractant because there was a significant difference between the treatment group and the control group which was carried out in the laboratory. Therefore, the researcher hopes that further research will carry out testing with positive controls or carried out in the field.

Research from Widya et al., shows that baker's yeast is more effectively used in sugar solutions (21). In the research on attractant fermentation of oyster mushroom filtrate that the researchers did, fermented products with baker's yeast were effective in producing attractant content if there was sugar in it. In the attractant that the researchers did, there was less sugar content in oyster mushrooms, so baker's yeast did not give results as in the study of Widya et al (21). Thus, the researcher hopes that further researchers will conduct research on the effect of adding sugar on oyster mushroom attractants.

Mosquito attractant is a substance that can attract or attract mosquitoes to come and land on the substance. Compounds that can become attractants include: octenol, CO₂, lactic acid, ammonia, and carboxylic acids. When these compounds combine, they produce strong attractants (6). In this study, the attractant used was oyster mushroom filtrate which was fermented for 5 days. Based on preliminary studies, the fermented oyster mushroom filtrate contains attractants such as octenol 9.52%, CO₂ 9.05%, lactic acid 18.98%, fatty acids 1.30% and ammonia 0.18%.

Octenol compounds are volatile compounds that can be obtained from mushrooms (commonly known as mushroom alcohols). The compounds such as CO₂, lactic acid, and ammonia are the product compounds of the fermentation process (22). Carbon dioxide has been known to be one of the compounds that is a stimulus to attract mosquitoes when looking for a host. Respiratory products from animals and humans contain high levels of carbon dioxide, so that they become a marker or signal for the presence of a host for mosquitoes. The lactic acid compound is a compound that can be obtained through the process of fermentation or glycolysis. Lactic acid is a by-product of the glycolysis process produced by pyruvic acid under anaerobic conditions. Lactic acid compounds efficiently act as mosquito attractants when synergized with carbon dioxide or other compounds, but lactic acid will be more efficient at attracting *Aedes aegypti* mosquitoes if it is not mixed with other ingredients. In contrast to ammonia compounds, these compounds will be more addictive to attract

mosquitoes when synergized with other compounds such as lactic acid and carbon dioxide. Likewise with fatty acids, these compounds have been shown to provide an attractant effect for the *Aedes aegypti* mosquito (23).

Based on the explanation above, it is possible that there is no significant difference in the average between each treatment group (20%, 30%, 40%, 50%, and 60%) in this study due to the levels of compounds that are less synergistic with each other. It should also be noted that the content of oyster mushrooms through the fermentation process produces by-products that can reduce the synergy of attractant compounds to attract mosquitoes. Therefore, to obtain maximum attractant results, isolation or extraction of several attractant compounds (such as octenol, CO₂, lactic acid, fatty acids and ammonia) produced by oyster mushroom filtrate fermentation can be carried out for further research.

In addition to being less attractive to attract mosquitoes, there are also some elements in the mosquito that cannot be controlled as living things. Mosquitoes can capture odors or compounds in the air using their olfactory receptors. The olfactory receptor organs that work include the antennae, maxillary palps, and trunk. In this organ there is an ORN (Olfactory Receptor Neuron) which can capture substances in the air. These nerves will send impulses from the periphery to the antenna lobes to be interpreted as information by the mosquito (24).

Mosquitoes can capture olfactory signals by integrating temperature, humidity, mechanosensory, and visual information thus providing the ability for mosquitoes to find hosts, avoid danger, find mates, and find suitable nesting sites. Female mosquitoes of many species depend on blood for essential nutrients for egg development, while their metabolic needs are primarily met through feeding on nectar. Host detection involves sensing and integrating three main cues: CO₂, host body odor and heat, although humidity detection and visual cues are also involved (23).

The criteria for mosquitoes in this study (11) include female *Aedes aegypti* species that have mated and are in a state of blood thirst for at least 4 days and thirst for sugar for 24 hours. Even though the mosquito criteria were correct, at the time of 6 hours of exposure, it was likely that the tested mosquitoes did not have different levels of hunger and different levels of catching olfactory signals and began to react slightly to attractants at 24 hours exposure. The possibility that occurs is that the test mosquito has not been able to catch the smell of the attractant because of the low CO₂ level at 6 hours of exposure to integrate the contents of several attractants. In addition, there is the possibility of mosquitoes experiencing starvation so that at 24 hours exposure they require nutritional intake from nearby materials. These possibilities are in line with the research of Lala et al (10) and Widya et al (21), mosquitoes have different olfactory signals to integrate attractant content without optimal CO₂ levels. Based on this, the less than optimal attractant to attract mosquitoes can be caused by mosquito habits to different attractants. Thus, the possible drawback of this study is not using positive controls as a differentiator. The researcher hopes that the next researcher will make differences in the variation of attractant types to determine the level of fermented oyster mushroom filtrate attractants with other attractants in attracting mosquitoes.

CONCLUSION

The aim of this study was to analyze the potential of fermented oyster mushroom (*Pleurotus ostreatus*) filtrate as an attractant for the *Aedes aegypti* mosquito. The conclusion that can be obtained from this study is that there is a significant difference in the mean number of *Aedes aegypti* mosquitoes in the traps of each concentration group of 20%, 30%, 40%, 50%, 60% with control (0%) at 6 hours and 24 hours exposure, however, there was no significant difference between each concentration treatment group. This means that the fermented oyster mushroom filtrate has potential as an attractant for the *Aedes aegypti* mosquito. Based on the mean rank, exposure time of 6 hours with 40% concentration of fermented oyster mushroom filtrate can attract more *Aedes aegypti* mosquitoes in the trap than other concentrations. At exposure time of 24 hours a concentration of 60% fermented oyster mushroom filtrate can attract more *Aedes aegypti* mosquitoes in the trap than other concentrations. The temperature and humidity of the room during the study were fluctuating which could be one of the possible reasons for the less effect of the oyster mushroom filtrate fermenting attractant in this study. As for suggestions, it is hoped that further researchers can change other variables such as length of exposure with variations of more than 24 hours, concentration, and methods of making attractants, and can examine whether there is an effect of additional yeast on making attractants to mosquito attraction.

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Management of Hazardous and Toxic (B3) Covid-19 Infectious Waste in Nganjuk Hospital 2021

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ABSTRACT

Nganjuk Hospital is a Referral Hospital for patients who have been confirmed positive COVID-19 and produce infectious medical waste *COVID-19*. The volume of *COVID-19* infectious B3 waste in the past month for was 1707.85 kg. The purpose of this study was to analyze the management of hazardous and toxic waste (B3) infectious *COVID-19* at the Nganjuk Regional General Hospital. This type of research was descriptive observational. Data collection techniques were through observation, questionnaires, assessment, and SWOT analysis. Data were analyzed by comparing based on regulations concerning the Regulation of the Minister of Health Number 7 of 2019, Minister of Environment and Forestry Number 56 of 2015 and Decree Minister of Health of the Republic Indonesia Number HK.01.07/ MENKES/537/2020. The results of the research of managing infectious B3 waste of *COVID-19* were sourced from 3 rooms, which is Lotus Room 1, Puspa Indah Room 3, and Sedudo Room 3. The waste volume generated during the period December-February 2021 was 17,487.62 kg. It was found that 86% of the assessment results on management and factors influence had great power and opportunity to improve infrastructure and human resources. When it's evaluated by SWOT analysis, it's were in Quadrant 1. The conclusion of this study was the management of *COVID-19* infectious B3 waste at Nganjuk Hospital in accordance with related regulations. In that case, Nganjuk Hospital needs to monitor the management by staff officer to increase knowledge and importance of managing *COVID-19* infectious B3 waste at Nganjuk Hospital according to the regulations laid down.

Keywords: Management, B3 COVID-19 infectious waste, Nganjuk Hospital.

INTRODUCTION

The Ministry of Health has established 132 Referral Hospitals for the Management of Certain Emerging Infectious Diseases based on the Decree of the Minister of Health of the Republic of Indonesia number HK.01.07/MENKES/169/2020 concerning the Designation of Referral Hospitals for the Management of Certain Emerging Infectious Diseases. According to data from the Directorate of Hazardous and Non-B3 Waste Management Performance Assessment of the Ministry of Environment and Forestry on 15 October 2020, the amount of COVID-19 B3 medical waste generated in Indonesia in the period 19 March 2020 to 19 September 2020 was 1,662.75 tons, with details Sumatra Region 193.29 tons, Java Region 903.09 tons, Kalimantan Region 286.04 tons, BaliNusra Region 150.34 tons, Sulawesi Region 54.38 tons, and MalukuPapua Region 75.60 tons.

The amount of B3 COVID-19 medical waste generated from 3 Referral Hospitals, COVID-19 Emergency Hospital and several health service facilities in Nganjuk Regency in the period March 2020 to October 2020 amounted to 15,180.42 kg. The three Referral Hospitals in processing COVID-19 B3 medical waste use 3rd party services. Meanwhile, data from the Environmental Health Installation of the Nganjuk Hospital in the Lotus Room and Puspa Indah Room, which are the treatment rooms for COVID-19 patients, the amount of COVID-19 B3 medical waste generated in the period March 2020 to October 2020 was 8,416.57 kg based on data from the Environmental Service. Long live Nganjuk Regency. Based on data from the Ministry of Ecology and Environment of China until March 21, 2020, there was an increase in medical waste from 4,902.8 tons/day to 6,066 tons/day (Hatta, 2020). The assumption of the amount of medical waste generated from COVID-19 patients is 2.5 kg/bed, which is higher than the daily medical waste generation of 0.6 kg/bed in 2018 (Yu, 2020).

The results of a preliminary survey conducted on November 5, 2020 at the Nganjuk Hospital found several problems, including temporary storage at TPS not in accordance with the COVID-19 waste management guidelines set by the Indonesian Ministry of Health, namely having a freezer or cold storage due to the transportation process for processing to 3rd party there is a time span of up to 4 days. The transportation carried out by the 3rd party for waste treatment asked the hospital to place the waste in a cardboard made of paper that had previously been put in crackle. The amount of hazardous and toxic (B3) waste generated by COVID-19 infection that accumulates in the Temporary Storage Area which may result in Nosocomial Infections for COVID-19 Infectious Hazardous and Toxic (B3) Waste Management officers.

METHODS

This type of research was descriptive case report. Data collection techniques were through observation, questionnaires, assessment, and SWOT analysis. The research variable in this study were the management of the infectious hazardous and toxic material (B3) waste generated by the Nganjuk Hospital. Hazardous and Toxic (B3) waste management COVID-19 is the generation, sorting, storage, transportation and temporary storage. Analysis data by comparing based on regulations concerning the Regulation of the Minister of Health Number 7 of 2019, Minister of Environment and Forestry Number 56 of 2015 and Decree Minister of Health of the Republic Indonesia Number HK.01.07/ MENKES/537/2020.

RESULTS

1. Source and Volume of COVID-19 Infectious Hazardous Waste.

The source of the COVID-19 Infectious B3 Waste generated by the Nganjuk Hospital came from 3 rooms, namely the Lotus Room 1, Puspa Indah Room 3, Sedudo Room 3.

Table 1. Volume of COVID-19 Infectious Hazardous Waste generated during the last 3 months at Nganjuk Hospital

Generated Volume	Total (Kg)
December 2020	3.078,08
January 2021	6.953
February 2021	7.456,54

Source: Nganjuk Hospital

The amount or volume of COVID-19 Infectious B3 Waste for the last three months based on the logbook of the COVID-19 Infectious Hazardous Waste at Nganjuk Hospital was generated the most in February.

2. Results of the Assessment of the COVID-19 Infectious Hazardous Waste Management Process at the Nganjuk Hospital.

The process of managing COVID-19 infectious B3 waste at the Nganjuk Hospital which started from the Sorting, Storage, Transportation and Temporary Storage stages obtained a score of 86% so it was included in the Very Good category.

3. SWOT Analysis.

In the SWOT analysis, it began by examining the internal resources and external environmental conditions of the Nganjuk Hospital. From the identification of existing problems, it can be concluded that internal factors (strengths and weaknesses) and external factors (opportunities and threats) in the management of hazardous and toxic waste (B3) infectious COVID-19 Nganjuk Hospital.

DISCUSSION

1. Source and Volume of COVID-19 Infectious Hazardous Waste.

Based on the measurement of the volume of COVID-19 infectious B3 waste at the Nganjuk Hospital which was sourced from 3 rooms, namely the Lotus Room 1, Puspa Indah Room 3, and Sedudo Room 3. The collection of COVID-19 infectious B3 waste was carried out routinely, namely twice a day on morning and afternoon. The amount or volume of COVID-19 Infectious B3 Waste for the last three months based on the logbook of the COVID-19 Infectious Hazardous Waste at Nganjuk Hospital was generated the most in February.

Data obtained from logbooks and Sanitation Installations, the volume produced during the period December-February 2021 was 17,487.62 kg, which means there was an increase every month in the last 3 months, namely in December-February 2021. In reporting the volume of infectious B3 waste COVID-19 generated by RSUD Nganjuk always reported to the Environmental Service of Nganjuk Regency. The Persian study based on the COVID-19 case in China showed that the medical waste disposal capacity was originally 4,902.8 tons/day and then increased by 1,164 tons/day to 6,066.8 tons/day (Nugraha, 2020) with medical waste generation of 14.3 kg/day. days (Astuti, 2020). The assumption of medical waste generation from COVID-19 patients amounting to 2.5 kg/bed is four (4) times higher than the daily medical waste generation of 0.6 kg/bed in 2018 (Yu, 2020).

2. Results of the Assessment of the COVID-19 Infectious Hazardous Waste Management Process at the Nganjuk Hospital.

In the sorting stage, the officers have met the segregation requirements in the management of COVID-19 infectious B3 waste, namely separating waste based on characteristics, accommodating waste according to groups and already equipped with SOP for sorting based on regulations the Regulation of the Minister of Health Number 7 of 2019, Minister of Environment and Forestry Number 56 of 2015 and Decree Minister of Health of the Republic Indonesia Number HK.01.07/ MENKES/537/2020. This study was in line with research, Reducing the volume of waste and segregation of waste is an important safety requirement for disposal officers (Alamsyah, 2007).

In the containment stage, the conditions that met at the time of observation are medical B3 waste put in a container/bin lined with a yellow plastic bag with the symbol "biohazard". After full or 12 hours at the longest, the waste/B3 waste was packed and tied tightly disinfected and placed in a place out of reach of the general public. Infectious waste were put in a yellow plastic bag, meaning that COVID-19 infectious B3 waste were put in a yellow plastic bag. The study was in line with research conducted by (Alvionita, 2017) at RSUD dr. Soetomo Surabaya Every room that produces medical waste is provided with a trash can with a plastic container and bag whose color is adjusted according to the type of waste intended. However, in this containment stage, officers have not implemented according to regulations or regulations, namely if there is liquid waste, it must be disposed of into the provided waste water reservoir or a hole in the sink or WC that drains into the Waste Water Management Installation (IPAL). This can lead to excessive amounts or accumulation of waste during temporary storage at the TPS. The large volume of waste also causes costs to swell in the treatment or disposal of waste carried out by the 3rd Party. Reduction activities at sources are important because they include preventive activities (Yunianti, 2012). Good waste management can increase financing efficiency (Rachmawati et al., 2018).

The stage of transporting COVID-19 infectious B3 waste is carried out in the morning and afternoon by officers who use personal protective equipment (PPE) complete with the condition of the transportation equipment in the form of special trolleys for infectious waste made of water-resistant, easy to clean, rust-resistant and leak-proof. special lane on the transportation which means it is in accordance with the based on regulations the Regulation of the Minister of Health Number 7 of 2019, Minister of Environment and Forestry Number 56 of 2015 and Decree Minister of Health of the Republic Indonesia Number HK.01.07/ MENKES/537/2020. This is in accordance with (Paramita, 2007) which states that the risk of disease transmission can arise from the process of collecting, transporting and storing waste.

The stage of temporary storage carried out for COVID-19 infectious B3 waste has requirements that are not in accordance with on regulations the Regulation of the Minister of Health Number 7 of 2019, Minister of Environment and Forestry Number 56 of 2015 and Decree Minister of Health of the Republic Indonesia Number HK.01.07/ MENKES/537/2020. is a transport trolley that has not been disinfected with disinfectant and there is no cold storage/freezer in temporary storage at TPS. Research at the Gatot Soebroto Army Central Hospital explained that the function of this storage is to collect B3 waste before it is burned and to prevent transmission either through air, direct contact, or through animals (Paramita, 2007). TPS in the Nganjuk Hospital environment also has a TPS permit. That the provision of hospital facilities in terms of handling waste requires careful planning (Maulana, 2017).

3. SWOT Analysis.

Internal factors (strengths and weaknesses) and external factors (opportunities and threats) in the management of COVID-19 infectious B3 waste can be identified which will then be analyzed using IFAS and EFAS matrices to determine the position of the COVID-19 infectious B3 waste management so that it can be

used to improve COVID-19 infectious B3 waste management system is getting better. Analysis of external factors in the management of COVID-19 infectious B3 waste at the Nganjuk Regional General Hospital showed that it had a greater opportunity than a threat. The existence of this opportunity is very supportive to improve the management of infectious B3 waste for COVID-19. While the analysis of internal factors shows that the strength is greater than the weakness. The study was in line with research of Hapsari (2012), which shows that organizations in managing COVID-19 infectious B3 waste have great strengths and opportunities so that they are in quadrant I which means they can take advantage of existing strengths and opportunities. According to Rangkuti (2015), quadrant I is a favorable situation so the strategy that must be applied is to support aggressive growth policies. After knowing the SWOT analysis diagram is in quadrant I, then the COVID-19 infectious B3 waste management strategy at the Nganjuk Regional General Hospital can be determined by combining the results of the analysis of external and internal factors in the SWOT matrix to create a strategy.

CONCLUSION

Observations on the management of the infectious B3 waste of COVID-19 at the Nganjuk Hospital were obtained from 3 rooms, namely the Lotus Room 1, Puspa Indah Room 3 and Sedudo Room 3 and were always recorded in the logbook. The volume produced during the period December-February 2021 was 17,487.62 kg, which means there was an increase every month in the last 3 months. In reporting the volume of COVID-19 infectious B3 waste generated by the Nganjuk Hospital, it is always reported to the Department Environment of Nganjuk Regency. Obtained an 86% assessment result on the management (sorting, storage, transportation and temporary storage) of COVID-19 infectious B3 waste, which means that the management is included in the very good category. The results of the evaluation of the management of COVID-19 infectious B3 waste at the Nganjuk Hospital using a SWOT analysis based on calculations based on external and internal conditions in the management of COVID-19 infectious B3 waste at the Nganjuk Hospital, indicating that the organization in the process of managing COVID-19 infectious B3 waste has great strengths and opportunities, so that the position of the organization in the SWOT diagram is in quadrant I.

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THE EFFECT OF DUST LEVELS IN THE FURNITURE INDUSTRY ON RESIDENT'S SUBJECTIVE COMPLAINTS (Case Study in Tanjungan Village, Driyorejo District, Gresik Regency)

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ABSTRACT

The people of Tanjungan Village experienced health complaints. The perceived health complaints included shortness of breath, coughing, sneezing, sore throat and eye irritation. This study aimed to determine the effect of dust levels produced by the furniture industry in Tanjungan Village on subjective complaints such as shortness of breath, coughing, sneezing, sore throat, and eye irritation.

The research method used in this study is analytic observational using a cross sectional approach. This research measuring dust levels and subjective complaints of residents was conducted in Tanjungan Village, Driyorejo District, Gresik Regency. The study obtained data by distributing questionnaires to residents and measuring the level of dust produced by the furniture industry.

The results of the study using a simple linear regression test showed that $\text{sig. } 0.000 < \alpha 0.05$, which means that there was an effect of dust content in the furniture industry on the subjective complaints of the population. The percentage of the influence of wood dust levels on the subjective complaints of the population is 21.1%.

It was concluded that there was an effect of wood dust content on the subjective complaints of residents in Tanjungan Village, Driyorejo District, Gresik. It is recommended that the industry increase efforts to control dust levels so that the environmental air is not polluted. It is also recommended for residents to use personal protective equipment such as masks and goggles to minimize the impact caused by wood dust.

Keywords: Dust Levels, Furniture Industry, Subjective Complaints.

INTRODUCTION

Air is one of the most important elements for living things. Air quality is very well maintained so as not to experienced air pollution. In Indonesia, air pollution has become one of the caused of health problems for living things. Air is an important component for the survival of humans, flora, fauna, and existing ecosystems (Fatimah et al., 2016). One of the air pollutants that can have a negative impact on humans is dust particles. Sources of air pollution resulting from various human activities included: industry, transportation, offices, and housing (Riani P.D, 2017). According to Fitria 2009 in Riani P.D (2017) pollutants that enter the respiratory tract when breathing will cause several complaints or symptoms.

Industrial progress in Indonesia is currently growing rapidly. Gresik Regency is one of the areas that is the center of various kinds of industries from small cottage industries to large industries. In Tanjungan Village, there are 4 home furniture industries located between residents' houses. The furniture industry is an industry that processes wood into items such as doors, tables, chairs, and cabinets. The furniture industry can produce pollutants in the form of dust. Excessive dust levels can caused subjective complaints that are felt by the surrounding community. Subjective complaints are complaints that are felt by someone caused by various factors. Various factors that influenced the incidence of complaints experienced by residents caused by dust are the characteristics of dust, which include particle size, shape, concentration, solubility and chemical properties, as well as duration of exposure. While individual factors included lung defense mechanisms, anatomy and physiology of the respiratory tract and immunological factors (Fatimah et al., 2016).

The results of the research conducted by Widiyari S, et al (2019) with a sample of 24 furniture industries with 70 workers, the results showed that workers who experienced subjective complaints were 29

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respondents (41.4%) and workers who did not experienced subjective complaints were 41 respondents (58.6%). According to research conducted by Rohmah M, et al (2016) explained that wood dust can affected the occurrence of respiratory complaints experienced by workers. Most of the dust levels that can be inhaled by workers met the requirements of 4.158 mg/m³.

According to the Central Bureau of Statistics of Gresik Regency, (2018) The total population living in Gresik Regency was 1,299,024 people. Meanwhile, the total population in Driyorejo District was 106,757 people. Driyorejo District consists of 16 villages, one of them is Tanjungan Village. According to profile data, Tanjungan Village has a population of 5,423 people.

According to a preliminary survey that has been conducted, information obtained that there were 7 workers in the furniture industry who have complaints, 4 people experienced shortness of breath, sneezing, sore throat, and eye irritation. Meanwhile, 3 people experienced complaints of sore throat and eye irritation. People who live near the industry also often experienced complaints. At RT 02/RW 01 Tanjungan Village, Kec. Driyorejo in 2020 the community experienced complaints. Complaints experienced such as shortness of breath, coughing, sneezing, sore throat, and eye irritation. According to the Tanjungan Village Midwife, around 50 people from RT 02/RW 01 experienced these subjective complaints.

The purpose of this study was to determine the effect of dust levels produced by the home furniture industry on subjective complaints experienced by residents in Tanjungan Village, Driyorejo District.

METHODS

This type of research is observational analytical with a cross sectional approach. The object of the study was a resident of Tanjungan Village with a population of 5.423 people and was taken as a sample of 94 respondents. The study was conducted from February 2021 to July 2021. The sampling technique in this study used a purposive sampling method with the criteria of taking samples according to the wind direction ± 500 m to the west from the location of the furniture industry.

The independent variable in this study was the level of dust produced from the home industry. While the dependent variable in this study was subjective complaints experienced by residents such as shortness of breath, coughing, sneezing, sore throat, and eye irritation. The first research procedure is the preparation of tools and materials, the second is the determination of sampling points, third is the measurement of dust at 3 points, fourth is the measurement of humidity, fifth is the measurement of temperature, the sixth measurement of wind speed and wind direction, the seventh spread of questionnaires to respondents. Data analysis in this study used simple linear regression analysis with SPSS data processing applications.

RESULTS

Table 1. Measurement of Dust Levels, Temperature, Humidity, Wind Speed at Point 1 Tanjungan Village, Driyorejo District, Gresik in 2021

Measurement Location	Hours (WIB)	Dust Level ($\mu\text{g}/\text{Nm}^3$)	Temperature ($^{\circ}\text{C}$)	RH (%)	Wind velocity (m/s)
Point 1 (furniture industry area)	09.10	1,1551	30,9	65,6	0,21-0,88
	13.05	0,9159	33,2	61,5	0,68-1,91
	15.02	0,3114	31,3	63,7	0,66-1,21
Average		0,7941	31,8	63,6	0,85

Based on the results in table 1, the results of measured dust levels at point 1 in the furniture industry area were 1.1551 g/Nm³, 0.9159 g/Nm³, and 0.3114 g/Nm³. The average dust content at point 1 was 0.7941 g/Nm³. The results of the measurement of dust levels did not meet the requirements of ambient air quality standards based on East Java Governor Regulation No. 10 of 2009 concerning Ambient Air Quality Standards and Emissions from Immovable Sources in East Java, which is 0.26 g/Nm³. The results of temperature measurements at point 1 of the furniture industry area were 30.9 C, 33.2 C, and 31.3 C. The average temperature at point 1 was 31.8 C. The results of humidity measurements at point 1 of the furniture industry area were 65.6%, 61.5%, and 63.7%. The average humidity at point 1 is 63.6%. And the results of

wind speed measurements at point 1 of the furniture industry area were between 0.21 m/s – 1.91 m/s. The average wind speed at point 1 is 0.85 m/s. The wind direction at point 1 was dominant to the west. At the time of measurement the weather was sunny.

Table 2. Measurement of Dust Levels, Temperature, Humidity, Wind Speed at Point 2 Tanjungan Village, Driyorejo District, Gresik in 2021

Measurement Location	Hours (WIB)	Dust Level ($\mu\text{g}/\text{Nm}^3$)	Temperature ($^{\circ}\text{C}$)	RH (%)	Wind velocity (m/s)
Point 2 (residential area)	09.30	0,2769	31,0	65,1	0,43-0,69
	13.12	0,5204	33,5	61,3	0,82-1,61
	15.06	0,3839	31,8	66,2	0,53-1,02
Average		0,3937	32,1	64,2	0,59

Based on the results in table 2, the results of measured dust levels at point 2 of the residential area were 0.2769 g/Nm³, 0.5204 g/Nm³, and 0.3839 g/Nm³. The average dust content at point 2 was 0.3937 g/Nm³. The results of the measurement of dust levels did not meet the requirements of ambient air quality standards based on East Java Governor Regulation No. 10 of 2009 concerning Ambient Air Quality Standards and Emissions from Immovable Sources in East Java, which was 0.26 g/Nm³. The results of temperature measurements at point 2 of the residential area were 31.0 C, 33.5 C, and 31.8 C. The average temperature at point 2 was 32.1 C. The results of the measurement of humidity at point 2 of the residential area were 65.1%, 61.3%, and 66.2%. The average humidity at point 2 is 64.2%. And the results of wind speed measurements at point 2 of the residential area were between 0.43 m/s – 1.61 m/s. The average wind speed at point 2 was 0.59 m/s. The wind direction at point 2 is dominant to the west. At the time of measurement the weather was sunny.

Table 3. Measurement of Dust Levels, Temperature, Humidity, Wind Speed at Point 3 Tanjungan Village, Driyorejo District, Gresik in 2021

Measurement Location	Hours (WIB)	Dust Level ($\mu\text{g}/\text{Nm}^3$)	Temperature ($^{\circ}\text{C}$)	RH (%)	Wind velocity (m/s)
Point 3 (area of the resident's house in front of the tomb)	09.45	0,3551	30,6	65,2	0,33-0,79
	13.17	0,4206	33,6	62,1	0,64-1,53
	15.16	0,0342	31,6	66,4	0,56-1,43
Average		0,2699	31,9	64,5	0,6

Based on the results in table 3, the results of measured dust levels at point 3 of the residential area in front of the tomb were 0.3551 g/Nm³, 0.4206 g/Nm³, and 0.0342 g/Nm³. The average dust content at point 3 was 0.2699 g/Nm³. The results of the measurement of dust levels did not meet the requirements of ambient air quality standards based on East Java Governor Regulation No. 10 of 2009 concerning Ambient Air Quality Standards and Emissions from Immovable Sources in East Java, which is 0.26 g/Nm³. The results of temperature measurements at point 3 of the residential area in front of the tomb were 30.6 C, 33.6 C, and

31.6 C. The average temperature at point 3 is 31.9 C. The results of measurements of humidity at point 3 of the residential area in front of the tomb were 65.2%, 62.1%, and 66.4%. The average humidity at point 3 was 64.5%. And the results of wind speed measurements at point 3 of the residential area in front of the tomb are between 0.33 m/s – 1.53 m/s. The average wind speed at point 3 was 0.6 m/s. The wind direction at point 3 was dominant to the west. At the time of measurement the weather was sunny.

Table 4. Grouping of Subjective Complaints Questionnaire Results for Tanjungan Villagers, Driyorejo District, Gresik in 2021

No	Category	Number of Respondents	Percentage (%)
1	Mild	27	28,7

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2	Moderate	32	34,1
3	Severe	35	37,2
Amount		94	100

Based on the results in table 4, it is known that subjective complaints of respondents were divided into 3 categories, namely mild, moderate, and severe. The light category obtained a result of 28.7% with a total of 27 respondents. The moderate category obtained a result of 34.1% with a total of 32 respondents. And the severe category obtained a result of 37.2% with a total of 35 respondents.

Table 5. Results of Data Processing Effect of Dust Level on Subjective Complaints of Tanjungan Villagers, Driyorejo District, Gresik in 2021

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0,826	0,393		2,103	0,038
	Dust level	3,618	0,730	0,459	4,959	0,000

a. Dependent Variable: complaint

In the output table of the results of the simple linear regression equation above, the t count of dust content was 4.959. With degrees of freedom (df) = $n-2 = 94-2 = 92$ from the t table it is found that the t table was 1.665. So it can be concluded that t count > t table ($4.959 > 1.665$). Because t count > t table then H_0 was rejected and H_a was accepted. This means that there was a significant influenced between the levels of wood dust on the subjective complaints of the population. And the known value of sig. 0.000 was smaller than 0.05 ($0.000 < \alpha 0.05$) this means that there was a close influenced between wood dust levels on the subjective complaints of the population.

Table 6. Percentage of Effect of Dust Level on Subjective Complaints of Tanjungan Villagers, Driyorejo District, Gresik in 2021

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,459 ^a	0,211	0,202	1,58969

a. Predictors: (Constant), dust level

Based on table 6 above, it is known that the R Square value was 0.211 (21.1%). This showed that by using a regression model, where the independent variable (wood dust content) has an influence on the dependent variable (subjective complaints of residents) of 21.1%. While 78.9% was influenced by other variables.

DISCUSSION

From the results of measurements of dust levels carried out at points 1, 2 and 3, the results of measurements of dust levels did not met the requirements of ambient air quality standards based on East Java Governor Regulation No. 10 of 2009 concerning Ambient Air Quality Standards and Emissions from Immovable Sources in East Java of 0.26 g/Nm³. The level of dust around the home furniture industry that exceeds the

quality standard was influenced by wind speed, temperature, and humidity. Wind speed can spread dust to the area around the industry according to the wind direction. At the time of the study the wind was blowing hard, this could be due to the sunny weather caused the wind to blow hard. The impact of dust levels that exceed the quality standard value can cause health problems.

Based on research conducted by Hikmiyah (2018), it was stated that the dust measurement at point 1 obtained an average result of 2.814 g/Nm³ and the dust measurement at point 2 obtained an average result of

3.077 g/Nm³. The measurement results exceed the quality standard values that have been set because of dust particles formed by motorized vehicles and dry soil blown by the wind. From the results of temperature measurements carried out at points 1, 2 and 3, the results of temperature measurements that did not met the requirements according to predetermined criteria according to BMKG data were the average air temperature in 2020 of 27.3° C. The temperature around the furniture industry area at points 1, 2 and 3 exceeds the predetermined criteria because the measurements were carried out during sunny weather. Based on research conducted by Chaeruddin et al (2021) measurements made in sunny weather can affect the condition of the air drier with air temperatures tend to be high and caused pollutants in the air, also tend to be high. From the results of humidity measurements carried out at points 1, 2 and 3 obtained the results of humidity measurements that did not met the requirements in accordance with the criteria that had been determined according to the Regulation of the Minister of Health of the Republic of Indonesia No. 1077 in 2001 between 40% - 60%. The humidity around the furniture industry area at points 1, 2 and 3 exceeds the predetermined criteria. Based on research conducted by Syech (2017) explained that the large value of humidity can extend the time of pollution which caused an increase in PM10 particulates in the air. From the results of wind speed measurements carried out at points 1, 2 and 3, the results of wind speed measurements did not met the requirements in accordance with the average wind speed in the tropics between 2 m/s – 8 m/s. The wind speed around the furniture industry area at points 1, 2 and 3 was less than the predetermined criteria. Based on research conducted by Ruhban (2017) explained that air pollutant particles are reduced because high windspeeds can spread air pollutant particles over a wider area. In measurements made around the furniture industry area, the dominant wind direction is westward.

From the results of the questionnaires that have been obtained, local residents experienced several complaints included shortness of breath, coughing, sneezing, sore throat, and eye irritation. Respondents in this study were prioritized who live permanently in the area around the home industry. From the results of table 4 that there were 3 categories in the assessment, namely the light category, moderate category and severe category. The light category obtained a result of 28.7%. In the moderate category, respondents only experienced complaints 1 complaint out of 5 complaints contained in the questionnaire. The moderate category got a result of 34.1%. In the moderate category, respondents experienced complaints of 2-3 complaints from the 5 complaints contained in the questionnaire. And the severe category obtained a result of 37.2%. In the severe category, respondents experienced 4 complaints out of 5 complaints contained in the questionnaire. Complaints felt by local residents could be caused by negligence in protected themselves from exposure to wood dust. Lack of awareness of the population in the use of masks and goggles can also affect the entry of wood dust more easily. This research was supported by Fatimah's research (2018) that dust can caused respiratory tract disorders such as coughing, sneezing, and shortness of breath. The results obtained in this study were that residents around the furniture industry experienced complaints of shortness of breath, sore throat, sneezing, coughing, and eye irritation. Based on Widiyari's research (2019), the complaints experienced were the result of the body's defense system in cleaning particles that enter the respiratory system. One of the efforts to protect oneself from the emergence of these subjective complaints is to use personal protective equipment, especially masks to prevent the entry of dust particles and use glasses to avoid the entry of dust particles into the eyes.

From the results of this study, there was a significant effect between wood dust levels on subjective complaints felt by residents of Tanjungan Village, Driyorejo District, Gresik. In the results of data processed, it is also known the value of R Square to find out how many percent of the x variable affects the y variable. The value of R Square in this study was 0.211. In this case, it shows that the independent variable (wood dust content) has an influence on the dependent variable (subjective complaints of residents) of 21.1%. While 78.9% is influenced by other variables. According to research conducted by Sholikhah (2015), that there was a significant relationship between dust levels and complaints experienced by workers. In this study, the results showed that the level of wood dust also affected the subjective complaints of residents around the

industry. According to research conducted by Siswati (2017) Exposure to dust for a long time can have a negative effect on health. Therefore, it is recommended that residents around the furniture industry use personal protective equipment such as masks and goggles as an effort to prevent dust particles from entering the body.

CONCLUSION

Based on the results and discussion of research that has been carried out in the Tanjungan Village area, Driyorejo District, Gresik Regency, it is concluded that the dust content exceeds the quality standard 0.26 m/Nm³, the temperature exceeds the quality standard 27.3 C, the humidity exceeds the quality standard 40%

- 60%, the wind speed is below the quality standard of 2m/s – 8 m/s and the dominant wind direction is to the west. The subjective complaint questionnaire was grouped into 3 categories, namely the light category of 28.7%, the moderate category of 34.1%, and the severe category of 37.2%. Dust levels affect subjective complaints felt by the residents of Tanjungan Village. The effect is 21.1%.

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THE EFFECT OF DISTANCE OF BENOWO WASTE FINAL DISPOSAL (TPA) SURABAYA CITY ON H₂S AND NH₃ LEVELS IN THE SETTLEMENT ENVIRONMENT

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ABSTRACT

Hydrogen Sulfide and Ammonia gas is one of the gases that can cause a source of air pollution that can cause respiratory tract health problems. This study aims to determine the relationship between distance and levels of hydrogen sulfide and ammonia in the residential environment. This research is included in analytical research with approach cross sectional. This study used primary data collection including measurements of levels of H₂S, NH₃, and meteorological factors. Sampling of H₂S and NH₃ was carried out at 3 points, at point 1: a radius of 100 meters, point 2: a radius of 500 meters and point 3: a radius of 1000 meters. The data were analyzed using the Correlation Test Spearman. The results showed that the average temperature of point I was 31.1°C, point II was 32°C, and point III was 32.1°C. Humidity at point I was 69.3%, point II was 68.3%, and point III was 69%. The wind speed is around 0.7 m/s. Levels of H₂S point I 0,041 ppm, point II 0.04 ppm and point III 0.04 ppm. And the levels of NH₃ point I 1,813 ppm, point II 1,776 ppm and point III 1,882 ppm. The conclusion of this study is that there is an effect between distance and levels of H₂S in residential areas and there is no effect between distance and levels of NH₃ in residential areas. So it is advisable to monitor air quality regularly and plant lots of plants that can absorb pollutant gases around the Benowo waste landfill.

Keywords: *Hydrogen Sulfide, Ammonia, Distance, Final Disposal of Waste*

INTRODUCTION

Clean air has an important role in the life of living things such as humans, animals and plants. Living things cannot breathe without air. The development of technology is getting higher resulting in lower air quality in the environment. In the past the air was fresh but now it has turned dirty. Air quality can endanger human health and have a wide impact on ecosystems in the environment. Air pollution is caused by foreign substances that enter the air and can cause changes so that it is not in accordance with its designation (1). Sources of air pollution can come from natural activities or human activities. Final disposal sites (TPA) are part of the source of air pollution originating from human activities. One of the sources of air pollution that comes from garbage buried in a given time period will decompose and produce gases in the air such as methane (CH₄), ammonia (NH₃), sulfur dioxide (SO₂), carbon dioxide (CO₂) and hydrogen sulfide (H₂S) so that it can be a disease (2).

Hydrogen sulfide gas (H₂S) is the greatest concentration causes the strong odor that obtained from bacteria or chemical processes. This gas has the characteristics of being invisible, because this gas is colorless but very toxic, flammable and has a rotten egg smell. Exposure to gas H₂S can cause bad effects on health because of rapidly absorbed by the lungs. Low concentrations of this gas can cause irritation of the eyes, nose, throat and even difficulty breathing in asthmatics and at high concentrations of 500 ppm it can cause loss of consciousness and even death (3).

Ammonia gas (NH₃) is a gas that has odorless characteristics but has a pungent odor, is corrosive, and very toxic even in low concentrations. This compound is usually found in the form of a gas with a characteristic sharp odor. Ammonia gas is formed from the anaerobic decomposition of waste in the landfill, the gas formed then spreads in piles of waste both vertically and horizontally and finally escapes into the atmosphere. Although ammonia has an important contribution to the existence of the earth's nutrition, but ammonia itself can damage health if exposed to the body in excess. Ammonia at 50 ppm can cause eye and nose irritation, throat irritation, coughing, chest pain and shortness of breath. While even higher levels of 2500 ppm-6500 ppm, ammonia gas can cause severe eye irritation (keratitis), shortness of breath (*dyspnea*), chest pain, pulmonary swelling, coughing up blood, bronchitis and pneumonia (4).

The existence of the Benowo TPA is very helpful in reducing the waste problem in the city of Surabaya because it has a large area of land and can accommodate large amounts of waste. TPA Benowo has a negative impact related to air pollution and water pollution that occurs in the surrounding area. Pollution that occurs with high intensity, namely air pollution with the appearance of unpleasant odors to residential residents (5). The results of a field survey conducted by researchers on December 16, 2020 at TPA Benowo, namely TPA Benowo near a settlement with a distance of 1 km resulted in frequent appearance of unpleasant odors in the residential environment and could lead to health problems. The health impacts that appear on the community are diarrhea, itching, and coughing. The incidence of skin diseases is also influenced by the length of stay between 3-5 years, as well as health problems that are often experienced by scavengers, namely coughs and shortness of breath. Health problems that often arise are also influenced by piles of garbage that invite bacteria, disease vectors and viruses to grow (6).

The purpose of this study was to determine the effect of the distance to the final disposal site (TPA) of the Benowo waste in the city of Surabaya on the levels of H₂S and NH₃ in residential areas.

METHODS

This type of research is analytic with approach *cross sectional*. This research was conducted in the residential area of TPA Benowo Surabaya in January 2021 – June 2021. The object of this research is the air around the residential area adjacent to the TPA Benowo Surabaya area within a radius of 100 meters. The sampling technique was done by *simple random sampling*. Sampling of H₂S and NH₃ was carried out at 3 points, at point 1 the closest distance to the landfill: a radius of 100 meters, point 2 the distance from the landfill to a residential area: a radius of 500 meters and point 3 the distance from the landfill to the nearest residential neighborhood: radius 1000 meters. Primary data were collected directly from sources which included measurements of gas levels of H₂S, NH₃, temperature, humidity, wind speed and wind direction. Analysis of the data used is the correlation test *Spearman*.

RESULTS

Air Physical Measurement

Table 1. Physical Quality Of Air In The Benowo Waste Residential Environment

Average Measurement Results					
No	Sampling Point	Temperature (°C)	Humidity (%)	Wind Velocity (m/s)	Direction of the wind
1.	Point I	31,1	69,3	0,707	South
2.	Point II	32	68,3	0,732	South
3.	Point III	32,1	69	0,738	South
Overall average		31,7	68,8	0,725	South

Based on the results of the average measurement of point I, the closest distance to the TPA, the physical quality of the air, temperature and humidity, is 31.1°C and 69.3%, respectively. The average results of physical air quality measurement at point II, distance from the landfill to residential areas, temperature and humidity were 32°C and 68.3%, respectively. Measurement of physical air quality, temperature and humidity at point III 3, the distance from the landfill to the nearest residential area, obtained an average result of 32.1°C and 69%. Then the overall average temperature and humidity of point I, point II and point III are 31.7°C and 68.8%. The wind speed is around 0.7 m/s and the dominant wind direction is to the south. At the time of measurement the weather was sunny.

Air Chemistry Measurement (H₂S)

Tabel 1. Levels Of H₂S In The Settlement Enviromen Of Benowo TPA

No	Measurement Location	Average Hydrogen Sulfide (ppm)
1.	Point I	0,041
2.	Point II	0,04
3.	Point III	0,04

Based on the results of measurements of hydrogen sulfide gas (H_2S) The point I distance closest to the landfill to get an average of 0.041 ppm. The average measurement of hydrogen sulfide gas (H_2S) Point II distance from the landfill to the residential neighborhood of 0.04 ppm. While the results of the measurement of Hydrogen Sulfide (H_2S) Point III the distance from the landfill to the nearest residential area got an average of 0.04 ppm. The dominant wind direction is to the south. So that the average measurement results at Point I, Point II and Point III do not meet the requirements according to PERGUB JATIM No. 10 of 2009 concerning Ambient Air Quality Standards and Emissions from Immovable Sources in East Java, which is 0.03 ppm.

Air Chemistry Measurement (NH_3)

Tabel 3. Levels Of NH_3 In The Settlement Enviromen Of Benowo TPA

No	Measurement Location	Average Ammonia (ppm)
1.	Point I	1,813
2.	Point II	1,776
3.	Point III	1,882

Based on the results of the average measurement of Ammonia gas levels (NH_3) Point I, the closest distance to the landfill is 1,813 ppm. The average measurement of Ammonia (NH_3) Point II, the distance from the landfill to the residential environment, is 1,776 ppm. While the results of the measurement of Ammonia (NH_3) Point III distance from the landfill to the nearest residential neighborhood get an average result of 1,882 ppm. The dominant wind direction is to the south. So that the average measurement results at Point I, Point II and Point III meet the requirements according to PERGUB JATIM No. 10 of 2009 concerning Ambient Air Quality Standards and Emissions from Immovable Sources in East Java, which is 2.00 ppm.

Effect Of Distance With Hydrogen Sulfide (H_2S) And Ammonia (NH_3) Levels

Correlation test results *Spearman* showed that there is a relationship between the distance to the level (H_2S) in the residential neighborhood of 0.0414 ($P = 0.012 < 0.05$) and there was no relationship between the distance to the level (NH_3) in the residential neighborhood of - 0.069 ($P = 0.689 > 0.05$).

DISCUSSION

Air Physical Measurement

The difference in the results of the average temperature at point I was because on the first day the measurements were carried out in a cooler location and not exposed to direct sunlight, while at points II and III they were in locations exposed to direct sunlight without being protected by trees. In addition, the difference in the average air temperature during the day is higher than the air temperature in the morning and evening due to the lack of green plants that can withstand the heat of the sun. According to (7) the function of plants is to control the temperature and humidity of the environment with the hydrological cycle experienced by plants. Plants act as absorbers of solar radiation and for the evapotranspiration process they need heat, so plants can lower the environmental temperature.

Based on research conducted by (2) There is an effect of time differences on meteorological conditions. During the day the air temperature is high because the absorbed sunlight will cause the expansion of the air. The expansion of the air that takes place will dilute the concentration of pollutant gases. In addition, air temperature also affects air pressure and humidity which will then affect wind speed. In theory, meteorological factors such as temperature, wind direction and speed can affect the measurement results. This parameter has a big effect on the dispersion and removal of air pollutants naturally.

Measurement of air humidity at the three points is carried out in locations directly exposed to sunlight without being protected by the roof of the building so that the air humidity is high. The level of air humidity determines the size of the pollutant content in both closed and open spaces due to the presence of pollutant solvents that cause pollution. According to (1) Air conditions in the morning and evening are cooler than in the afternoon so that hydrogen sulfide and ammonia gas are retained in the earth's surface layer coupled with high air humidity which can accelerate the process of decomposition of waste by microorganisms.

The dominant wind direction blows to the south with an average wind speed of 0.7 m/s. The low wind speed is due to the fact that at the time of sampling it was carried out in a low place where the wind speed was influenced by the height of the place from the ground. The higher a place is from the ground, the faster the wind speed. In the research of (8) stated that high wind speeds can cause low concentrations of pollutants, and vice versa. The low wind speed causes the spread of air to a wider space to be slow and accumulate around the study site. So that the addition of walls or trees in the building area around the Benowo TPA which functions as a *wind breaking*. Trees have been proven to be able to reduce bioaerosol dispersion around the Benowo TPA area.

Air Chemistry Measurement (H₂S)

The results of measurements of hydrogen sulfide gas at the Benowo Surabaya Waste Final Disposal Site (TPA) with an average of 0.04 ppm. According to East Java Governor Regulation No. 10 of 2009 concerning Ambient Air Quality Standards and Emissions from Immovable Sources in East Java, which is 0.03 ppm. This means that the hydrogen sulfide level at that location exceeds the threshold value. Based on research by (2) it is stated that the closer the ambient air sampling distance is to the pollutant source, the greater the concentration of gas produced. High levels of Hydrogen Sulfide (H₂S) in the ambient air is affected by piles of garbage that decompose naturally. The decomposition of waste itself is caused by the activity of microorganisms which will produce hydrogen sulfide gas which is toxic to the body (9).

Air Chemistry Measurement (NH₃)

The results of the measurement of ammonia gas at the Benowo Surabaya Final Disposal Site (TPA) with an average of 1.823 ppm. According to East Java Governor Regulation No. 10 of 2009 concerning Ambient Air Quality Standards and Emissions from Immovable Sources in East Java, which is 2.00 ppm. This means that the ammonia level at that location does not exceed the threshold value. This is in line with research conducted by (10) that the ammonia level in the ambient air in active cells in the waste landfill is greater than the ammonia gas level in inactive cells. Likewise with the distance, the farther the point of air sampling from the waste landfill, the lower the ammonia gas content of the measurement results.

Effect Of Distance With Hydrogen Sulfide (H₂S) And Ammonia (NH₃) Levels

The results of the Correlation test *Spearman* sig. 0.012 < 0.05, then Ho is rejected, which means that there is an effect of distance on the levels of Hydrogen Sulfide (H₂S) in the residential environment. Correlation test results show that distance has a moderate relationship strength and a positive relationship direction ($r=0.414$) to the levels of Hydrogen Sulfide (H₂S). Meanwhile, the results of the correlation test *Spearman* Ammonia (NH₃) sig. 0.689 > 0.05, then Ho is accepted, which means that there is no effect of distance on levels of Ammonia (NH₃) in residential areas. The results of the correlation test showed that distance had a weak relationship strength and the direction of the relationship was negative ($r=-0.069$) with Ammonia (NH₃). These data are supported by research (9) states that there is a significant relationship between the distance to the levels of hydrogen sulfide (H₂S). Hydrogen sulfide and ammonia levels in ambient air are also affected by temperature, humidity, and wind speed. Strong wind speed will carry pollutants flying in all directions. On the other hand, if the wind speed is weak, the pollutant will remain silent, collect so that the concentration will increase and only pollute where the pollution is. The more closely spaced sampling ambient air to the sources of pollution, the higher the gas hydrogen sulfide and ammonia resulting from.

CONCLUSION

Based on the research that has been done it can be concluded that there is influence between the distance to the levels of hydrogen sulfide (H₂S) in the residential neighborhood and there is no influence between the distance to the levels of ammonia (NH₃) in the residential neighborhood.

For people who live around the Benowo Waste Final Disposal Site (TPA) with a distance of less than 3 Km from the TPA, they want to plant more trees and plants that can absorb pollutant gases around the Benowo Waste Final Disposal Site (TPA).

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RELATIONSHIP OF HYGIENE AND SANITATION WITH MICROBIOLOGICAL QUALITY OF
DRINKING WATER DEPO WATER DURING THE COVID-19 PANDEMIC IN 2021 (In Dupak
Village, Krembangan District, Surabaya City)

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ABSTRACT

Drinking water depots (DAM) in Dupak sub-district use Ultraviolet disinfection and 40% of depots do not meet the requirements. Good in sanitation including roofs in fragile locations and lots of cobwebs, Drinking water depots floors are dirty with lots of dust and close to garbage dumps, poor hygiene includes not wearing masks and many operators do not have certificates to take drinking water depots sanitation hygiene courses. The purpose of this study was to analyze the relationship between hygiene and sanitation with the microbiological quality of drinking water depots during the COVID-19 pandemic in Dupak Village, Krembangan District, Surabaya City. This type of research is an analytic observational study, using a cross sectional approach. This research method is an analytic observation study, using a cross sectional approach and Chi-square test. The number of samples studied were 10 drinking water depots, the causes or risks and consequences or cases that occurred in the research object were measured and collected simultaneously or at the same time, and data assessment obtained by direct observation, data analysis using SPSS version 2.0 with bivariate test by analyzing the relationship between variables to be studied.

Data analysis using SPSS version 2.0 with bivariate test by analyzing the relationship between variables to be studied. The results showed that 80% of drinking water depots sanitation met the requirements and 80% of hygiene did not meet the requirements. There is no relationship between sanitation conditions and the microbiological quality of drinking water depots drinking water in Dupak sub-district ($p=1,000$) because drinking water depots sanitation in Dupak Village meets the requirements and from the results of research related to handler hygiene, there is no relationship between handler hygiene and microbiological quality of drinking water depots drinking water in Dupak Village ($p=1,000$) because the equipment in the drinking water depots has met the requirements. The microbiological quality of water in the drinking water depots in Dupak Village has no relationship with hygiene and sanitation. 80% meet the requirements in terms of sanitation, 80% do not meet the requirements in terms of hygiene, and 40% drinking water depots does not meet the requirements of water microbiological quality. People who use drinking water depots water are advised to reprocess or boil drinking water depots water before it is consumed for drinking purposes. This is to avoid diseases caused by the drinking water depots water, and also the handlers pay more attention to personal hygiene.

Keywords : Drinking Water Depot, Hygiene, Sanitation, Quality microbiology

INTRODUCTION

Drinking water is water that has been processed or without processing that meets the health requirements for drinking. Drinking Water Depot (DAM) is drinking water in bulk produced by home industry businesses through a raw water treatment process that meets health requirements and can be drunk directly. Procurement of clean water for drinking water needs must meet the requirements set by the government. Healthy drinking water based on Permenkes No. 492/MENKES/PER/2010 with the mandatory parameters for determining the

quality of drinking water in microbiology is total coliform and *Escherichia coli* with the maximum permissible level of 0 per 100 ml, which humans need safe drinking water and not contaminated by microbiology or disease-causing bacteria. . Not only microbiological parameters, physical parameters are also important in drinking water including odor, color, total dissolved solids (TDS), turbidity, taste and temperature. Sources of raw water can be taken from springs, Regional Drinking Water Company (PDAM), bore wells, dug wells and other sources that have been recommended by the Regency or City government.

Many people choose drinking water depots as drinking water because the price is cheaper than bottled drinking water (ADMK), it is also easy to obtain, and the level of practicality that does not need to be re-cooked makes people increasingly dependent on refilled water or the existence of drinking water depots. The presence of Drinking Water Depots (DAM) continues to increase in line with the dynamics of the community towards quality and safe drinking water for consumption. Even though it is cheaper, not all drinking water depots are guaranteed products, especially sanitation. One of the standards of cleanliness and water health is measured by the presence or absence of *E. coli* and Coliform bacteria as these indicators. The presence of these indicator microorganisms in water is evidence that the water is contaminated by feces from humans or animals and an opportunity for pathogenic microorganisms to enter the water (Mutiar, 2017).

Sanitation at the drinking water depot is very important, because if the sanitation conditions are lacking, it will affect the quality of the water produced by the drinking water depot. Many drinking water depots do not meet the requirements due to poor sanitation conditions. Hygiene and sanitation of drinking water depots is one of the efforts in the health sector to reduce the factors that make drinking water polluted and the processing, storage and distribution of drinking water (Selomo, 2018). According to data from the Dupak Health Center related to drinking water depots in Dupak Village in 2020 the sanitary conditions of drinking water depots in Dupak Village do not meet the requirements in terms of buildings that do not meet the requirements because they are dirty and have lots of cobwebs.

Hygiene in drinking water depots is also very important and influences the good and bad requirements of drinking water depots. 80% of drinking water depots do not meet the requirements. One of the problems is the behavior of the handlers who do not apply the health protocol. The good behavior of handlers is because when handling buyers, they always wash their hands, wear masks, maintain health, and do not smell bad. The bad behavior of the handlers is not washing their hands when handling buyers, not wearing masks, not bathing, not wearing clothes. According to data from the Dupak Health Center in 2020 regarding drinking water depots in Dupak Village, the behavior of handlers or people serving buyers does not meet the requirements because they do not have handlers' certificates.

Microbiological quality is the most important and very important in drinking water depots. Microbiological parameters include total coliform bacteria and *E. coli* with the maximum allowable concentration of 0 per 100 ml sample. The presence of coliform bacteria in the water indicates the presence of enteropathogenic or toxigenic microbes that are harmful to health, while *E. coli* in drinking water indicates that there has been contamination of feces from humans and warm-blooded mammals. The absence of a disinfection process causes the effect of microbiological quality in the presence of *E. coli* bacteria and Coliform bacteria in drinking water at drinking water depots (Mutiar, 2017). According to the results carried out by Bambang Wahyudi, the research showed that the physical quality of the drinking water depot did not meet the requirements, but the results of sampling and laboratory examination showed 100% of the requirements for the bacteriological quality of drinking water because no coliform bacteria were found (Bambang Wahyudi 2020). This study aims

to determine whether there is a relationship between sanitation conditions and the behavior of the handlers with the microbiological quality of drinking water at the drinking water depot in Dupak Village.

METHODS

The type of research in this activity is analytic observation, because the research is directed to explain the causal relationship between two variables in an observational way, where the form of the relationship is in the form of analysis of differences (Arikunto, 2006). The approach used is cross sectional, the cause or risk and effect variables or cases that occur in the object of research are measured and collected simultaneously or at the same time (Arikunto, 2006). study examined 10 drinking water depots from each depot, 2 samples were taken to examine the content of *Eschericia coli* and Coliform bacteria each 100ml/sample and also made observations on sanitation at the depot, among others observing the condition of the buildings and equipment at the depot and also observing the drinking water depot handler

RESULTS

Criteria	number of drinking water depots	Persentase
Qualify	8	80%
Not eligible	2	20%
Amount	10	100%

Table 1. Sanitation Recapitulation of Drinking Water Depots in Dupak Village in 2021

Based on table 1 that 10 drinking water depots in Dupak Village, 8 drinking water depots were found to meet the requirements in terms of sanitation conditions with a percentage of 80%, and 2 drinking water depots did not meet the requirements in terms of sanitation conditions the floor is flooded by water, the roof has lots of cobwebs and it's dusty

with a percentage of 20%. Based on the results of the analysis using the chi-square test, the data obtained is $p = 1,000$, which means that there is no relationship between sanitation and water microbiological quality. This is because the sanitary conditions have met the requirements

The results of this study are in line with research conducted by Hayati, (2020) which shows that there is no relationship between the hygiene and sanitation conditions of drinking water depots with the microbiological quality of refilled drinking water. In this study, it was revealed that based on observations and assumptions at the time of the study that the ratio of the proportion of unqualified sanitation hygiene conditions to good sanitation hygiene with microbiological quality did not meet the requirements.

Criteria	number of drinking water depots	Persentase
Qualify	2	20%
Not eligible	8	80%
amount	10	100%

Table 2. Hygiene Recapitulation of Drinking Water Depots in Dupak Village in 2021

Based on table 2, it can be seen that 10 drinking water depots in Dupak Village found that 2 drinking water depots met the requirements in terms of handler hygiene Don't wear a mask and don't wash your hands before serving buyers with a percentage of 20%, and 8 drinking water depots did not meet the requirements in terms of handler hygiene with a percentage of 80%. Based on the results of the Chi-Square test, the data obtained is $p = 1,000$, which means there is no relationship between hygiene and microbiological quality of water because the existing equipment at the drinking water depot has met the requirements and post-filling handling is recommended to clean gallons with alcoholic tissue. the results of research conducted by Mirza, (2012) in Demak which explained that there was no relationship between the hygiene of the handlers and the number of coliforms in drinking water depots.

Based on the description above, it can be explained that the sanitation hygiene of drinking water depot handlers has an influence on the contamination of drinking water by coliform bacteria so that the quality and quality of drinking water becomes unfit for consumption. dirty work, long fingernails, doing other work and not washing hands first when serving customers.

DISCUSSION

Environmental conditions Drinking water depots in Dupak Village 8 drinking water depots meet the requirements with a percentage of 80% eligible and 2 drinking water depots do not meet the requirements with a percentage of 20%, because the drinking water depots are in locations free from pollution and disease transmission, because they are far with a temporary garbage dump, no waterlogged areas and swamps, and not a location close to the accumulation of used goods or toxic hazardous materials (B3).

Based on observations, it was found that the condition of drinking water depots in Dupak Village not all drinking water depots met the requirements, because there were cracked floors, 1 drinking water depot without plastered floor conditions this could cause puddles inside. In terms of waterproof walls made of plastered bricks (concrete) but the condition of the walls is very dirty, in terms of roofs and ceilings they have strong

and anti-rat roofs, but there are cobwebs in all drinking water depots. The results of the study through a bivariate analysis test between sanitation hygiene and microbiological quality of drinking water at drinking water depots which stated that p value = (1,000) which means there is no relationship between sanitation hygiene and microbiological quality of drinking water. Based on the results of the research conducted, there is no relationship between the conditions of sanitation and hygiene at the drinking water depot with the microbiological quality of the water. This is because the sanitation of the drinking water depot in Dupak Village meets

results of observations about the hygiene of handlers in Dupak Village found that out of 10 drinking water depots in Dupak Village, only 2 drinking water depots met the requirements. This is because the drinking water depot handlers in Dupak Village do not apply Health protocols, including: not wearing masks, not washing their hands before serving consumers. Of the 10 drinking water depots, it is stated that 2 drinking water depots handlers use clean and neat work clothes. All of the 10 handlers of drinking water depots did not carry out regular health checks at least once a year. All the handlers from 10 drinking water depots did not have a certificate of having attended a drinking water depot hygiene sanitation course.

Based on the results of the study, 10 drinking water depots with poor hygiene of handlers, the number of microbiological quality did not meet the requirements, 8 more drinking water depots than those that met the requirements, namely 2 drinking water depots. From the results of statistical tests using the chi-square test, a p value of 1,000 is obtained where this value is <0.05 so this shows that there is no significant relationship between the hygiene of the handlers and the microbiological quality of drinking water at the drinking water depot.

relationship between the hygiene of the handlers and the microbiological quality of drinking water at the drinking water depot because the existing equipment at the drinking water depot has met the standards and the disinfection process has met the requirements. And post-filling handling is recommended to clean the gallon with alcoholic wipes. Therefore, the processing process into drinking water is good. Before filling the water gallon, the gallon is cleaned first

CONCLUSION

1. At the drinking water depot in Dupak Village, it was found that 80% of the drinking water depots met the requirements
2. The hygiene of the handlers at the drinking water depot in the Dupak sub-district was found to be 80% unqualified
3. Microbiological quality of drinking water at the drinking water depot in Dupak Village, it was found that 60% of the drinking water depot met the requirements
4. There is no relationship between sanitation and microbiological quality of drinking water in drinking water depots with $p=1,000$. There is no correlation between hygiene and microbiological quality of drinking water in drinking water depots with $p = 1,000$.

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INFLUENCE OF SO₂ AND NH₃ GAS LEVELS ON PUBLIC HEALTH AROUND BENOWO FINAL
DISPOSAL SITE, SURABAYA CITY

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ABSTRACT

The pile of organic and inorganic waste on Benowo Final Disposal Site (TPA) in Surabaya City reaches 1,600 – 1,700 tons/day undergoing a process of degradation or decomposition of solid waste, causing unpleasant odors and toxic gases. Some of the gases that arise are Methane (CH₄), Sulfur Dioxide (SO₂), Ammonia (NH₃), and Hydrogen Sulfide (H₂S). The presence of these gases can cause disturbances to public health. The purpose of this study is a measure, identify and determine the effect of gas levels of SO₂ and NH₃ on public health around the Benowo Final Disposal Site, Surabaya City. This type of the research is descriptive analytic with a cross sectional approach. This study used primary data collection methods in the form of measurements and interviews of respondents using *proportional random sampling*. Data analysis by comparing based on East Java Governor Regulation No. 10 of 2009 about Ambient Air Quality Standards. The averages result of this research gas levels of Sulfur Dioxide (SO₂) and Ammonia (NH₃) at points 1,2 and 3 were 98.95 g/Nm³ respectively; 186.29 g/Nm³ ; and 39.87 g/Nm³ and also the averages of NH₃ gas at points 1,2 and 3 is 23.92 g/Nm³ ; 60.44 g/Nm³ ; and 24.21 g/Nm³. From 25 respondents who live around the Benowo Final Disposal Site do not feeling health complaints due to the gas that arises, but other factors. The sum up of this study is the levels of Sulfur Dioxide (SO₂) and Ammonia (NH₃) gas has qualified from the requirements set by the East Java Governor Regulation No. 10 of 2009. The physical factors of the air that affect the presence of pollution are in accordance with the direction and speed of the wind, humidity also has the qualified from the requirements and the temperature hasn't qualified from the requirements of SNI T-14-1993-03. Instance and public has gave some information about result of the research for prevention.

Keywords: Final Disposal Site (TPA), Sulfur Dioxide Gas (SO₂), Ammonia Gas (NH₃), Public Health

INTRODUCTION

Air has a role which is very important for the life of the creatures live and function for the maintenance of health, well-being of humans and the assurance of quality through the control of pollution of the air. Air pollution is the entry or inclusion of substances, energy and or other components into the ambient air by human activities, so that the quality of the ambient air drops to a certain level which causes the ambient air to be unable to fulfill its function. There are eight parameters pollutant Air among others dust, ammonia (NH₃), Lead (Pb), carbon oxide (CO), Sulfur Dioxide (SO₂), Hidrocarbons, Nitro Dioxide (NO), and Hydrogen Sulfide (H₂S), the parameters that have the potential dangers of their own to the health environment (PPRI 41 Year 1999).

Processing of garbage are thermally conducted with the processing of garbage that involves the combustion of materials that can be burned and contained in the trash and or generate energy. The emission quality standard is included in the size of the limit or maximum level and the maximum emission load that is allowed to enter or be introduced into the ambient air (PERMENLHK RI No. 70 of 2016). In Regulation of the Government of the Republic of Indonesia Number 41 Year 1999 there are eight parameters polluting the air, out of the eight parameters that, I did 2 measurements of compounds that parameter Sulfur Dioxide and Ammonia. Tools that are used in the research is water sampler impinger when taking samples of the air, as sampling of ambient air pollution, sampler was taken at three points on each gas parameter and at each

location.

The risk of contamination of the air at the point of disposal of end derived from the odor that arises from the process of degradation of garbage that getting old is getting no odor, from the results of a pile of garbage organic and inorganic who undergo the process of decomposition produces gas toxic. Because of the pollution is, citizens around where the disposal of end feel less comfortable due to the odor that arises, in which case it can interfere with the health and channel breathing. The gas that arise in the environment around the landfill in the form of gas methane (CH_4), and channel breathing. The gas that arise in the environment around the landfill in the form of sulfur dioxide (SO_2), ammonia (NH_3), and hydrogen sulfide (H_2S), so that may be the cause of the onset of diseases related to the respiratory (breathing), cardiovascular, and physiological changes such as lung function and blood pressure (Harjanti, 2016).

One of the diseases that most lots in suffered by the public is ISPA (Infection Channel Respiratory Upper), mostlarge of infections tract breathing only be mild such as colds. Disease ISPA often occurs in children and aged further because the system of defense of the body are low. Factors causing ARI also is the state of the environment physically and maintenance of neighborhood homes that are not maintained on the inside and outside of the home about cleanliness as well as setting the exchange of air or ventilation (Putriyani, 2017).

Government area of Surabaya, (1990) suggested that before the year 2000, in accordance with the Master Plan has been prepared, Kota Surabaya designated as a city of industrial, trade, maritime and education, an increase in the activities the city in all sectors. Improvement aspects of the activities accretion population of the town which is quite large, the increase of all forms and types of buildings, the more dense the vehicle motor in the city, everything is very affecting the level of climatology cities, such as the temperature of the air, radiation sun, the humidity of air, as well as the flow and speed of the city (Khambali, 2017). Increasingly high number of residents of the city of Surabaya which led to increased congestion, the data from the Office website Population and Note Civil Kota Surabaya to mention that the number of residents of the city of Surabaya in the year 2011 and the year 2012 is amounted to 3,006,789 inhabitants. This figure is considered very high because the population of Surabaya in the previous two years was only around 2.9 million people.

TPA (The Disposal Final) Benowo which is managed by the private sector namely PT Sumber Organik (SO) since the year 2012 is a central disposal of garbage people city of Surabaya is in Romokalisari, District of Benowo borders with the territory Kota Gresik. Size landfill is very big around 37.4 hectares, as much as 22 hectares used area pengolaha garbage into electricity by the method *Sanitary Landfill* or compacting trash and shut it down to prevent the pollution of air. TPA Benowo able to accommodate a lot of rubbish that is produced by the people of Surabaya, location is close to ± 2 km in the area of settlement residents and adjacent to the landfill are Stadion Gelora Bungtombo (Abidin, 2017).

Besed study Dwicahyono HB, (2017) which entitled Analysis of the levels of gas NH_3 characteristics of individuals and complaints of respiratory scavengers in landfill garbage Benowo and not scavengers at around landfill garbage Benowo Surabaya, get the result in place Disposal End of $113.9 \mu\text{g}/\text{Nm}^3$ and $28.4 \mu\text{g}/\text{Nm}^3$ in the settlement residents. But both are still at the bottom of the raw quality that has ditetapkan by Regulation governor of Jawa Timur No. 10 of 2009 which is equal to $1360 \text{ g}/\text{Nm}^3$. The results of measurements of the levels of gas NH_3 is able to be influenced by the speed of the wind, temperature, and humidity. If it exceeds the standard of quality also can cause disruption of health Respiratory population at around Place Disposal Final Benowo city of Surabaya.

METHODS

Type of research is a research descriptive analytic that use the approach of time in *cross-sectional* (cut latitude) and the determination of the population of respondents who in the interview using the technique of *proportional random sampling*. Research is carried out in the Settlement Neighborhood TPA Benowo, Village Tripe Acne, District of Pakal, Surabaya. Measurement and interviews conducted began in January 2021 - June 2021. Large samples of respondents interviewing as many as 25 people and measuring the levels of gas in the SNI 19-7119.6-2005 with 3 points and the interval of time in the morning, afternoon and evening day Variable Free (independent variables) are variable levels of Variable Bound (Dependent variable), namely health communities in around where the disposal of end Benowo Surabaya. Variable control is variable with a way to measure and determine the amount of numbers the result of measurement parameters of the direction and speed of wind, humidity, and temperature.

RESULTS

1. The Effect of Sulfur Dioxide (SO₂) and ammonia (NH₃) levels on Public Health Complaints.

a. Sulfur Dioxide (SO₂) Levels

Results penelitian influence the levels of gas Sulfur Dioxide (SO₂) against complaints healthcommunities in around the landfill Benowo presented in the table at the bottom of this :

Table 1. Results Of The Effect Of Sulfur Dioxide (SO₂) On Community Health Complaints Around Benowo TPA

Sulfur Dioxide (SO ₂)	Public Health Complaints		Total	P Value
	Yes	No		
Qualify	14 (63,6 %)	8 (36,4 %)	22 (100 %)	0,918
Not eligible	2 (66,7 %)	1 (33,3 %)	3 (100 %)	
Total	16 (64,0 %)	9 (36,0 %)	25 (100 %)	

b. Levels of Ammonia (NH₃)

Results penelitian influence the levels of gas Ammonia (NH₃) to complaints health communities inaround the landfill Benowo presented in the table at the bottom of this :

Table 2. Effect Of Amonia (NH₃) Levels On Community Health Complaints Around Benowo TPA

Ammonia Level (NH ₃)	Public Health Complaints		Total	P Value
	Yes	No		
Qualify	14 (63,6 %)	8 (36,4 %)	22 (100 %)	0,918
Not eligible	2 (64,0 %)	1 (33,3 %)	3 (100 %)	
Total	16 (64,0 %)	9 (36,0 %)	25 (100 %)	

Intake of sample concentration Gas Sulfur dioxide (SO₂) and ammonia (NH₃) conducted in the settlementsaround where exhaust end Benowo Surabaya. It is done because of the gas that investigated arise in the environment around the landfill, which is in the form of gas Methane (CH₄), Sulfur Dioxide (SO₂), ammonia (NH₃) and Hydrogen Sulfide (H₂S). There are meteorological factors that affect ambient air quality, one of which is the direction of the wind, leading to the south, namely Pondok Benowo Indah RW 11. The area is close to the final disposal site with a distance of ± 2 km (Abidin, 2017).

Measurement of levels of gas Sulfur Dioxide (SO₂) in point 1 the interval time of the morning today at 09:07 – 10:07 pm, during the day at 11:07 to 12:07 pm and afternoon day at 16:18 to 17:18 pm. Measurement of point 2 the interval measurement time of the morning the day at 09:18 to 10:18 pm, during the day at 11:17 to 12:17 pm and in the afternoon the day at 16:23 to 17:23 pm. Measurement point 3 with interval measurement time of the morning the day at 09:25 to 10:25 pm, during the day at 11:46 to 12:46 pm and in the afternoon the day at 16:31 to 17:31 pm.

The results of research are presented in Table IV.1 address that the average levels of sulfur dioxide (SO₂) in point 1 of of 98.95 µg/Nm³, at point 2 of 186.29 µg/Nm³ and in point 3 bigs 39.87 µg/Nm³. Levels of sulfur dioxide (SO₂) that meets the standard of quality of air ambient that has been set by East Java Governor Regulation No. 10 Year2009 About Materials Quality Ambient Air and Emissions Sources Not Engaged in Java East which amounted to 262 g/Nm³, but the point to 2 by the interval measurement time of evening the experience of raising or exceeding of the standard of quality that exist that 400.75 g/Nm³.

The results of research are presented in Table 4.1 directing that the average levels of gases Ammonia (NH₃) at point 1 of 23.92 g/Nm³, at point 2 of 60.44 g/Nm³ and in point 3 sebesar 24.21 g/Nm³. the levels of ammonia (NH₃) that meets the standard of quality of air ambient that has been set by East Java Governor Regulation No. 10 Year 2009 About Materials Quality Ambient Air and Emissions Sources Not Engaged in Java East which amounted to 1360 µg/Nm³, but the point to 2 by the interval measurement time of evening the experience of raising or exceeding of the standard of quality that exist that 153.23 g/Nm³.

The high results of measurements of the levels of gas SO₂ and NH₃ air ambient in neighborhoods around where the disposal end Benowo Surabaya can be influenced by the direction and velocities of wind, humidity and temperature (Dwicahyo, 2016). Wind velocities that strong will carry pollutants that fly to all direction and can contaminate the area the other. If wind velocities is weak then the pollutants will quietly accumulate, so the concentration is getting a lot and only pollute the air environment that are around the location of contaminants such.

The results of the analysis of the data by the method of Chi-square test on the effect of levels of ammonia (NH₃) to the health of people in the surrounding Places Disposal (TPA) Benowo Surabaya in 2021 obtained the value of P = 0.918 which means the value of P is more substantial than 0.05 then H₀ The received thus can be concluded that the levels of ammonia (NH₃) no effect against complaints health communities in around where the Benowo Final Disposal Surabaya in 2021.

The results of interviews that have been conducted on 25 community respondents at the Pondok Benowo Indah location, many health complaints are experienced by people exposed to pollutants that meet the quality standard requirements for levels of SO₂ and NH₃ (63.6%) as many as 14 people this is because there are other causes which mengangu health such as comorbid or history of disease congenital.

There is no influence between the levels of Sulfur Dioxide (SO₂) and Ammonia (NH₃) on public health complaints due to the direction and velocities of the wind, humidity and temperature that change every time. At the time of making the sampling weather in the morning until noon the day sunny cloudy, but when the afternoon the day down rintikan rain in a short time.

Results Penelitian is in accordance with penelitian were conducted by Haryato *et al.*, (2014) which states that the more distant point of taking samples of air from the source Points Disposal (TPA) litter, then getting lower also the levels of gas results measurement.

2. Influence of Community Characteristics Around Final Disposal Sites (TPA) on Public Health Complaints

a. Age

Influence of age on complaints health community are presented in Table 3 below this.

Table 3. Age Distribution Results On Community Health Complaints Around The TPA

Age	Public Health Complaints		Total	P Value
	Yes	No		
0 – 40	4 (50,0 %)	4 (50,0 %)	8 (100 %)	0,317
≥40	12 (70,6 %)	5 (29,4 %)	17 (100 %)	
Total	16 (64,0 %)	9 (36,0 %)	25 (100 %)	

The results of the research that has been conducted, from 25 respondents in Pondok Benowo Indah (100%) that the complaint health community a lot going on in the community were aged ≥40 years as many as 12 people (70.6%). The test results statistically by the method of Chi-Square test was obtained P = 0.317 which means the value of P is more Bedar than 0.05 eat H₀ received thus can be concluded that age is not no effect on the complaints health communities in around where the Benowo Final Disposal (TPA), Surabaya 2021. According to Dian Fitriana, (2019) the relationship is statistically between ages with disorders of health because of immunity of the body that affect an individual's own.

The results of the study Wijiarti *et al.*, (2016), age -up or ≥40 years of an age that is very influential on the toxicity in the body, such as occurs decrease the function of the organs of the body that can

affect the metabolism and working muscles. Communities around the landfill is already familiar with the smell is not unpleasant that arise.

3. Illness History

Influence history of the disease to the complaints of health of society is presented in Table 4 below it.

Table 4. Distribution History Results To Community Health Complaints Around The TPA

Illness History	Public Health Complaints		Total	P Value
	Yes	No		
Pernah	4 (57,1 %)	3 (42,9 %)	7 (100 %)	0,656
Tidak Pernah	12 (66,7 %)	6 (33,3 %)	18 (100 %)	
Total	16 (64,0 %)	9 (36,0 %)	25 (100 %)	

The results of the research that has been done can be known that from 25 respondents (100%), which is housed stayed in around where the Final Disposal of Benowo Surabaya Year 2021, obtained results that were not everhave a history of illness breathing, sore throat , and pain in the chest as many as 12 people (66.7%). The results of the analysis of the data by the Chi-square test value of $P = 0.656$ which means the value of P is more big to 0.05 then H_0 is accepted so that can be concluded that a history of the disease does not affect to the complaints health communities in around where the Final Disposal of Benowo Surabaya 2021.

There is no influence between the history of disease and public health complaints because based on the results of interviews 12 people out of 25 people do not have a history of disease. Factors history of the disease willbe visible impact when gas high or exceeds the requirements of standard quality of the air.

4. Other Activities

Influence the activites of other against complaints health community are presented in Table 5 below this.

Table 5. Distribution Results Of Other Activities On Community Health Complaints Around The TPA

Other Activities	Public Health Complaints		Total	P Value
	Yes	No		
Kerja	1 (50,0 %)	1 (50,0 %)	2 (100 %)	0,667
Rumah Tangga	15 (65,2 %)	8 (34,8 %)	23 (100 %)	
Total	16 (64,0 %)	9 (36,0 %)	25 (100 %)	

From the results of the research that has been done can be known that from 25 respondents (100%), whichis housed stayed at around Final Disposal (TPA) Benowo Surabaya, obtained results that were spending time long was in the house that is 15 people (65.2%). Test Results Statistics with the method of Chi-square test was obtainedniali $P = 0.667$ which means the value of P is more substantial than 0.05 then H_0 is accepted so that can be concluded that long exposure to no effect against complaints health communities in around where the Final Disposal of Benowo Surabaya in 2021.

Based on the results of research Rezha Pratama, (2018) about the activities of others who do scavengers atthe landfill Cipayung Depok many respondents spend time with activities of home stairs 83% that is not there is a relationship only between the health of a scavenger due to exposure gas Sulfur Dioxide (SO_2).

DISCUSSION

Respondents in the study is more many were aged > 40 years where as the increasing age of the ability of the organs of the body semakin decreased so that a person is more at risk and vulnerable to disruption diseases as degeneration of muscles - the muscles of the body and channel the respiratory decline that will be reduced to 20% after the age of 40 years. Conditions like this will grow worse with the state of the environment that is less clean and congenital diseases of the person or people that own because of their relationship factors of age with the potential possibility to be exposed to a source of infection, the level of immunity, immunity of the body that affect travel sickness someone.

Results of the study is in line with study were conducted by Herman Good, 2017 on "Analysis of NH₃, Characteristics of Individuals and Complaints Respiratory scavengers in landfill waste Benowo and not Scavengers in Neighborhood Landfill Waste Benowo Surabaya" that did not exist a relationship, things this indicates that respondents with history of the disease and do not have a history of the disease most large still experience the complaint breathing lightly. The diseases that can affect the capacity of vital lung someone by Guyton (1997) is pneumonia, asthma, emphysema pulmonary chronic, Atelektasi, Tuberculosis and some diseases the other breath.

Not their influence activities of others on complaints health community because based on interviews, Most people who spend time at home automatically someone that often breathe air not unpleasant time of the afternoon before the night the day and after a drop in rainfall. It should be remembered that the gas that arises due to the process of decomposition and combustion in the final disposal site is not only SO₂ and NH₃ gas because the results of the research show that the quality standard of the gas content does not exceed, it is possible that it can be influenced by other gases arising from the decomposition process. and burning the gas H₂S and CH₄.

CONCLUSION

1. Based on the results and discussion can be in drag conclusion that the results of measurements of the levels of gases Sulfur Dioxide (SO₂) and ammonia (NH₃) the average gas SO₂ at point 1.2 and 3 each - each is 98.95 g/Nm³; 186.29 g g/Nm³; and 39.87 g/Nm³ and the average NH₃ gas at points 1,2 and 3 was 23.92 g/Nm³; 60.44 g/Nm³; and 24.21 g/Nm³.
2. Respondents who experienced complaints health of society as much as 16 people (64.0%) and were not experiencing complaints health of people 9 people (36%) as a result of exposure to the gas Sulfur Dioxide (SO₂) and ammonia (NH₃) case is due to factors other influences ie history of individual congenital disease (comorbid) or H₂S and CH₄ gases.
3. The results of physical air quality measurements based on SNI T-14-1993-03 parameters of wind direction and speed and humidity meet the requirements, and the temperature does not meet the quality standard requirements whose standard value is >27.1°C.
4. Not no influence levels of gas Sulfur Dioxide (SO₂) and ammonia (NH₃) to the health of people in the surrounding area disposal of end Benowo Surabaya Year 2021.

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THE EFFECT OF NOISE DUE TO AIRCRAFT PASSING IN SETTLEMENTS AROUND JUANDA AIRPORT ON COMMUNITY SUBJECTIVE COMPLAINTS

(Case Study in Sedati Gede Village, Sidoarjo in 2021)

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ABSTRACT

Aircraft activity in the area around the airport can cause hearing loss, communication disorders, sleep disorders, higher levels of stress, namely anxiety, depression, psychological morbidity, hypertension disorders and coronary heart disease. This study aims to determine the effect of noise caused by airplanes on subjective complaints of people in Sedati Gede Village, Sidoarjo. This type of research is descriptive analytic with a Cross Sectional approach. Data was collected by measuring noise, interviews, and observations. The study was conducted in settlements in the village of Sedati Gede, Sidoarjo, totaling 2290 families and a sample of 45 families. The data obtained will then be processed and presented in tabular form. The analysis of differences in noise intensity with distance and the effect of noise on people's subjective complaints was then analyzed by descriptive analysis and analysis of differences in subjective complaints of people in three zones and then analyzed by statistical analysis to test the hypothesis with the one-way anova test. The results showed that the noise in the near zone was 86.8 dBA, in the middle zone was 85.3 dBA, and in the far zone was 67.5 dBA, people who experienced complaints were quite disturbed by 15.6%, slightly disturbed 48.9%, not disturbed 35.6%, and there were no people with complaints of being very disturbed and disturbed, there was a difference in noise level with distance, there was a significant difference between the subjective complaints of the community with the three zoning of the study area with a significance value of $p = 0.005$ (<0.05), and there is an influence effect of noise intensity on the subjective complaints of the community. The conclusion of this study states that there is an influence due to aircraft noise in settlements around Juanda airport on people's subjective complaints. Therefore, the community can improve the health condition of their homes by planting vegetation and greening plants around their homes.

Keywords: Noise, Airplanes, People's Subjective Complaints, Distance

INTRODUCTION

Technology and services are developing rapidly in today's era. Transportation facilities have also progressed a lot, such as many people traveling either just to relieve stress or between cities using public transportation. Public transportation is one of the ideal choices for every human movement today. One of the public transportation that is often used is an airplane. Airplanes have high efficiency and speed, so many tourists and business people prefer to use airplanes as a means of transportation for tourism and business activities¹.

Juanda International Airport is one of the airports with the highest passenger growth during the period of July 2020. Cumulatively up to July 30, Juanda airport has served 319,609 domestic passengers. When compared with the same period last year, airplane passengers tend to decrease by 75%. Despite the impact of the pandemic, the number of domestic flights at Juanda Airport Surabaya in August increased by 24%².

The community's need for public transportation certainly causes many impacts, including positive and negative impacts. The positive impact due to the location adjacent to the airport, namely, a strategic location, land prices that continue to increase from time to time so that it benefits people who will sell land, as well as high selling prices for entrepreneurs in the culinary, hotel, and boarding houses. From an economic point of view, the people around the airport tend to be profitable. However, less in terms of health. The negative impact that is felt is that the quality of the environment decreases, which can cause health problems and discomfort for the surrounding community. Environmental impacts in residential or residential areas include air pollution and noise. The dominant source of noise comes from vehicular traffic and transportation³.

The negative effects of noise that occur continuously from airport activities are very broad, providing psychological and physiological effects such as disturbances when communicating because the noise generated by airplanes is greater than the sound when talking, can cause discomfort and fear for the public. Newcomers because loud noises can cause shock, anxiety and discomfort⁴. The impact of aircraft activities at the airport, among others, can cause hearing loss, communication disorders, sleep disorders, higher stress levels, namely anxiety, depression, psychological morbidity, hypertension and coronary heart disease⁵.

Based on the preliminary survey conducted by the researcher, on February 9, 2021 with 10 respondents in Sedati Gede Village. that, respondents who feel uncomfortable launching an airplane crossing their house get a percentage of 60%, respondents who feel surprised when they first live in an area exposed to noise get a percentage of 80%, and respondents who experience communication disorders such as asking for repetition when the plane passes get a percentage 90%. From the results of these observations, there were several complaints from the community, namely discomfort, shock when they first arrived home, and communication disorders.

The purpose of this study was to analyze the effect of noise due to aircraft traffic in settlements around Juanda airport on people's subjective complaints (a case study in Sedati Gede Village, Sidoarjo in 2021).

METHODS

This research is included in analytical descriptive research, using approach *cross sectional*. The study was conducted in settlements in the village of Sedati Gede, Sidoarjo, totaling 2290 families and a sample of 45 families. The sampling technique was carried out by accidental sampling. Data was collected by measuring noise, interviews, and observations. The data obtained will then be processed and presented in tabular form and analyzed by statistical analysis to test the hypothesis with the test *one-way anova*.

RESULT

Noise Intensity Measurement

Tabel 1. Average Noise Intensity Based on Sample Points in the morning, afternoon, and evening in Sedati gede Village in 2021

No	Sample point	Noise intensity measurement results			Average noise intensity
		morning 06-00	afternoon 12.00	evening 15.00	
1.	Point 1	86,6	86,9	86,8	86,8
2.	Point 2	85,4	85,4	85,1	85,3
3.	Point 3	68,2	66,0	68,4	67,5

Based on the table above, it can be seen that the noise intensity at point 1 results in 86.6 dBA in the morning, 86.9 dBA in the afternoon, and 86.8 dBA in the afternoon with an average noise intensity of 86.8 dBA. The noise intensity at point 2 obtained results of 85.4 dBA in the morning, 85.4 dBA in the afternoon, and 85.1 dBA in the afternoon with an average noise intensity of 85.3 dBA. The noise intensity at point 3 obtained results of 68.2 dBA in the morning, 66.0 dBA in the afternoon, and 68.4 dBA in the afternoon with an average noise intensity of 67.5 dBA.

Community Subjective Complaints in the Research Area

Tabel 2. The level of community complaints in the research area in Sedati Gede Village in 2021

No.	Community complaints level	Number of respondents	Percentage (%)
1.	<i>Very disturbed</i>	0	0%
2.	<i>Disturbed</i>	0	0%
3.	<i>Moderately disturbed</i>	7	15,6%
4.	<i>Slightly disturbed</i>	22	48,9%
5.	<i>Not disturbed</i>	16	35,6%
	amount	45	100%

Based on the table above, it can be seen that the level of complaints from people who experience complaints are quite disturbed as many as 7 people with a percentage of 15.6%, people who experience complaints are slightly disturbed as many as 22 people with a percentage of 48.9%, people who are not disturbed as many as 16 people with a percentage of 35,6%, and there are no people who feel very disturbed and disturbed.

Analysis of differences in noise levels in 3 zones at Sedati gede Village in 2021

Tabel 3. Differences in Noise Levels in 3 Zones at Sedati Gede Village area.

No.	3 sampling point zones	Measurement results	Noise (<55 eligible, 55 not eligible)	explanation
1.	point 1 (near)	86,8 dBA	≥ 55 dBA	Not eligible
2.	Point 2 (middle)	85,3 dBA	≥ 55 dBA	Not eligible
3.	Point 3 (far)	67,5 dBA	≥ 55 dBA	Not eligible

Based on the table, it can be seen that the noise level in the three zones of the measurement area, namely, point 1 (near) gets a result of 86.8 dBA, point 2 (middle) gets a result of 85.3 dBA, and point 3 (far) gets a result of 67, 5 dBA. The noise level in the three regional zones exceeds 55 dBA so it does not meet the requirements.

Analysis of Differences in Community Subjective Complaints in 3 Research Zones

Tabel 4. Differences in Community Subjective Complaints in 3 Zoning Research Areas

Sedati Gede Village in 2021

No.	Community complaints	Sampling point zoning					
		near		middle		Far	
		N	%	N	%	N	%
1.	Very disturbed	-	-	-	-	-	-
2.	Disturbed	-	-	-	-	-	-
3.	Moderately disturbed	3	20%	4	26,7%	-	-
4.	Slightly disturbed	12	80%	3	20%	7	46,7%
5.	Not disturbed	-	-	8	53,3%	8	53,3%
	Total	15	100%	15	100%	15	100%

Based on the results of the analysis of differences in subjective complaints of people in the three research zones, it can be seen that in the near zone there are 3 people who experience moderately disturbed complaints and 12 people who experience slightly disturbed complaints, in the middle zone there are 4 people who experience moderately disturbed complaints, 3 people experience complaints slightly disturbed, and 8 people felt undisturbed, in the far zone there were 7 people experiencing complaints of being slightly disturbed and 8 people feeling undisturbed.

Analysis of the Effect of Airplane Noise on Community Complaints in Sedati Gede Village.

Tabel 5. The Effect of Aircraft Noise Levels Passing on Community Complaints in Sedati Gede Village in 2021.

No	Noise intensity	Subjective complaints									
		Very disturbed		Disturbed		Moderately disturbed		Slightly disturbed		Not disturbed	
		n	%	n	%	n	%	n	%	n	%
1.	< 55	0	0%	0	0%	0	0%	0	0%	0	0%
2.	≥ 55	0	0%	0	0%	7	15,6%	22	48,9%	16	35,6%

Based on the table, it can be seen that there are no people in Sedati Gede Village who get the results of measurements of noise intensity less than 55 dBA, while people who get results of measurements of noise intensity above 55 dBA experience complaints of being quite disturbed as many as 7 people with a percentage of 15.6%. 22 people who experienced complaints of being slightly disturbed with a percentage of 48.9%, and people who felt undisturbed were 16 people with a percentage of 35.6%.

DISCUSSION

Noise Intensity

Noise is unwanted sound from a business or activity at a certain level and time which can cause disturbances to human health and environmental comfort⁶. Based on the results of measurements of noise intensity conducted on April 27, 2021 in Sedati Gede Village using a sound level meter (SLM), the results were >55 dB.

This shows that the settlements around the airport, especially in the village of Sedati Gede, which is the take-off and landing route, do not meet the residential requirements because the noise level in the three zones exceeds 55 dBA. So it can be suggested that the community should make efforts to improve the health of the condition of the house by planting vegetation and reforestation around the residence. Some types of plants can be a noise reducer in the environment such as longan trees and swan trees. The Angsana tree can grow up to 40-30 meters high, has compound leaves with 5-11 leaflets, hairy, and sits alternately. The Angsara tree has a function as a tree that adorns the city, holds and filters solid particles and gases from the air, absorbs pollution, binds O₂, and reduces noise⁷.

Another factor that affects aircraft noise is the type of aircraft and the number of flights, the more the number of flights, the more noise is generated. The biggest contributor to noise in the area around the airport is the flight traffic activity itself.

Community Subjective Complaints

Non-auditory complaints are a combination of physiological disorders, psychological disorders, and communication disorders that are subjectively felt by the public as a result of exposure to noise in the environment where they live and at work.

People's subjective complaints can be influenced by several factors such as the intensity of noise received and the length of exposure to noise so that people feel accustomed to the noise caused by passing airplanes. However, the public is disturbed by several types of large airplanes because they cause quite high noise.

Analysis of Differences in Noise Levels in Three Zones

Based on the results of the analysis, it can be seen that there are differences in the three zoning research areas. The further away the sampling point is, the less noise generated by passing aircraft. It can be concluded that there are differences in noise levels in the three study zones. However, the noise obtained at the three points does not meet the requirements because it is still above the noise threshold for residential areas, which is 55 dBA. Therefore, it can be recommended to consider the distance of the area zoning measurement in order to get a variety of noise, so that it can determine the noise distance that meets the requirements.

Analysis of Differences in Community Subjective Complaints in the Three Zoning Research Areas

Based on the results of statistical tests get a P value of 0.005. In this study, $p < \alpha$, then H_0 is rejected, which means that there are differences in subjective complaints of the community in the three study zones in Sedati Gede Village, Sidoarjo. It can be concluded that there are significant differences in the level of subjective complaints of the community with the three study zones. This is caused by differences in the level of noise intensity received by the community in each zone of the study area, so that there are differences in complaints in each zone of the study area.

It can be concluded that distance has an effect on noise. As is the case with community complaints which show that there is a difference between community complaints and distance because there are differences in the intensity of noise received by the community at each zoning distance of the research area. So that there are differences in public complaints in each zoning of the research area.

Analysis of the Effect of Aircraft Noise on Community Subjective Complaints

According to the results of the analysis, it can be seen that there is an influence between aircraft noise on people's subjective complaints because the intensity of noise causes various complaints from the community. The most common complaint in the community was that it was slightly disturbed by 22 people. Another factor that affects subjective complaints due to noise is the length of stay so that people are used to the noise disturbance caused by passing airplanes.

The results of this study contradict the results of research by Ristyna Choirunisa which states that there is no influence between aircraft noise and physiological and psychological disturbances⁸. However, this research is in line with Rahmi's research entitled Analysis of the Relationship between Noise Levels and Subjective Complaints (Non Auditory) on gas station operators in DKI Jakarta. In the study stated that there is an influence between noise and psychological disorders.

CONCLUSION

The noise intensity in the three zones of the study area exceeds the threshold, the near zone gets 86.8 dBA of noise, in the middle zone it gets 85.3 dBA of noise, and in the far zone it gets 67.5 dBA of noise. People who experience the most complaints are slightly disturbed by 48.9%. There are differences in noise levels in the three zoning research areas. There is a significant difference between the subjective complaints of the community and the three zoning research areas with a significance value of $p = 0.005$ (<0.05). There is an influence between aircraft noise on people's subjective complaints.

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THE EFFECT OF WORKING PERIOD, NUTRITIONAL STATUS, AND SMOKING
HABITS ON WORK FATIGUE AT PT. ATLANTIC ANUGRAH METALINDO
SURABAYA YEAR 2021

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ABSTRACT

Fatigue is one of the K3 (Health) problems and Occupational Safety) which is the cause of work accidents. This study aims to analyze the effect of age, years of service, nutritional status, and smoking habits on work fatigue on workers in the manufacturing and fabrication area of PT. Atlantic Anugrah Metalindo.

This type of research is analytic observational with a cross sectional approach. The sample size is 36 workers in the manufacturing and fabrication area of PT. Atlantic Anugrah Metalindo was taken randomly from a population of 40 workers. Data was collected by measuring work fatigue, height and weight, interviews, and observation. The data obtained were then processed and presented in tabular form and then analyzed statistically using the Spearman statistical test ($\alpha=0.05$).

The results of this study indicate that workers who have an age of 66.7% aged 26 to 45 years, 47.2% of work years are more than 10 years, who experience an overweight nutritional status with a severe level of 38.9%, have a smoking habit of 41.7% moderate smokers, workers with a level of work fatigue do not experience fatigue as much as 52.8%, there is no influence of age with a p value = 0.101 (> 0.05) working period with a p value = 0.841 (> 0.05), nutritional status with p value = 0.395 (> 0.05), smoking habit with p value = 0.276 (> 0.05) on work fatigue in the workforce.

It was concluded from this study that there was no effect of age, years of service, nutritional status, and smoking habits on work fatigue in the workforce. Therefore, companies can pay attention to work fatigue by providing attention and counseling to workers regarding efforts to control work fatigue.

Keywords: work fatigue, age, nutritional status, working period, smoking habit

INTRODUCTION

Indonesia is at the stage of the process of socio-economic change that affects the livelihood system of an agrarian society into an industrial society, this is due to technological advances. In general, industrial activities are able to ensure the sustainability of the regional economic development process. Human resources are the most important assets that must be owned and maintained by the company. The role of humans here is very important, namely working to create goals, innovate, and achieve company goals and can meet market needs. (1)

Industrial development can have a positive impact, namely increasing the welfare of life with a steady income. Creating employment opportunities, fulfilling various community needs, and encouraging forward thinking for the people. Industrial development also triggers the absorption of labor, so as to increase per capita income. From 2009 to 2015, the average growth in employment absorption increased by 2.49%. The growth of the industrial

sector had a significant positive effect on employment. So, when the industrial sector experiences an increase in the number of business units, it will be followed by an increase in employment in the industrial sector. (2)

Industrial developments can also have a negative impact, namely a decrease in social interaction between people due to a lot of workers spending time at work. Environmental pollution, agricultural land is decreasing, and population mobility is increasing. Workers spend a lot of time at work, physical factors in the work environment such as temperature, light, noise, smoke, security, accidents, dust, and odors need to be considered in order to create comfort and safety for workers. (3)

Fatigue is one of the K3 (Occupational Health and Safety) problems that can be the cause of work accidents. The term fatigue refers to the weakening of the workforce to carry out an activity, resulting in reduced work capacity and body resistance. The World Health Organization (WHO) predicts that the second killer disease after heart disease is feeling tired. Factors causing fatigue in industry vary widely, one of which is the work environment, if working in uncomfortable conditions over time it will cause fatigue. Apart from the physical factors of the work environment, Suma'mur predicts several main factors that are significant to fatigue which include gender, age, nutritional status, workload, body size of the worker concerned and the time spent at work. (4)

Based on BPJS Employment data, in 2019 there were 77,295 workplace accidents (Sultan, 2019), in Indonesia every day on average there were 414 work accidents, 27.8% due to high fatigue, approx. 9.5% or 39 people have disabilities. According to the International Labor Organization (ILO) in 2014 every year the fatigue factor is the cause of workers dying due to work accidents with as many as two million workers. In this study, there were 18,828 of 58,115 samples, with a percentage (32.8%) experiencing fatigue. In Indonesia, more than 65% of workers visited the company's polyclinic with the same complaint, namely work fatigue. Based on the work accident data above, the industry in Indonesia must take corrective action to eliminate the work accident. (5)

Based on a preliminary survey conducted by researchers, on January 15, 2021, from 15 workers in the manufacturing and fabrication department of PT. Atlantic Anugrah Metalindo taken at random. It was found that 40% of the workforce had a working period of more than 5 years, 27% of the workforce were severely overweight, and 33% of the workforce were heavy smokers. The importance of this research is that in the area of manufacturing and fabrication, from these results there are several labor problems with problems that interfere with the workforce, namely work fatigue caused by various factors and one of them is individual factors, namely years of work, nutritional status and smoking habits.

METHODS

This research is an analytic observational with a cross sectional approach. The sample size is 36 workers taken by simple random sampling from 40 workers. Data were collected through observation, interviews and measurements. The data collected was processed and analyzed using the SPSS program through the Spearman test.

RESULT

Tabel 1. Distribution of Worker Frequency by Age at PT. Atlantic Anugrah Metalindo Year 2021

No	Age	Frequency	Perentage (%)
1.	26-35 tahun	6	16,7
2.	36-45 tahun	24	66,7
3.	46-55 tahun	6	16,7
Total		36	100

Most of the workers in the manufacturing and fabrication section of PT Atlantic Anugrah Metalindo are aged 36 to 45 years, namely 24 people with a percentage of 66.7%, 26 to 35 years and 46 to 55 years, namely 6 people with a percentage of 16.7 %.

Tabel 2. Distribution of Worker Frequency by Period of Service at PT. Atlantic Anugrah Metalindo 2021

No	Period of Service	Frequency	Percentage (%)
1.	< 5 tahun	9	25
2.	5-10 tahun	10	27,8
3.	> 10 tahun	17	47,2
Total		36	100

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1st International Conference of Environmental Health (ICoEH)

Most of the workers in the manufacturing and fabrication division of PT Atlantic Anugrah Metalindo have more than 10 years of service, namely 47.2%, 27.8% 5 to 10 years, and 25% less than 5 years.

Tabel 3. Distribution of Worker Frequency by Nutritional Status at PT. Atlantic Anugrah Metalindo 2021

No	Nutritional Status	Frequency	Percentage (%)
1.	Severely underweight	0	0
2.	Mildly underweight	1	2,8
3.	Normal weight	10	27,8
4.	Mildly overweight	11	30,6
5.	Overweight level	14	38,9
Total		36	100

The frequency distribution of workers in the manufacturing and fabrication division of PT Atlantic Anugrah Metalindo has a nutritional status of severe overweight as much as 38.9%, mild overweight as much as 30.6%, normal weight as much as 27.8%, underweight light weight level as much as 2.8%, and no one was severely underweight.

Tabel 4. Distribution of Worker Frequency by Smoking Habits at PT. Atlantic Anugrah Metalindo 2021

No	Smoking Habits	Frequency	Percentage (%)
1.	Light Smoker	13	36,1
2.	Medium Smoker	15	41,7
3.	Heavy Smoker	8	22,2
Total		36	100

The frequency distribution of workers in the manufacturing and fabrication section of PT Atlantic Anugrah Metalindo has a smoking habit of heavy weight, which is 38.9%, moderately overweight, as much as 30.6%, normal weight as much as 27.8%, underweight mild level of body weight as much as 2.8%, and no one experienced severe level of underweight.

Tabel 5. Distribution of Work Fatigue Frequency at PT. Atlantic Anugrah Metalindo 2021

No	Kebiasaan Merokok	Frequency	Percentage (%)
1.	Normal	19	52,8
2.	Light Work Fatigue	16	44,4
3.	Smokers Moderate Work Fatigue	1	2,8
4.	Heavy Work Fatigue	0	0
Total		36	100

Tabel 6. Effect of Age on Work Fatigue at PT. Atlantic Anugrah Metalindo Year 2021

No	Age	Work Fatigue								Total		P value
		Normal		Mild		Medium		Severe				
		n	%	N	%	N	%	N	%	n	%	
1.	26-35 years	5	83%	1	16,7%	0	0%	0	0%	6	100%	0,101
2.	36-45 years	12	50%	11	45,8%	1	4,4%	0	0%	24	100%	
3.	46-55 years	2	33,3%	4	66,7%	0	0	0	0%	6	100%	

Table IV.6 can be seen that from 36 workers (100%), workers aged 36 to 45 years who experience work fatigue in the normal category as many as 12 people with a percentage of 50%, 11 people with mild with a percentage

of 45.8%, and moderate as many as 1 person with a percentage of 4.2%. There are 5 workers aged 26 to 35 years who experience normal work fatigue with a percentage of 83.3% and 1 person mild with a percentage of 16.7%. Workers aged 46 to 55 years who experience normal work fatigue are 2 people with a percentage of 33.3% and mild as many as 4 people with a percentage of 66.7%.

Tabel 7. Effect of Working Period on Work Fatigue at PT. Atlantic Anugrah Metalindo Year 2021

No	Working perid	Work Fatigue								Total		Pvalue
		Normal		Mild		Medium		Severe				
		n	%	N	%	N	%	N	%	n	%	
1.	<5 tahun	3	44,4%	5	55,6%	0	0%	0	0%	8	100%	0,841
2.	5-10 tahun	7	70%	3	20%	1	10%	0	0%	11	100%	
3.	>10 tahun	8	47,1%	9	52,9%	0	0	0	0%	17	100%	

Table IV.7 can be seen that of 36 workers (100%), workers with a working period of more than 10 years experienced work fatigue in the normal category as many as 3 people with a percentage of 44.4% and 5 people with mild with a percentage of 55.6%. Workers with a working period of 5 to 10 years who do not experience fatigue or normal as many as 7 people with a percentage of 70%, who experience a mild level of work fatigue as many as 3 people with a percentage of 20%, and 1 person with a percentage of 10% experiencing moderate level of fatigue.

Tabel 8. Effect of smoking on Work Fatigue at PT. Atlantic Anugrah Metalindo Year 2021

No	Status Gizi	Kelelahan Kerja								Total		Pvalue
		Normal		Mild		Medium		Severe				
		n	%	N	%	N	%	N	%	n	%	
1.	Severely underwweight	0	83%	0	0%	0	0%	0	0%	0	0%	0,395
2.	underweight mild levels	0	50%	1	3%	0	0%	0	0%	1	100%	
3.	Normal weight	5	60%	4	30%	1	10%	0	0%	10	100%	
4.	overweight light level	4	36,4%	7	63,6%	0	0%	0	0%	11	100%	
5.	Overweight	9	64,3%	5	35,7%	0	0%	0	0%	14	100%	

Table IV.8 can be seen that from 36 workers (100%), workers with nutritional status who are included in the category of severe overweight tend to experience normal work fatigue as many as 9 people with a percentage of 64.3%, and 5 people experiencing mild fatigue. with a percentage of 35.7%. Workers with nutritional status in the mild overweight category experienced normal work fatigue as many as 4 people with a percentage of 36.4%, and those who experienced light work fatigue as many as 7 people with a percentage of 63.6%. Workers with nutritional status in the normal weight category experienced normal work fatigue as many as 5 people with a percentage of 60%, workers with mild fatigue with a percentage of 4 people with a percentage of 30%, and 1 person experiencing moderate fatigue with a percentage of 10%. Workers with light weight nutritional status are 1 person with a percentage of 3%.

Tabel 9. Effect of Smoking Habits on Work Fatigue at PT. Atlantic Anugrah Metalindo Year 2021

No	Smoking Habits	Work Fatigue								Total		Pvalue
		Normal		Mild		Medium		Severe				
		n	%	N	%	N	%	N	%	n	%	
1.	Light smoker	7	61,5%	4	30,8%	1	7,7%	0	0%	13	100%	0,276
2.	Moderate Smokers	7	46,7%	8	53,3%	0	0%	0	0%	15	100%	
3.	Heavy smokers	4	50%	4	50%	0	0	0	0%	8	100%	

Table IV.9 shows that out of 36 workers (100%), workers with the category of moderate smokers tend to experience normal work fatigue as many as 7 people with a percentage of 46.7% and 8 people experiencing light work fatigue with a percentage of 53.3%. Workers in the light smoker category experienced normal fatigue as many as 7 people with a percentage of 61.5%, and those who experienced light work fatigue with a percentage of 4 people with a percentage of 30.8%. Workers in the category of heavy smokers experience normal work fatigue as many as 4 people with a percentage of 50% and those who experience light work fatigue as many as 4 people with a percentage of 50%.

DISCUSSION

The absence of the effect of age on work fatigue can occur because the average age of workers is 36 to 45 years, so that at that age is still classified as a productive age even though there is a decrease in the ability of organs or muscles. A person's age is directly proportional to the physical work capacity to some extent. Fatigue can occur due to monotonous work conditions. Working conditions that are repetitive or monotonous, can cause boredom, and make employees feel tired and bored. However, it can also be caused by the workload felt by employees, as well as environmental conditions such as a hot working climate and noise from the production machines used. A work environment with noise that exceeds the threshold can be one of the factors causing work fatigue. (6)

The absence of the effect of working period on work fatigue can be caused because the work period describes the length of work that has been passed for years and the ability of a person's body to adapt and accept a job is different. As for another reason, the longer a person works, the higher the level of adaptation to fatigue. This is because the level of endurance he experiences affects the feeling of being used to the work being done. Work experience can also distinguish the effect of working conditions on the impact that arises on himself. The length of service period is because workers feel comfortable with a work environment that is supported by wise leaders and can work according to their expertise. Reduction of psychological and physiological functions can be eliminated with recovery efforts. (7)

The absence of influence of nutritional status on work fatigue, can be caused by the influence of other factors, namely the workload of workers is high and exceeds the ability of workers. This can occur due to the influence of other factors, such as a non-ergonomic work position, causing workers to feel tired. The number of calories needed to do work must be met from the food and drinks consumed. If the nutritional intake is not sufficient, the ability of the workforce to work will be reduced and they will get tired more easily. (8)

The results of this study are in line with previous research conducted by Febriyanto (2019) where the study stated that smoking had no effect on work fatigue caused by other factors such as gender, workload, alcohol drinking habits, drug abuse and musculoskeletal disorders. (9)

CONCLUSION

Workers who have an age of 66.7% are 26 to 45 years old and 16.7% are 26 to 35 years old and 46 to 55 years old. Workers who have a working period of 47.2% more than 10 years, 27.8% 5 to 10 years and 25% less than 5 years. Workers who experience nutritional status of severe overweight as much as 38.9%, moderately overweight 30.6%, normal weight 27.8%, mildly underweight 2.8%, and none of the respondents experienced severe level of underweight. Workers who have a smoking habit are 41.7% moderate smokers, 36.1% light smokers, and 22.2% heavy smokers. Workers with work fatigue levels who do not experience fatigue are 52.8%, mild fatigue are 44.4%, moderate work fatigue are 2.8%. There is no effect of age on work fatigue with a significant value of $p = 0.101$, years of service on work fatigue in workers with a significant value of $p = 0.841$, nutritional status on work fatigue in workers with a significant value of $p = 0.395$, and smoking habits on work fatigue in the workforce with a significant value of $p = 0.276$

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Society Role in Drinking Water Treatment with *Ipomoea carnea*

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ABSTRACT

drinking that safe and affordable for all. One of the bacteriological requirements for safe drinking water is the total *coliform* content must be absent (0). Society has done drinking water treatment by *Ipomoea carnea* as an antibacterial as a natural alternative. The most effective concentration of *Ipomoea carnea* as antibacterial drinking water managed by the society is 0.15 grams of leaf extract in 100 mL of drinking water samples which can reduce the number of germs to 80.33%. The purpose of this study to analyze the acceptance and to use of antibacterial *Ipomoea carnea* for drinking water treatment by society. This research is the field conducted in Magetan Regency. Method data collection was carried out by interview using a questionnaire and observation of people who treat drinking water. Analysis quantitative descriptive, based on mean using *central tendency*. The results people received *Ipomoea carnea* as antibacterial for drinking water treatment as many as 56.67% and all those people agree to use *Ipomoea carnea*. It is recommended that society use *Ipomoea carnea* as an antibacterial for drinking water. It is also to boil water for drinking water.

Keywords : Society, drinking water, *Ipomoea carnea*

INTRODUCTION

One of the targets for sustainable development (Sustainable Development Goals) in Indonesia by 2030 is to achieve universal and equitable access to safe and affordable drinking water for all. The high access to adequate household drinking water provides optimism for achieving the SDGs targets while continuing to seek, maintain, and improve basic services for safe drinking water for urban households. Access to adequate drinking water sources for rural residents who still need attention from the government ¹.

Some areas in Magetan district provide clean water by the society, namely by the society and/or individuals, with the form of clean water management based on the water source used, namely protected springs/sources, wells (deep/shallow) either protected dug wells, dug wells using pumps, drilled wells using pumps, and rainwater reservoirs ².

Based on the Regulation of the Minister of Health Number 429/MENKES/PER/IV/2010 concerning Drinking Water Quality Requirements. The requirements state that drinking water must not contain all types of bacteria (*E coli* and Coliform Bacteria). Clean water for drinking water in society nonPDAM as much as 93.64% still does not meet the bacteriological requirements, namely 2 to 1898 /100 mL of the water sample. Water sources come from types of clean water facilities, both from dug wells, deep dug wells, pipelines, and drilled wells³.

People treat drinking water using antibacterial *Ipomoea carnea* as an alternative to nature. The decrease in bacteriological content was 80.33% from 0.15 grams of *Ipomoea carnea* leaf extract in 100 mL of society-treated drinking water samples. *Ipomoea carnea* contains active ingredients Alkaloids and Flavonoids which can be used as antibacterial ⁴.

The purpose of this study was to assess the acceptance and use of antibacterial *Ipomoea carnea* by society in drinking water treatment.

METHODS

This research is the field conducted in Magetan Regency with a sample of 30 respondents. Respondents in this study were the head of the family, mother, or family member who was responsible for the use of drinking water sources at home. The sampling technique in this study used a purposive sampling method with criteria

of antibacterial *Ipomoea carnea* for drinking water treatment by the society. Method data collection was carried out by interview using a questionnaire and observation of people who treat drinking water.

The independent variable in this study was antibacterial *Ipomoea carnea* for drinking water treatment by the society, while the dependent variable in this study was acceptance and to use of antibacterial *Ipomoea carnea* for drinking water treatment by the society. Acceptance of antibacterial *Ipomoea carnea* for drinking water treatment by the society variables were knowledge, confidence, awareness, risk, altruistic, and egoistic. Use of antibacterial *Ipomoea carnea* for drinking water treatment by the society variables were method, time, concentration and behavior.

Data analysis in this study use quantitative descriptive, based on mean using *central tendency*, and chi-square.

RESULTS

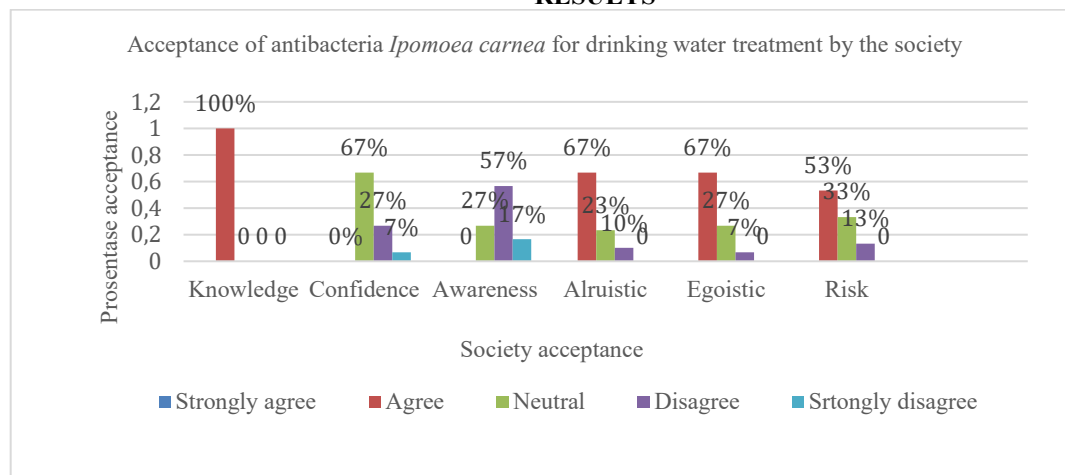


Figure 1. Acceptance of antibacteria *Ipomoea carnea* for drinking water treatment by the society

Society acceptance as shown in figure 1, the society knows about *Ipomoea carnea* by 100%, the society has a belief that 66.67% accepts *Ipomoea carnea* as an antibacterial in drinking water, but as much as 56.67% of the society has a neutral awareness of the acceptance of *Ipomoea carnea* antibacterial. Society agrees that *Ipomoea carnea* can provide welfare for themselves and others by 66.67%, and the society by 53.33% accepts the risk of *Ipomoea carnea* as an antibacterial drinking water

Table 1 Chi-Square Test Results of Respondents' Characteristics of Acceptance

Respondents' Characteristics	Acceptance	Not Acceptance	p	Description
Region			0,19	No difference
- Poncol Districs	3	3		
- Plaosan Districs	3	0		
- Sidorejo Districs	0	3		
- Panekan Districs	5	4		
- Kawedanan Districs	2	2		
- Parang Districs	4	1		
Gender			1,00	No difference
- Male	10	8		
- Female	7	5		
Family Status			0,10	No difference
- Head of family	10	5		
- Housewife	7	5		
- Member of family				

	0	3		
Education			0,68	No difference
- Elementary School	3	1		
- Junior High School	3	1		
- Senior High School	10	10		
- College	1	1		
Water Sources			1,00	No difference
- Springs	12	10		
- Deep wells	5	3		

Chi-square test results of respondents' characteristics of acceptance are shown in table 1, this means that the technology is accepted by all levels of society, both male and female, in all locations, at all levels of education, whether using springs or deep wells.

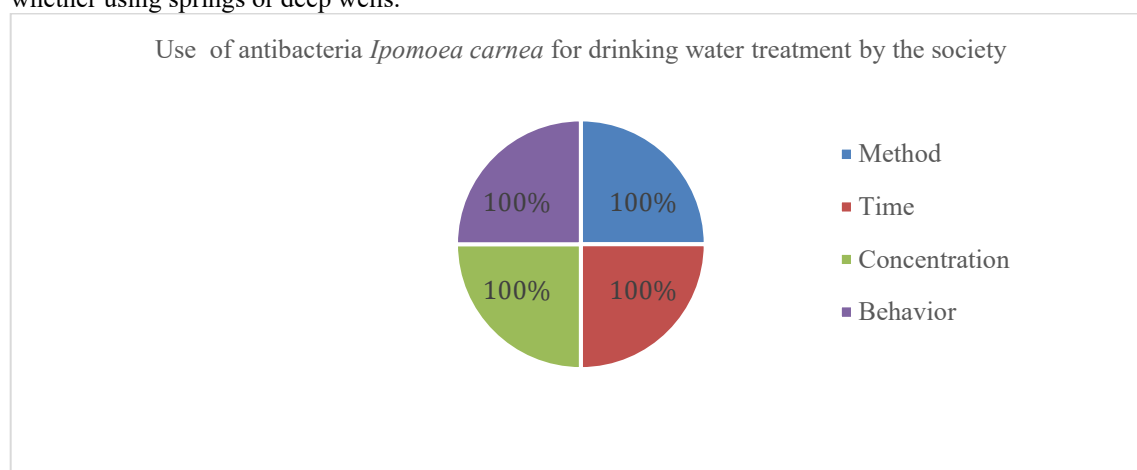


Figure 2. Use of antibacterial *Ipomoea carnea* for drinking water treatment by the society

The results of observations of the use of *Ipomoea carnea* were analyzed from the method, time, concentration, and social behavior in treating drinking water. The respondent's method of using *Ipomoea carnea* as an antibacterial 100% answered yes. The time the respondent used *Ipomoea carnea* as an antibacterial 100% was appropriate, namely before the drinking water was used the extract was put into the drinking water reservoir. The concentration of *Ipomoea carnea* as an antibacterial used by respondents was 100% appropriate, namely 0.15gram extract/100 mL water sample. The society uses the conversion concentration, which is 15 grams/10 liters of water in drinking water reservoirs.

Respondents' behavior includes: washing hands before and after the mixing process, closing drinking water reservoirs, maintaining cleanliness around drinking water reservoirs and regularly cleaning drinking water reservoirs 100% answered yes. Figure 2 showing the use of antibacterial *Ipomoea carnea* by the society for drinking water treatment.

DISCUSSION

The results show acceptance of 56.67% average and 43.33% < average, so it can be accepted. The acceptance of *Ipomoea carnea* by the society for drinking water treatment consists of several variables, namely knowledge, belief, awareness, welfare for others (Altruistic), own welfare (Egoistic), and risk to new technology. The knowledge variable with yes and no answers used an average of 50% accepted and < 50% did not accept, while

the answers from the belief, awareness, altruistic, egoistic, and risk variables using the options strongly agree, agree, neutral, disagree and strongly disagree agree to use the mean with these intervals and categories.

The application in the society using antibacterial *Ipomoea carnea* leaf extract with a concentration of 15gram/10,000mL in society reservoirs has a significant germ number value with the value of the germ number that was examined for total Coliform MPN in the laboratory with the lowest germ value 2 colonies/100mL drinking water samples and the highest 38 colonies/100 mL of the drinking water sample. Application with an antibacterial treatment of *Ipomoea carnea* leaf extract with a concentration of 15 grams/10,000 mL in society reservoirs.

Characteristics of respondents which include region, gender, status in the family, education and water sources used show > 0.05 so that the antibacterial technology of *Ipomoea carnea* is accepted by all circles of society, both male and female. and women, in all locations, at all levels of education, whether using springs or deep wells.

Society accepts *Ipomoea carnea* as an antibacterial for drinking water treatment as much as 56.67% and people who agree that all use *Ipomoea carnea*.

Acceptance was obtained from 100% of the people knowing about *Ipomoea carnea* shown by this plant by 97%, people easily encountering *Ipomoea carnea* by 97% and knowing how *Ipomoea carnea* reproduces by 90%. 60% male respondents with 50% family head status and 66.7% graduated from high school have knowledge that exceeds the average knowledge of the respondents. and women, in all locations, at all levels of education, whether using springs or deep wells.

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Acceptance was obtained from 100% of the people knowing about *Ipomoea carnea* shown by this plant by 97%, people easily encountering *Ipomoea carnea* by 97% and knowing how *Ipomoea carnea* reproduces by 90%. 60% male respondents with 50% family head status and 66.7% graduated from high school have knowledge that exceeds the average knowledge of the respondents. Women tend to pay more attention to the prices of products and services and are more cost-conscious than men. Furthermore, women are usually more involved in purchasing and thus more responsible and careful with money than men⁵. Given men's propensity to play with technology, the value men charge for technology is likely to be higher than the value women place for the same technology⁶. In research it was revealed that gender can reduce the effects of anxiety. Women tend to be more sensitive to their feelings and social roles are closer to the social mirror effect of the surrounding environment. These two reasons ultimately make the effect of anxiety greater for women than men. Second, gender is empirically proven to reduce the relationship of hedonic motivation, price values, habits, and anxiety on behavioral intentions. In addition, gender also reduces the relationship between habits and conditions that facilitate use behavior. Men have stronger effects on hedonic motivation and behavior, while women have stronger effects on value, anxiety, and facilitating conditions. In family status, the head of the family and the housewife as the wife have the same rights in determining the attitude and behavior of accepting a technology. The advantages of men over women are functional. This means that a man who is in charge of finding and being able to meet the needs of his wife and family, then he can become a leader in the household. Men and women also have the same social function, namely carrying out domestic tasks in the household. Therefore, if a man cannot fulfill his obligation to meet the needs of his wife or family, and the wife is the backbone of the family, then the advantages of being the leader of the family certainly belong to the woman (wife)⁷. Concerning a person's healthy behavior, the existence of education is a process that is deliberately sought in society to educate, foster, and build individuals both in the home environment or in their social environment and is responsible for being a driving force towards progress. Every human being, both individually and in groups, has different behavior. Some people behave always consider all aspects around them and some act as they please. School as an educational institution, in which a person can learn how to behave in a good and healthy manner, learn the norms or rules that are obeyed. So it is hoped that education can change a person's behavior or healthy living behavior for the better because one of the functions of education is to develop patterns of behavior (social) following existing norms and rules. Therefore, one's education will change a person to understand everything such as knowing healthy living behavior that should be done by the society which will change the quality of the social environment to be cleaner, healthier, and more comfortable, because if we know about maintaining health, it is something that must be done by the society. person or society. Education is something that affects our daily behavior and environment so that education is the main capital in all things⁸.

Public belief 66.67% neutral accepts *Ipomoea carnea* because they do not agree, all parts of *Ipomoea carnea* can be used both roots, stems, leaves, flowers, and fruit except 53.33% of respondents strongly agree that stems can be used. 70% of the society strongly agree that the existence of *Ipomoea carnea* will disturb the environment if it is not used and 73.33% of the society strongly agree to use it so that the environment is clean/no weeds. This belief is 46.7% of men as heads of neutral families with 50% education graduating from high school.

Public awareness does not agree to accept *Ipomoea carnea* by 56.67%, although people are very aware that *Ipomoea carnea* can be used as antibacterial drinking water, people are aware that their drinking water sources contain bacteria and people are aware that they will give antibacterial *Ipomoea carnea* to drinking water sources both tofu and tofu. contain bacteria or not. The educational background of those who graduated from high school was 36.7% disagreed, male and female and 13.3% housewives were neutral.

The altruistic value, namely the welfare benefits for other people is neutral, obtained from 73.33% of the society strongly agree that using *Ipomoea carnea* as an antibacterial, 60% of the society strongly agree that the environment will be clean, drinking water will meet health requirements while the society agrees 43.33 % using antibacterial *Ipomoea carnea* in drinking water sources will reduce diarrheal disease at a low cost. The neutral altruistic value of the respondent's characteristics was obtained from the family status of the head of the family by 23.33%, educated people who graduated from high school with male gender 26.7% agreed.

The egoistic value, namely the welfare benefits for oneself, 66.67% agree, where 53.33% strongly agree that using *Ipomoea carnea* as antibacterial drinking water will meet health requirements, 56.67% strongly agree that it can reduce diarrheal disease, 50% strongly agree because reduce weeds and 40% agree to use low cost. 23.3% of men agreed, 20% of family heads and educated people who graduated from high school agreed.

The risk of the benefits of the new technology 53.33% agree, because the society 53.33%, strongly agree that it is not disturbed, 60% is easy to use *Ipomoea carnea* as an antibacterial and 43.33% strongly agrees because it is suitable for new technology, 40% agrees because it is cheap.

All genders, 16.7% neutral, including housewives, 20% of educated people who graduated from high school, strongly agree.

The attitude factor of each user behavior with two variables, namely ease of use and usefulness⁹. These two variables can explain aspects of user behavior, so user acceptance is influenced by benefits and convenience. Perceptions about the ease of use of technology are defined as a measure by which a person believes that the technology can be easily understood and used, i.e. the technology is very easy to learn, does what the user wants, easily improves user skills, and is easy to operate. Perception of usefulness is defined as a measure where the use of technology is believed to bring benefits to those who use it, including usefulness, namely: making work easier, more useful, increasing productivity and effectiveness, namely enhancing effectiveness and developing job performance¹⁰.

Technology has increasingly focused on perceived risk and benefit. The general public's perception of risk is usually based on factual information¹¹, but is also important on feelings, ethics, preventive differences, and attitudes, and can be ambiguous. Perhaps not always fact based, decision making about technology is influenced by perceptions of risk, and these perceptions are based on terms of reference and knowledge. The perceived risks and benefits of technology are not just concepts, they are constantly subject to change by the current cultural understanding, which is an acceptable risk. New technology can be perceived as risky, but when it is embedded in routine behavior, that perception can change to not being risky. In addition, perceived risks and benefits also affect each other; the level of perceived benefit affects the level of perceived risk acceptance. The ease with which the technology is used will not affect the respondent's attitude towards the use of technology. There is no effect between perceptions of the ease of using technology and user attitudes¹². The use of *Ipomoea carnea* as an antibacterial is very good on the method, time, concentration, and behavior of the society. People use *Ipomoea carnea* extract by directly putting the extract into 10 liters of drinking water without stirring it before use with a concentration of 15 grams. Society washes their hands before and after the mixing process, closes drinking water reservoirs, maintains cleanliness around drinking water reservoirs, and regularly cleans drinking water reservoirs. Health status is a related relationship between health behavior and overall health. Interventions are often more effective in holistic health outcomes¹³. States that the effects of health promotion interventions take up to 6 weeks and 14 days to get a chance, so behavior requires time to change^{14 15}. People-based on their knowledge and knowing the risks and benefits of the new technology obtained will accept the antibacterial *Ipomoea carnea*, because the general public's risk perception is usually based on factual information, but is also important on feelings, ethics, preventive differences, and attitudes, and can ambiguous. Perhaps not always fact-based, technology decision-making is influenced by the perception of risk; and this perception is based on a frame of reference and knowledge. People use antibacterial *Ipomoea carnea* very well because the perceived risks and benefits of the technology are not fixed concepts; rather, they are constantly subject to change by today's cultural understanding of acceptable risk: a new technology may be perceived as risky, but when it is embedded in routine behavior, that perception may change to be non-risky. In addition, perceived risks and benefits also affect each other; the level of perceived benefit affects the level of perceived risk acceptance. In addition, the acceptance and use of antibacterial *Ipomoea*

carnea requires a process so that behavior requires the application of time to change. The variable that has the biggest influence on people's behavior is the characteristics of innovation¹⁶.

CONCLUSION

The society received *Ipomoea carnea* as an antibacterial by 56.67% and of the people who received it they all used *Ipomoea carnea* for drinking water treatment.

The role of the society in drinking water treatment with the use of antibacterial *Ipomoea carnea* can be carried out in individual reservoirs on a household scale or a larger communal scale. So that the application of antibacterial *Ipomoea carnea* in a sustainable manner will be able to be carried out for the safety and feasibility of drinking water for the society, it can be a step to fulfill sustainable development goals.

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Ipomoea carnea Leaf Extract As Antibacterial Drinking Water Deep Wells

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ABSTRACT

Drinking water is a basic necessity of living. It will be a problem if it contains microorganisms. Drinking water Standard based on WHO and the Republic of Indonesia Regulation No. 492 / Menkes / Per / IV / 2010 where microorganisms must be zero and must be processed. The society has not done drinking water treatment either chemically or by other methods. As a natural alternative, *Ipomoea carnea* contains active ingredients such as alkaloids and flavonoids which can be used as antibacterial substances. The study aims to prove the extract of leaves of *Ipomoea carnea* in reducing the bacteriological content of drinking water source of deep well. This research is an experimental research in the laboratory and the field. Samples in the form of sources of drinking water from springs deep wells that do not quality bacteriological with purposive sampling. Maserasi methods the extract of leaves of *Ipomoea carnea* with MPN *Coliform* test with one way anova analysis. The results obtained revealed that the results obtained revealed that concentrations 0,15g/100mL samples water drinking source springs extract of leaves of *Ipomoea carnea* can reduce bacteriological content 80,33%.

Keywords: Water drinking, *Ipomoea carnea*, deep well

INTRODUCTION

Water is a very important need for life. Sufficient, safe and accessible supplies must be met so that they are of significant health benefit. All efforts should be made to achieve safe drinking water quality. Supply of clean water for every home in developing countries, access to clean water and unhygienic sanitation causes water-borne infections. Clean water that does not meet bacteriological requirements will have an impact on human health, including *Salmonella typhosa*, *Shigella dysenteriae*, *E. coli* and *Vibrio comma*. These bacteria grow in the intestines of humans and warm-blooded animals. Human feces and animal waste containing these bacteria when it enters a water body, the bacteria can still live for several days. When humans drink water, pathogenic bacteria that are still alive enter the intestines and will grow which can cause disease. Water serves as a carrier of disease¹.

WHO² requires that all pathogenic bacteria should not be present in water. Parameters that are directly related to health for water microbiological parameters in Indonesia are based on the Regulation of the Minister of Health Number 429/MENKES/PER/IV/2010 concerning Drinking Water Quality Requirements. The requirement states that drinking water must not contain all types of bacteria (*E coli* and *Coliform Bacteria*)³ Chlorination requirements for the environment and humans as a chlorine disinfectant in drinking water are at a maximum concentration of 0.2-1 mg/L⁴. Exposure to chlorine, hypochlorous acid, and hypochlorite ion for household consumption as drinking water if it exceeds the concentration it will cause irritation of the throat and mouth, asthma, skin irritation, High Density Lipoprotein (DHL) and cholesterol will increase, the most serious risk is having a carcinogenic effect especially the bladder. The more the impact of chlorine on the environment and health is known, it is necessary to seek alternatives to replace chlorine. Especially in the treatment of clean water or drinking water, chlorine is replaced with other technologies such as ozonation, membrane processes and ultraviolet⁵.

Antimicrobial activity of *Ipomoea carnea* leaf extract against several test bacteria. Leaf powder extracts of *Ipomoea carnea* family Convolvulaceae sub-family fistulosa tested were n-hexane extract, ethyl acetate, acetone, ethanol and acetone fraction⁶. Potential of *Ipomoea carnea* leaf extract with reference to phytochemicals, pharmacological activities and others, where *Ipomoea carnea* as a medicinal plant is used as an anti-bacterial, anti-fungal, anti-oxidant, antimicrobial, anti-cancer, anti-convulsant, immunomodulatory, anti-diabetic, hepatoprotective, anti-inflammatory. Inflammatory, anxiolytic, sedative, cardiovascular,

inhibitory and wound healing activities also toxicological effects with extract⁷. From the several studies above, there is still no research on *Ipomoea carnea* as an antibacterial for drinking water.

The Magetan community has not treated drinking water from deep wells. Sources of drinking water still contain microorganisms (total *Coliform*) that exceeds the quality standard of 93.64% and still do not meet the bacteriological requirements, namely 2 to 1898 /100 mL of water sample. For this reason, research on drinking water treatment through intervention using extracts will be carried out. *Ipomoea carnea*.

The purpose of this study was to test the leaf extract of *Ipomoea carnea* to reduce the number of germs in drinking water from deep wells.

METHODS

This research was conducted in the laboratory and in the field, to test the extract of *Ipomoea carnea* as an antibacterial for drinking water from deep wells. In the laboratory, extracts are made using the maceration method and total *Coliform* test, in the field it is an application of the results of laboratory tests

This study used green leaves of *Ipomoea carnea* plants at least 2 weeks old, from their natural habitat, not cultivated in Magetan Regency, East Java, Indonesia, which is located at (7°30'34"-7°47'49") South Latitude and (111°10'54" -111°30'46") BT.

The independent variable is the concentration of *Ipomoea carnea* leaf extract, and the dependent variable is the bacteriological content (germ count) of deep well water sources.

The sampling method is purposive sampling, namely the sample as desired by the researcher according to the goals achieved, with a population of deep well water sources managed by the community, the sample in the form of community managed deep well water sources whose bacteriological standards do not meet WHO requirements and the Indonesian Minister of Health Regulation No. 492/2010.

The data obtained are both primary and secondary data. Primary data from the results of measurements in the laboratory and measurements in the field, namely drinking water from deep wells in community reservoirs and the results of observations through observation sheets. The experimental process starts from the manufacture of *Ipomoea carnea* leaf extract, treatment of deep well water samples, analysis of the Most Probobality Number (MPN) *coliform* and conversion applications in the field in community reservoirs. Making extracts using the maceration method. Maceration is done by soaking the simplicia powder in a liquid filter. Maceration is used for simplicia extraction that contains active substances that are easily soluble in the liquid filter, does not contain substances that easily expand in the liquid filter, does not contain benzoid stirrak and others. The advantage of the extraction method using maceration is that the way of working and the equipment used is simple and easy to cultivate. Wetting the powder prior to sieving is intended to provide the greatest opportunity for the liquid to enter all the pores in the simplicia so as to facilitate the subsequent extraction process. At the time of making simplicia powder, some cells had their walls broken and some were still intact. Cells whose walls have been broken have nothing to block the process of extracting juice, so that the process of extraction takes place by diffusion. The process of filtering the cell wall that is still intact, the active substance dissolved in the filter fluid will come out of the cell must pass through the cell wall, so that the filtration takes place by osmosis. Diffusion events are much more influential when compared to osmosis events⁸. The principle of MPN is to grow bacteria in a liquid medium and the calculation is carried out based on the number of positive tubes after incubation at a certain temperature and time⁹

The analysis of the test of *Ipomoea carnea* leaf extract in reducing the bacteriological content in drinking water from deep wells is the one way ANOVA statistical test.

RESULTS

This research was carried out in the laboratory and in the field, to test the extract of *Ipomoea carnea* as an antibacterial in drinking water, using *Ipomoea carnea* leaves to reduce the bacteriological number of deep well water sources by the maceration process. The results showed a decrease in the number of germs presented in Figures 7 and 8.



Figure 1. Natural habitat *Ipomoea carnea*



Figure 4. Inoculation

Figure 2. Sampling of deep well drinking water sources



Figure 5. Incubation

Figure 3. Extract of *Ipomoea carnea* leaves



Figure 6. Check for positive bacteria

The number of germs before treatment or without treatment with the highest value of 96 colonies/100m, was replicated three times for each sample., the results are presented in Figure 7

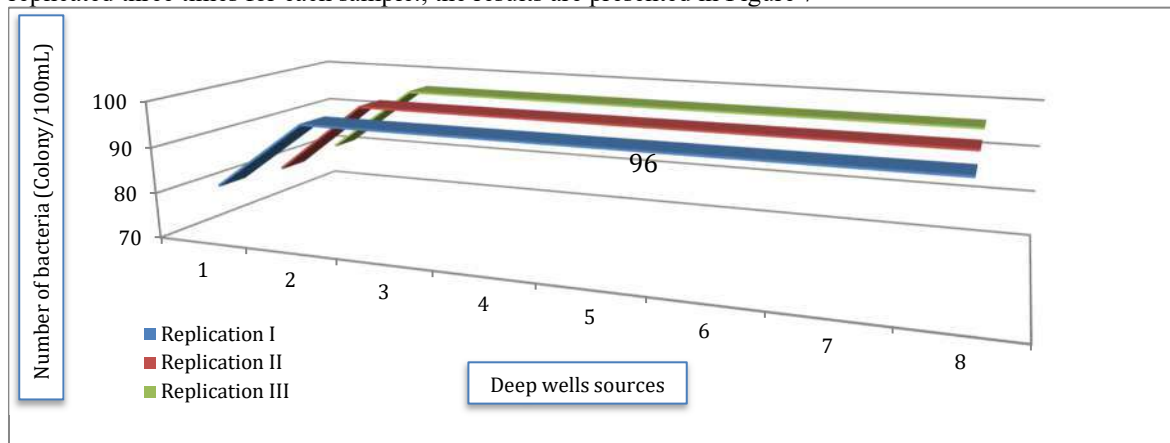


Figure 7. Germ count of deep wells water sources without antibacterial treatment of *Ipomoea carnea* leaf extract

Figure 9 presents the germ number with the addition of antibacterial treatment of *Ipomoea carnea* leaf extract with a concentration of 0.15 gram/100mL, the highest germ number value was 32 colonies/100mL and the lowest was 2 colonies/100mL, with three replications for each sample. The highest germ number values were obtained from deep wells water 3 and 4.

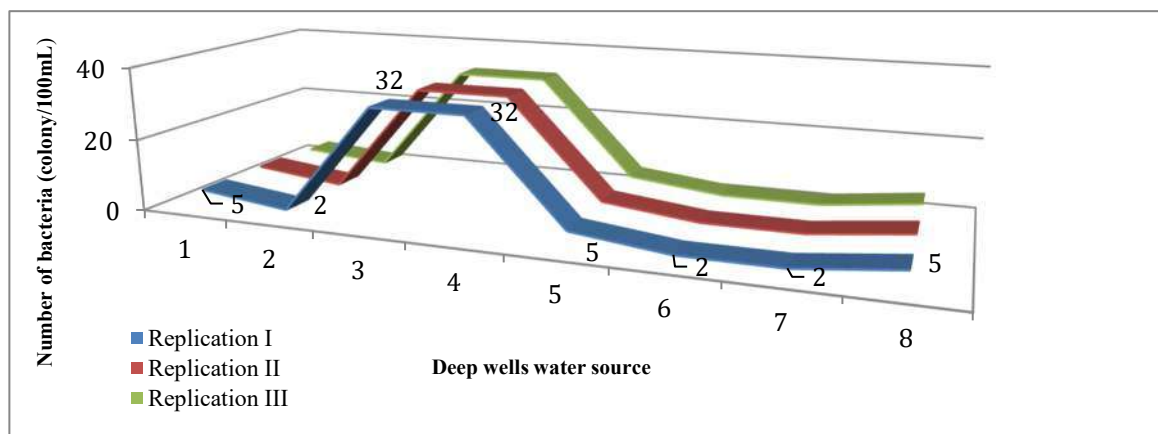


Figure 8. Germ count of deep wells water sources with antibacterial treatment of *Ipomoea carnea* leaf extract

DISCUSSION

The more the impact of chlorine on the environment and health is known, it is necessary to seek alternatives to replace chlorine. Especially in the treatment of clean water or drinking water, chlorine is replaced with other technologies⁵. The effects of using chlorine on humans include: irritation of the throat, burning sensation in the mouth and throat, spontaneous vomiting, asthma, skin irritation, impact on the liver. Chlorine as a disinfectant in drinking water must have a concentration of 0.2-1 mg/liter⁴. Utilization of *Ipomoea carnea* as an antibacterial in drinking water is an alternative effort to replace chlorine. The test of the effectiveness of *Ipomoea carnea* leaf extract obtained results at a concentration of 0.15g/100 mL of drinking water samples can reduce the largest number of bacteria, namely 80.33%, so that it has effectiveness as an antibacterial that can be used by the community to treat drinking water.

Ipomoea carnea as an antibacterial drinking water contains active ingredients of alkaloids and flavonoids. Leaf extract contains the active ingredients of 3,141 g/g alkaloids and 11.65% w/w flavonoids, having the largest content than other parts of *Ipomoea carnea*. This is due to the fact that many alkaloid compounds are contained in roots, fruit, wood, leaves and animals¹¹. Alkaloids are the largest group of secondary plant substances⁹. While most of the flavonoids collected in plant cell vacuoles. Blue wavelength light increases the formation of flavonoids and flavonoids increase plant resistance to ultraviolet radiation¹². Alkaloids are compounds in plants from the largest secondary metabolite group. Alkaloids have the ability to act as antibacterials by interfering with the peptidoglycan constituent components of bacterial cells, so that the cell wall layer is not fully formed and causes cell death⁹. The ability of alkaloids as an antibacterial by interfering with the peptidoglycan constituent components in bacterial cells, so that the cell wall layer is not fully formed and causes cell death¹³. The mechanism of action of flavonoids in inhibiting bacterial growth, among others, is that flavonoids cause damage to the permeability of bacterial cell walls. Flavonoids are the largest group of phenolic compounds, phenolic compounds have effective properties to inhibit the growth of viruses, bacteria, and fungi. Generally, flavonoid compounds are antioxidants and many are used as a component of raw materials for medicines. Flavonoids contain phenolic compounds. Phenol is a type of alcohol that is acidic so it is also called carboxylic acid. Phenol has the ability to denature proteins and damage bacterial cell walls¹¹.

CONCLUSION

Based on the results of the discussion and the research objectives, it can be concluded that the most effective concentration of *Ipomoea carnea* extract as an anti-bacterial in drinking water managed by the community is 0.15 grams of *Ipomoea carnea* leaf extract in 100 mL of drinking water deep wells samples can reduce the number of germs up to 80.33%.

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The Examination of The Quality of Chitosan from Bamboo Shell Waste with Variations of NaOH Concentration in the Deacetylation Process

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ABSTRACT

The bamboo shells that have been unused will be thrown away. Bamboo shell waste is still not utilized or processed optimally, better processing and utilization are needed so that the waste does not pollute the surrounding environment. Bamboo shells can be used as chitosan. The main organic material found in the mollusca animal group contains organic material that forms chitin and chitosan compounds. This study aims to determine the quality of chitosan from bamboo shell waste with variations in NaOH 60%, 65%, 70%, 75%. Analysis of research data using simple regression test. The results of quality inspection of bamboo shell chitosan showed that yield and degree of deacetylation obtained significance of $p = 0.03$ and 0.01 ($p < 0.05$) so NaOH effect on yield quality and degree of deacetylation, water content and ash content are significant $p = 0.21$ and 0.20 ($p > 0.05$) so NaOH has no effect on the quality of water content and ash content. The conclusion of this study is chitosan from bamboo shells has the quality standards of SNI 7949 in 2013. Suggestions for other researchers are to add other variables and parameters, while for industry use chitosan as an absorbent for heavy metals, cosmetics, food preservatives.

Keywords: Bamboo shellfish, quality of chitosan, NaOH concentration, daecetylation process

INTRODUCTION

The high number of shellfish for consumption by the general public will also be directly proportional to the amount of shellfish waste produced. If the waste is disposed of continuously without proper treatment, the environmental balance will be disturbed due to the accumulated waste. *Solen* sp. often found on the coast of Madura in Pamekasan district, East coast of Surabaya, Cirebonan Kejawan beach and in the waters of Tanjung Solok Jambi. Bamboo shells burrow vertically into the sediment and will come to the surface at low tide. Has a long flat shape like a bamboo for an adult's finger. Its unique shape resembles a razor blade, so it is also called a knife shell, razor clam or also a jack knife (Muhammad et al, 2017). Bamboo shell waste is still not utilized or processed optimally, so that better processing and utilization is needed so that the waste does not pollute the surrounding environment. One of the uses of bamboo shell waste that can be done is to make the shell as a material for making chitosan. Chitosan is a polysaccharide consisting of D-glucosamine and N-acetyl-D-glucosamine linked through - (1,4) bonds.

Chitosan has excellent biological properties including biocompatible, biodegradable, non-toxic, and antioxidant (Huang et al., 2020). Chitosan is derived from chitin compounds produced from the deacetylation process (Alawiyah and Taufik, 2016). The transformation of chitin into chitosan is called the deacetylation step, namely by adding a base at a high concentration. The reaction produced in the deacetylation process using alkali at high temperatures will cause the release of the acetyl group (-COCH₃) from the chitin molecule and form a free amine group (-NH₂) which means that the chitosan molecule has been formed (Wulandari, et al 2020). The benefits of chitosan, especially in the field of environmental health, are also quite broad, such as: coagulant, flocculant, waste adsorbent, food product preservative, especially fishery.

The benefits of chitosan, especially in the field of environmental health, are also quite broad, such as: coagulant, flocculant, waste adsorbent, food product preservative, especially fishery. Utilization of waste bamboo shellfish (*Solen* sp.) compared to other types of shellfish, such as blood clams, green mussels, and scallops as chitosan is still very little, so it needs to always be developed. This study aims to determine the content of chitosan made from waste bamboo shells using a variation of 60% NaOH concentration. 65%, 70%

and 75% in the deacetylation process in order to get the best deacetylation degree (DD) results, which is at least 75% according to SNI 7949 of 2013, this is because the degree of deacetylation (DD) is a very important chemical characteristic in determining the content and the quality of the chitosan itself (Azhar et al., 2010).

METHODS

The research that will be conducted is experimental research or (experimental research experimental research). The type of research used in this study is a quasi (quasi-experimental design-experimental design). The research design used in this study is the One Shot Case Study, where the subject will be given treatment and then the results of the treatment are observed. The object of the research is the content and characteristics of chitosan, including: yield, moisture content, ash content, and the degree of deacetylation to determine the level of chitosan produced based on different concentrations of NaOH in the deacetylation process. Each variation of NaOH 60%, 65%, 70% and 75% chitosan that will be studied has 6 (six) repetitions without control. Data collection techniques by means of literature study, observation, and laboratory examination. Data analysis used a simple regression test on the SPSS application.

The first stage is demineralization, then deproteinization stage to produce chitin. Demineralization was carried out by giving 100 ml of 1N NaOH solution in 25 grams of the sample of bamboo shell powder. The powder was heated in a magnetic stirrer for 30 minutes at a temperature of 65°C, rinsed with distilled water and dried in an oven at 100°C for 1 x 24 hours.

The deproteinization stage was carried out after the powder was dry. This stage was carried out by giving 100 ml of HCL solution, heated in a magnetic stirrer for 30 minutes at a temperature of 75°C. The powder was rinsed with aquades and dried in an oven at 100°C for 1 x 24 hours. The chitin of the bamboo shells was formed and the chitin yield was calculated.

The transformation of chitin into chitosan was carried out through a deacetylation step using 60%, 65%, 70%, and 75% NaOH solutions. Chitin powder was heated with a magnetic stirrer for 1 hour at a temperature of 100°C. The powder was rinsed with distilled water and dried in an oven at 100°C for 1 x 24 hours. Chitosan was then examined for yield, moisture content, ash content, FTIR spectro, and determination of the degree of deacetylation (Laila and Niken, 2012).

RESULTS

Chitin and Chitosan Yield of Bamboo Shells

Table 1. Chitin weight (gr)

No.	Result	No.	Result	No.	Result	No.	Result
1.	19,683	7.	20,129	13.	19,614	19.	20,312
2.	17,054	8.	20,312	14.	19,461	20.	22,127
3.	19,278	9.	19,421	15.	20,325	21.	21,079
4.	18,731	10.	19,269	16.	20,211	22.	20,414
5.	21,476	11.	20,224	17.	22,312	23.	18,618
6.	20,379	12.	21,379	18.	20,182	24.	20,312

The table above is the result of shrinkage of bamboo shell powder (chitin) after going through demineralization and deproteinization resistance. The initial powder sample is 25gr. The following is the result of measuring the chitin yield with the formula :

$$\text{Yield} = \frac{\text{chitin weight}}{\text{initial weight sample}} \times 100\%$$

Table 2. Chitin weight yield (gr)

No.	Result	No.	Result	No.	Result	No.	Result
1.	78,732	7.	80,516	13.	81,248	19.	78,456
2.	68,216	8.	88,508	14.	88,508	20.	77,844
3.	77,112	9.	77,684	15.	84,316	21.	81,3
4.	74,924	10.	77,076	16.	81,656	22.	80,844
5.	85,904	11.	80,896	17.	75,471	23.	89,248
6.	81,526	12.	85,516	18.	81,248	24.	80,728
Total average							80.72%

The variation of NaOH here has not been applied, so the calculation of the average value is carried out thoroughly. The results of the transformation of chitin into chitosan after going through the deacetylation stage with various concentrations of NaOH 60%, 65%, 70%, and 75% were then calculated using the same formula as the previous chitin yield calculation to determine the chitosan yield.

Table 3. Chitosan weight yield (%)

Concentration of NaOH	Weight yield chitosn bmboo shell						average
	1	2	3	4	5	6	
60%	78,708	67,876	76,348	71,072	85,868	81,444	76.886
65%	74,856	75,844	76,024	73,664	79,976	83,588	77.325
70%	75,056	72,704	70,596	69,784	79,456	79,488	74.514
75%	67,896	75,564	67,984	78,912	71,872	78,996	73.537

Based on the results in the table above, the highest average yield of bamboo shell chitosan was obtained by 77.325% with a variation of 65% NaOH concentration, while the lowest average was 73.537% using a 75% NaOH concentration variation.

Bamboo Shell Chitosan Water Content

The water content examination was carried out using the method Gravimetric/oven. The sample of chitosan used for measuring the water content is 1 gram.

Table 4. Chitosan water content

Concentration of NaOH	Chitosan water content						average
	1	2	3	4	5	6	
60%	1.6 %	1.2 %	0.4 %	0.5 %	0.6 %	0.8 %	0.85 %
65%	1.4 %	1.2 %	0.9 %	0.7 %	0.6 %	0.5 %	0.88 %
70%	0.6 %	1.2 %	0.7 %	0.6 %	0.7 %	0.7 %	0.75 %
75%	0.6 %	0.7 %	0.6 %	0.6 %	0.7 %	1.4%	0.76 %

Based on the table above, it can be seen that the highest average water content in chitosan is 65% variation, which is 0.88% and the lowest average is 70% variation of 0.75%. It is known that each sample does not exceed the quality standard of water content in chitosan according to SNI 7949 of 2013 which is a maximum of 12%.

Bamboo Shell Chitosan Ash Content

Examination of ash content using method Drying Ash. The chitosan samples used for measuring the water content were 4 grams each.

Table 5. Chitosan ash content

Concentration of NaOH	Chitosan ash content						average
	1	2	3	4	5	6	
60%	0,175%	0,15%	0,15%	0,525%	0,175%	0,4%	0,26, %
65%	1,075%	0,575%	0,225%	0,15%	0,4%	0,175%	0,43%
70%	1,95%	1,275%	0,175%	0,925%	0,1%	0,225%	0,77%
75%	1,4%	0,925%	0,35%	0,3%	2,025%	0,25%	0,87%

Based on the measurement results above, it can be seen that the highest average is in the 75% NaOH concentration variation of 0.87% while the lowest average is in the 60% NaOH concentration of 0.26%. Of the 24 samples, none exceeded the quality standard of ash content in chitosan in accordance with SNI 7949 of 2013 which is a maximum of 5%.

FTIR Spectrophotometry of Bamboo Shell Chitosan

Spectrophotometry FTIR was used to determine the characteristics of the functional groups contained in chitosan. The wavelength used is $4000-400\text{cm}^{-1}$. The following is one of the results of FTIR spectrophotometer on chitosan:

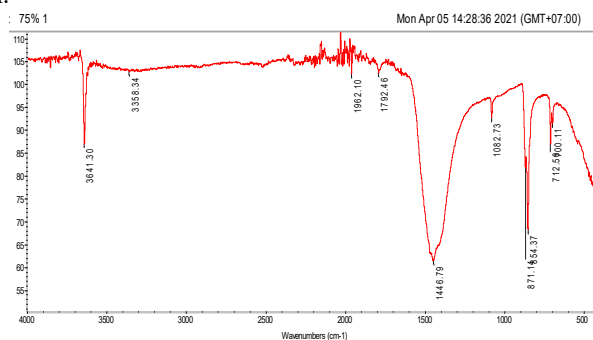


Figure 1. Chitosan FTIR spectrum

Table 6. FTIR adsorption characteristic of chitosan

Type of vibration	Wavenumber (cm^{-1})
Stretching vibration OH	3450,3340
Stretching vibration NH	3400
Asymmetric stretching vibration CH	2926
Symmetric stretching vibration CH	2864
Stretching vibration C = O	1650
Bending vibration NH	1596
Stretching vibration CN	1200 – 1020
Asymmetric bending vibration CH	1418
Symmetrical bending vibration CH	1377
Asymmetric stretching vibration C – O	1082
Symmetric stretching vibration C – O	1033
Stretching vibration β – 1,4 – glikosidik	850

bamboo shell chitosan deacetylation degree

The calculation or determination of the degree of deacetylation in this study uses the method *Baseline* or the equation formula with the formula:

$$\%DD = 100 - \left[\frac{A_{1655}}{A_{3450}} \times \frac{100}{1,33} \right] \%$$

Description :

A = $\log \frac{P_o}{P}$

P_o = The distance between the baseline and the tangent, the highest peak at wavelengths 1655^{cm-1} and 3450^{cm-1}

P = The distance between the baseline and the lowest valley at wavelengths 1655^{cm-1} and 3450^{cm-1}

1,33 = Determination of the perfect degree of deacetylation

A₁₆₅₅ = Absorbance of amide/acetamide groups

A₃₄₅₀ = Absorbance of hydroxyl groups

The following is the result of measuring the degree of deacetylation of chitosan from bamboo shells based on the results of the FTIR spectro:

Table 7. deacetylation degree of chitosan

Concretation of NaOH	Deacetylston degree				Average
	1	2	3	4	
60%	96,84%	96,67%	96,59%	96,76%	96,71%
65%	97,87%	97,33%	97,47%	97,45%	97,53%
70%	98,47%	97,74%	97,79%	97,84%	97,88%
75%	98,64%	98,94%	98,71%	98,86%	98,78%

Based on the table above, it can be seen that the highest average value of the degree of deacetylation is 98.78% at 75% NaOH concentration variation, while the lowest average is 96.71% at 60% NaOH concentration variation. The highest deacetylation degree value from all variations and replications was 98.94% at 75% NaOH concentration variation, then the lowest deacetylation degree value was 96.59% at 60% NaOH concentration variation. The results of all concentration variations show that there is no value of the degree of deacetylation below the quality standard of SNI 7949 in 2013. The value of the degree of deacetylation according to the regulation is 75%.

Characteristics of Bamboo Shell Chitosan

Table 8. Characteristics of Bamboo Shell Chitosan

Parameter	chitosan SNI 7949 : 2013	Chitosan bamboo shell
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		NaOH 60%	NaOH 65%	NaOH 70%	NaOH 75%
Praticle shape	Flakes to powder	Powder	Powder	Powder	Powder
color	Light brown to white	Brownish white	Brownish white	Brownish white	Brownish white
physical	Requirement				
- Foreign object	Negative	-	-	-	-
chemical	requirement				
- Deacetylation degree	Min 75%	96,48 %	97,33 %	97, 79%	98,86 %
Test type	requirement				
- pH	7-8	7	7	7	7
- Ash content	Maks 5%	0,175%	0,575%	0,35%	0,925%
- Water content	Maks 12%	1,6 %	1.2 %	0,7 %	0,6 %

Based on the comparison table above, it can be seen that the bamboo shell chitosan in this study has met the requirements in accordance with SNI 7949 of 2013

DISCUSSION

Bamboo Shell Chitosan Yield

The yield of chitosan in each concentration variation was different. The higher the concentration of NaOH given, the lower the yield value obtained. The results of different yields can be influenced by several factors, including: temperature and time of stirring in the deacetylation process, the concentration of alkali used, as well as the size and thickness of the raw materials used. Alkali concentration and high temperature can cause a decrease in polymer and yield value (Mursida et al., 2018). In the deacetylation process, alkali can bind more acetyl groups. The yield produced by the variation of the 75% NaOH concentration is indeed lower than the 60% NaOH concentration, but the quality of the chitosan obtained is getting better and purer, because many acetyl groups in chitosan are released from chitin. High temperatures can also affect the resulting yield value. The concentration of NaOH and high stirring and heating temperatures in the deacetylation process can accelerate the release of excess acetyl chitin chains, so that finer chitosan particles dissolve in NaOH and can cause the chitosan mass to decrease (Anggun et al., 2018).

Bamboo Shell Chitosan Water Content

The average ash content produced based on the variation of NaOH concentration was 0.85%, 0.88%, 0.75%, and 0.76%, respectively. The lower the water content produced, the better the quality of chitosan obtained. A good drying process will produce a low (good) moisture content. The size of the water content value is fully influenced by the drying method, drying time, means of drying, the amount of chitosan being dried, and the drying area used so that the concentration of NaOH in chitosan has no effect on the high or low water content value obtained (Loede Muhammad et al., 2018).

Bamboo Shell Chitosan Ash Content

Factors that can affect the quality of the ash content in chitosan are the duration of stirring and the consistency of stirring, as well as washing to a neutral pH during the demineralization process. Ash content is used to remove mineral residues during the demineralization process. If the ash content obtained is still high, then the demineralization carried out has not been effective and perfect. Washing the pH to neutral can minimize the occurrence of acids that are entangled and diffuse with free amino acids and protein residues that can cause damage during the drying process (Pinta Purbowati, 2016). The demineralization process in this study was carried out using a stove *magnetic*, stirrer so that the stirring and the heat that was delivered were stable or homogeneous. Stable stirring process causes HCL to bind minerals effectively. The low ash content indicates that the quality and purity of the processed chitosan is good.

FTIR Spectrophotometry of Bamboo Shells

The absorption pattern shows the presence of OH (hydroxyl) and NH (amine) functional groups, which means that the two groups indicate that the acetyl group (COCH₃) has been lost. Another characteristic of chitosan lies in the amide group at wave number 1655 – 1310 cm⁻¹ and the hydroxyl group at wavenumber 3550 – 3300 cm⁻¹, then there is also a -1,4-glycosidic bond. The results of the FTIR spectrum of bamboo shell chitosan show the location of the amide group and hydroxyl group at a predetermined wave number, and there is a -1,4-glycosidic bond so that bamboo shell chitosan has been successfully formed (Sari, 2013).

Bamboo Shell Deacetylation Degree Value

The deacetylation process is the stage of releasing the acetyl group from the chitin molecular chain, so that if the value of the degree of deacetylation is high, the purer the quality of the chitosan produced (Fatmawati, 2019). Factors that affect the degree of deacetylation are the concentration of NaOH, stirring time, and stirring temperature. In this study, the concentration of NaOH in the deacetylation process used was stratified, namely 60%, 65%, 70%, and 75%. The higher the concentration of NaOH given, the higher the degree of deacetylation produced will also be. The addition of high NaOH causes the hydroxyl group for the hydrolysis process (transformation of chitin to chitosan) to be high, so that the acetyl group can be eliminated properly and the formation of a high amine group is also better (Bahri, 2015).

The higher the degree of deacetylation, the better the quality and purity of the chitosan. The data on the degree of deacetylation in table 7 shows the highest degree of deacetylation at 98.95% in the 75% NaOH concentration variation, and the lowest at 96.84% at the 60% NaOH concentration variation, so that the NaOH concentration affects the value of the chitosan deacetylation degree. Chitosan with a deacetylation degree value of about 90% can be applied for food quality and pharmaceuticals, as long as the moisture content, ash content and other standard requirements have been determined (Century Siregar, 2016).

Characteristics of Bamboo Shell Chitosan

The characteristics of chitosan in this study refer to SNI 7949 of 2013 which has several parameters, including: chitosan powder form, water content, ash content, pH, color, and degree of deacetylation. The results of the research on the quality of bamboo shell chitosan showed that all of them had met the quality standards. The form of chitosan in this study was a fine powder. The texture of the powder of the raw material is smooth and evenly distributed, and can provide good effectiveness during the chitosan manufacturing process, so that it can absorb evenly and well. The pH of chitosan shells is 7 (neutral). pH that is too acidic or too alkaline will affect the demineralization process which can cause high ash content values, so rinsing with distilled water must really be carried out until neutral. In this study, the color of the chitosan produced was brownish white. The color of chitosan can vary depending on the raw materials used. Chitosan with a degree of deacetylation of about 90% can be applied for food quality and pharmaceuticals, as long as it takes into account the moisture content, ash content and other predetermined standard requirements.

CONCLUSION

Examination of the quality of bamboo shell chitosan using the reference of SNI 7949 in 2013. The results of this study were in accordance with the provisions of quality standards, both the NaOH concentrations of 60%, 65%, 70%, and 75%. The chemical quality of bamboo shell chitosan from each concentration of NaOH has met the quality standard requirements. The results of the analysis showed that the concentration of NaOH had a significant effect on the yield quality and degree of deacetylation, while the water content and ash content had no significant effect.

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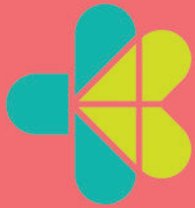
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The Association Between Peers Influence and Sweets Consumption Pattern in Adolescent Girls

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ABSTRACT

Overweight and obesity among adolescents tend to continue into adulthood and increase risks of cardiometabolic morbidity. New focus research on peers and obesity has shown that obesity is significantly influenced by social norms and peer groups among adolescents and adults. This study aims to explore the association between peers' influence and sweets consumption patterns in adolescent girls. This was an analytic observational with a cross-sectional design study. This study was conducted in Tangerang, in June 2021. The sampling technique used cluster random sampling with a total sample of 122 adolescent girls aged 13-15 years. The data of peers influence measured by *The Diet Social Support Assessment* (DSSA), data of sweets consumption pattern measured by *Food Frequency Questionnaire* (FFQ). Data were analyzed by SPSS V.23. Percentage of subjects with strong peer influence is 60.0%, majority of them (65.0%) had an often consumption of sweets compared to those who not often (35.0%). There was significant association between peer influence and sweets consumption pattern (p-value = 0.018, OR: 2.6, 95% CI: 1.2 – 5.3). When the peer influence becomes more strong, the sweets consumption pattern is more likely to increase too.

Keywords: Adolescent girls, Peer influence, Sweets consumption pattern

INTRODUCTION

Nutrition in adolescents will have an impact on current and future health. Especially nutrition for adolescent girls, which will be closely related to health during future pregnancies and the lives of mothers and children who are born (UNICEF Indonesia, 2021). The nutritional problems faced by adolescents today are not only problems of undernutrition but also problems of overnutrition, such as overweight and obesity. According to the World Health Organization (WHO), more than 1.9 billion adults aged over 18, and more than 340 million children and adolescents aged 5-19 were overweight and obese in 2016 (WHO, 2017).

An adolescent with overweight and obesity problem tend to continue into adulthood and becomes 1.1 to 5.1 times increase risk of cardiometabolic morbidity (diabetes, hypertension, coronary heart disease, and stroke) (Reilly *et al.*, 2011). A recent study showed that adolescents with obesity may have difficulties socially with the environment and particularly with their age groups (Özdemir, 2015). Overweight and obesity in children and adolescents is generally caused by a lack of physical activity, unhealthy eating patterns resulting in excess energy intake, or a combination of the two resulting in energy excess (Güngör, 2014). New focus research on peers and obesity has begun, there is increasing evidence that obesity weight control behavior was significantly influenced by social norms and peer groups among adolescents and adults (Hammond, 2010).

A peer is an individual with whom an individual shares a common interest and they tend to influence each other, this is called peer influence (Deewan, 2018). In adolescence, they begin to have the freedom to make their own decisions on food without parental supervision. Especially, during adolescence, youth often spend time with their peers and make them easily influenced (Steinberg *et al.*, 2007). Peer was found to more often influence negatively than positively on adolescents' healthy eating (Rageliene *et al.*, 2020). A multitude study was showed that peer modeling was related to adolescents' sugar-sweetened beverages intake (Watts *et al.*, 2018). Similar results were also found that adolescent consumption of unhealthy food (Sugar-Sweetened Beverages/SSB, simple sugar, fatty foods, and fast food as meals) are positively correlated with their peers (Gwozdz *et al.*, 2019).

Having a poor diet is one of the main causes of overweight and obesity in adolescents. Consumption of sweets has been one of the dietary contributors to obesity. Intake of free sugar and sugar-sweetened beverages has

a determinant on body weight, increased sugars intake was associated with weight increase (Morenga *et al.*, 2013). Evidence showed, compared with an adolescent with normal weight, added sugar is consumed more in an adolescent with overweight and obese (Tripicchio *et al.*, 2019). In contrast, another study was observed that there was no effect of increasing free sugar with obesity in adolescents (Flich *et al.*, 2020).

The available study found that the majority of children and adolescents in the Eastern Mediterranean Region (EMR) have an unhealthy diet, they consumed less water and milk, but consumed more Sugar-Sweetened Beverages (SSBs), as well as frequent consumption of energy-dense, nutrient-poor foods such as sweet and savory snacks (Al-Jawaldeh *et al.*, 2020). A study showed that adolescents 10-17 years old drink sugary beverages as the second most commonly consumed beverages after water, and recorded women is higher consumption than men (Guelinckx *et al.*, 2015). A recent study showed that total sugar intake in adolescent girls was significantly higher than in boys (kyungho, 2015). WHO has published a recommendation of consumption of free sugars to less than 10% of total energy intake (WHO, 2018).

According to baseline health research 2018 in Indonesia, the prevalence of obesity and overweight in adolescents is still high. Data showed that the prevalence of overweight is 16% (overweight 11,2% and obese 4,8%), the prevalence increased when compared data in 2013, which was 10,8% (overweight 8,3% and obese 2,5%). Banten is one of the provinces with a high prevalence of obesity cases with 4,2%, and Tangerang city is the highest prevalence of obesity cases with 4,2% (Risesdas, 2018).

Based on the several studies before, further study is still needed. To do so, this study aimed to explore more on how peers influence sweets consumption patterns in adolescents.

METHODS

This study used an observational analytic method with a cross-sectional design study. This study was conducted by involving adolescent girls aged 13-15 in Tangerang, on June 2021. The sample size in this study was counted by slovin formulas, and resulted in 122 adolescent girls with 13818 of the total population. The sampling technique used in this study was cluster random sampling. The subject who can be included in this study was a subject who is capable of communicating online, lived with parents, and was healthy during the study. The subject who is on medication, such as consumed anti-depressants, anti-anxiety, mood stabilizers, appetite stimulants, and stimulants for weight gain/loss, adolescents on diets, smoke and drink alcoholic beverages, have a disease that can affect food consumption patterns (diabetes, heart, cancer) were exclude from the study.

This study was conducted in Covid-19 outbreak, so the data was collected online. The data of peer influence was measured by *The Diet Social Support Assessment* (DSSA). This questionnaire measured how often peers support healthy and unhealthy eating. This questionnaire consists of 7 question items with and rated on a five-point Likert scale score ("never" to "very often"). The result of scoring will be compared with mean of the population and categorized into "weak influence" or "strong influence". The data of sweets consumption pattern was collected from sweet/sugary snacks and drinks in the last 1 month, and calculated using data form a Food Frequency Questionnaire (FFQ) which include types of sweet snacks and drinks. The results will be rated on a Likert score, 0 for never, 5 for 1-3 times a month, 10 for 1-2 times a week, 15 for 3-4 times a week, 20 for daily, and 25 for more 2 times a day. The scoring results will compared with the mean of population and categorized into "often" or "not often".

Statistical analyses were performed with SPSS V.23. Since the data from both variables were categorical, therefore the chi-square test was used to know the association between the two variables. This study hypothesized that peer influence was associated with sweets consumption patterns in adolescent girls. The trial was approved by the Ethics Committee of Medicine Faculty of Sebelas Maret University, Surakarta No.40/UN27.06.6.1/KEP/EC/2021.

RESULTS

The sample consisted of 122 adolescent girls who were junior high school students in Tangerang City Area. Characteristics population of the study including age, grade, mother education, father education, parent income, peer influence, and sweets consumption pattern in Table 1. The majority subjects (52.5%) were aged 14, the rest were aged 13 (35.2%), and aged 15 (12.3%). More than half of the subjects (68.0%) were 2nd grade, the rest were 1st grade (27.9%) and 3rd grade (4.1%) in high school. The majority (61.5%) of mother subjects have intermediate education, and the others have high (20.5%) and basic education (18.0%). The same result was also found in father subjects, the majority (59.0%) have intermediate, and others have high (30.3%) and basic education (10.7%). Based on The Tangerang City Regional Minimum Wage in 2021 which was 4.262.015.37 IDR per month, 50.8% of parents were above it and 49.2% below it. Examining peer influence on the subjects, half of subjects (50.8%)

had weak influence and the rest had a strong influence (49.2%). Examining sweets consumption pattern subjects, 46.7% of subjects were classified as not often and 53.3% as often.

Table 1. Distribution of Characteristic Subjects

Category	N = 122	
	n	%
Age (years)		
13	43	35.2
14	64	52.5
15	15	12.3
Grade		
7 (1 st grade)	34	27.9
8 (2 nd grade)	83	68.0
9 (3 rd grade)	5	4.1
Mother Education		
Basic	22	18.0
Intermediate	75	61.5
High	25	20.5
Father Education		
Basic	13	10.7
Intermediate	72	59.0
High	37	30.3
Parent Income*		
< Regional Minimum Wage	60	49.2
≥ Regional Minimum Wage	62	50.8
Peer Influence		
Weak Influence	62	50.8
Strong Influence	60	49.2
Sweets Consumption Pattern		
Not Often	57	46.7
Often	65	53.3

Note: (*) Tangerang City Regional Minimum Wage in 2021 was 4.262.015.37 IDR per month

Peer influence distribution based on sweets consumption pattern is presented in Table 2. It can be shown that the percentage of subjects with weak peer influence was 62.0%, majority of them (58.1%) had less frequent/not often consumption of sweets compared to those who often (41.9%). The percentage of subjects with strong peer influence is 60.0%, majority of them (65.0%) had an often consumption of sweets compared to those who not often (35.0%). Results of the chi-square test showed the p-value was 0.018, and the Odds Risk (OR) value was 2.6 (95% CI: 1.2 – 5.3).

Table 2. Distribution of Subjects based on Peer Influence and Sweets Consumption Pattern

	Sweets Consumption Pattern				Total		OR (95% CI)	P value
	Not Often		Often					
	n	%	n	%	n	%		
Weak Influence	36	58.1	26	41.9	62	100.0	2.6 (1.2 – 5.3)	0.018
Strong Influence	21	35.0	39	65.0	60	100.0		
Total	57	46.7	65	53.3	122	100.0		

*Chi-square test with significant $p < 0.05$

DISCUSSION

The prior literature review study about peer influences on children and adolescent eating and physical activity had synthesized that children and adolescents energy intake was increased by peers and friends presence, except when impression management concerns are high and peers exhibit healthy eating (Salvy *et al.*, 2012). Recent similar studies have found that peers more often influence negatively than positive on healthy eating by increasing consumption of energy-dense and low-value foods (Rageliene *et al.*, 2020). Different from previous research, this study focuses on how association between peer influence and sweets consumption patterns in adolescent girls. Our findings indicate that adolescent girls with strong peer influence had a frequent consumption pattern of sweets higher than those who less frequent consumption pattern of sweets. According to gender differences, previous studies have revealed that effect of peer influence on sugary beverages intake is found greater on female students, peers have greater influence on female students who have habits on drinking sugary beverages before entering college compared to those who did not (Chen, 2015). In contrast, other studies revealed that a strong association between individual and peer snack consumption found in boys (Wouters *et al.*, 2010). This is accordance to other studies, where it found that healthy food items such as fruit are more likely to consumed by girls than boys (Moreno-Maldonado *et al.*, 2018), and in line with findings that boys was more frequently consume unhealthy foods and eating out with peers in fast food restaurant (Bargiota *et al.*, 2013).

Peer influence and sweets consumption pattern were found significantly associated on this study, with a p-value 0.018. Similar evidence was found in other studies, peers are positively correlated with adolescents' consumption less healthy foods, such as Sugar Sweetened Beverages (SSBs), simple sugar, fatty foods, and fast foods (Gwozdz *et al.*, 2019). The results of another study found that peers as one of the multifactors that correlated with adolescent SSBs intake (Watts *et al.*, 2018).

Differences from previous studies, this study was also examined the Odds Ratio (OR) value to measure the association between an exposure and an outcome, and the result was 2.6 (95% CI: 1.2 – 5.3), which means that adolescent girls with strong peer influence were 2.6 times more likely to have a frequent sweets consumption patterns compared to those who had weak peer influence. It is really possible to happen, because in social interaction, peers have a role as models who can give crucial impact on changing in children and adolescents eating habits. Experimental studies have found that children who were assigned individually to view peers consuming a modeled vegetable (bell paper) from a video segment showed greater preference for eating vegetables again, compared to children who were not exposed to video (Staiano *et al.*, 2016). However, peers as models still needed further study among adolescent subjects.

Other studies have reviewed several studies on the association between peers and eating behavior among overweight adolescents. It results that the presence of peers is not always increased eating because there is an increased awareness of food consumption among adolescents. This study explained when overweight adolescents eat with unfamiliar peers and friends at a normal weight, adolescents tend to decreased or suppressed food consumption. In addition, when adolescents were under ostracized by peers seem to increase eating (especially those who are overweight) and they do not fear incurring negative stigmas to eat as much they want (Salvy *et al.*, 2014). However, our study did not examine the nutritional status of the subjects, therefore this study cannot describe the peer influence that occurs based on nutritional status. It happened because the study was conducted during the Covid-19 outbreak, so it was not possible to measure nutritional status directly on the subject.

There are some limitations in these present study include the online data collection that may result in fake answers, it might happen when the respondents were uncooperative and want to immediately finish the questions. In addition, this study was using a self-report questionnaire that may be affected by the subjectivity of respondents. Also, cross-sectional design was used in the current study, in which causality between the variables can't be analyzed.

CONCLUSION

Overall, it can conclude that peer influence was significantly associated with sweets consumption patterns and when the peer influence becomes more strong, the sweets consumption pattern is more likely to increase too. These associations were as expected direction and answered the research question.

Considering how the consumption of sweet foods affects poor health, it is necessary to follow up on this matter. Several previous studies focus on peers as models to change eating behavior among children subjects, so we suggest further research to determine the effect on adolescent subjects which can later be used as an intervention for changes in healthier eating behavior among adolescents.

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Effect of Dates (*Phoenix dactylifera* Linn.) on Low-Density Lipoprotein (LDL) in Type 2 Diabetes Mellitus Patients

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ABSTRACT

Background: Patients with type 2 diabetes mellitus are often accompanied by dyslipidemia, namely metabolic abnormalities in the lipid fraction of plasma. Dates contain high antioxidants that can reduce Low-Density Lipoprotein (LDL) so that they can be used as non-pharmacological therapy by consuming them every day. **Purpose:** This study aims to determine the effect of giving dates (*Phoenix dactylifera* Linn.) to low-density lipoprotein (LDL) in type 2 DM patients. **Patients and methods:** The research method is a Randomized Control Trial (RCT) using Pretest and Posttest with Control Group Design. There were 36 outpatients at Pucang Sewu Public Health Center which were divided into 2 groups, namely the control group and the treatment group. Each group was randomly selected (randomized) and observed for 14 consecutive days. The control group and the treatment group were the same in dietary treatment, namely consuming the diet according to their needs and taking antidiabetic drugs every day. The difference was that the treatment group was given 50 grams of dates a day which was consumed before the main meal. LDL examination was carried out twice at the beginning and at the end of the study. Statistical analysis of research data using Paired t-test. **Results:** In the control group, LDL increased by 4.87 mg/dL from 101.33±20.6 to 106.11±19.5 ($p=0.183$) while the treatment group decreased by 1.00 mg/dL from 102.00 ± 17.5 to 101.00 ± 22.1 ($p = 0.848$) but not significant, indicating that there was no effect of giving dates to LDL ($p = 0.383$). **Conclusion:** giving dates to type 2 DM patients for 14 days can reduce LDL but not significantly.

Keywords: Dates, Low-Density Lipoprotein (LDL), Diabetes Mellitus Type 2

INTRODUCTION

Diabetes mellitus (DM) type 2 is a chronic condition characterized by hyperglycemia due to progressive loss of β -cell function, insulin resistance, or both (Tanton, D, et al, 2018). Long-term insulin deficiency affects fat metabolism thereby accelerating fat catabolism accompanied by increased formation of ketone bodies, decreased fatty acid synthesis, and triglycerides. (Guyton A.C., 2006)

Type 2 DM patients are often accompanied by dyslipidemia which triggers atherosclerosis which causes heart disease (Pujari, S.Subhash., 2013). Dyslipidemia is a metabolic disorder of fat characterized by an increase or decrease in the lipid fraction in plasma known as triad lipids or diabetic dyslipidemia, namely low HDL cholesterol levels, hypertriglyceridemia, and hypercholesterolemia, especially LDL cholesterol in small solid form (Price, SA, 2005; Shahab, A., 2010; Shahab, A., 2011). LDL cholesterol is more dangerous in DM patients because it is denser and smaller in size (small dense) which easily enters and then sticks to the deeper layers of blood vessels and is atherogenic. The increase in small dense LDL could be due to oxidation, decreased binding to LDL receptors, and increased small dense LDL binding to the arterial walls (Juha, V., Sari, M., 2000).

Insulin resistance plays an important role in diabetic dyslipidemia causing increased release of free fatty acids from insulin-resistant fat cells, inhibited release of free fatty acids can increase hepatic VLDL production, which is correlated with the level of hepatic fat accumulation (Diamant, M. , 2010). Excess fatty acids are converted into phospholipids and cholesterol in the liver. In addition to these two substances, excess triglycerides will also be released into the blood in the form of lipoproteins, so that in conditions of insulin deficiency there is a threefold increase. Hormone-sensitive lipase becomes active and inhibits the action of lipoprotein lipase. VLDL and chylomicron catabolism will be reduced so that triglycerides and cholesterol rise and LDL becomes denser, smaller and easily oxidized, and atherogenic. Large triglycerides are exchanged for cholesterol esters from HDL and produce HDL low cholesterol esters but high triglycerides which are more easily catabolized by the kidneys causing a decrease in serum HDL counts (Guyton AC, 2006; Sudoyo, A. W, et al, 2006) .

Dates are one of the fruits that contain antidiabetic, antihyperlipidemic, and high antioxidants such as flavonoids, steroids, saponins, and phenols as free radical scavenging compounds (Baliga, M. S, et al, 2011). Dates also contains low fat and a high source of fiber, both soluble and insoluble fiber which can reduce cholesterol absorption and can reabsorb bile acids in the intestinal lumen. Fiber can reduce insulin secretion in blood sugar, can inhibit liver cholesterol biosynthesis, reduce hypercholesterolemia (Marlett, et al., 2002; Elleuch, et al., 2008, Ali, A., et al., 2009; Assirey, EAR, 2014). The content of phytosterols and phytoestrogens in dates can reduce hypercholesterolemia. -sitosterol inhibits cholesterol synthesis by inhibiting HMG-CoA (Field, et al., 1997).

Several studies have shown that the antioxidant content contained in dates can function as antihyperlipidemic, significantly lowering fasting blood sugar, LDL, and triglyceride levels. Based on the description above, the researchers hypothesize that giving dates (*Phoenix dactylifera* Linn.) has an effect on low-density lipoprotein (LDL) in patients with type 2 diabetes ellitus..

METHODS

This research has received ethical clearance approval issued by the Faculty of Medicine, Universitas Sebelas Maret with the number: 377/UN27.6/KEPK/2018 issued on November 21, 2018. The research subjects were 36 people with type 2 DM who received outpatient treatment at the Pucang Sewu Public Health Center, Surabaya, which were divided into two groups. Selected randomly by giving a serial number, the even number is the control group and the odd serial number is the treatment group with 18 people in each group. Subjects were selected according to criteria, including: aged 30-59 years and taking oral drugs in the form of glibenclamide or metformin while the exclusion criteria included: type 2 DM patients with severe complications such as chronic kidney failure, liver disease, Acute Myocardial Infarction (AMI), Congestive Heart failure (CHF) and stroke, having a history of surgery/trauma of less than 3 months, taking insulin and dropping out during the study were subjects who did not finish the dates given for 3 consecutive days and withdrew during the study. The types of dates used were lulu dates that had been seeded and consumed in the morning, afternoon and evening before the main meal, the total consumption of which was 50 grams a day and observed for 14 consecutive days. Data obtained from interviews with questionnaires such as age, data on weight, height, and date intake. Food intake and date intake were obtained from interviews, recorded using a date consumption compliance form and a 24-hour recall form which were analyzed using the nutrisurvey program. Provision of seedless lulu dates in the morning, afternoon and evening before the main meal, the total consumption of 50 g a day for 14 consecutive days. It is given to the patient every 2 days by asking the consumption of dates every day. The recall was carried out 3 times, namely before, in the middle, and at the end of the study. Laboratory results in the form of low-density lipoprotein (LDL) examination taken while fasting/not eating and drinking for at least 10-12 hours. using SPSS version 20. The results of the study are presented in tabular form. The difference between the control and treatment groups used the Paired t-test. Significance of the difference if $p < 0.05$.

RESULTS

Based on the results of the study between the intervention and control groups according to age and gender did not differ, the average age was 52.6 years where the minimum age was 35 years and the maximum was 59 years with the largest gender being female as shown in table 1

Table 1. Characteristics of Research Subjects

Characteristics	Research Group			
	Intervention		Control	
	n	%	n	%
Age (year)				
30-39	1	5.5	0	0
40-49	3	16.6	7	38.9
50-59	14	77.8	11	61.1
Gender				
Man	1	5.6	3	16.7
Woman	17	94.4	15	83.3

The results of the analysis of the data distribution showed that the data were not normally distributed so that the analysis of the difference in the effect of treatment using the Mann Whitney test with $p < 0.05$ had a significant difference between the 2 groups (Table 2). All subjects were given nutritional counseling about the 4 pillars of DM management so that all subjects continued to carry out standard DM therapy. In the intervention group, a date consumption obedience form was given. Patients who did not consume dates for 3 consecutive days were declared dropouts from the study.

Table 2. Effect of dates (*Phoenix dactylifera* Linn.) on low-density lipoprotein (LDL) in type 2 diabetes mellitus patients

	Low Density Lipoprotein (LDL)		
	Control	Treatment	p-value
Before	101,33± 20,6	102,00± 17,5	0,183
After	106,11± 19,5	101,00± 22,1	0,848
Δ pre-post	4,87	-1,00	0,383

DISCUSSION

Dyslipidemia is a metabolic disorder of fat that is characterized by an increase or decrease in the lipid fraction in plasma known as triad lipids or diabetic dyslipidemia, namely low levels of HDL cholesterol, hypertriglyceridemia, and hypercholesterolemia, especially LDL cholesterol in small solid forms. prevent or reduce the incidence of cardiovascular disease (Price, S.A., 2005; Shahab, A., 2010; Shahab, A., 2011; Koolman Jan, et al, 1994).

The content of dates such as flavonoids, phenols, steroids, and saponins as antioxidants that can bind free radicals, phytosterols, and phytoestrogens inhibit liver cholesterol biosynthesis after the production of short-chain fatty acids, bile acid reabsorption and the presence of fiber reduces cholesterol absorption in the intestine (Patel, MD, et al., 2006). Dates also increase insulin secretion, help glucose absorption and glycogen synthesis by cells, and/or provide protection for the pancreatic cells and oxidative stress (Seyyed Ali Mard et al., 2010).

Giving dates can reduce several markers such as fasting blood sugar, cholesterol, triacylglycerol, LDL, and VLDL. Dates are one of the fruits that contain antioxidants such as flavonoids, saponins, quercetin, -sitosterol, proanthocyanidins, catechins, and anthocyanins which have cardioprotective and antihyperlipidemic effects. new therapy for DM (Zangiabadi. N, et al., 2011).

Based on the results of statistical analysis in Table 2 shows that in the control group there was an increase in LDL of 4.87 mg/dL while the treatment group experienced a decrease of 1.00 mg/dL but it was not significant. In line with existing research where dates have a hypoglycemic effect that can reduce DM complications such as hyperlipidemia and weight loss. In alloxan-induced DM rats, the hypocholesterolemic and hypotriglyceridemic effects of dates can reduce dyslipidemia (Seyyed Ali Mard, , et al., 2010; Onat. A et al., 2006). Consumption of 100 grams of dates (equivalent to 7 grains) per day for four weeks was shown to reduce serum triglyceride levels in healthy human subjects and 50 grams in subjects with DM patients with oral hypoglycemia did not cause a significant increase in blood glucose levels. This may be due to the use of dates as a secondary DM intervention (Zangiabadi. N et al., .2011)

Dates contain low fat and high fiber which can reduce cholesterol absorption and can reabsorb bile acids in the intestinal lumen. The content of phytosterols and phytoestrogens in dates can reduce hypercholesterolemia. -sitosterol inhibits cholesterol synthesis by inhibiting HMG-CoA (Field et al., 1997). One serving of 3 dates (15g) is equivalent to 1 medium-sized Ambon banana (50g), large avocado (50g), 20 grapes (165g), 1 small red apple (85g), 1 apple Malang medium size (75g) with a calorific value of 50 kcal and 10 g carbohydrates (Kemenkes RI., 2014). The recommended daily fiber intake is about 25 g/day, dates are a high source of fiber, both soluble and insoluble fiber, the main fractions are cellulose, hemicellulose, pectin and lignin which can provide about 9-13% of the total daily fiber requirement or approx. 8g/100g depending on the type of cultivar and origin of growth (Marlett et al., 2002; Elleuch et al., 2008; Ali et al., 2009).

Food intake and date intake were obtained from interviews, recorded using a date consumption compliance form and a 24-hour recall form which were analyzed using the nutrisurvey program. Recall of food intake was carried out 3 times before, in the middle and at the end of the study. Recall and compliance with the provision of dates is done every 2 days. Dates are given to the patient every 2 days with one serving of 3 dates wrapped in one

meal (3 packs @ 3 dates). The use of dates as a secondary DM intervention with antioxidant content can inhibit or suppress LDL levels for DM patients (Zangiabadi et al., 2013).

From the results of the study, it was found that the fiber intake of both the control group and the intervention group did not match the needs, all of which were below the requirement. Carbohydrate intakes in the control group were all below the requirement and none were appropriate, while in the intervention group the carbohydrate intake of 5 people was as needed and 13 people were not. Errors that may occur in calculating nutrient intake, including several things such as memory factors and underreporting of the subject, the subject's error factor in estimating the size/portion size and it can also be a factor from the interviewer in accurately calculating the amount of food that has been consumed by the subject.

During the study, nutritional counseling was conducted, the material given was a DM diet with the 3 J principle (Schedule, Type and Amount) that was appropriate to control foods that could affect blood glucose levels and lipid profiles. There are still research subjects who do not understand in carrying out a diet, especially in terms of selecting food ingredients that may and should not be consumed and the amount that is allowed to be consumed. The habit of consuming fiber such as fruit, vegetables and nuts can affect lipid profiles, especially lowering LDL and consuming cholesterol and saturated fat from food every day can increase and decrease lipid profiles such as total cholesterol, LDL and HDL (Guyton and Hall, 2008). The study time was 14 days, which was not long enough so that the results of blood glucose levels and lipid profiles were not significant. Food intake cannot be uniformed for consumption, the selection of food ingredients has not been maximized, especially carbohydrates and fiber because most subjects do not / do not like to eat vegetables and are not accustomed to consuming fruit.

CONCLUSION

Giving dates (*Phoenix dactylifera* Linn.) in patients with type 2 diabetes mellitus can reduce low-density lipoprotein (LDL) so that it can be used as an alternative non-pharmacological therapy. There was no difference in LDL reduction in type 2 DM patients who were given lulu dates as much as 50 grams a day with those who were not given dates. The most important thing is that nutrient intake needs to be considered, especially carbohydrate and fiber intake, consuming dates alone without other vegetables gives less effective results in lowering blood glucose levels and lipid profiles.

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The Effect Of Training Using The Stunting Module On The Knowledge And Skills Of Cadres About Prevention And Handling Of Stunting At Tanoyan Health Center, Lolayan Regency, Bolaang Mongondow Regency

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ABSTRACT

Posyandu cadres are the main driver of all activities carried out at posyandu. The existence of cadres is important and strategic, when the services provided get sympathy from the community, it will have positive implications for community awareness and participation. The purpose of this study was to measure the effect of training using modules on the knowledge of cadres in the prevention and treatment of stunting. The research method is quasi-experimental with a pre-test and post-test design. This research was conducted in the working area of the Tanoyan Health Center with the subjects selected using the total sampling method, namely all 30 posyandu cadres. The variables studied were the knowledge and skills of cadres before and after the intervention. The data were then analyzed by univariate and bivariate. Results: The data shows that before being given training, a pre-test was carried out with the results that 50.0% of cadres had less knowledge and 60.0% less skills after intervention in the form of training and post-test for knowledge and good practice was 76.7%. The paired t test statistic test showed that there was a significant increase in the knowledge and attitudes of posyandu cadres after the intervention $p = 0.000$, value ($p < 0.05$). The conclusion there is an effect of training using modules on the knowledge and skills of cadres in the prevention and treatment of stunting in the Tanoyan Health Center Work area, Lolayan District, Bolaang Mongondow Regency. Suggestion And the puskesmas are expected to always monitor the work of posyandu cadres by assisting and providing education about stunting problems and correct anthropometric measurements.

Keywords: *Capacity Building, Stunting, Module, Posyandu Cadre*

INTRODUCTION

Globally, 3.1 million children under the age of five die each year due to malnutrition, which is almost half of all deaths that occur in children under 5 years of age (Bhutta et al., 2008)). The World Health Organization (WHO) highlights that stunting is the most dominant form of malnutrition among children under 5 and it is estimated that globally around 161 million children under the age of 5 are stunted (de Onis & Branca, 2016). Stunting increases globally as a health burden contributing 45% of all under-five deaths. More than two million children under five die each year due to malnutrition worldwide ((García Cruz et al., 2017). The other impact of stunting is disease, lack of intelligence and productivity which is certainly very beneficial for future generations (Yisak et al., 2015).

Stunting is a very important problem, so community-based interventions must be formulated and implemented to improve children's health. At the individual level, interventions should focus on educating mothers about the basics of proper nutrition and the need to take advantage of available health services. At the community level, health systems that facilitate public health interventions include: maternal and child health programs that need to be made accessible to women in rural areas. This intervention will improve the nutritional status of children under five so that the WHO global target of 2025 can be achieved (Akombi et al., 2017).

Several studies have shown that the risk caused by stunting has a negative effect on cognitive abilities in children, such as lower IQ and lack of academic achievement (Daracantika et al., 2021) : (Ekholuenetale et al., 2020), increasing the risk of obesity and a low quality of life increasing the risk of obesity and a lower quality of

life (Reinhardt & Fanzo, 2014) and increased risk of degenerative diseases (Picauly & Toy, 2013) : (Crookston et al., 2013).

The role of posyandu cadres is to obtain various health information beforehand and more completely. Take a real role in the development of growth and development of children under five and maternal health. One of the functions of posyandu is as a medium for promoting health and nutrition, monitoring the growth of children under five. Therefore, providing information about stunting prevention for posyandu cadres is very important, because then the cadres have the provisions to carry out their role in providing counseling to mothers in posyandu, so it is hoped that the incidence of stunting can be reduced (Maywita, 2018).

Research by (Masyita Haerianti, 2018) to increase the knowledge of cadres in detecting stunting from the results of interviews conducted with several participants showed that the knowledge of cadres about stunting was still very low, even most of the participants did not know what stunting was.

Training with the KMS-2008 companion module can significantly increase the accuracy of cadres, and has better effectiveness than training without the use of modules in interpreting the results of weighing children under five at the Posyandu in the working area of the Darul Imarah Health Center, Aceh Besar District (Al-rahmad, 2015)

This is evidenced in the research of (Juniarti, 2021) show that the level of skill, accuracy and accuracy of the data collected by a posyandu cadre is still very low, 90.3% of posyandu cadres are not correct in weighing.

The problem above is also in line with the research of (Husniyawati & Ratna, 2016) . The results of the observation of weight measurement are quite good, but some cadres still forget to take off the attributes worn by children when weighing and do not repeat the measurement 3 times.

METHODS

The research design used was quasi-experimental with a non-equivalent control group design. with a pre-test-post-test design. The population used in this study were posyandu cadres in the working area of the Tanoyan Health Center, Lolayan District, Bolaang Mongondow Regency. According to data from the Puskesmas, there were 30 active Posyandu cadres spread over 7 villages. The sampling technique used is total, where each member or unit of the population is taken as a sample in this study as many as 30 posyandu cadres.

The number of subjects is all posyandu cadres as many as 30 people from 7 villages in the Tanoyan Health Center area, Lolayan District, Bolaang Mongondow Regency.

The independent variable in this study is the Training Module on stunting prevention and control. The dependent variable in this study is the level of knowledge and skills.

Posyandu cadres are given training for 4 days with a total of 30 hours of lessons referring to the training curriculum and modules. The training module developed by the researcher has gone through the development stages before this research was carried out with a curriculum structure consisting of three parts, namely: 1) Basic Materials containing Introduction to the First 1000 Days of Life, 2) Core Materials containing Stunting, Teenage Girls Nutrition, Preconception Nutrition, Nutrition Pregnant Women, Infant and Breastfeeding Nutrition, Community Based Total Sanitation, Supplementary Food Manufacturing Practices based on local food and Stunting Prevention and Management Practices. 3). Supporting Materials on Nutritional Issues in the Research Area and Follow Up Plans'

The measurement of the knowledge level of posyandu cadres begins with a pre-test questionnaire instrument and after training a post-test is carried out with 40 questions, each correct answer is given a score of 1 and the wrong answer is given a score of 0. The scores are then grouped into three categories, namely "less if the score is less than 60%, Enough if the value is between 60-80%, and good if the value is above 80% (Khomsan, 2004). Practical measurements are carried out with posyandu cadres who practice measuring nutritional status including Measurement of Height and Weight, Upper Arm Circumference and Head Circumference which are observed and assessed by the evaluator if carried out according to the procedure given a value of 1 and not appropriate given a value of 0.

Data processing is done using SPSS software. Furthermore, descriptive data analysis was carried out, namely univariate analysis (descriptive statistics) and bivariate analysis. Bivariate analysis used is parametric test (paired t test), because the data is normally distributed (Based on the results of the normality test with saphiro Wilk p value > 0.05). aims to test (Ha): there is an effect of training using modules on knowledge and skills of cadres in stunting prevention and treatment and Ho: There is no effect of training using modules on knowledge and skills of cadres in stunting prevention and treatment.

This research has been declared ethically worthy by the Health Research Ethics Committee of the Health Polytechnic of the Ministry of Health Manado KEPK. 01/03/038/2021 March 17, 2021.

RESULTS

Subject Characteristics

This posyandu cadre training was held for four days on March 29 – April 1, 2021 at the Tanoyan Health Center.

The characteristics of the subjects in this study include gender, age, marital status, education, length of service as cadres are presented in table 1. The results show that all subjects are female (100%). In this study, the age range was dominated by early adults (26-35 years) as much as 33.3%.

Posyandu cadres work 82.3% as housewives, the majority of posyandu cadres with high school education are 40% with marital status as much as 28% have been married and 30% have been posyandu cadres in the range of 6-10 years.

Table 1. Characteristics of Subject

Subject Characteristics	Total	
	n	%
Age (years)		
20 – 25 (Late Adolescence)	2	6.7
26 – 35 (Early Adult)	10	33.3
36 – 45 (Late Adults)	9	30.0
46 – 65 (Early Elderly)	9	30.0
Profession		
Housewife	25	82.3
Honorary	3	10
Trader	2	6.7
Education		
Primary school	5	16.7
junior high school	9	30.0
high school	12	40.0
College	4	13.3
Marital status		
Marry	28	93.3
Divorced	2	6.7
Length of time as a cadre (years)		
< 5	8	26.6
6 - 10	9	30.0
11 - 15	3	10.0
16 – 20	3	10.0
> 21	4	13.3

The general description from table 2 shows that before being given training the level of knowledge of posyandu cadres regarding the stunting prevention and handling training module as much as half of the sample (50%) was in the less category and after being given the training it was in the good category namely 76.7%.

Regarding of the skills of posyandu cadres in measuring and determining the results of weighing measurements, there are still many subjects did this task incorrectly, it is proven by the results that 40.0% of cadres are included in the less category and only 2.7% are included in the good category. After the training and practice there was an increase in the skills of cadres in taking measurements, as many as 76.7% of cadres were included in the good category as shown in table 2 below:

Table 2. Distribution of Pre-Test and Post Test Results of Cadre Knowledge and Practice Tests about the contents of the Training Module

Category	Pre - Test		Pos - Test	
	n	%	n	%
Knowledge				
Less $\leq 60\%$,	15	50.0	0	0
Enough 60-80%	15	50.0	7	23.3
Good $\geq 80\%$	0	0	23	76.7
Amount	30	100	30	100
Practice				
Less $\leq 60\%$,	12	40.0	2	6.7
Enough 60-80%	16	53.3	5	16.7
Good $\geq 80\%$	2	2.7	23	76.7
Amount	30	100	30	100

Bivariate Analysis

The results of the comparison of knowledge and practice of posyandu cadres through training before and after can be seen in table 3 below ;

Table 3. Test the Differences Pre-Test and Post-Test Knowledge and Posyandu Cadre Practice

Variable	n	Pre Test	Post Tes	Average \pm SD	Value P
		Mean \pm SD	Mean \pm SD		
Knowledge	30	22.7 \pm 3.7	33.5 \pm 2.5	-10.8 \pm 4.4.	0.0000
Practice	30	5.7 \pm 1.7	8.2 \pm 1.7	2.5 \pm 1.6	0.0000

Normality test with Shapiro-Wilk obtained data with normal distribution. Based on table 3 as the result of parametric test (paired t test). For both variables, p value = 0.000 (<0.05) which means that there is a significant difference in knowledge before and after the training. There is an increase in the average shown from knowledge before training, an average of 22.7 was obtained and after training an average of 33.5 was obtained. The average shown from the skills before training, obtained an average of 5.7 and after training obtained an average of 8.2. So that it can be concluded that there is a difference in the average knowledge and skills before and after training.

DISCUSSION

This study aims to measure the effect of training using modules on the knowledge and skills of cadres in the prevention and treatment of stunting. The modules used have been developed before this research was carried out.

Based on table 3, it can be seen that the pre-test and post-test results show that there are differences in the skills of posyandu cadres in practicing the stunting prevention and handling training module, this can be seen at the p value <0.05 , which means there is an increase in the average skill and practice score. significant after the training.

The results of this study are in line with research by (Yuliana,dkk 2019) which shows the level of knowledge of posyandu cadres in anthropometric measurements is in the high category with a value of 53.3% and the low category of 20%.

The skills of health cadres, one of which includes the ability to carry out weighing stages, where health cadres usually carry out weighing activities are still not in accordance with anthropometric measurement procedures, so the results obtained from weighing are not precise. Anthropometric measurements carried out

by cadres included measurements of weight and height in infants, toddlers, and the elderly. Body weight is an important anthropometric measure and is most often used in infants and toddlers. In infancy and toddlerhood, body weight can be used to see the rate of physical growth and nutritional status (Supriasa, 2001).

Research by (Adistie et al., 2018) regarding the provision of integrated posyandu modules increases the attitude of cadres to carry out posyandu functions. Attitude is said to be an evaluative process that arises when individuals are faced with a stimulus that requires an individual reaction. Attitudes arise based on the evaluation process within the individual which concludes the stimulus in the form of good or bad values, positive negative, pleasant or unpleasant. The attitude structure consists of three mutually supportive components, namely cognitive, affective, and conative components. The cognitive component is a representation that is believed by the individual possessing the attitude, the affective component is a feeling related to the emotional aspect, and the conative is an aspect of the tendency to behave in a certain way in accordance with a person's attitude.

The results of the research from (Fitri dan Mardiana, 2011) showed an increase in the pretest to posttest scores. It can be concluded that the training provided to posyandu cadres regarding the skills of cadres in anthropometric measurements has succeeded in improving the skills of posyandu cadres.

The provision of nutrition education can affect the increase in knowledge scores, attitudes and skills of cadres. However, the most influential among the three variables is the knowledge score. (Imansari et al., 2021).

The combination of nutrition education techniques with simulations and practices and supporting media such as modules has proven to be effective in increasing the knowledge and skills of cadres (Hastuti & Sembiring, 2017). The nutrition education provided aims to improve the mastery of skills and techniques for implementing cadres' work in detail and routine, so that gaps in the skills of cadres in carrying out their duties such as counseling can be resolved (Alfina et al., 2015).

In addition to knowledge and motivation, the skills of posyandu cadres are one of the keys to the success of the service system at Posyandu. Posyandu cadres' skills in carrying out posyandu activities will increase trust and positive responses from mothers of children under five who come to posyandu, which in turn will have an impact on increasing D/S coverage of toddlers in posyandu. The skills of posyandu cadres will also increase the confidence of cadres and assist cadres in solving various problems faced in carrying out posyandu activities (Purwanti, 2019).

CONCLUSIONS

There is an effect of training using modules on the knowledge and skills of cadres in the prevention and treatment of stunting in the Tanayon Health Center Work area, Lolayan District, Bolaang Mongondow Regency and the suggestion are health care at Health Center expected to always monitor the posyandu cadres by assisting and providing education about stunting problems and correct anthropometric measurements.

The limitation in this study is the condition of filling out the questionnaire which has not been properly conditioned where there are still cadres who are working on filling out the questionnaire together so that it can produce a bias in the information that the researcher receives. The practice of measuring height and weighing weight and head circumference of children under five and measuring mid upper arm circumference of pregnant women was only carried out in a simulation in the training class because the posyandu implementation had been carried out before the research

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THE VARIATION " TOFU WASTE NUGGET WITH SUBSTITUTION OF BASIL LEAVES EXTRACT " ON ORGANOLEPTIC TEST AND BACTERIAL POLLUTION

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ABSTRACT

Tofu waste can still be used as processed food because of its protein content. Nuggets are one of the foods that are easy to make, practical and can be modified according to taste. The purpose of this study was to identify the organoleptic test and analyze the microbiological test of the product on tofu waste nuggets with basil leaf extract substitution for damaging cell membranes and flavonoids which function to inhibit the growth of bacteria. This research design is an experimental using the *Hedonic Test*, namely the level of acceptance in the form of liking or disliking the color, taste, scent, texture and microbiological test using the *Total Plate count* (TPC). on tofu waste nuggets with basil leaf extract substitution. The organoleptic test results showed that the panelists preferred the nuggets with the formulation of tofu waste and basil leaf extract of 50: 50, Nugget with C code is an average value of 3,80 for color, scent, texture and taste for the organoleptic test. The results of microbiological examination showed that the mean number of bacteria was 3.200 for the tofu waste nugget sample with basil leaf extract substitution and 6.870 for the control tofu waste nugget sample. The addition of basil leaves to tofu waste nuggets can suppress the growth of the number of bacteria.

Keywords: basil leaf extract, microbiological test, organoleptic test, tofu waste nuggets

INTRODUCTION

Tofu waste is solid waste from a tofu factory, with 15 kg of soybeans as the main ingredient, which will produce 20 kg of wet tofu waste. The tofu waste are not durable and after 24 hours will produce a foul odor (Sari, Ab, Yulianti, & Permana, 2018). The high protein content in tofu waste can cause tofu waste to be easily damaged with the characteristics of a bad smell, sour taste, and slimy.

Basil is one type of plant that has many benefits. The bioactive content of basil functions as an insecticide, nematicide, fungicide and antimicrobial (Wahid *et al.*, 2020). Phenol in basil has a membrane-damaging effect and stimulates the disruption of potassium ions in microbial cells. These flavonoids will work by inhibiting nucleic acid synthesis, inhibiting the function of the cytoplasmic membrane and inhibiting cell energy metabolism in microbes. In addition, saponins in basil have a function to damage cell membranes and flavonoids which function to inhibit the growth of *E. coli*. The results of research by Angelina (2015), Basil leaf extract (*Ocimum sanctum*) functions as an antibacterial having a minimum inhibitory concentration (MIC) at a concentration of 16.33% and a minimum killing rate (KBM) at a concentration of 50% against *Staphylococcus aureus*. Based on the results of the Threenesia study, it was known by *coulony counter*, basil extract was able to inhibit the growth of bacteria in media with concentrations of 25%, 50%, and 75%, respectively 1mm, 2-3mm, and 4mm.

Nugget is also one of the popular products in Indonesia because it is practical in serving, cheap and nutritious. Nugget is a product that is widely consumed in Indonesia due to the availability of abundant raw materials for chicken meat. This ingredients to make *nuggets* such as: chicken eggs with complete nutrition contain vitamins D, A, B2, B6, B12, folic acid, and excellent minerals such as iron, calcium, sodium, and phosphorus. (Ratu *et al.*, 2020), chicken meat, wheat flour have varied characteristics, depending on the wheat milling process, the location of the wheat growth and the wheat growing conditions. This study aims

to identify the results of organoleptic tests and analyze the results of bacterial contamination tests in tofu waste nuggets with basil leaf extract substitution. Because of Basil leaf extract substitution is used as an inhibitor of bacterial growth because of the ingredients in basil such as essential oils, carbohydrates, phytosterols, alkaloids, phenolics, tannins, lignin, starch, saponins, flavonoids, terpenoids, anthraquinones, volatile oils including methyl cinnamate, methyl heptenone, methyl nonylketone, as well as the content of flavonoids and phenols into compounds as antibacterial ingredients. Besides this product being easy to make and very simple, the processed tofu waste nuggets with the substitution of basil leaf extract are expected to be a snack food that is safe for consumption.

METHODS

The research design is experimental and was carried out in October 2020 - June 2021. The making process and organoleptic testing of the product "Nugget Waste Tofu with Basil Leaf Extract Substitution" was carried out at the Taste Testing Laboratory of the Department of Nutrition, Health Polytechnic of the Ministry of Health Surabaya, Jalan Pucang Jajar Selatan No 24B. The microbiological test of the product was carried out at the Surabaya Industrial Standardization and Research Institute (Baristand) with *TPC* method on Jalan Jagir Wonokromo No.360 Surabaya. The sample tested for microbiology is the most preferred by the panelists who are Nutrition students of Health Polytechnic of the Ministry of Health Surabaya.

This study used three formulations with comparisons in each formulation resulting in a sample size of 100g for each code for panelists in the sample of tofu waste nuggets with basil leaf extract substitution. The percentage of the formulation of the amount of tofu waste and basil leaf extract to be studied will be described in the following table.

Tabel 1. Formula Nugget Ampas Tahu Dengan substitusi Ekstrak Daun Kemangi

Keterangan	Control (A)	F1 (B)	F2 (C)
Tofu Waste	100g	80 g	50g
Basil Leaf Extract	0ml	20 ml	50 ml

The procedure for making basil extract:

- Basil leaves cleaned with running water
- Then blended with a 1:3 ratio between basil leaves and water
- The basil leaf solution is then filtered to produce juice (Tarigan, 2016).

Nuggets making procedure:

- Prepare Tofu waste that have been weighed early and are ready to be roasted
- Tofu Waste Roast 10-15 minutes
- Mix the Tofu Waste with Basil Leaf Extract according to the formulation, then add other additional ingredients such as chicken meat, wheat flour, garlic, sugar, salt, pepper, and others that have been mashed and eggs
- Then print it into a rectangular mold to facilitate the steaming process
- Print on a rectangular baking sheet with a thickness of 3-4cm
- Steam approximately 20-25 minutes
- After ripe. Chill. Once cool then cut into small rectangular pieces

- h. After that, dip the nugget pieces into the flour mixture like flour dough for fried bananas. Then spread over breadcrumbs
- i. Fry over medium heat until cooked and ready to serve

Nutritional Content of Tofu Waste Nugget with Basil Leaf Extract Substitution

One dough of tofu nuggets with basil leaf extract substitution can be divided into 15 pieces/portion of which 3 formulations contain:

1. Tofu waste	50 grams
2. Basil leaves	50 mL
3. Chicken meat	50 grams
4. Chicken eggs	120 grams
5. Wheat Flour	50 grams

In this study, the nutritional content of tofu nuggets with basil leaf extract substitution was calculated and presented in the following table.

RESULTS

Table 2. Characteristics of Tofu Waste Nugget with Basil Leaf Extract Substitution

No	Indicator	Formulation of Tofu Waste Nugget with Basil Leaf Extract Substitution		
		Code A	Code B	Code C
		Control Sample	(Tofu Waste: Basil Leaf Extract)	(Tofu Waste : Basil Leaf Extract)
		100 : 0	80 : 20	50 : 50
1.	Color	Brownish White	Light Green / faded	Green
2.	Texture	Solid	Solid	Slightly softer
3.	Scent	Slightly foul-smelling	Characteristic of Basil Leaves (Weak)	Typical of Leaves Basil (medium)
4.	Taste	like nuggets with a slightly unpleasant taste	Like nuggets with fresh taste typical of basil leaves	Like Nuggets with fresh taste typical of basil leaves

In general, tofu waste nuggets without substitution of basil leaf extract (code A) are brownish white, dense texture, slightly unpleasant scent and taste like nuggets in general, while the tofu waste nuggets with basil leaf extract substitution (code B) are brown light green or faded green color, dense texture, slightly smells typical of basil leaves and has a taste like nuggets in general. Tofu waste nuggets with basil leaf extract substitute (code C) are green, densely textured, have a moderate scent typical of basil leaves and have a taste

similar to nuggets in general. This can happen because of the substitution of basil leaf extract in tofu waste nuggets where the chlorophyll in this basil leaf has a green color and a distinctive scent.

Organoleptic Test Results of Tofu Waste Nugget with Basil Leaf Extract Substitution

The moderately trained panelists (students majoring in Nutrition) were asked to taste and give an assessment of the sample with the 3 formulations according to predetermined parameters. The results of the assessment by 25 panelists can be seen in table 3 as follows.

Table 3. Organoleptic Test of Tofu Waste Nugget Formulation with Substitution of Basil Leaf Extract

No	Indicator	Code A	Code B	Code C
		Control Sample	(Tofu Waste: Basil Leaf Extract)	(Tofu Waste: Basil Leaf Extract)
		100 : 0	80 : 20	50 : 50
1.	Color	3,08	3,56	3,92
2.	Texture	3,56	3,5	3,6
3.	Scent	3,16	3,64	4
4.	Sense	3,12	3,56	3,92
Average		3,23	3,56	3,86

Category Score Score

1 (Strongly Dislike);2 (Dislike);3 (Slightly like);4 (Like);5(Very like)

Kruskal Wallis Results Of Tofu Waste Nugget with substitution Extract Basil

Table 4. Results ofTest *Kruskal Wallis* on Tofu Waste Nugget with Basil Leaf Extract Substitution Based on Organoleptic

No	IndicatorsIndicator	Test Value <i>Kruskal Wallis</i>
1.	Color	0,001
2.	Scent	0,002
3.	Texture	0,904
4.	Taste	0,001

The results of the *Kruskal Wallis test* on the color,scent, and taste parameters have a p value of <0.05 which indicates there are differences in color, scent and taste in the formulation of tofu waste nuggets with basil leaf extract substitution

Man Whitney Nugget Test Results Tofu Waste with Basil Leaf Extract Substitution

After it was known that there were differences in color, scent and taste, it was continued with theTest *Man Whitney* to see whether there were differences in color, scent and taste between formulations. The results of thetest *Man Whitney* can be seen in table 5.

Table 5. Test Results *Man Whitney* NuggetTofu Waste with Basil Extract Substitution Based on Organoleptic Indicators

No	Indicator	Test Value <i>Man Whitney</i>		
		A : B	A : C	B: C
1.	Color	0,031	0,000	0,087
2.	Scent	0,029	0,001	0,117
3.	Taste	0,086	0,000	0,147

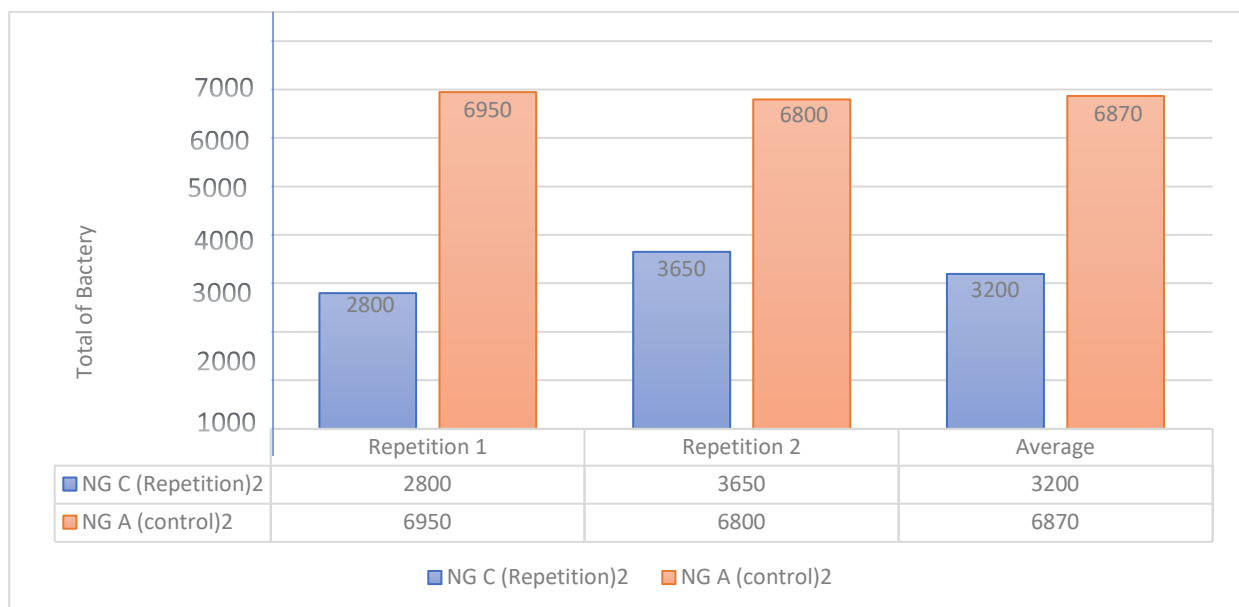
Based on table 5, the results of the test *Mann Whitney* were used to determine the difference between the control and treatment samples. The color parameters in the formulation code A: B, code A: C, and code B: C has a p value <0.05, that the hypothesis is accepted which means there is a color difference. on the formulation.

For the scent parameter in the code A:B and code A:C has a p value <0.05 and indicates that the hypothesis is accepted, which means that there is a difference in scent in the two formulations.

For the taste parameter in the A:B and the 1:3 formulation with code A:C has a p value <0.05 and indicates that the hypothesis is accepted, which means that there is a difference in taste in the two formulations.

Microbiological Test

tests were conducted to determine the number of bacteria by looking at the comparison of bacterial colony growth using *Total Plate Count (TPC)*. The results of the microbiological test with this method can be seen in graph 1.



Graph 1. Number of bacterial colonies in basil leaf extract substitution

For the results of the analysis *Total Plate Count (TPC)* (tofu waste nuggets with) on tofu waste nuggets with control samples (A code) the number of colonies was 6.950 in the first and 6800 on the second repetitions. Based on BPOM standards/regulations No. 13 of 2019 the number of colonies on tofu waste nuggets with control samples (code A) meets bacterial standards which are acceptable which is explained that 10.000 for the limit contamination for the bacterial on *TPC* Method.

While the results of the analysis of *Total Plate Count (TPC)* on tofu waste nuggets with basil leaf extract substitution on the treatment sample (code C) showed the number of colonies of 2.800^3 in the first repetition and 3.650^3 in the second repetition. From these results it can be seen that the control sample has more colonies than the treatment sample with the C code and even so if Based on BPOM standards/regulations No. 13 of 2019 the number of colonies in tofu waste nuggets with the control sample (Code C) also meets the bacterial standard, which can indicate that the product is acceptable. The control sample had a higher number of bacteria due to the characteristics of the tofu waste which were watery and also easily damaged.

DISCUSSION

Organoleptic Test of Tofu Waste Nugget with Substitution of Basil Leaf Extract

1. Color

Color is the first appearance that greatly influences consumers to choose a product. The function of color in a food is very important, because it can affect consumer tastes and can arouse appetite. (Hasniar.,*etc*,2019)

The highest average value on the color indicator is found in formulation 3 (code C) with a value of 3.92 which means like The difference in values and categories in the 3 formulations of tofu waste nugget with the substitution of basil leaf extract was due to a visible color difference where formulation 1 produced a brownish white color, formulation 2 produced a light green color or faded and formulation 3 green color. This means, the greater the extract Based on the results of the hedonic test, the panelists preferred tofu waste nuggets with basil leaf extract substituted because they have a green color that comes from chlorophyll and are considered more attractive the consumers.

2. Texture

Texture can be seen and felt from the outermost form either directly by consumers so that this can affect the assessment of the acceptability of the product. Good texture is influenced by the basic ingredients used. The rough or smooth shape of the resulting meatball product is an aspect that is assessed from the texture (Soeparno, 2005).

The highest average value on the texture indicator shows the results of formulation 3 (code C) with a value of 4.0. There was no significant difference in the values in the three formulations due to almost the same size, shape, and density. So the addition of basil leaf extract did not give a significant effect on the texture of the tofu dregs nuggets.

3. Scent

Scent is a certain substance or component that has several functions in food, including being able to improve and make the product more valuable. According to Yulistiani, R(2015), Aroma is one of the parameters or aspects that are assessed in testing sensory (organoleptic) properties using the sense of smell. Aroma is acceptable if the resulting material has a specific aroma

The highest average value on the scent indicator is found in formulation 3 (code C) with a value of 4.0 and It means that the panelists preferred the tofu waste nuggets with the substitution of basil leaf extract which has a distinctive scent of basil leaves and. The difference in values and categories in the 3 formulations of tofu waste nuggets with basil leaf extract substitution is due to differences in scent as formulation 1 (code A) produces a slightly unpleasant scent and formulation 2 (code B) produces a distinctive scent of basil leaves which is weak and formulation 3 (code C) produces a characteristic scent of medium basil leaves. That's because the component of basil leaves is an essential oil that can give off the distinctive scent of this plant. formulation 3 (code C) has the highest value for aroma because it produces a medium typical aroma of basil leaves. That's because the component of basil leaves is an essential oil that can give off the distinctive aroma of this plant. Based on the hedonic test, the panelists preferred the tofu dregs nuggets with the substitution of basil leaf extract which has a distinctive aroma of basil leaves.

4. Taste

According to Wahidah (2010), the complexity of a taste can result from the diversity of natural perceptions. Taste can be influenced by three factors, namely smell, taste, and oral stimulation (hot and cold). The first factor can be detected by the sense of smell and the last two factors can be detected by the sensory cells present in the tongue.

Organoleptic testing for the taste of various nuggets was carried out by tasting and giving the taste value of each nugget using the hedonic scale test method. Taste is a biological perception such as the sensation produced by matter that enters the mouth. The highest average value on the taste indicator is found in formulation 3 (code C) with a value of 3.92 which means like. This can happen because in the nuggets there is a taste of fresh basil leaves and little bit different from nuggets taste in general. Besides that, the unpleasant taste in the tofu waste can also be overcome by the presence of a mixture of basil leaf extract in this nugget

Total Plate Count (TPC)

Total 2 samples that were tested by the laboratory using the method *TPC*. The first sample was formulation 1 of control or tofu waste nuggets with code A and the second sample was tofu nuggets with substitution of basil leaf extract formulation 3 with code C. Formulation 3 was chosen because it is the best result from organoleptic test and is the most preferred by panelists. The *TPC* results showed that the tofu waste nuggets (code A) had more bacterial growth than the tofu waste nuggets with basil leaf extract substituted in formulation 3 (code C). so that it can be seen that tofu waste nuggets with basil leaf extract substitution in Code C can inhibit bacterial growth compared to tofu waste nuggets without basil leaf extract substitution due to the content of basil which has antibacterial. This can be seen from the amount of bacterial contamination from the two nuggets

Some of the ingredients in basil are essential oils, carbohydrates, phytosterols, alkaloids, phenolics, tannins, lignin, starch, saponins, flavonoids, terpenoids, anthraquinones, volatile oils including methyl cinnamate, methyl heptenon, methyl nonylketone, and the content of flavonoids and phenols. compounds as antibacterial agents. Several groups of these chemical compounds can inhibit the growth of bacteria such as *Escherichia coli*, *Staphylococcus aureus*, and *Klebsiella pneumonia* such as alkaloid compounds, essential oils and phenols. The nature of this inhibition is referred to as bacteriostatic or bactericidal so that the tofu waste nuggets are still safe for consumption . (Angelina, Turnip and Khotimah, 2015)

The nutritional content of tofu waste nuggets with the substitution of basil leaf extract can be seen that 1 dough can be divided into two servings for one snack meal with details of energy calculations per serving:

- Energy : 186,4 kcal
- Protein : 11,14 gram
- Fat : 28,4 gram
- Carbohydrates : 218,8 gram

From the results above, it can be seen that for 1 serving/piece of tofu waste nuggets with basil leaf extract substitution, it contains 186,4 kcal of energy, 11,14 grams of protein, 28.4 grams of fat and carbohydrates 218.8 grams . So, that snacks made from tofu waste nuggets with basil leaf extract substitution can be sufficient and meet the standard for snacks because the results of the calculation per serving show the results in accordance with the calculations above.

CONCLUSION

Tofu waste nuggets with basil leaf extract substituted the most preferred by the panelists were formulation 3 (code C) with a ratio of tofu waste and basil leaf extract of 50: 50 and an average score of 3.86, while the basil leaves in tofu waste nuggets could suppress growth slower bacteria or less bacterial contamination than tofu nuggets as seen from the results of the test *TPC* and bacterial growth graph where the average number of bacteria for two repetitions in the control sample was 6.870 and the treatment sample was 3.200.

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Administration of Pismatom Juice in Increasing the Energy Efficiency In Middle-Distance Run Athletes of PASI Denpasar, Bali-Indonesia

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ABSTRACT

Adequate nutrition supply the source of energy and the efficiency of using it, is required to achieve peak performance in middle-distance running athletes. Giving a mixture of banana honey tomato (*Pismatom*) juice provides energy, electrolyte and antioxidants during exercise. This study aims to prove that *Pismatom* juice administration increases energy efficiency. Subjects of were 28 males athletes divided into 2 groups with randomized pre-posttest control group design. The treatment group was given 240 cc of *Pismatom* juice and control group was given 240 cc of mineral water before and after physical exercise for 14 days. The results showed that speed time run 2,4 Km control group obtained average 11.25+ 1.63 minutes (pretest) and 11.37+1.97 minutes (post test), while treatment group averaged 11.34 + 1.28 minutes (pretest) and 11.06 + 1.16 minutes.(post test). Heart rate in control group was 164.00 + 15.13 beats/minute and treatment group was 155.36 + 19.72 beats/minute. Average energy efficiency in the control group was 65.76 + 16.85% and treatment group was 51.66 + 10.93%. The energy efficiency in treatment group 51.66 ± 10.93% vs 65.76 ± 16.85 % showed significant difference (p<0.05). It is concluded that *Pismatom* juice administration increased energy efficiency in middle-distance running athletes.

Kewywords: *Pismatom* juice, energy efficiency and middle-distance run

INTRUCTION

Running athletes must be able to maintain energy balance obtained from food, fluids, supplement products which is in balance with the energy released. Energy expenditure and body fluids in the form of sweat and breathing on physical activity can increase body temperature which is able to interfere metabolic processes and reduce electrolytes levels which have an impact on decreasing physical performance. The recovery acceleration and running time are the indicators of athlete's performance improvement. Athlete's performance must be carried out with the principle of efficiency energy use to achieve maximum performance goals [1]. The role of adequate nutrition containing electrolyte fluids, carbohydrates, ready-to-use energy and antioxidants needs to be given to moderate-high intensity athletes to support athlete performance and efficient use of body energy [2]

Carbohydrate containing drinks which are given during prolonged physical exercise can prevent dehydration and reduce the effects of lack of fluids on cardiovascular function and exercise ability and slow the occurrence of fatigue. Drinks that contain electrolytes, carbohydrates, minerals (potassium) and high antioxidants with a slightly sweet, cool and natural taste can be obtained from fruit juices made from bananas, honey and tomatoes called *Pismatom* juice. A study states that consuming 150-300 grams of bananas can increase potassium and blood glucose levels 30-60 minutes after digestion, so this is potential to prevent fatigue [3]. Physical fitness increases through maximum oxygen uptake in athletes by consuming honey before and after exercise for 7 consecutive days [4]. Giving tomato juice before and after exercise accelerates recovery in boxing athletes [5]. Honey is another source of carbohydrate which is immediately used as energy during exercise.

METHOD

This study was an experimental, using one group pre-test and post-test design [11]. The number of subjects were 28 middle run athletes who are members of PASI Kota Denpasar with a membership of at least 2 years at the time this study was conducted, male sex, age 14-18 years, body mass index (BMI) category 18.5 - 24, 9. The study was conducted by measuring the heart rate, speed time, energy expenditure

and percentage of energy efficiency. *Pismatom* juice was given to the athletes in treatment group. *Pismatom* juice is made with banana, honey, and tomato. *Pismatom* juice is given to athletes with composition of 240 cc volume and consist of 100 grams banana, 10 grams honey, 100 grams tomato and 30 cc of water (240 cc volume) during 14 days in middle-distance runner. *Pismatom* juice was given 30 minutes before and immediately after exercise. On the 14th days after exercise training program a remeasurement of exercise heart rate, speed time, energy expenditure and percentage of energy efficiency were conducted. According to, energy efficiency using Brooks and Fahey (1985) formula that energy efficiency percentage was calculated by recovery heart rate and speed time compare with energy expenditure. The SPSS (17) software was used to data management and analysis, while Microsoft Excel was used for charts. The results were expressed as mean \pm standard deviation of the mean. Statistical analysis was carried out using t-independent test and $p < 0.05$ was accepted as significant.

RESULT

1 Subject Characteristics

The number of subjects in this study were 28 middle-distance run athletes of Athletic Association (PASI) in Denpasar. The characteristics of the subject can be seen in Table 1 below.

Table 1. Characteristics of Research Subjects

Variable	n	Control Group	Treatment Group	t	p*
		Average \pm SD	Average \pm SD		
Age (years)	1	15,36	15,29 \pm	0,4	0,68
	4	\pm 1,50	1,33	3	3
Weight (Kg)	1	54,24	56,69 \pm	-	0,25
	4	\pm 4,79	6,17	1,1	0
				7	
Height (cm)	1	167,84	167,94	-	0,96
	4	\pm 5,63	\pm 6,55	0,4	6
				3	
Body Mass Index	1	19,34	20,08 \pm	-	0,16
	4	\pm 1,04	1,61	1,4	3
				4	
Heart Rate Training (beats/minute)	1	164,00	155,36	1,3	0,20
	4	\pm 15,13	\pm 19,72	0	5

Noted:

p^* The normal data distribution $p > 0,05$

2. Nutritional Composition of *Pismatom* Juice

Nutritional analysis of *Pismatom* juice was conducted at Food and Technology Laboratory Unit, Udayana University [11] with the composition of 240 cc volume (serving portion) i.e ; energy 149,55 Kcal, carbohydrate 119,02 gr, protein 6,62 gr, fat 0,45 gr, fibre 2,13 mg, sodium 19,57 mg, potassium 292,5 mg, flavonoid 0,4719 (mg/1000E), antioxidant capacity 14,59%, vit. C 22, 162 mg/100gr, sucrose 96,336 mg, water soluble 201,54 gr.

3. Efficiency Energy Analysis

Adequate energy for an athlete and efficiency of energy use are absolutely important to achieve peak performance. The efficiency of energy expenditure in physical activity is affected by working ability, intensity of physical exercise and total energy used. The performance of a running athlete, especially

middle-distance can be shown through the speed time to get finish line. The results of the research showed that speed time for 2,4 km in the initial data control group (pre test) obtained average of 11.25 + 1.63 minutes and final data control group (post test) showed average of 11.37 + 1.97 minutes. While in the initial data treatment group (pretest) shown an averaged of 11.34 + 1.28 minutes and post test data shown an average of 11.06 + 1.16 minutes. Based on the data, the Pismatom Juice treatment group showed better performance by average speed time of 0.31 minutes faster than the mineral water group.

Based on the average heart rate during the exercise in both groups, the Control group was 164.00 + 15.13 beats/minute and in the Treatment group 155.36 + 19.72 beats /minute. Meanwhile, the average energy expenditure seen from the total energy expenditure in the two groups, including the control group was 2935.2857 + 253.81 Kcal/day and the Treatment group was 3236.78 + 354.33 Kcal/day. The average of total energy expenditure in both groups is classified as the category of energy expenditure in high intensity exercise [12]

Based on the parameters of travel time speed, exercise heart rate and total energy expenditure, therefore the level of energy use (efficiency %) in both groups can be measured by the formula proposed by Brooks and Fahey [14]. The average of efficiency energy in the Control Group was 65.76 + 16.85% and in the Treatment Group it was 51.66 + 10.93%. The results of data variance homogeneity test on the average of energy efficiency in both groups obtained $p = 0.066$ ($p > 0.05$), which means that the data variance is homogeneous. The results of t-independent test on the level energy expenditure use in both groups can be seen in Table 2.

Table 2. Energy Efficiency Difference
In the control and treatment groups

Group	n	Energy Efficiency Percentage (%)	t	p
Control	14	65,76 ± 16,85	2,627	0,014
Treatment	14	51,66 ± 10,93		

The analysis results in Table 2 showed that there was a significant difference in energy efficiency with a value of $p=0.014$ ($p < 0.05$). Based on the GLM analysis results to the treatment group, energy use was 10.956 higher by controlling age and body mass index (BMI) (coefficient = 10.956) variable. These results indicate that the Pismatom juice intervention was more efficient in energy use by 11%, compared to the Control Group.

DISCUSSION

Energy needs for an athlete must be adjusted to the amount of energy expenditure (Energy Expenditure) to carry out daily activities, especially physical exercise. According to Brooks and Fahey [14], energy efficiency can be determined by many factors such as ; running speed, intensity, and total energy expenditure. Study result showed that the level of energy use to the athlete's performance was 51.66% in the Treatment Group. Meanwhile in Control Group was 65.76%. The result of statistical analysis showed that there was a significant difference ($p < 0.05$) in the level of efficiency energy use to the athletes performance. The GLM analysis results showed that the Pismatom juice intervention was more efficient in energy use by 11% compared to the Control Group. This proved that the use of energy to achieve athlete performance is more efficient by consumed Pismatom juice compared to mineral water.

This study result are in line with Ivy's research [15], which revealed that administration of food contain carbohydrates as much as 0.2 grams/kg body weight before and after 2 hours session cycling exercise, increase the working capacity and efficiency of energy use by 11% in the last 30 minutes of a training session.

Administration of Pismatom juice containing high carbohydrate that made with bananas and honey have a positive effect to the athlete performance and energy efficiency. According to Irawan (2007),

carbohydrates that is consumed during exercise can be stored in the liver, therefore when the body need an additional energy, the liver will release of glucose into the bloodstream to maintain the blood glucose levels and the rate of carbohydrate-burning proses. Carbohydrates-burning proses as the body's main energy source will increase by up to 100% when the exercise intensity of 70-95% VO₂ Max. This process will help to prevent fatigue and efficiency of the energy use in endurance sports, which are usually have a long duration [16].

Speed is the ability that determines the athlete's achievement in running [17]. The study results that an athlete who consume Pismatom juice before and after physical exercise was 0.31 minutes faster than an athlete who drink mineral water with in 2.4 Km. This result is in line with the results of research by Nieman et al., (2015) proved that consuming bananas as a source of carbohydrates as much as 0.6/kg body weight before and during physical exercise in 75 Km distance runner, can improve athlete performance by 5% compared to a runner who just drink water [18].

Faster travel time in the group who consume Pismatom Juice affects the efficiency level of energy use. This study results are in line with Iaia et al research., (2008) that endurance and speed training during submaximal exercise can reduce the use of energy expenditure by athletes without decreasing the expression of the UCP3 gene (mitochondrial uncoupling protein 3) in mitochondria [19]. According to Soekarman (2005), when the cells need to add on ATP in physical exercise, then mitochondria can replicate. This is possible because mitochondria contain dioxiribonucleotide acid (RNA) which is similar to DNA in the nucleus cells. Mitochondria is one of the most important organelles as a place to form the main energy of cells, such as the provision of ATP and NAD⁺ (nicotinamide adenine dinucleotide) so that it is often referred to as the center of cell energy reserves [20].

To provide energy for cells metabolism, glucose is converted into ATP in mitochondria. Intake of banana honey tomato as a source of energy and potassium, increases muscle contraction during physical exercise. This is occur because of the potential action and energy in the form of ATP which causes a shift in the actin and myosin filaments, thus affecting the athletes performance [21].

The role of Pismatom juice in increasing energy efficiency in middle-distance run due the energy used is effective to increase working capacity, both working capacity of skeletal muscle through speed bio-motoric component and working capacity of the heart muscle, which is indicated by exercise heart rate. When a muscle contracts, it does work and requires energy. A large amount of ATP is broken down to form ADP during the contraction process, the greater the amount of work done by the muscle, the greater the amount of ATP that is broken down. Some of this energy is needed to pump calcium and sarcoplasmic ions into the sarcoplasmic reticulum after contraction ends and to pump sodium and potassium ions through the muscle fiber membrane to maintain a suitable ionic environment to form a potential action of the muscle fiber.

Administration 240 cc volume of pismatom juice before and after exercise, contribute 299.1 Kcal of energy or 11.33% of the total energy required for running athletes. The increasing of energy by 11.33% from total energy expenditure is an effort to make a diet formulation that prioritizes natural food ingredients that are suitable for athletes during physical exercise to improve athlete performance. Based on the interviews results to the Treatment Group who consumed Pismatom juice, they physically felt better and fit to perform 14 days exercise program.

CONCLUSION

Generally, this study proved that Pismatom juice can be used as a natural isotonic drink with its electrolytes (potassium), carbohydrates and antioxidants content that contribute to improve athlete performance which is indicated by the increassing of energy efficiency.

RECOMENDATION

Pismatom juice needs to be applied to athletes who conduct a training center (TC) program on a certain event or championship with a monitoring process of administration according to dosage. This is easier and well-organized, therefore oxidative stress can be prevented and minimized, recovery is faster and more efficient in energy used to reach of Athlete's peaks performance.

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**ACCEPTABILITY AND NUTRITIONAL CONTENT OF SUPPLEMENTARY FOOD
FOR PREGNANT WOMAN WITH CHRONIC ENERGY DEFICIENCY IN
SAMBIKEREB SUB-DISTRICT SURABAYA**

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ABSTRACT

Pregnant women suffering from anemia of chronic energy deficiency affects the quality of Indonesia's resources. One the efforts to overcome the problem of chronic energy deficiency in pregnant women is supplementary food program in the form of pregnant women's milk which is carried out in Sambikerep sub district. This study aims to determine the acceptability of additional food for pregnant women, and to determine the percentage of nutritional adequacy of energy, protein and iron in supplementary food to the additional nutritional value of chronic energy deficient pregnant women . The research design used a cross-sectional research design, namely the research design conducted by observing the subject with a one-time approach. The results of the study from 21 respondents who had collected data on the level of preference for supplementary feeding 61.9% of pregnant women were in the category of liking and receiving 100% good because they were spent according to the serving suggestion. The contribution of supplementary feeding to the fulfillment of the nutritional adequacy rate for energy is 5%, protein is 12%, and iron is 25%. This is still not in accordance with the management of supplementary feeding in pregnant women. It is recommended that supplementary feeding (PMT) to pregnant women be adjusted to the management of supplementary feeding to pregnant women, both for gestational age and the amount of calories and protein adjusted to the needs of pregnant women. In addition, the provision of supplementary food for pregnant women is advised to use food and local food-based foods.

Keywords: acceptability, supplementary feeding , chronic

INTRODUCTION

One of the programs launched by the government in the world of health in the field of nutrition is "1000 Days of Nutrition". This program aims to make people aware of the importance of applying nutrition in the first 1000 days of a child's life in achieving optimal growth and development (Kemenkes, 2012).

This program begins by paying attention to the nutritional status of pregnant women, because a child's life begins in the mother's womb. Nutritional intake that is not strong in pregnant women in addition to endangering the health of the mother, will also have an impact on the inhibition of fetal growth and development. Malnutrition for a long time in pregnant women will cause pregnant women to experience a condition called Chronic Energy Deficiency . Chronic energy deficiency conditions in pregnant women have health impacts on mothers and children in the womb, including increasing the risk of babies with low birth weight, miscarriage, premature birth and death in mothers and newborns. Not infrequently the condition of chronic energy deficiency in pregnant women is the main cause of bleeding, prolonged labor, abortion and infection which are the main factors of maternal death (Sirojudin, 2007).

The prevalence rate of risk of chronic energy deficiency in women of childbearing age , Basic Health Research, 2007) in Indonesia is 13,6%. Meanwhile, based on the Indonesian health map, the prevalence of chronic energy deficiency pregnant women is 16.8%. As previously described, one of the effects of chronic energy deficiency is low birth weight. According to the 2010 Indonesian Health Demographic Survey (IDHS), the infant mortality rate is 34 per 1000 live births. The main cause of infant mortality is due to low birth weight . Data for low birth weight (BBLR) according to Riskesdas in 2010 was 11,1%. This percentage still does not meet the government's target in the 2010 Healthy Indonesia program, which is only 7%. Achievement of the target of the National Medium Term Development Plan 2010-2014 related to the problem of chronic energy deficiency in pregnant women, namely reducing the Infant Mortality Rate (IMR) to 24 per 1000 live births. This target is also closely related to the health

and nutritional status of pregnant women as well as a decrease in the number of stunted children to 32% which is a manifestation of chronic energy deficiency pregnant women (Depkes, 2010).

Low birth weight is one of the effects of pregnant women who suffer from chronic energy deficiency and will have poor nutritional status. Low birth weight is associated with high infant and under-five mortality rates, it can also have a serious impact on the quality of future generations, namely it will slow down the growth and mental development of children and affect the decline in intelligence (Intelligence Question (IQ)). According to WHO and BPN (2007), every child with poor nutritional status has a risk of losing IQ 10-15 points (Albulgis, 2008).

Low birth weight affects the growth of toddlerhood and subsequent growth in adolescence. Adolescents with less weight and height result in mothers-to-be with small bodies. Adolescents with this condition also marry at a young age. With a state of the body that is not ready and mothers with small bodies will have a risk of low birth weight. Improvement of nutritional status needs to be done at every point so that it can have an impact on the next period (Mason, in Ichwanuddin 1997). Naeye's research in the United States revealed that nutritional status was measured by weight gain during pregnancy, it was found that birth weight had a positive correlation with maternal weight gain during pregnancy. The greater the mother's weight gain, the greater the birth weight of the baby, but this correlation seems to be in underweight mothers, the correlation becomes less significant in obese mothers (Marsianto, 1997).

The incidence of low birth weight is closely related to the nutritional status of pregnant women both before and during pregnancy, can describe the availability of nutrients in the mother's body to support fetal growth. Predictors of maternal nutritional status during pregnancy are carried out by measuring Upper Arm Circumference and hemoglobin test. Measurement of in pregnant women is associated with Chronic Energy Deficiency. Chronic Energy Deficiency is a problem that often occurs in pregnant women with Upper Arm Circumference < 23.5 and must get treatment so that complications do not occur in the fetus.

Based on a previous preliminary study conducted by researchers in Sambikerep District in 2016, Chronic energy deficiency in pregnant women is one of the health problems that is a major concern in Sambikereb District, Surabaya. The prevalence of pregnant women Chronic Energy Deficiency is around 19.5% or 23 people out of 118 pregnant women and is still a problem for public health which has a threshold above 10%. The prevalence of pregnant women that still exceeds the threshold is the background for the handling program for pregnant women Chronic Energy Deficiency in Sambikerep District, Surabaya.

Efforts to improve the nutritional status of mothers during pregnancy in dealing with the problem of chronic energy deficiency are supplementary feeding. In 2017 the Indonesian Ministry of Health distributed the supplementary feeding program in the form of a manufacturer's supplementary feeding. This program is prioritized for pregnant women with chronic energy deficiency, especially in districts/cities that are prone to malnutrition (Ministry of Health, 2010). The supplementary feeding program carried out in Sambikereb District was carried out for 90 days in the form of milk for pregnant women continuously and uninterruptedly with the priority target of pregnant women with chronic energy deficiency with an Upper Arm Circumference indicator of less than 23.5 cm. The nutritional content per one preparation/serving (45 grams) is a total of 190 kcal energy, 9 grams of protein and 25% iron. The purpose of this study to determine the acceptability of additional food for pregnant women, and the percentage of nutritional adequacy of energy, protein and iron in supplementary food to the additional nutritional value of chronic energy deficient pregnant women

METHODS

This type of research is descriptive analytic, to determine the acceptability of supplementary feeding recovery in pregnant women with chronic energy deficiency in Sambikerep district, Surabaya. Based on the time of implementation, the data were collected in a cross sectional manner, because the independent variables and the dependent variable were measured at the same time. This research was conducted by using a sampling technique in the form of simple random sampling, which is a sampling method that provides equal opportunities to be taken for each element of the population and is taken randomly. This research was carried out in the working area of Sambikereb District, Surabaya City, carried out during the period April to October 2017. The population of this study were pregnant women with chronic energy deficiency in the Sambikereb sub-district, Surabaya. The entire population of pregnant women with chronic energy deficiency was used as a sample. Data collection techniques were carried out using interview techniques which included the identity of the respondent through interviews, energy and protein intake through interviews using a 24-hour recall form, consumption patterns of iron-rich foods

through interviews with respondents and using a 24-hour recall form. The data collected from direct measurements were then processed and tabulated and analyzed descriptively.

RESULTS

In this study, an intervention in the form of Supplementary Feeding was carried out for pregnant women with Chronic Energy Deficiency in the working area of Sambikereb District. Sambikereb District consists of 2 Puskesmas, namely Lontar Health Center with a target number of 10 people and the Made Health Center with a target number of 11 people.

Supplementary food is given for 90 consecutive days with the characteristics of pregnant women respondents in the age range of the youngest 22 years and the oldest 41 years with the gestational age of most having entered the third trimester, namely 47.7%.

Additional food given to the treatment group was 45 boxes of Frisian Flag Mama milk during pregnancy. Some of the factors considered in the selection of product types are products that are well known and have good taste so that they are widely liked and accepted by the community, are practical, have a relatively long shelf life and are easy to serve. Another aspect to consider is the nutritional composition of the product. For Frisian Flag mama's nutritional content, see table 1

Table 1. Nutritional Composition of supplementary feeding program Pregnant Women Per Serving (45 grams)

No	Nutrient content	Total
1	Energy	45 kkal
2	Protein	9 gram
3	Iron	9 mg

Some of the parameters observed in this study were: Level of Preference of Pregnant Women to supplementary feeding program Pregnant Women, Acceptance of Pregnant Women to supplementary feeding program Pregnant Women, Energy Intake of Protein and Fe, Energy Contribution of supplementary feeding program Pregnant Women to Energy Adequacy Rates, Protein Contribution from supplementary feeding program Pregnant Women Against Protein Adequacy Rate, Fe Contribution from supplementary feeding program Pregnant Women to Fe Adequacy Rate.

A. Level of Preference of Pregnant Women to supplementary feeding program for Pregnant Women

Table 2. Distribution of Intake Pregnant Women's Preference Levels for supplementary feeding program Pregnant Women in the Work Area of the Sambikereb Health Center in 2017

No	Category	Frequency	Percentage
1	Really Like	7	33,4
2	Like	13	61,9
3	Normal	1	4,7
4	Dislike	-	-
5	Very Dislike	-	-
	Total	21	100

Based on Table 2, the level of preference is divided into five categories, namely very dislike, dislike, normal, like, and very like and 61.9% (13 people) of pregnant women said they liked the type of supplementary feeding program given.

B. Acceptance of pregnant women to supplementary feeding program pregnant women

Table 3. Distribution of Acceptance of Pregnant Women in the Work Area of the Sambikereb Health

Center in 2017

No	Category	Frequency	Percentage
1	Not Eaten	-	-
2	Just Tasted	-	-
3	Half Eaten	-	-
4	Quarter Eaten	-	-
5	Eaten Up	21	100
	Total	21	100

Table 3 shows that the receptivity of pregnant women to the supplementary feeding program given is very good. It can be seen that all 21 pregnant women (100%) spent the given supplementary feeding program.

C. Intake of Energy, Protein and Iron

The data were obtained from a 24-hour recall, then the energy/protein/fe intake of pregnant women was compared with the nutritional adequacy rate of pregnant women and multiplied by 100%. Table 4 shows the Distribution of Energy, Protein and Fe Intake of Pregnant Women in the Work Area of the Sambikereb Health Center in 2017

Table 4. Distribution of Energy, Protein and Fe Intake of Pregnant Women in the WorkArea of the Sambikereb Health Center in 2017

Energy			Protein			Iron		
Category	Frequency	Percentage	Category	Frequency	Percentage	Category	Frequency	Percentage
Heavy deficit	16	76,2	Heavy deficit	11	52,4	Heavy deficit	21	100
Mediumdeficit	3	14,4	Mediumdeficit	6	28,6	Mediumdeficit	-	-
Mild deficit	1	4,8	Mild deficit	1	4,8	Mild deficit	-	-
Normal	1	4,8	Normal	3	14,4	Normal	-	-
Above sufficiency	-	-	Above sufficiency	-	-	Above sufficiency	-	-
Total	21	100	Total	21	100	Total	21	100

Table 4. shows that most respondents have a severe energy deficit value of 76.2% (16 people), 11 pregnant women (52.4%) have a severe protein intake value that is <70% of the nutritional adequacy rate (NAR), and 21 pregnant women (100 %) had a severe deficit of Fe intake, which was <70% of the NAR.

D. Energy Contribution from supplementary feeding program for Pregnant Women to Energy Adequacy Rate Table 5. Energy Consumption and Contribution based on Food Sources of Pregnant

Tabel 5. Women to AKE in the Work Area of the Sambikereb Health Center in 2017

Variable	Average Consumption Value		
	Pregnant Women Intake	supplementary feeding program	Total Consumption
Consumption(Calories/day)	1037	90	1027
Adequacy (Calories/day)	-	-	1786
Contribution (%)	58%	5%	63%

AKG deficiency

759 calories (37%)

Based on the table above, the total contribution of energy based on food sources for pregnant women 63% has not met the average daily adequacy. The contribution given by PMT for pregnant women is 5%. Meanwhile, from daily food consumption 58%. To meet 100% of the energy adequacy rate, it is still necessary to consume 759 calories (37%).

Table 6. Protein Consumption and Contribution based on Food Sources of Pregnant Women to AKE in the Work Area of the Sambikereb Health Center in 2017

Variable	Average Consumption Value		
	Pregnant Women Intake	PMT	Total Consumption
Consumption(Calories/day)	51	9	60
Adequacy (Calories/day)	-		76
Contribution (%)	67%	12%	79%
NAR deficiency			16 gram (21%)

Based on the table above, the total contribution of protein based on food sources for pregnant women is 79% not meeting the average daily adequacy. The contribution given by supplementary feeding program for pregnant women is 12%. Meanwhile, 67% of daily food consumption. To meet 100% of the protein adequacy rate, 16 grams (21%).

E. Contribution of Fe from supplementary feeding program (SFP) for Pregnant Women to Fe Adequacy Rate

Table 7. Consumption and Contribution of Fe based on Food Sources of Pregnant Women to AKE in the Work Area of the Sambikereb Health Center in 2017

Variable	Average Consumption Value		
	Pregnant Women Intake	SFP	Total Consumption
Consumption(Calories/day)	11	9	20
Adequacy (Calories/day)	-		37
Contribution (%)	29%	25%	54%
NAR deficiency			17 mg (46%)

Based on the table above, the total contribution of Fe based on food sources for pregnant women 54% has not met the average daily adequacy. The contribution given by supplementary feeding program for pregnant women is 25%. Meanwhile, from daily food consumption 29%. To meet 100% of the Fe adequacy rate, it is still necessary to consume 17 grams (46%).

DISCUSSION

A. Preferred Level of supplementary feeding program for Pregnant Women

The level of preference of pregnant women for supplementary feeding program for pregnant women can be influenced by the preferences or preferences of pregnant women themselves. The assessment of preference for supplementary feeding program pregnant women is carried out by means of a preference test using a hedonic scale.

Based on Table 2, the level of preference is divided into five categories, namely very dislike, dislike, normal, like, and really like and 61.9% (13 people) of pregnant women said they liked the type of supplementary feeding program given the remaining 33.4% said very much like it and only 1 person said it was normal. The level of preference will greatly affect the acceptability of food.

B. Acceptance of supplementary feeding program for Pregnant Women

Acceptance of pregnant women to supplementary feeding program Pregnant women According to Gregoire & Spears (2007), the method used to measure food acceptance is plate waste, which is the amount of food left on the plate. This leftover can be used to weigh the number of menus that are not eaten or the total food leftovers for individuals/groups. Frequency distribution of pregnant women's acceptance of supplementary feeding program pregnant women.

Table 3 shows that the receptivity of pregnant women to the supplementary feeding program given is very good. It can be seen that all 21 pregnant women (100%) spent the given supplementary feeding program. Some of the factors considered in the selection of product types are the product is well known and has a good taste so that it is widely liked and accepted by the community, is practical, has a relatively long shelf life and is easy to serve. Another aspect to consider is the nutritional composition of the product. This type of product was selected in the form of pregnant women's milk. This is in line with the results of a study by NA Taslim, (2010), pregnant women with chronic energy deficiency who received supplementary feeding program containing approximately 600-700kcal and 15-20 g of protein every day for 3 consecutive months and iron tablets containing contains 60 mg of ferrous sulfate and 0.025 mg of folic acid, indicating that there was a significant increase in the average hemoglobin level after 3 months of intervention. The eating arrangements of pregnant women will affect the nutritional adequacy and nutritional status of pregnant women. This is supported by a cohort study conducted by P Lagiou, et al which showed a relationship between regulation of energy intake and an increase in body weight of pregnant women at the end of the second trimester ($p = 0.006$). Likewise, the results of research conducted by L M Sacco showed a relationship between the regulation of energy and protein intake on nutritional adequacy in pregnant women (Chandradewi, 2015).

C. Contribution of Adequate Energy, Protein and Iron

Supplementary food for pregnant women with Chronic Energy Deficiency in Sambikereb Sub-district, Surabaya is in the form of manufactured processed foods, namely pregnant women's milk. Based on the table above, the total contribution of energy based on food sources for pregnant women 63% has not met the average daily adequacy. The contribution given by supplementary feeding program for pregnant women is 5%. Meanwhile, from daily food consumption 58%. To meet 100% of the energy adequacy rate, it is still necessary to consume 759 calories (37%). While the contribution of protein based on food sources for pregnant women 79% has not met the average daily adequacy. The contribution given by supplementary feeding program for pregnant women is 12%. Meanwhile, 67% of daily food consumption. To meet 100% of the energy adequacy rate, 16 grams (21%).

Likewise, the Fe Sufficiency Level, the total contribution of Fe based on food sources for pregnant women, 54% has not met the average daily adequacy. The contribution given by for supplementary feeding program According to the nutritional adequacy rate, the calculation of calories and protein needed in each semester is: in the first trimester, 100 kcal of energy and 17 grams of protein, while the second and third trimesters are 300 kcal of energy and 17 grams of protein. So the preparation of Supplementary Food for Pregnant women should consider these needs. Nutritional value per serving Supplementary food Pregnant women have a minimum energy content of 100-150 calories while the protein is 5-7 grams.

Pregnant women in the first trimester can consume at least one serving per day. 2nd trimester pregnant women consume at least 2 servings per day and 3rd trimester pregnant women can consume 3 servings per day.

While the implementation of giving supplementary feeding program in Sambikereb District is the same for every gestational age. Pregnant women in trimesters 1, 2 and 3 all get supplementary feeding program with the same number of calories, namely the amount of energy 45 calories per serving with consumption of 2 servings per day. So the total supplementary feeding program energy is 90 calories, both for pregnant women in the 1st trimester

or 3rd trimester.

Pregnant women are used as a snack or snack. Energy needs that must be met at snack time is 20% of energy needs for one day. Snack time is divided into two times a day, namely morning and afternoon interludes with a distribution of 10% of energy needs per one snack time/interlude (Almatsier, 2004). The average value of the contribution of additional food (biscuits) to the total energy consumption is 23.44% (501.38 Kcal) \pm 2.56% (53.47 kcal), while the total protein consumption is 26.99% (18, 83 grams) \pm 5.8% (4.06 grams). Based on the guidelines for providing supplementary food for recovery for pregnant women with chronic energy deficiency, the energy content is 180-300 kcal and 17 grams of protein (Kemenkes RI, 2012). The condition of pregnant women is very different from normal daily conditions. Pregnant women need increased nutrients due to increased energy metabolism and support for fetal growth and development. Pregnant women need the addition of all nutrients, only the ones that are often neglected are protein energy and some minerals, such as iron and calcium. Pregnancy causes an increase in energy metabolism, therefore the need for energy and other nutrients increases during pregnancy. The increase in energy and nutrients is needed for fetal growth and development, the increase in the size of the uterine organs, changes in the composition and metabolism of the mother's body (Rosyanti, 2018).

CONCLUSION

Based on the results of research and discussion, the following conclusions are the acceptability of pregnant women to the provision of supplementary feeding program is 100%, the supplementary feeding program given is eaten up. But the contribution given by the provision of supplementary feeding program for pregnant women to the fulfillment of the nutritional adequacy rate for energy is 5%, protein is 12% and Fe is 25%. This is still not in accordance with the management of giving supplementary feeding program to pregnant women. The implication is that supplementary feeding for pregnant women should be based on the number of calories and protein according to the needs of pregnant women. Supplementary feeding for pregnant women is recommended to use local food-based foods because they are easy to obtain in their environment.

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The Relationship between Acceptance, Leftover Food and Nutritional Intake in Covid 19 Patients at the Surabaya Lung Hospital

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ABSTRACT

Corona Virus Disease 2019 or COVID-19 is a new type of disease caused by infection with the Severe Acute Respiratory Syndrome Coronavirus 2 (SARSCOV-2) or known as the novel coronavirus (2019-nCoV) (Singhal, 2020). There are many studies reporting that the intake of antioxidants and nutrients can help the function of the immune system. . The purpose of this study was to determine the relationship between food acceptance and nutritional intake in patients with Covid 19 at the Surabaya Lung Hospital. The type of this research is analytic descriptive with cross sectional study approach. This study used a questionnaire form to determine food acceptance and a recall form to determine the nutritional intake given to 30 respondents using a saturated sample technique. From the statistical results using the Spearman method, it was found that there was a relationship between food waste and macronutrient intake (energy, protein and fat) in Covid 19 patients at the Surabaya Lung Hospital with $P < 0.05$. The statistical results of the Spearman method showed that there was no relationship between food waste and food acceptance in Covid 19 patients at the Surabaya Lung Hospital with $P = 0.070$, which means $P > 0.05$. It was found that there was no relationship between food waste and micronutrient intake (Vitamin C and Vitamin A) in Covid 19 patients at the Surabaya Lung Hospital with $P > 0.05$.

Keywords: COVID-19, Acceptance, Micronutrients

INTRODUCTION

Corona Virus Disease 2019 or COVID-19 is a new type of disease caused by infection with the Severe Acute Respiratory Syndrome Coronavirus 2 (SARSCOV-2) or known as the novel coronavirus (2019-nCoV) (Singhal, 2020). From its initial appearance at the end of 2019 until May 20, 2020, this disease has infected 4,789,205 people and caused the death of 318,789 people worldwide. (WHO, 2020). Currently, there is no COVID-19 vaccine that can make people immune to it. Children to adults, everyone can be infected. One of the vulnerable groups is the elderly, therefore it is necessary to take proper nutrition in the prevention and treatment of COVID-19. There are many studies reporting that intake of antioxidants and nutrients can help the immune system function. Immune function is advised to eat a healthy diet with balanced nutrition that is rich in colorful fruits and vegetables. Specific advice for the elderly is to increase the consumption of vitamin C (200 mg--2 g/day), vitamin E (134--800 mg/day), zinc (30--220 mg/day), and vitamin D (10-- 100 g/day) for those with low vitamin D levels. (Suganda, 2020). Currently, there is no vaccine for COVID-19 that can make people immune to it. Children to adults, everyone can be infected. One of the vulnerable groups is the elderly, therefore it is necessary to take proper nutrition in the prevention and treatment of COVID-19. There are many studies reporting that intake of antioxidants and nutrients can help the immune system function. Immune function is advised to eat a healthy diet with balanced nutrition that is rich in colorful fruits and vegetables.

Food service in hospitals is carried out with the aim of providing food of good quality, quantity according to needs and proper and adequate service for patients in need. The quality of good nutrition services will affect the indicators of the quality of hospital services. The better the quality of hospital nutrition services, the higher the patient's recovery rate, the shorter the length of stay and the lower the cost of hospital care. The success of a nutritional service, among others, is associated with the patient's acceptance of the food served, so that it is one way of determining the evaluation which is simple and can be used as an indicator of the success of nutritional services.

Based on above, this research aims to analyze the relationship between leftover food and energy, protein, fat, vitamin C and Vitamin A intake in Covid 19 patients at the Surabaya Lung Hospital.

METHODS

The design of this study was descriptive analytic, to determine the relationship between food acceptance and nutritional intake in patients with Covid 19 at the Surabaya Lung Hospital. Based on the time of implementation, the data were collected in a cross sectional manner, because the independent variables and the dependent variable were measured at the same time.

Research and data collection was carried out for 4 months from August to November 2020. This research will be carried out at the Surabaya Lung Hospital

The population in this study were all patients with Covid 19 in October 2020 based on data from July 2020, Covid 19 patients who were treated at the Surabaya Lung Hospital as many as 40 people. The sample in this study was all patients with Covid 19 at the Surabaya Lung Hospital, a total of 23 people. The sampling technique used is a simple random sampling system, which is taking a random sample from the entire population. Every person or member of the population has the same opportunity to be selected as a sample (Notoadmodjo, 2012).

The independent variables in this study were acceptability and leftover food, while the dependent variable was nutrient intake in patients with COVID-19 at the Surabaya Lung Hospital. Data collection techniques are carried out using interview techniques which include: identity of respondents and acceptability through interviews and questionnaires and the intake of energy, protein, fat and vitamin C through interviews using Form Recall 2x24 hours.

RESULTS

A. Cross Tabulation of Acceptance and Leftover Food

Based on the results of a 2x24 hour recall on Covid 19 patients at the Surabaya Lung Hospital, it can be seen that leftover food compared to the recommended acceptability can be seen in Table 1

Tabel 1 Distribution of Acceptance Frequency and Leftover Food for Covid 19 Patients at Surabaya Lung Hospital 2020

Food Acceptance	Leftover Food						Total	
	Well		Not Good		Very Less			
	n	%	n	%	n	%	n	%
Not Enough	0	0	2	8,7	3	13	5	21,7
Enough	6	26,1	5	21,7	6	26,1	17	73,9
Well	1	4,3	0	0	0	0	1	4,3
Total	7	30.4	16	30.4	9	39.2	23	100

Source : Primery Data, 2020

Based on table 6.10 above the cross tabulation above, it can be seen that, among respondents with food acceptance in the sufficient category, most of them had good leftovers (<25%) as many as 6 people,

B. Cross Tabulation of Leftover Food and Energy Intake

Based on the results of a 2x24 hour recall on Covid 19 patients at the Surabaya Lung Hospital, it can be seen that leftover food compared to the recommended energy intake can be seen in Table 2.

Tabel 2. Distribution of Leftover Food Frequency and Energy Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

No.	Leftover Food	Energy Intake									
		Over		Normal		Mild Deficit		Medium Deficit		Total	
		N	%	n	%	n	%	N	%	n	%
1.	Well	0	0	7	30,4	0	0	0	0	7	30,4
2.	Not Enough	0	0	4	17,4	3	13	0	0	7	30,4
3.	Very Less	0	0	1	4,3	5	21,7	3	13	9	39,2
Total Mean		0	0	12	52,2	8	34,8	3	13	23	100

From the cross tabulation between leftover food and energy intake, most of the Covid-19 patients at the Surabaya Lung Hospital had a mild deficit intake with very less leftover food (> 50%) with 5 respondents

C. Cross Tabulation of Leftover Food and Protein Intake

Based on the results of a 2x24 hour recall on Covid 19 patients at the Surabaya Lung Hospital, it can be seen that leftover food compared to the recommended protein intake can be seen in Table 3.

Tabel 3. Distribution of Leftover Food Frequency and Protein Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

No.	Leftover Food	Protein Intake									
		Over		Normal		Mild Deficit		Medium Deficit		Total	
		n	%	N	%	n	%	N	%	n	%
1.	Well	0	0	4	17,4	1	4,3	2	8,7	7	30,4
2.	Not Enough	0	0	0	0	6	26	1	4,3	7	30,4
3.	Very Less	0	0	0	0	2	8,7	7	30,4	9	39,2
Total Mean		0	0	0	17,4	9	39	10	43,4	23	100

From the cross tabulation between leftover food and protein intake, most of the Covid-19 patients at the Surabaya Lung Hospital had a mild deficit intake with very less leftovers food (> 50%) with 7 respondents

D. Cross Tabulation of Leftover Food and Fat Intake

Based on the results of a 2x24 hour recall on Covid 19 patients at the Surabaya Lung Hospital, it can be seen that leftover food compared to the recommended energy intake can be seen in Table 4.

Tabel 4. Distribution of Leftover Food Frequency and Fat Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

No.	Leftover Food	Fat Intake									
		Over		Normal		Mild Deficit		Medium Deficit		Total	
		n	%	n	%	n	%	n	%	n	%
1.	Well	1	4,3	5	21,7	1	4,3	0	0	7	30,4
2.	Not Enough	0	0	6	26,1	0	0	1	4,3	7	30,4
3.	Very Less	0	0	1	4,3	5	21,7	3	13	9	39,2
Total Mean		1	4,3	12	52,2	6	26	4	4,3	23	100

From the cross tabulation between leftover food and fat intake, most of the Covid-19 patients at the Surabaya Lung Hospital had normal intake with very less leftovers food ($> 50\%$) with 5 respondents.

E. Cross Tabulation of Leftover Food and Vitamin C Intake

Based on the results of a 2x24 hour recall on Covid 19 patients at the Surabaya Lung Hospital, it can be seen that leftovers food compared to the recommended intake of Vitamin C can be seen in Table 5.

Tabel 5. Distribution of Leftover Food Frequency and Vitamin C Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

No.	Leftover Food	Vitamin C Intake							
		Over		Normal		Deficit		Total	
		n	%	n	%	N	%	n	%
1.	Well	1	4,3	4	17,4	2	8,7	7	30,4
2.	Not Enough	1	4,3	4	17,4	2	8,7	7	30,4
3.	Very Less	1	4,3	6	26,1	2	8,7	9	39,2
Total Mean		3	13	14	60,9	6	26,1	23	100

From the cross tabulation between leftovers food and energy intake of Vitamin C covid-19 at the Surabaya Lung Hospital, most of them had normal intake with very less leftovers food (> 50%) with 6 respondents.

F. Cross Tabulation of Leftovers Food and Vitamin A Intake

Based on the results of a 2x24 hour recall on Covid 19 patients at the Surabaya Lung Hospital, it can be seen that leftovers food compared to the recommended intake of Vitamin A can be seen in Table 6.

Tabel 6. Distribution of Leftover Food Frequency and Vitamin A Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

No.	Leftover Food	Vitamin A Intake							
		Over		Normal		Deficit		Total	
		n	%	n	%	n	%	N	%
1.	Well	0	0	4	17,4	3	13	7	30,4
2.	Not Enough	0	0	4	17,4	3	13	7	30,4
3.	Very Less	2	8,7	3	13	4	17,4	9	39,2
Total Mean		2	8,7	11	47,8	10	43,5	23	100

From the cross tabulation between leftovers food and energy intake of Vitamin A covid-19 at the Surabaya Lung Hospital, most of them had normal intake with less leftovers food (<50%) with 8 respondents.

The analyzed statistic results of food intake at the Surabaya Lung Hospital

a. The Relationship between Leftover Food and Acceptance at the Surabaya Lung Hospital

Tabel 7. Distribution of Leftovers Food Frequency and Acceptance of Covid 19 Patients at Surabaya Lung Hospital 2020

			Leftovers Food	Acceptance
Spearman's rho	Correlation Coefficient		1.000	-.385
	Leftovers Food Sig. (2-tailed)		.	.070
	N		23	23
	Correlation Coefficient		-.385	1.000
	Acceptance Sig. (2-tailed)		.070	.
	N		23	23

From the results of the statistic with the Spearman method, $P = 0.070$, namely $P > 0.05$, which means that there is no relationship between leftovers food and food acceptance in Covid 19 patients at the Surabaya Lung Hospital.

b. The Relationship between Leftover Food and Energy Intake at Surabaya Lung Hospital

Tabel 8. Distribution of Leftovers Food Frequency and Energy Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

			Leftovers Food	Energy Intake
Spearman's rho	Leftovers Food	Correlation Coefficient	1.000	.751**
		Sig. (2-tailed)	.	.000
		N	23	23
	Energy Intake	Correlation Coefficient	.751**	1.000
		Sig. (2-tailed)	.000	.
		N	23	23

From the results of the statistic with the Spearman method, $P = 0.000$, namely $P < 0.05$, which means that there is a relationship between leftovers food and energy intake in Covid 19 patients at the Surabaya Lung Hospital.

c. The Relationship between Leftover Food and Protein Intake at Lung Hospital Surabaya

Tabel 9. Distribution of Leftover Food Frequency and Protein Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

			Leftovers Food	Protein_Intake
Spearman's rho	Leftovers Food	Correlation Coefficient	1.000	.567**
		Sig. (2-tailed)	.	.005
		N	23	23
	Protein_Intake	Correlation Coefficient	.567**	1.000
		Sig. (2-tailed)	.005	.
		N	23	23

From the results of the statistic with the Spearman method, $P = 0.005$, namely $P < 0.05$, which means there is a relationship between leftovers food and protein intake in Covid 19 patients at the Surabaya Lung Hospital.

d. The Relationship between Leftover Food and Fat Intake at Surabaya Lung Hospital

Tabel 10. Distribution of Leftover Food Frequency and Fat Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

			Leftovers Food	Fat_Intake
Spearman's rho	Leftovers Food	Correlation Coefficient	1.000	.664**
		Sig. (2-tailed)	.	.001
		N	23	23
	Fat_Intake	Correlation Coefficient	.664**	1.000
		Sig. (2-tailed)	.001	.
		N	23	23

From the results of the statistic with the Spearman method, $P = 0.001$, namely $P < 0.05$, which means that there is a relationship between leftovers food and fat intake in Covid 19 patients at the Surabaya Lung Hospital.

e. The Relationship between Leftover Food and Vitamin C Intake at Lung Hospital Surabaya

Tabel 11. Distribution of Leftover Food Frequency and Vitamin C Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

			Leftovers Food	VITC_Intake
Spearman's rho	Leftovers Food	Correlation Coefficient	1.000	-.028
		Sig. (2-tailed)	.	.900
		N	23	23
	VITC_Intake	Correlation Coefficient	-.028	1.000
		Sig. (2-tailed)	.900	.
		N	23	23

From the results of the statistic with the Spearman method, $P = 0.900$, namely $P > 0.05$, which means that there is no relationship between leftovers food and Vitamin C intake in Covid 19 patients at the Surabaya Lung Hospital.

f. The Relationship between Leftover Food and Vitamin A Intake at Lung Hospital Surabaya

Tabel 12. Distribution of Leftover Food Frequency and Vitamin A Intake of Covid 19 Patients at Lung Hospital Surabaya 2020

			Leftovers Food	VITA_Intake
Spearman's rho	Leftovers Food	Correlation Coefficient	1.000	-.094
		Sig. (2-tailed)	.	.670
		N	23	23
	VITA_Intake	Correlation Coefficient	-.094	1.000
		Sig. (2-tailed)	.670	.
		N	23	23

From the results of the statistic with the spearman method, $P = 0.670$, namely $P > 0.05$, which means that there is no relationship between leftovers food and Vitamin A intake in Covid 19 patients at the Surabaya Lung Hospital.

Discussion

Food Acceptance

The results of the study showed that the acceptability of Covid 19 patients at the Surabaya Lung Hospital was mostly in the sufficient category, namely 17 people (79.9%). This is contrary to the results of research at the Sunan Kalijaga Hospital, Demak in 2014.

Based on a survey of patient leftovers food carried out by the nutrition installation of Sunan Kalijaga Hospital, Demak in 2012, the standard menu contained an average of 26.6% leftovers consisting of vegetable waste by 32%, rice 28.3%, vegetable side dishes 27.8%, and animal side dishes 18.3%. The acceptability of food for new patients is around 78.25%.

The patient's low acceptance of the food menu served is probably due to the condition of the Covid-19 patient who is experiencing sensory stimulation disorders, especially the sense of smell and taste. In addition, the patient also experienced symptoms of coughing which caused the patient to dislike solid food textures.

Leftovers Food

The results of the research show that the leftover food for Covid 19 patients at the Surabaya Lung Hospital is still quite large with an average of 41% of leftovers food, still above the standard 25%. Most of the rest is the vegetable menu, this is because most of the respondents have an unusual culture of consuming vegetables in their daily menu. This is contrary to the results of research at Sunan Kalijaga Demak Hospital in 2012. Based on a survey of patient food waste conducted by the nutrition installation of Sunan Kalijaga Demak Hospital in 2012 on

the standard menu there is an average of 26.6% leftovers consisting of vegetable scraps of 32%, rice 28.3%, vegetable side dishes 27.8%, and animal side dishes 18.3%.

Energy Intake

Based on data collection, it shows that most of the respondents have energy intake in the normal category as many as 12 people (52.2%) however, there are still many patients who have energy intake in the category of mild deficit, namely 8 people (34.8%) and moderate deficit 3 people. (13%). There are still many respondents who have a deficit intake, possibly due to the energy requirement for Covid 19 patients, which is an additional 13% of the total daily intake so that patients do not finish their food. This is in line with the results of research conducted by Lydiyawati in 2008, which showed that the level of energy intake to the needs of less than 60% is said to be in deficit. The energy needed by the body comes from nutrients which are the main sources of carbohydrates, fats and proteins. (Arsin, et al. 2012).

Protein Intake

Protein intake showed that most of the respondents had a mild deficit protein intake and moderate deficit, namely 19 people (82.4%) while the percentage of respondents who had normal protein intake was still very small, namely 4 people (17.6%). This is in line with the research by Salmawati (2006) which showed that most of the patients' protein intake (91.9%) was in the deficit category, the rest (8.1%) were in the category above needs. The protein availability deficit occurred allegedly because the protein requirement for Covid 19 patients increased by 100% from normal needs. Another possibility is the absence of high protein or the lack of application of two animal exchangers where this can help patients get high protein foods. Protein should be given high because the role of protein in the treatment of Covid 19 in addition to meeting nutritional needs, increasing the regeneration of damaged tissue can also increase the sterilization of the Covid 19 virus.

Fat Intake

The results of a 2 x 24 hour recall found that fat intake showed that most respondents had a normal fat intake of 12 people (52.2%) more than respondents who had a deficit fat intake of 10 people (30.3%). There is no additional fat requirement in Covid-19 patients, such as energy and protein needs so that the menu provided is sufficient so that fat intake in Covid 19 patients has been met and most of the categories are normal. Fat needs are also very necessary because fat can help the process of dissolving vitamins that are needed very much needed by Covid 19 patients. Fat also functions to protect organs such as the lungs from damage.

Vitamin C Intake

The results of a 2 x 24 hour recall found that the intake of Vitamin C showed that most of the respondents had intake of vitamin C in the normal category, namely 14 people (60.9%) and more than 3 people (13%) more than the respondents who had Vitamin C intake in the deficit category of 6 people (27.1%). The function of Vitamin C is to increase the formation of antibodies for the immune system. The recommended vitamin C for COVID-19 patients is 200 mg/day. Consumption of vitamin C from food of 100-200 mg / day is sufficient to prevent infection and improve immune function. Vitamin C supplementation in patients with infection (pneumonia) as much as 250-800 mg/day reduces the length of stay. The need for Vitamin C in Covid-19 patients at the Lung Hospital is met from the provision of fruit juices with a fairly good reception, besides that there is also the addition of high-dose vitamin C supplementation.

Vitamin A Intake

The results of the 2 x 24 hour recall found that the intake of Vitamin A showed that most of the respondents had the intake of vitamin A in the normal category, namely 11 people (47.8%) and more than 2 people (8.7%) more than the respondents who had the intake of Vitamin A in the category deficit of 10 people (43.5%). The function of Vitamin A is to increase the formation of antibodies for the immune system. Adult recommendation 600 g RE-900 g, 450 mcg vitamin A supplementation improves leukocyte and T-cell function. T cells play a role in the secretion of cytokines that promote an active immune response. Cytokines are proteins that function to prevent infection, the need for Vitamin A which in Covid19 patients at the Lung Hospital is met by giving fruit juices with a fairly good reception. So even though no supplementation is given, the need for vitamin A can already be met from snacks in the form of fresh fruit and fruit juices.

CONCLUSION

Conclusion

This research was found that there was no relationship between leftovers food and intake of micronutrients (Vitamin C and Vitamin A) in Covid 19 patients at the Surabaya Lung Hospital with $P > 0.05$. Thus, for hospitals, especially food service installations, in order to improve food quality with nutrient-dense foods in small portions so that they can reduce leftovers food problems

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Effect of additional tuna fish flour (*Euthynnus affinis*) to organoleptic test of taro cookies (*Colocasia l. Schoott*) for pregnant women

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ABSTRACT

Chronic Energy Deficiency in pregnant women is a condition in which pregnant women are malnourished. This is due to insufficient energy and protein requirements during pregnancy and causes health problems. Supplementary food that is high in energy and protein with local food ingredients is expected to overcome this problem. The purpose of this study was to find the best extra food formulation based on taro and tuna flour that could be accepted by panelists and to determine its nutritional value. This research method is an experimental study using 33 untrained panelists to find the best organoleptic formula. There are five formulas with different composition were tested and repeated two times for each samples. The results obtained the F1 formula (mixed 40% wheat flour, 50% taro flour and 10% tuna flour) which is the best mixed formula of tuna and taro biscuit that can be accepted and liked by the panelists from organoleptic test. The results of the proximate analysis showed that the nutritional value of 60 grams of F1 biscuits was of 1.4 g, ash content of 1.6 g, protein content of 6.2 g, fat content of 13.5 g, carbohydrate content of 37 g and calories of 294.3 kcal. The conclusion of this study is that F1 biscuits formula which is made from 10% tuna and 50% taro flour can be an alternative food supplement for pregnant women.

Keywords: taro, tuna, flour, biscuit, pregnant, organoleptic

INTRODUCTION

Chronic Energy Deficiency in pregnant women is a condition in which pregnant women are malnourished. Research Basic Health (Riskesdas) in 2018 shows the prevalence of keK risk in pregnant women (about 15-49 years old) is still quite high at 17.3%. Based on health of ministry data in 2020 collected from 34 provinces, it was concluded that the percentage of pregnant women with a risk of chronic energy deficiency in Indonesia is decreased to 9.7%, and in East Kalimantan 9.4%.

This is due to insufficient energy and protein requirements during pregnancy and causes health problems. As a step in overcoming the nutritional problems of Chronic Energy Deficiency in pregnant women, the Ministry of Health in 2016 conducted an additional feeding program in pregnant women which each piece of biscuits contains 104 calories and is fortified 9 kinds of vitamins (A, B1, B2, B3, B6, B12, C, D and E) and 8 minerals (Folic Acid, Iron, Selenium, Calcium, Sodium, Zinc, Iodine, and Phosphorus). All health centers in Samarinda City also receive biscuits as food supplement for Chronic Energy Deficiency pregnant women from the Central Ministry of Health.

The food supplement program of pregnant women from the government is also considered effective in improving the nutritional status of pregnant women as evidenced by research from Amareta (2015) that gave food supplement to Chronic Energy Deficiency pregnant women for 3 months showed an average weight gain of 4.48 ± 3.2 kg. In addition, research by Nurmadinisa (2012) also found that 65% of pregnant women who were given food supplement had weight gain according to the gestational age of the baby. The provision of food supplement in pregnant women who do not have Chronic Energy Deficiency is also known to have a significant effect on the weight of the baby with an average difference in the weight of the baby in pregnant women treatment group and comparison group which is 274 grams (Zulaidah et al, 2014).

Food supplement in pregnant women provided by the government so far depend entirely by the factory. However, the development of food supplement products using local food of East Kalimantan is still not developed. The province of East Kalimantan has rich in nutritious local food. Among them are fish and taro. These two materials are commodities have the opportunity to be developed in overcoming and lowering the number of Chronic Energy Deficiency in pregnant women.

This local food supplement product is made with the aim that the community can process this alternative supplementary feeding itself using foodstuffs available in the surrounding area. In addition, the manufacture of

alternative supplementary feeding products is also the first step for the people of East Kalimantan to further encourage food diversification programs by the Food Security of East Kalimantan Province. Although this food supplement is made using local food typical of East Kalimantan, food supplementation cookies are also expected to meet nutritional needs during pregnancy even in Chronic Energy Deficiency pregnant women. This local food made in from taro (*Colocasia esculenta* (L.) Schoott) and tuna (*Euthynnus affinis*) flour.

The aim of this study was to find the best extra food formulation based on taro and tuna flour that could be accepted by panelists and to determine its nutritional value.

METHODS

This study uses a true experimental type with 1 factor Randomized Control Trial (RCT). The treatment factors given were 6 and repeated 1 time so that the number of samples produced was 12 (Table 1).

Table 1 Comparison of Cookies Treatment Formulation from Wheat Flour, Taro Flour and Tuna Fish Meal

Tabel 1. Ingredient of cookies

Treatment Type	Ingredients		
	Wheat flour	Taro flour	Tuna fish flour
F0 (kontrol)	100%	-	-
F1	40%	50%	10%
F2	40%	40%	20%
F3	40%	30%	30%
F4	40%	20%	40%
F5	40%	10%	50%

Tools used for the production of cookies are 60 mesh syings, blenders, brushes, baking pans, mixers, ovens, spatulas, scales. Tools used for chemical analysis are petri dishes, porcelain cups, decikators, incubators, filter paper, , waterbath, aluminum foil, separator tools, test tubes, drip pipettes, mohr pipettes, upright coolants, bunchers, bunsers and spiritus, chemical cups, analytical balance sheets, ovens, soxhlets, spectrophotometers, and furnaces.

The ingredients used for the production of cookies are taro flour, wheat flour, cob flour, margarine, eggs, sugar, salt, and baking powder. The chemicals used for chemical analysis are NaOH, H₂SO₄, HCl, K₂SO₄, boric acid, PP indicator, diphenyl-2-picrylhydrazil (DPPH), aquadest, buffer, ethanol, BPW (Buffer Pepton Water) Oxoid, PDA (Potato Dextrose Agar) Oxoid and PCA (Plate Count Agar) Oxoid. The formulation in the manufacture of cookies which can be seen in the table below:

Tabel 2. Taro and Tuna-based Cookie Formulation (gram)

Making cookies goes through three stages, the first stage is to make dough. The eggs and butter are mixed

Ingredient	Formulation					
	F0 (Control)	F1	F2	F3	F4	F5
Wheat flour	200	80	80	80	80	80
Taro flour	-	100	80	60	40	20
Tuna flour	-	20	40	60	80	100
Sugar flour	100	100	100	100	100	100
Baking powder	2,5	2,5	2,5	2,5	2,5	2,5
Salt	2,5	2,5	2,5	2,5	2,5	2,5
Milk flour	20	20	20	20	20	20
Butter	150	150	150	150	150	150
Egg	50	50	50	50	50	50

and then whisked using a mixer with low exposure for \pm 3 minutes until a homogeneous cream is formed. Then,

put other ingredients such as wheat flour, taro flour, cob flour, refined sugar, baking powder, salt and milk powder into the dough and stir until a moldable dough is formed. The second stage is the process of shaping dough using a circle-shaped mold with a thickness of 0.5 cm and the weight of each sample 5 gr. The last stage is roasting the dough into the oven at $\pm 1200^{\circ}\text{C}$ for 40 minutes.

Once all cookie formulations are formed, the following research steps conduct a organoleptic cookie test for color, taste, aroma, texture, aftertaste and overall to determine the best cookie formulation. The level of likes divided into scales 1-7 is "Very dislike = 1, Dislike = 2, Somewhat dislike = 3, Somewhat likes = 4, Likes = 5, Very likes = 6 and Very very like = 7". Cookies selected in the hedonic test are the best cookies of hedonic test results, then will be determined nutritional content through proximal analysis in the form of water content tests (AOAC, 1984), ash (AOAC, 1984), fat (AOAC, 1984), protein (AOAC, 1984), carbohydrates (Almatsier, 2002) and coarse fiber (AOAC, 1984).

In this study the water content was determined using the oven method, protein levels were determined by the kjeldahl method, fat analysis using the soxhlet method, sample carbohydrate levels were calculated by difference by reducing 100% of the sample's nutritional content with water content, ash content, protein levels, and fat content. As well as the analysis of coarse fibers is determined by the gravimetric method.

The best formulas are done descriptive calculations by calculating the average level of liking of each characteristic such as color, aroma, texture, taste and overall of each formula, then if the data is not distributed normally then each formula will be calculated mean rank using the Kruskal Wallis test. The kruskal walis test is also used to test the difference in color, aroma, taste, texture and overall of all cookie formulas. If there is a noticeable difference in the characteristics between formulas, it can be followed by the Mann Whitney test to test the characteristic differences in specifics between two specific formulas.

This study sample was selected purposive sampling who have not received training on hedonic tests, are willing to follow the research and do not have allergies to cookie ingredients. A total of 33 untrained panelists aged 19-22 years old participated in the study to conduct organoleptic cookies tests. This research has also been through ethical clearance tests with number No. LB.02.01/7.1/2064/2020

RESULTS

A. Characteristics of Respondence

Tabel 3. Characteristic of response

Characteristic of response		n	%
Gender	Male	3	9
	Female	30	91
Age	19-20 years old	23	70
	21-22 years old	10	30

In table 1, the characteristics of panelists are known as 30% female and 3% male. 70% aged 19-20 years old and 10% aged 21-22 years old. After making biscuits and organoleptic tests obtained results related to color, texture, aroma, taste and overall.

A. Color biscuits

Table 4. Average Distribution of Panelists' Preferred Levels of Cookie Color Characteristics

Characteristic	Level of preference							Total	Mean	Mean Rank
	1	2	3	4	5	6	7			
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)			
Color										
F0 ^{a)b)c)d)e)f)}			1 (3)	1 (3)	4 (12,1)	12 (36,4)	15 (45,5)	33 (100)	6	313,64
F1 ^{a)b)c)d)e)f)}				5 (15,2)	16 (48,4)	9 (27,3)	3 (9,1)	33 (100)	5,1	240,11
F2 ^{a)b)c)e)f)}		2 (6,1)	1 (3)	9 (27,3)	15 (45,5)	6 (18,2)		33 (100)	4,5	191,85
F3 ^{a)b)d)f)}		2 (6,1)	2 (6,1)	9 (27,3)	18 (54,5)	2 (6)		33 (100)	4,3	177,32
F4 ^{a)b)c)e)f)}		3 (9,1)	4 (12,1)	12 (36,3)	12 (36,4)	1 (3)	1 (3)	33 (100)	4,2	151,31
F5 ^{a)b)c)d)e)f)}		6 (18,2)	6 (18,2)	11 (33,4)	9 (27,3)	1 (3)		33 (100)	3,5	116,78

a)b)c)d)... = results of the Mann Whitney test p-value test to test the difference of characteristics between specific formulas is significant with values <0.05

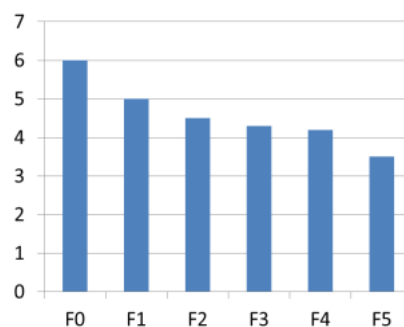


Figure 1. organoleptic test differences in biscuit color based on formula



Figure 2. The colour of biscuit formula

In this study it can be seen that in addition to the control, the addition of 10% tuna fish flour (F1) was the most preferred by the panelists. Based on statistical analysis there are significant differences between products except in formula F2 to F3 ($p=0.378$) and F3 to F4 ($p=0.09$) which the panelists say are not too different.

B. Taste of Cookies

Table 5. Average Distribution of Panelists' Preferred Levels of Cookie Tast

Characteristic	Level of preference							Total	Mean	Mean Rank
	1	2	3	4	5	6	7			
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)			
Taste										
F0 ^{a)b)c)d)e)f)}				1 (3)	2 (6)	13 (39,4)	17 (51,5)	33 (100)	6,2	324,42
F1 ^{a)b)c)d)e)f)}	1 (3)	1 (3)	1 (3)	1 (3)	12 (36,2)	12 (36,4)	5 (15,2)	33 (100)	5,1	247,82
F2 ^{a)b)c)e)f)}	1 (3)	1 (3)	3 (9,1)	8 (24,2)	15 (45,5)	4 (12,)	1 (3)	33 (100)	4,4	188,28
F3 ^{a)b)d)e)f)}	1 (3)	1 (3)		11 (33,4)	17 (51,5)	2 (6,1)	1 (3)	33 (100)	4,4	185,29
F4 ^{a)b)c)d)e)}	1 (3)	3 (9,1)	7 (21,2)	15 (45.5)	5 (15,2)	2 (6)		33 (100)	3,6	132,86
F5 ^{a)b)c)d)f)}	2 (6,1)	4 (12,1)	8 (24,3)	13 (39,4)	5 (15,2)	1 (3)		33 (100)	3,3	12,33

a)b)c)d)... = results of the Mann Whitney test p-value test to test the difference of characteristics between specific formulas is significant with values <0.05

Favorite distribution graph based on taste by panelists depicted in figure 3



Figure 3. Distribution of Organoleptic Favorites By Taste of Cookies

Based on statistical analysis there are significant differences between products except in formula F2 to F3 ($p=0.9$) and F4 to F5 ($p=0.1$) which panelists say are not too different. In F0 biscuit products are the biscuits that most like the taste by panelists. Taste is the most important characteristic in determining the accepting power of biscuits. Taste can arise due to the food ingredients themselves or caused by the addition of other substances (Endrasari and Nugraheni, 2012)

C. Aroma Cookies

Tabel 6. Distribusi Rata-Rata Tingkat Kesukaan Panelis terhadap Aroma Cookies

Characteristic	Level of preference							Total	Mean	Mean Rank
	1	2	3	4	5	6	7			
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)			
Aroma										
F0 ^{a)b)c)d)e)f)}				1 (3)	3 (9,1)	16 (48,5)	13 (39,4)	33 (100)	6,1	328,05
F1 ^{a)b)c)d)e)f)}		1 (3)	4 (12,1)	1 (3)	16 (48,5)	8 (24,2)	3 (9,1)	33 (100)	5	236,29
F2 ^{a)b)c)e)f)}		1 (3)	4 (12,1)	10 (30,3)	14 (42,4)	3 (9,1)	1 (3)	33 (100)	4,3	197,08
F3 ^{a)b)d)e)f)}		2 (6,1)	2 (6,1)	14 (42,4)	13 (39,4)	2 (6)		33 (100)	4,2	190,32
F4 ^{a)b)c)d)e)}		6 (18,2)	13 (39,4)	8 (24,3)	5 (15,1)	1 (3)		33 (100)	3,3	115,18
F5 ^{a)b)c)d)f)}		5 (15,2)	10 (30,3)	13 (39,4)	4 (12,2)	1 (3)		33 (100)	3,4	124,08

a)b)c)d)... = results of the Mann Whitney test p-value test to test the difference of characteristics between specific formulas is significant with values <0.05

Favorite distribution graph based on aroma cookies by panelist depicted in figure 4

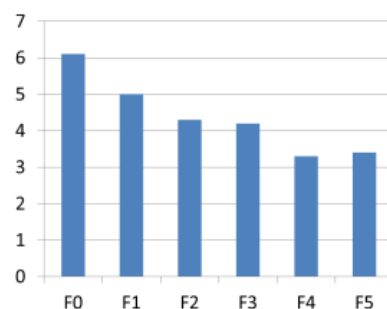


Figure 4. Distribution of Favorites By Aroma of The Cookies

Based on statistical analysis there is a significant difference between products except in formula F2 vs F3 ($p = 0,7$) and F4 vs F5 ($p = 0,3$) which according to panelists is not too different. In F1 biscuit products are biscuits that are added 10% tuna flour close to the F0 biscuit formula that is preferred taste by panelists.

D. Texture of Cookies

Table 7. Average Distributions of Panelists' Preferred Levels of Cookie Texture

Characteristic	Level of preference							Total n (%)	Mean	Mean Rank
	1	2	3	4	5	6	7			
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)			
Texture										
F0 ^{a)b)c)d)e)f)}				1 (3)	4 (12,1)	16 (48,5)	12 (36,3)	33 (100)	6,1	248,92
F1 ^{a)b)c)e)f)}				3 (9,1)	11 (33,3)	15 (45,5)	4 (12,4)	33 (100)	5,4	218,53
F2 ^{a)b)c)}				4 (12,1)	19 (57,6)	10 (30,4)		33 (100)	5	172,77
F3 ^{a)d)f)}				4 (12,1)	18 (54,6)	11 (33,4)		33 (100)	5	187,66
F4 ^{a)b)}		2 (6)		8 (24,2)	14 (42,5)	7 (21,3)	2 (6)	33 (100)	4,8	165,27
F5 ^{a)b)}		2 (6,1)		9 (27,3)	12 (36,4)	10 (30,3)		33 (100)	4,8	161,86

a)b)c)d)... = results of the Mann Whitney test p-value test to test the difference of characteristics between specific formulas is significant with values <0.05

The graph of the distribution of preferences based on texture by the panelists is depicted in Figure 5

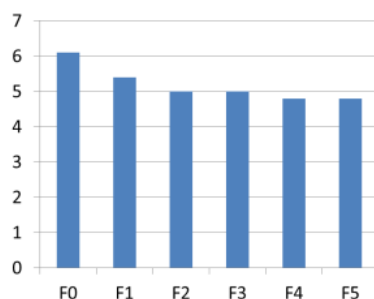


Figure 4. Distribution of Favorites By Aroma of The Cookies

Based on statistical analysis there are significant differences between the products except for the formula F1 to F3 ($p=0.08$), F2 to F3 ($p=0.3$), F2 to F4 ($p=0.5$), F2 to F5 ($p=0.4$), F3 to F4 ($p=0.1$), F3 to F5 ($p=0.1$) and F4 to F5 ($p=0.9$) according to the panelists, the textures were not too different because all biscuits produced a delicious taste. In the F0 biscuit product, the panelists liked the most crunchy texture. Meanwhile, for products that are added with fish meal and taro, the F1 formula is the most preferred.

E. Overall Characteristics of Cookies

Table 8. Average Distribution of Panelists' Preferred Rate for Whole Cookies

Characteristic	Level of preference							Total	Mean	Mean Rank
	1	2	3	4	5	6	7			
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)			
Overall										
F0 ^{a)b)c)d)e)f)}					3 (9,1)	13 (39,4)	17 (51,5)	33 (100)	6,3	331,48
F1 ^{a)b)c)d)e)f)}		2 (6,1)	1 (3)	3 (9,1)	10 (30,3)	14 (42,4)	3 (9,1)	33 (100)	5	238,58
F2 ^{a)b)c)d)e)f)}		2 (6,1)	1 (3)	9 (27,3)	16 (48,5)	5 (15,2)		33 (100)	4,5	184,89
F3 ^{a)b)d)e)f)}		2 (6,1)		9 (27,2)	17 (51,6)	5 (15,1)		33 (100)	4,4	179,50
F4 ^{a)b)c)d)e)}		1 (3)	2 (6,1)	7 (21,1)	13 (39,4)	8 (24,2)	2 (6,1)	33 (100)	3,7	128,94
F5 ^{a)b)c)d)f)}		6 (18,2)	4 (12,1)	11 (33,3)	11 (33,3)	1 (3)		33 (100)	3,7	127,61

a)b)c)d)... = results of the Mann Whitney test p-value test to test the difference of characteristics between specific formulas is significant with values <0.05

Graph of preferred distribution by texture by panelists depicted in figure 6

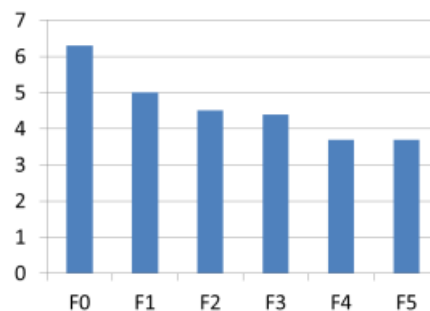


Figure 6. Favorite Distribution By Overall Characteristics of Cookies

Based on statistical analysis there are significant differences between products except in formula F2 against F3 (p=0.7), F4 to F5 (p=0.9). Similarly, the results of the test in difference between the biscuit groups statistically showed a significant difference in value between groups with p = 0.00. The test results data differing between groups of biscuits were presented in table 2.

Table 9. Comparison of Differences in Color Characteristics, Aromas, Textures and Overalls between Formula Cookies Groups

Formula type	Colour	Aroma	Flavour	Crunchy	Overall
F0*	6	6,1	6,2	6,1	6,3
F1*	5	5	5,1	5,4	5
F2*	4,5	4,3	4,4	5	4,5
F3*	4,3	4,2	4,4	5,1	4,4
F4*	4,2	3,3	3,6	4,8	3,7
F5*	3,5	3,4	3,3	4,8	3,7

p* = Kruskal Wallis p-value test results to test the difference in color, aroma, taste, texture and overall characteristics between all formulas (significant p-value <0.05)

DISCUSSION

From the average results of the favorite composition of taro biscuit products and cobs the most preferred is the F1 formula. In F0 biscuit products appear brightly colored and the increasing composition of fish flour compared to taro flour then the color of dark biscuits (Figure 2). The discoloration in biscuits is caused by a non-enzymatic browning reaction or often called the maillard reaction (Koeswardhani, 2016). The maillard reaction is caused by carbonyl groups found in carbohydrates from taro flour and wheat that bind to amino acids found in proteins from cob flour that occur at high temperatures (Winarno, 2004).

In the F1 formula is carried out modifications of wheat flour substitusi with 50% taro flour and 10% tuna fish flour, from the results of the test the favorite of F1 products is still preferred when compared to other fish addition formulas. The more fish meal added, the less the taste value by the panelists. This is because the protein in fish causes savory taste and fish oil that is slightly fishy in the mouth so that it lowers the taste of the addition of fish flour to the biscuit. Fishy smell is characteristic in fish, both freshwater fish and sea water fish. According to Hadiwiyoto (1993), the fishy smell in fish is caused by the compound trimethylamine. Although it has been washed with orange water, steaming with lemongrass ginger and pressing, the more addition of cob fish flour in this study, the taste of the fish that appears in the biscuit is increasingly felt. However, the addition of the composition of cob flour by 10% is still preferred and acceptable to the taste by panelists.

In this study, researchers did not add food additives in the form of aroma in order to determine the origin of each product. Aroma is a stimulus from food that is received by the tongue. Aroma is one of the important characteristics in determining the acceptability of a food product (Fiani and Japariato, 2012). Similar to the taste characteristics, the aroma also changes after the substitution of taro flour and fish. In the F1 formula, modification of the substitution of wheat flour with 50% taro flour and 10% tuna fish meal was carried out, from the results of the F1 product aroma preference test, it was still preferred and acceptable when compared to other fish meal addition formulas. The more fish meal added, it will affect the aroma of the biscuits, namely the assessment by the panelists is decreasing.

High starch content in wheat flour and taro can bind water during the gelatinization process, causing the biscuits to become crispy after being baked. With the use of more flour and taro, the resulting biscuit texture is more crunchy. This is due to the high content of starch in flour and taro, and the starch will contribute to the texture of the biscuit. Meanwhile, biscuits with high protein will experience coagulation, and cause the porosity of the biscuits to decrease, so that the texture becomes less crunchy (Williams and Margareth, 2001).

In this study it can be concluded that the best formulation in terms of color, aroma, taste, crunchy and overall in addition to f0 control is in F1 biscuit products which is a mixture between wheat flour 40%, taro flour 50% and 10% tuna flour.

The results of the proximal analysis obtained nutritional value in 60 grams of F1 biscuits, namely water content of 1.4 g, ash content of 1.6 g, protein content of 6.2 g, fat content of 13.5 g, carbohydrate content of 37 g and calories of 294.3 kcal. The nutritional value of F5 biscuit formula which is the composition of the most fish meal (50%), wheat flour 40% and taro 10% has a nutritional value of 1.1 g water content, ash content of 1.9 g, protein content of 13 g, fat content of 67.6 g, carbohydrate content of 26.16 g and calories of 765 kcal. The minimum standard pmt of pregnant women according to the Ministry of Health (2017) in every 60 grams of biscuits contains a minimum of 6 g of protein, 12 g of fat and 270 kcal of calories. The nutritional value of F1 biscuits already meets the criteria as the minimum requirement of pregnant women's food supplement biscuits. To meet protein intake, it can be recommended for pregnant women in the 1st trimester to consume F1 formula biscuits

as much as 60 g per day. The weakness of this study is that the sample that conducted organoleptic tests was not pregnant women because of limitations in the pandemic era.

CONCLUSION

The results showed significant differences among all panelists' favorite samples of color, texture, aroma, taste and overall p-value < 0.00. The nutritional value of 60 grams of F1 biscuits is water content of 1.4 g, ash content of 1.6 g, protein content of 6.2 g, fat content of 13.5 g, carbohydrate content of 37 g and calories of 294.3 kcal. Based on the nutritional value is equivalent to the minimum standard of food supplement for pregnant women according to the Ministry of Health. Thus, F1 biscuits formula which is made from 10% tuna and 50% taro flour can be an alternative food supplement for pregnant women.

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THE EFFECT OF GIVING EXPLANATION WITH CARD MEDIA *MAKE A MATCH* METHOD TO THE INCREASE OF ANEMIA PREVENTION BEHAVIOR AT 4th GRADE STUDENTS OF ELEMENTARY SCHOOL IN TANJUNG MORAWA SUB DISTRICT

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ABSTRACT

Primary school children are the next generation of the nation, to support learning activities in schools, good nutrition is needed. Unmet protein and Fe intake will affect the incidence of anemia in students which has an impact on learning achievement. The purpose of this study was to determine the effect of make a match learning on increasing the knowledge of anemia prevention of fourth grade school children at Elementary Schools in Tanjung Morawa sub district. The type of this study was quasi-experiment, using a non-randomized design with two groups pre-test and post-test in the intervention and control groups with 89 students each. This study was to determine the effect of giving Make a Match learning interventions to increase knowledge of anemia prevention in grade IV elementary school children in Tanjung Morawa Subdistrict. This study used the Independent T-Test $p \leq 0.05$. Statistical results showed that there was a significant difference in the average score of increasing knowledge and attitude of the group of children who received counseling on anemia prevention using Make A Match on increasing knowledge of anemia prevention in Grade IV schoolchildren in elementary schools in Tanjung Morawa sub-district $p < 0.05$. There is an effect of Make A Match counseling on increasing knowledge and attitudes to prevent anemia in fourth grade school children at Elementary Schools in Tanjung Morawa District.

Keywords : Anemia, Knowledge, Attitude, Make a Match

INTRODUCTION

Elementary school children are an important cycle in life where they will grow optimally if supported by a balanced diet. Most of the school children's food comes from the consumption of snacks in the school environment.¹

The low knowledge of elementary school children about health information, especially about anemia, requires innovation in learning. One of the innovations as an effort to increase knowledge about anemia is to use Make a Match media. Make a Match is expected to be one of the media to increase the knowledge of elementary school children about health so that it can reduce the number of anemia in elementary school children.

Anemia is a condition in which the number of red blood cells or hemoglobin (Hb) is insufficient for the body's physiological needs

According to the World Health Organization (WHO)³ in the Worldwide Prevalence of Anemia reports that the total world population suffering from anemia was 1.62 billion people with a prevalence in primary school children of 25.4% and 305 million school children worldwide suffer from anemia. Globally, the prevalence of anemia in school-age children showed a high rate of 37%. The prevalence of anemia among children in Asia was 58.4%, which is higher than the average in Africa (49.8%).

Based on data from 2013's *Riskesdas*, the prevalence of anemia in children aged 5-12 years was 29.4%. This figure shows that anemia is still a public health problem because its prevalence is 20%.⁴

The impact of anemia for elementary school students is that it can cause impaired physical growth and development, low resistance to disease, a lower level of intelligence than it should, study/work achievement and low sports achievement. In addition, anemia in children will have an impact on decreasing learning ability and concentration, disrupting the growth of both body cells and brain cells, causing facial symptoms to look pale, tired, lethargic and tired so that it can reduce fitness and learning achievement.

The causes of anemia problems in Indonesia include economic problems, namely in children whose parents belong to the middle to lower economic class so that they are unable to provide nutritious food for their children. In addition, the lack of knowledge about nutrition in children causes parents not to provide nutritious food to their children. Prevention can be done with nutrition education.⁴

There are several ways to prevent anemia. One of them is with health education with the aim of increasing knowledge.⁶ Several studies on nutrition education, especially on iron and hemoglobin levels, prove that nutrition education has a positive effect on knowledge of iron and hemoglobin levels.

Nutrition education is also one thing that is very appropriate, effective and sustainable to prevent iron deficiency anemia.

Based on the description above, the results of the preliminary survey of schools according to the results of interviews with school principals, parents of the school's students have a low economic level and low knowledge and education on nutritious food. So the authors are interested in conducting research with the title "The Effect of Make A Match Learning on Knowledge and Attitudes to Prevent Anemia in Class III and IV School children in four elementary schools in Tanjung Morawa District.

The purpose of this study was to determine the effect of make a match learning on increasing knowledge, attitudes and prevention of anemia in fourth grade school children at elementary schools in Tanjung Morawa district.

The benefits of this study are to provide increased knowledge of anemia prevention in school children by learning make a match and provide input to the school in providing information about the general description of make a match learning through monitoring the knowledge of children in the school environment towards anemia prevention attitudes from an early age both in the environment school and outside of school.

METHODS

This type of research was a quasi-experimental (quasi-experimental), using a non-randomized design with group pre-test and post-test.⁹ A pre-test on knowledge is carried out, then a make a match learning is given, then a post-test is carried out to determine changes knowledge after being given learning with make a match. The research will be conducted in 8 elementary schools in Tanjung Morawa District. The population in this study were all students who were in elementary schools in Deli Serdang District, totaling 8 schools, namely 4 schools for the intervention of 812 students. Data analysis used T-Independent test with p value < 0.05.

RESULTS

Overview of Research Sites

Deli Serdang Regency is one of 33 regencies in North Sumatra Province. Based on Government Regulation no. 7 of 1984, Deli Serdang Regency has 22 sub-districts where Lubuk Pakam is designated as the district capital. Deli Serdang District health program has advantages over other districts because Deli Serdang District is one of seven districts in Indonesia that has local regulations (Perda).

Subject Characteristics

Table 1. Characteristics of Subjects

Characteristics	Intervention		Control		p
	n	%	N	%	
Gender					
Man	39	46.8	41	47.1	>0.05
Woman	48	55.2	46	52.9	
Amount	87	100	87	100	
Father's occupation					
civil servant	7	8.0	2	22.2	<0.05
entrepreneur	59	67.0	50	45.9	
	21	37.5	35	62.5	

Laborer					
Amount	87	100	87	100	

Statistical results showed that the highest sex characteristics were female, in the intervention group with a yield of 55.2% and in the control group with a result of 52.9%. The characteristics of parents' occupations showed the highest results in the intervention group, namely self-employed with 67.0% results and in the control group with 45.9% results.

Knowledge Improvement

Table 2. Knowledge Level

Knowledge level	mean	Std. Deviation	P
Control	23.10	31,040	0.02
Intervention	32.76	24,097	

In Table 2 the average score of the level of knowledge in the intervention group is 32.76 with a standard deviation of 24.09 than the control group is 23.10 with a standard deviation of 31.04. Statistical results showed that there was a significant difference in the average score of increasing knowledge of the group of children who received Make A Match learning on increasing knowledge of anemia prevention in Grade IV schoolchildren in elementary schools in Tanjung Morawa sub-district $p < 0.05$.

Attitude Improvement

Table 3. Attitude Improvement

Attitude Improvement	mean	Std. Deviation	P
Control	4.2529	20.38195	0.001
Intervention	13.333	15,30061	

Based on the results of the pre and post tests, it showed that there was a difference in the average score of increasing attitudes towards the group of children who receive Make A Match, which is 13.33 with a standard deviation of 15.30 compared to the control group with an average score of 4.2 improving attitudes. standard deviation 20.38. Statistical results showed that there was an effect of counseling using Make A Match on increasing anemia prevention attitudes in fourth grade elementary school children in Tanjung Morawa District ($p < 0.05$). Media activities Make A Match cards used in ch where students are in counseling activities.

From the results of the table above, it showed that there was an effect of Make A Match method on increasing the attitude of preventing anemia in fourth grade elementary school children in Tanjung Morawa District ($p < 0.05$). a match can provide opportunities for children to play an active role in the learning process. The make a match learning model was developed by Lorna Curran in 1994.⁸ This model invites children to learn while playing by looking for a partner while learning a concept or topic in a fun atmosphere. The application of the make a match learning model can foster children's cooperation in answering questions by matching the cards in their hands.

DISCUSSION

The study showed that there was a significant difference in the average score of increasing knowledge of the group of children who received Make A Match learning towards increasing knowledge of anemia prevention in Grade IV of Elementary School Children in Tanjung Morawa District $p < 0.05$. mentioning words and other friends showing pictures can increase students' understanding of what anemia is, signs of anemia, what foodstuffs can prevent anemia in school children. This is a learning model in accordance with the learning objectives of make a

match where students can recognize and understand the characteristics of individuals and groups in understanding what anemia is. This is in accordance with the opinion of the Make A Match Cooperative learning model in which students look for pairs of cards while studying a certain concept or topic in a pleasant atmosphere. According to Aliputri (2018) stated that the Make A Match type cooperative model can improve students' understanding of learning in Blera Regency before and after learning with an average of 64.9 increasing to 76.9. It is stated that students can actively participate in learning, this causes students to remember more material for the sake of the material presented.¹² The cooperative learning model of the make a match technique makes students more enthusiastic because this learning uses game elements, besides that students are directly involved in learning. This method conditions an interactive class, effective so that students are trained in courage and can eliminate boredom when learning takes place. Make A match is one of the health education methods that can increase students' knowledge in increasing knowledge in preventing anemia

Providing education by counseling on prevention of anemia to elementary school children using the media of make a match cards with the aim that students can recognize and understand the characteristics of individuals and their groups. According to Suyatno¹⁰, the make and match learning model is a way of learning by using pairs of cards on one side of the card, questions about the problem are prepared and students answer by looking for a pair of cards from the card. Thus, students actively participate in games where students listen actively and quickly give answers by looking for pairs or matching from the picture cards. Students look serious but they are happy because if the paired cards are correct and match their friends' pairs.

Based on the above statement, it can be seen that; (1) Make A Match type cooperative learning model to convey messages about anemia prevention in school children instilling mutual respect, responsibility, developing a positive sense of oneself and the environment in the situation they face, (2) Make A Match is a counseling of model that makes students are more active in learning activities, in this learning children gain skill levels starting from the initial level to the advanced level that students have will be seen in this study. This study shows that there is an increase in eating behavior in preventing anemia, this can be seen in the Make A Match Prevention intervention group. Anemia in elementary school children showed an increase in anemia prevention behavior which is reflected in energy intake, protein and iron. Learning Make A Match children gain skill levels starting from the initial level to the advanced level that students have which will be seen from the impact of learning Make A Match. According to Wahyuni, stated that learning by using Make A Match media can improve students' skills to the advanced level of this learning, (3) learning Make A Match students express their opinions freely.¹⁴

CONCLUSION

The effect of make a match counseling can increase knowledge and attitudes to prevent anemia in fourth grade elementary school children in Tanjung Morawa sub-district. Thus, make a match counseling can be used to prevent anemia in elementary school children.

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Organoleptic Properties and Nutrient Cookies from *Flour of Taro Kimpul, Salak Manonjaya, and Tolo Beans As An Emergency Food*

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ABSTRACT

The potential production and nutritional content of local foodstuffs in West Java are taro kimpul, Manonjaya salak, and tolo beans, which can be developed into emergency food product cookies. This study was conducted to find out the picture of organoleptic properties (color, taste, texture and aroma) and the nutritional content in cookies of taro kimpul, Manonjaya salak, and tolo bean flours. This type of research was an experiment using descriptive analysis techniques. The organoleptic used was hedonic test. The formulas were by comparison of taro kimpul flour, Manonjaya salak flour, and tolo bean flour respectively for formula A (35%:20%:45%), formula B (31%:22%:47%), formula C (26%:24%:50%), formula D (22%:26%:52%) and formula E (18%:28%:54%). The panelists on the study were 30 people. Calculation of nutritional needs using the Indonesian Food Composition Table. Based on the results of organoleptic tests, in terms of preferred color is formula E, for the preferred aroma of panelists, namely formula D, for the taste and texture preferred by panelists, namely formula C. The best formula was C. The nutritional content of cookies produced was energy 247–248 kcal, protein 8.06–8.09%, fat 47.17–47.36%, and carbohydrates 45.16–45.35%. The energy content of emergency food produced has qualified which is 233-250 kcal per 50g.

Keywords: emergency food; cookies; local food; energy; organoleptic

INTRODUCTION

Indonesia is one of the disaster-prone countries. According to the National Disaster Management Agency (2019) there have been 2,190 disasters over the past 10 months. West Java province is one of the provinces that are prone to disaster. In 2019 West Java Province occupied the second position, as a province that often occurs disasters, namely as many as 430 times. Tasikmalaya Regency is one of the regencies in West Java Province that is prone to disasters¹.

One of the effects of the disaster is the onset of malnutrition problems. Malnutrition during disasters due to lack of nutritious food intake and limited availability of food at refugee sites. To overcome this, one alternative that can be done is the manufacture of emergency food for disaster victims. The purpose of making emergency food is to meet the caloric needs of disaster victims by 2,100 kcal, protein 35-45%, fat 10-15%, and carbohydrates 40-50% in one day².

In disaster conditions, ready-to-use food (RTF) is needed. One of the emergency foods that have a long shelf life is cookies. Cookies usually have a dense and crunchy texture when broken, are made from soft dough and have a high fat content³.

Research on emergency food cookies has been conducted by several other researchers. This study makes soyaba cookies products with the best treatment between Anjasmoro soybean flour and banana mas flour at a ratio of 80%: 20%. The chemical composition of soyaba cookies is in accordance with the quality of SNI 01-2973-1992, except for ash and carbohydrate levels. The water content of soyaba cookies is 3.46%, fat 13.57%, protein 38.14%, and carbohydrates 42.66%. Another study on emergency food cookies was made from kimpul flour and banana flour with a ratio of 20%: 40%⁴. The characteristics of these cookies are water content 6.25%, protein 9.15%, fat 22.43%, and carbohydrates 59.83%. Based on the results of the study, the fat and carbohydrate content exceeded the maximum limit of emergency food standards. In the study, the research formulation still added wheat flour as the main raw material. The use of wheat flour in the manufacture of cookies is very often used, but still rarely uses local foodstuffs to make cookies.

In general, cookies are made from wheat flour. Local foodstuffs that can replace wheat flour in emergency food cookies are taro kimpul, Manonjaya salak, and tolo beans. Taro kimpul is one type of taro that has a high

carbohydrate content. In general, the use of taro kimpul is still limited. Taro kimpul is usually processed as an additional food ingredient such as boiled, fried, made getuk, cabbageak, and chips⁶. The carbohydrate content in taro flour is greater when compared to wheat flour which is 83.57%, while the carbohydrate content in wheat flour is 77.2%⁵.

The addition of Manonjaya salak can complement the nutritional content of emergency food cookies. In 2018 the production of local salak in Tasikmalaya Regency was quite high, which was 620,812 tons. For Manonjaya salak production as much as 325,000 tons⁷. Manonjayalac lac is first processed into flour as a raw material for cookies. Manonjaya salak flour has enough nutritional content baik. Carbohydrate content per 100 grams of Manonjaya salak flour is 87.51%. So that Manonjaya salak can be one of the sources of carbohydrates in the manufacture of cookies. Manonjaya laced flour also contains a moisture content of 7.21%, fiber 5.96%, fat 0.55%, and protein 2.24%⁸. Manonjaya salak flour has also been developed into cookies, although it has not been specifically intended as an emergency food⁹.

To increase protein levels in cookies, it is necessary to add foods that have high protein content in order to meet emergency food standards. One of the foodstuffs that can be used as a source of protein is tolo beans. Tolo beans or delinquent beans have great potential as a food source of vegetable protein. Protein in tolo beans by 22.78% and water content by 11.15%¹⁰.

Another similar study in the development of locally made food was the foodbar. This food bar was made from tapioca flour, Manonjaya salak flour, peanut flour, and banana flour kepok. This food bar has nutritional content that was in accordance with emergency food standards¹¹. The development of other products as emergency food alternatives needs to be made from other local raw materials. In this study made emergency food cookies from taro kimpul flour, Manonjaya salak flour, and tolo nut flour. This product is made for emergency food standards both from nutritional content and organoleptic acceptance.

METHODS

The research that has been done was an experiment with descriptive data analysis, aiming to find out the descriptive of the organoleptic properties of cookies from taro kimpul flour, Manonjaya salak flour, and tolo nut flour. This research was used 5 variations of the treatment. Each treatment was tested for organoleptic properties by a consumer panel of 30 panelists.

Determination of formulation was done by calculating in advance the raw materials and additives that will be used in the manufacture of cookies so that per 50 grams of cookies can meet nutritional needs in accordance with emergency food requirements. Reference formulations are used based on the best research results from previous research, namely Characteristic of Cookies Emergency Wishful Thinking Based on Taro Kimpul Flour and Banana Kepok Flour. The best result on the study was wheat flour: taro kimpul flour: banana kepok flour (40:40:20)⁶. Then, researchers made modifications to other raw materials while still meeting the standards of nutritional content as emergency food. The modifications made by researchers were to vary formulation of taro Kimpul flour, Manonjaya salak flour, and Tolo bean flour. This formulation was done without the use of wheat flour. The treatment can be seen in Table 1.

Table 1. formulation of emergency food cookies research from kimpul taro flour, Manonjaya salak, and Tolo beans

Percent of taro kimpul flour : Manonjaya salak flour : tolo bean flour		Treatment Group				
		A (35:20:45)	B (31:22:47)	C (26:24:50)	D (22:26:52)	E (18:28:54)
No	Ingredients (grams)					
1	Kimpul taro flour	35	31	26	22	18
2	Manonjaya salak flour	20	22	24	26	28
3	Tolo bean flour	45	47	50	52	54
4	Margarine	55	55	55	55	55
5	Refined sugar	40	40	40	40	40
6	Telur	50	50	50	50	50
7	Baking powder	1	1	1	1	1

The instruments used in the study included food scales (digital) and organoleptic test forms. The data analysis technique used was descriptive analysis. The main parameters measured were organoleptic properties

and nutrient content. The data obtained was processed using a computer software. Data was presented in the frequency distribution table.

The creation of *cookies* begins by weighing all food ingredients in accordance with the formula that has been determined. Weighing materials was done using digital scales. The next stage was mixing ingredients including egg yolk, butter, refined sugar, vanilla, and *baking powder*. Then, dough stirred using a mixer for 3 minutes. Then the dough was added kimpul taro flour, Manonjaya salak flour, and tolo bean flour, stirred until mixed. After that, cookie dough was printed. Then, the cookie dough was baked in the stove oven for 1 hour.

Organoleptic tests in this study included the color, aroma, taste, and texture of cookies with 5 different formulas. The organoleptic test in this study used the *hedonic scale test* method¹². Organoleptic tests were conducted by 30 panelists in their respective residences. Before the organoleptic test process, the panelists are given an explanation in advance on how to perform organoleptic tests.

Nutrients in emergency food cookies were calculated using data base of raw material nutrient content from the Indonesian Food Composition Table and some literature of previous research results^{5,8,10}. The nutritional content of emergency food cookies was estimated based on the final product using the principle of mass equilibrium calculation¹³.

RESULTS

A. Organoleptic properties

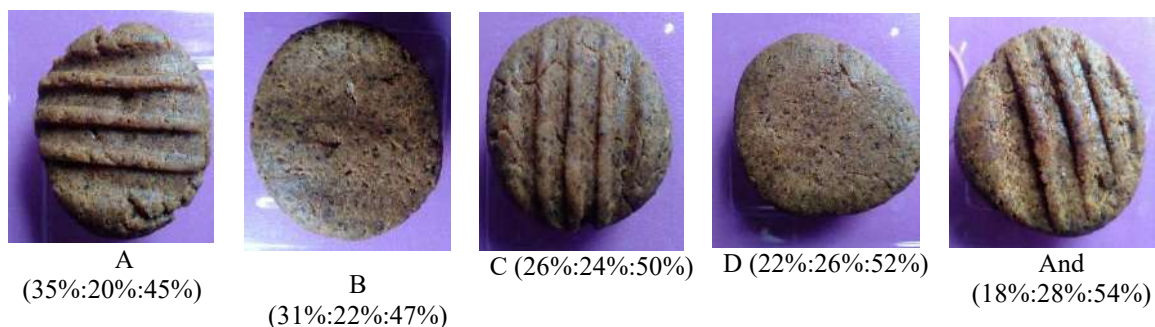


Figure 1. Emergency food cookies from kimpul taro flour, Manonjaya salak flour, and tolo bean flour

The products resulting from this study can be seen in Figure 1. In general, food cookies produced from taro kimpul flour, Manonjaya salak flour, and tolo nut flour have a brown color. The more composition of Manonjaya salak flour used, the more concentrated the brown color of cookies. Cookies for all treatments, have a distinctive aroma like biscuits in general that are processed by roasting. The more tolo nut composition used, the aroma and distinctive taste of the beans was also more pronounced. The texture of cookies on all treatments was crisp.

1. Color

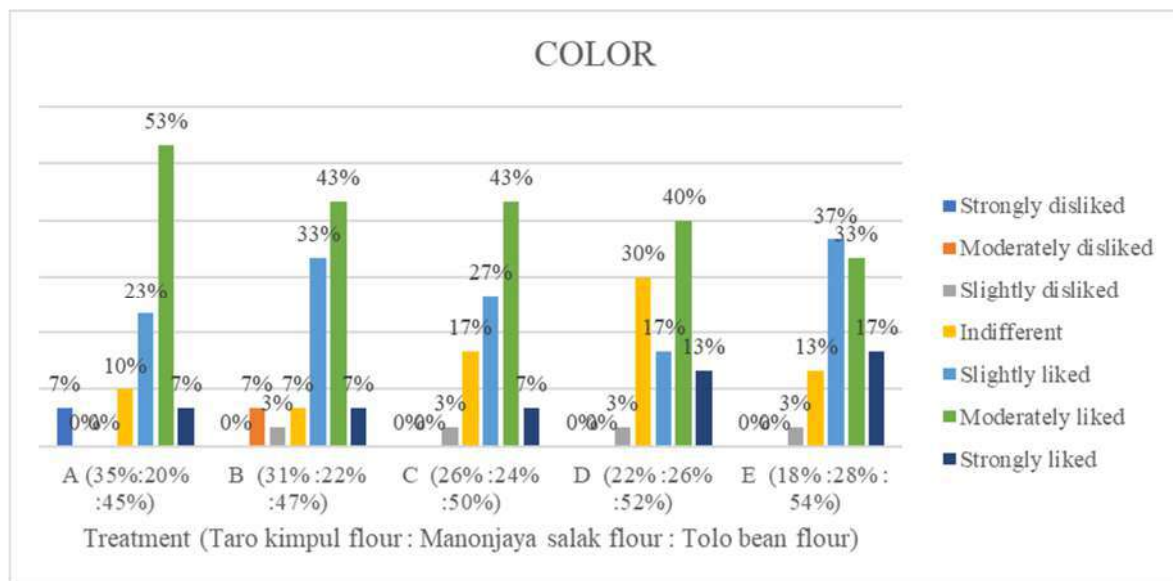


Figure 2. The level of panelist fondness for the color of emergency food cookies from taro kimpul flour, Manonjaya salak flour, and tolo nut flour

The level of panelists fondness for color in kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour can be seen in Figure 2. In Figure 2 above, 6.67% of panelists expressed their fondness for color in formula as many as 6.67% of panelists expressed great dislike, 6.67% of panelists expressed great liking, 10% of panelists expressed mediocrity, 23.33% of panelists expressed some dislike and 53.33% of panelists expressed favor.

The level of preference of panelists to color in formula B obtained the result that as many as 3.33% of panelists expressed some dislike, 6.67% of panelists expressed dislike, 6.67% of panelists expressed favor, 33.33% of panelists expressed somewhat like and 43.33% of panelists expressed favor. The level of panelists fondness for color in formula C resulted in 6.67% of panelists saying they disliked, 6.67% of panelists saying they liked it, 16.67% of panelists said they liked it, 26.67% of panelists said they liked it, and 43.33% of panelists said they liked it. The level of panelists preference for color in formula D resulted in the result that 13.33% of panelists expressed great liking, 16.67% of panelists expressed somewhat like, 30% of panelists said they liked it, and 40% of panelists expressed favor. The level of panelists' preference for color in formula E resulted that 13.33% of panelists said it was normal, 16.67% of panelists expressed great liking, 33.33% of panelists expressed favor, and 36.67% of panelists expressed somewhat like.

2. Aroma

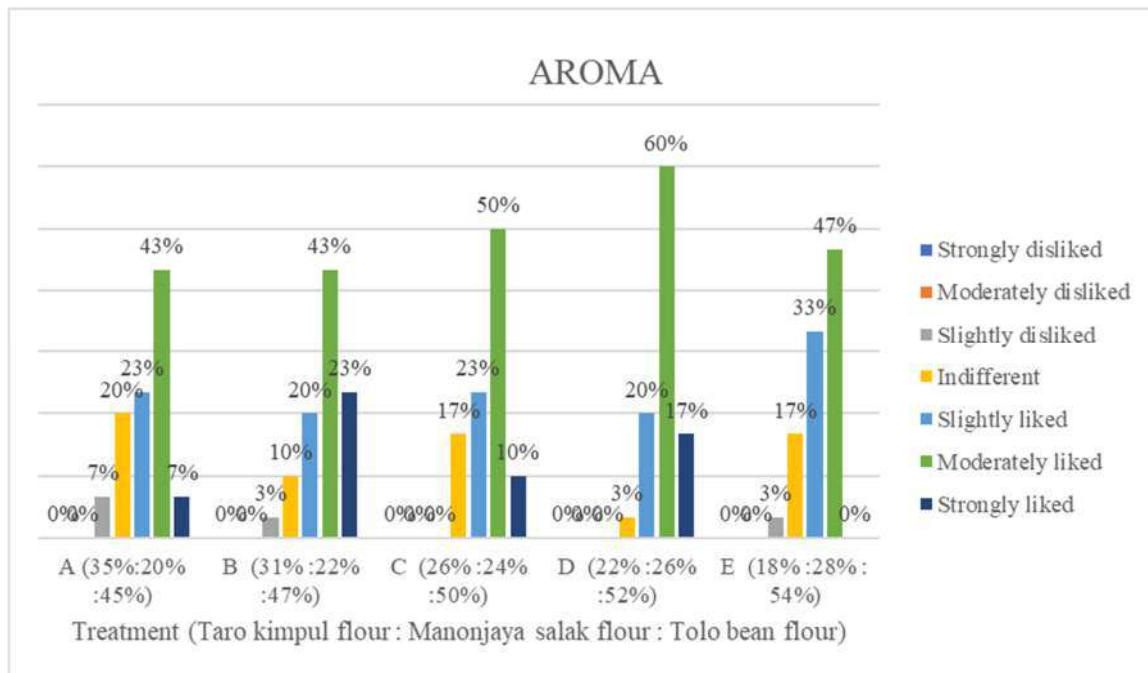


Figure 3. The level of panelist fondness for the aroma of emergency food *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo bean flour

The level of panelists fondness for aromas in kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour can be seen in Figure 3. 6.67% of panelists expressed slight dislike, 6.67% of panelists expressed their dislike, 6.67% of panelists said they liked it, 20% of panelists said they liked it, 23.33% of panelists said they liked it, and 43.33% of panelists said they liked it.

The level of panelists fondness for aroma in formula B resulted that 3.33% of panelists expressed some dislike, 10% of panelists said they liked it, 20% of panelists said they liked it, 23.33% of panelists said they liked it, and 43.33% of panelists said they liked it. The level of panelists' fondness for aroma in formula C resulted in that as many as 10% of panelists expressed great liking, 16.67% of panelists said they liked it, 23.33% of panelists said they liked it, and 50% of panelists said they liked it. The level of panelists' fondness for aroma in formula D resulted in the result that 3.33% of panelists said it was normal, 16.67% of panelists said they liked it, 20% of panelists said they liked it, and 60% of panelists said they liked it. The level of panelists' fondness for aroma in formula E resulted that 3.33% of panelists expressed some disliking, 16.67% of panelists said they were ordinary, 33.33% of panelists expressed somewhat liking, and 46.67% of panelists expressed favor.

3. Taste

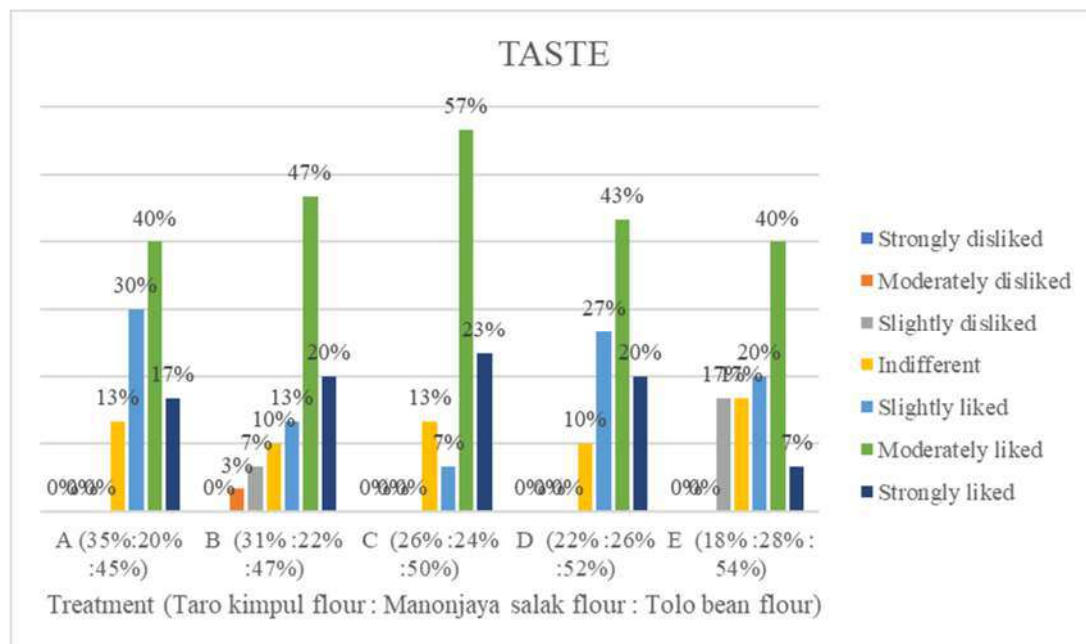


Figure 4. The level of panelist fondness for the taste of emergency food *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo bean flour

The level of panelists fondness for flavor in kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour can be seen in Figure 4. The panelists fondness for flavor in formula A resulted in the result that 13.33% of panelists said they were ordinary, 16.67% of panelists said they liked it, 30% of panelists said they liked it, and 40% of panelists said they liked it. The level of panelists' fondness for taste in formula B resulted in that 3.33% of panelists expressed dislike, 6.67% of panelists expressed some dislike, 10% of panelists expressed mediocrity, 13.33% of panelists expressed some dislike, 20% of panelists expressed great dislike, and 46.67% of panelists expressed favor. The level of panelists fondness for taste in formula C resulted in 6.67% of panelists saying they liked it, 13.33% of panelists said they liked it, 23.33% of panelists said they liked it, and 56.67% of panelists said they liked it. The level of panelists fondness for taste in formula D resulted in that 10% of panelists said they liked it, 20% of panelists said they liked it, 26.67% of panelists said they liked it, and 43.33% of panelists said they liked it. The level of panelists fondness for taste in formula E resulted that 6.67% of panelists expressed great liking, 16.67% of panelists expressed some dislike, 16.67% of panelists said they were ordinary, 20% of panelists expressed somewhat like, and 40% expressed favor.

4. Texture

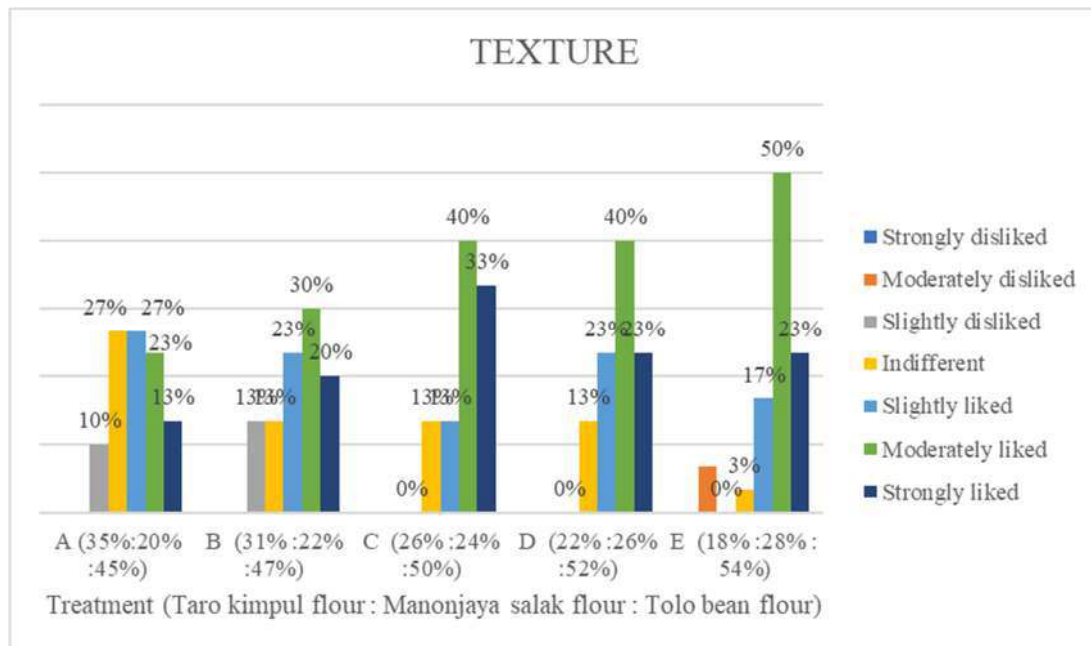


Figure 5. The level of panelist fondness for the texture of emergency food *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo bean flour

The level of panelists fondness for texture in kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour can be seen in Figure 5. The panelists fondness for texture in formula A resulted that 10% of panelists expressed some disliking, 13.33% of panelists expressed great liking, 23.33% of panelists expressed a lot of liking, 26.67% of panelists said they were normal, and 26.67% of panelists said they liked it. The level of panelists fondness for texture in formula B resulted that 13.33% of panelists expressed some dislike, 13.33% of panelists said they were ordinary, 20% of panelists said they liked it, 23.30% of panelists said they liked it, and 30% of panelists said they liked it. The level of preference of panelists to texture in formula C obtained the result that as many as 13.33% of panelists are ordinary, 13.33% of panelists say they like it, 33.33% of panelists say they like it, and 40% of panelists say they like it. The level of preference of panelists to texture in formula D obtained the result that as much as 13.33% ordinary, 23.33% of panelists expressed somewhat like, 23.33% of panelists said they liked it very much, and 40% of panelists liked it. The level of panelists fondness for texture in formula E resulted in the result that 3.33% of panelists said they were ordinary, 6.67% of panelists said they disliked, 16.67% of panelists said they liked it, 23.33% of panelists said they liked it, and 50% of panelists said they liked it.

5. Overall of Organoleptic Properties

An overall organoleptic test assessment of color, aroma, taste, and texture was performed by calculating the average panelist's assessment for each sample of organoleptic properties. This assessment was conducted to find out which samples were better accepted by panelists of all organoleptic properties. The results of the overall assessment of organoleptic properties, can be seen in Figure 6.

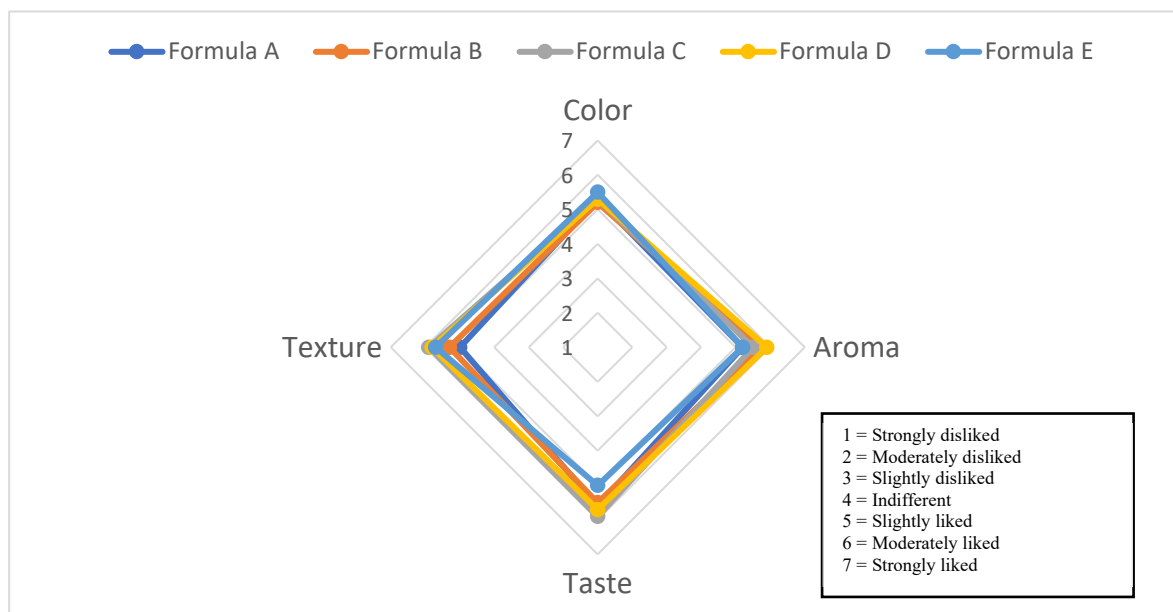


Figure 6. Panelist assessment of the overall parameters of emergency food *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo bean flour

Based on Figure 6, the results of organoleptic tests conducted by 30 panelists, showed that all formulas could be well received as emergency food, looking at an average value above 5. Judging from the characteristics preferred by panelists, from the preferred color parameters are formula E. From the preferred aroma parameters of panelists, namely formula D and from the parameters of taste and texture that the panelist prefers, namely formula C. The best formula was C.

B. Nutritional Content

Determination of the nutritional content of cookies is done by calculating the moisture content of *cookies* first. The moisture content of *cookies* generated on each product can be seen in Table 2. The content of macronutrients (carbohydrates, fats, and proteins) is calculated assuming the water content of the final product Cookies of 5% in accordance with the Indonesian National Standard (SNI) biscuits³. After the water content of each *cookie* formula was known, the next step is to do calculations to find out the nutritional content of *cookies* in accordance with emergency food conditions. The nutritional content of *cookies* from the five formulas can be seen in Table 2.

Table 2. Percentage of macronutrient content of emergency food *cookies* from taro kimpul flour, Manonjaya salak flour, and tolo nut flour per 50 grams

Treatment (taro kimpul flour: Manonjaya salak flour: tolo bean flour)	Percentage of Nutrients			
	Protein (%)	Fat (%)	Carbohydrates (%)	Energy (2)
A (35% : 20% : 45%)	8.06	47.17	45.16	248
B (31% : 22% : 47%)	8.06	47.17	45.16	248
C (26% : 24% : 50%)	8.09	47.36	45.35	247
D (22% : 26% : 52%)	8.09	47.36	45.35	247
E (18% : 28% : 54%)	8.09	47.36	45.35	247

C emergency food *ookies* per 50 grams in all formulas A, B, C, D, and E have qualified emergency foods for energy and carbohydrate content. The fat content of all five formulas exceeds emergency food requirements. The protein content of the five formulas has not yet reached emergency food requirements. Emergency food requirements can be met with the fulfillment of *makronutrient* namely protein 10-15%, fat 35-45%, carbohydrates 40-50%, and energy 233-250 kcal².

DISCUSSION

A. Organoleptic properties

Organoleptic testing is a type of testing using the human senses to assess the safety and quality of food and drink. The method used is a *hedonic scale test* with panelists as many as 30 people¹². Organoleptic tests are performed to determine the panelist's responsiveness to food.

Based on the results of research cookies taro kimpul flour, Manonjaya salak flour, and tolo bean flour, it was obtained that each formula has different organoleptic properties. The parameters used include color, aroma, taste, and texture.

1. Color

Color is one of the attributes of organoleptic testing, relating to the sense of sight¹⁴. The color produced from taro kimpul flour cookies, Manonjaya salak flour, and tolo bean flour, on average the entire formula produces a brown color. The color cookies of each formula were on average almost the same.

From the results of organoleptic tests, the most preferred color of panelists was in formula A (35%: 20%:45%) as many as 53.33% expressed liking, this was because the color of cookies in formula A was brighter than other formulas. This difference occurs because apart from the difference in the use of Manonjaya salak flour, it also occurs due to differences in the use of tolo bean flour. The more addition of Tolo bean flour, the darker the color of the cookies. In line with the results of Hallen's research, et al (2013) explained that the color obtained in bread that contains higher levels of tolo bean flour produces darker and browning colors. Embezzlement in tolo bean bread may be due to the Maillard reaction that occurs during the bread making process due to the high lysine content in tolo beans. Other studies show that the more use of salak flour, the lighter the snack bar color¹⁵. Tolo beans have a high protein content. Foodstuffs that have a high protein content eat more and more amino acids contained. Amino acids can act with sugar reduction in flour beans and fruit salak during the roasting process, so there is a maillard reaction and make the color of cookies darkened. Based on the results of the study, the color on all cookie formulas can be corrected by all panelists.

The brown color produced in the cookies from this research comes from Manonjaya salak flour. The basic color of Manonjaya salak flour was brown⁸. The color of these emergency food cookies is also similar to the color of cookies made in previous studies with the main ingredients of Manonjaya salak flour and wheat⁹. In addition, this emergency food cookie product also has a color similar to the emergency food bar which was also made from Manonjaya salak flour¹¹.

2. Aroma

Smell or aroma is one of the sensory properties that is difficult to describe because it has such a great diversity¹⁴. The aroma resulting from kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour, on average the entire formula produces the distinctive aroma of cookies in general.

From the results of organoleptic tests, the most preferred aroma of panelists was in formula D where as many as 60% of panelists say they like, the resulting aroma was the typical aroma of cookies in general and there was no aroma that stands out from taro kimpul flour, Manonjaya salak flour, or tolo nut flour. This happens due to the influence of complementary ingredients and the use of manual ovens to bake cookies. Complementary ingredients that affect the aroma are margarine and eggs. The aroma of both ingredients was more prominent. But the aroma in formula E aroma that stands out was a little burnt because during the roasting process occurs a little shake. The occurrence of shaking during the roasting process because the temperature in the manual oven was uneven and the time during the roasting process was not controlled. The process of roasting cookies using a manual oven can affect the aroma of cookies because when the air roasting process comes out through the cracks, thus reducing the resulting aroma. In line with other studies showing that the use of different ovens in the process of roasting cookies, can affect the resulting aroma of¹⁶. The roasting process using the resulting electric oven aroma is stronger because the electric oven is more closed, so that the air contained in the electric oven does not come out and the heat generated is evenly distributed. While the use of a manual oven for the process of roasting the air in the oven can come out through the cracks so as to reduce the aroma of cookies produced. Aroma in a product can also be affected by the addition of eggs in the material of the manufacture of the product¹⁷.

The aroma of emergency food cookies from this study is similar to the results of other studies using the baking process. For example, cookies from Manonjaya salak flour⁹, emergency food cookies from soybeans and bananas⁴, and an emergency food bar made from Manonjaya salak flour, peanut flour, and banana Kepok flour¹¹.

3. Taste

Taste is assessed through the taste senses that are considered to hammer a food. There are five basic flavors, namely sweet, sour, bitter, salty and umami¹⁴. The resulting taste of taro kimpul flour cookies, Manonjaya salak flour, and tolo bean flour was in formula A the cookie taste was less sweet, while in formula B, formula C, formula D, and formula E it tastes a bit sour.

From the results of organoleptic tests, the most preferred aroma of panelists was in formula C where as many as 56.67% of panelists expressed liking, where the resulting taste was slightly sour, and tends to taste of tolo beans. The taste of all formula cookies on average tastes less sweet. According to another reasearch, the more use of tolo bean flour causes the sweetness in biscuits to be reduced from very real to quite real, this was because the more use of tolo bean flour causes disguised sweetness with langu flavor¹⁸. The sour taste was influenced by Manonjaya salak where basically when Manonjaya salak was still in the form of fruit it tastes sour. Acid taste found in Manonjaya salak flour is a characteristic of fresh fruit^{8,9}. In line with other studies that show that the taste in cookies is also influenced by various ingredients such as sugar and butter¹⁶. In addition, the percentage of use of taro kimpul flour also affects the taste of cookies. The lower the use of taro kimpul flour, the taste of cookies produced the sweeter.

The taste of emergency food cookies as a result of this research was as favorable as baking products made from Manonjaya salak flour. These products were cookies from Manonjaya salak flour and wheat flour as well as emergency food food bar products from Manonjaya salak flour, peanut flour, and banana kepok flour^{9,11}.

4. Texture

The texture of a product can be tested using the sense of touch, using the fingertips of the hand. Texture has three elements, namely hardness and supple (mechanical), sandy and weak (geometric), oily and watery(mouthfeel)¹⁴. The texture produced from taro kimpul flour cookies, Manonjaya salak flour, and tolo bean flour is on average all formulas produce a crunchy texture.

From the results of organoleptic tests, the most preferred texture of panelists was in formula E where as many as 50% of panelists express liking. The texture produced in the formula was crispy texture. This happens because of the percentage difference in the use of tolo beans. In line with another reaserach, the higher the addition of tolo bean flour produces crackers products with a crunchy texture¹⁹. This is due to the higher carbohydrate content of peanut flour. According to another reasearch, one of the important components in the manufacture of cookies is fat²⁰. The function of fat in the manufacture of cookies is as an emulsifier material so that it can produce a crisp texture of cookies. In addition, margarine in the manufacture of cookies can also make the texture of cookies soft and crisp. The texture of these emergency food cookies is as well-liked as other research's cookie products^{4,9}.

5. Overall of Organoleptic Propersties

An overall assessment of the five formulas showed that kimpul taro flour cookies, Manonjaya salak flour, and tolo bean flour were generally well received by all panelists on each assessment parameter i.e. color, aroma, taste, and texture. The color parameter preferred by panelists is formula E, the color in formula E is darker when compared to other formulas. For aroma parameters that are preferred by panelists, namely formula D with the typical aroma of cookies in general. As for the parameters of taste and texture that panelists like, namely formula C, with the resulting taste is a slightly sour taste from salak flour and taste of tolo beans. The best formula was C. In general, the organoleptic properties of these emergency food cookies are the same as baked products made from other Manonjaya salak flour^{9,11}.

B. Nutritional Content

Cookies are one of the products that can be used as emergency food. The nutritional content in cookies,must meet emergency food requirements. Cookies are made with 5 different formulas, weighing 50 grams/product. Calculation of nutrients is done after obtaining the water content obtained in each formula. The water content produced from each formula is 5%³.

Formula A cookies products have a nutritional content of 248 kcal, protein 8.06%, fat 47.17%, and carbohydrates 45.16%. Formula B cookies have a nutritional content of 248 kcal, protein 8.06%, fat 47.17%, and carbohydrates 45.16%. Formula C cookies have a nutritional content of 247 kcal, protein 8.09%, fat 47.36%, and carbohydrates 45.35%. Formula D cookies have a nutritional content of 247 kcal, protein 8.09%, fat 47.36%, and carbohydrates 45.35%. Formula E cookies have a nutritional content of 247 kcal, protein 8.09%, fat 47.36%, and carbohydrates 45.35%.

For cookies per 50 grams, formulas A, B, C, D, and E have qualified emergency food for energy and carbohydrate content. The fat content of all five formulas exceeds emergency food requirements. The protein

content of the five formulas has not yet reached emergency food requirements. Emergency food requirements can be met with the fulfillment of micronutrients namely protein 10-15%, fat 35-45%, carbohydrates 40-50%, and energy 233-250 kcal². Not yet achieved the need for protein occurs because the constituent ingredients of making cookies are still lacking in meeting the needs of nutrients, especially protein. For fat content that exceeds emergency food requirements occur due to the excess constituent ingredients of making cookies in the fulfillment of nutrients, especially fat sources.

To find out the accuracy of the calculation of nutrients (proteins, fats and carbohydrates) cookie products need to be done laboratory tests so that the results of calculation of nutritional content are more precise and accurate. In addition, to determine the accuracy of water content, laboratory tests need to be carried out. Further research is needed to develop this cookie product. To improve the texture on cookies it is recommended when possessing the manufacture of tolo bean flour when drying must be dry in order to use a syring with a size of 80 mesh.

Cookies of taro kimpul flour, Manonjaya salak flour, and tolo bean flour can be developed for emergency food, for researchers who will develop, for supporting ingredients of fat sources should be reduced so as not to exceed emergency food requirements. It is recommended in the process of developing cookies added the constituent ingredients of other protein sources so that protein needs can be fulfilled.

CONCLUSION

Organoleptic test results from all five formulas showed that *kimpul* taro flour cookies, Manonjaya salak flour, and tolo bean flour were generally well received by all panelists. The comparison of taro kimpul flour, Manonjaya salak flour, and tolo bean flour is for formula A (35%: 20% : 45%), formula B (31%: 22% : 47%) formula C (26%: 24% : 50%) formula D (22% : 26 %:52%) and formula E (18% : 28 % : 54%). Based on the results of organoleptic tests, the color parameter preferred by panelists is formula E, the color in formula E is darker when compared to other formulas. For aroma parameters that are preferred by panelists, namely formula D with the typical aroma of *cookies* in general. As for the parameters of taste and texture that panelists like, namely formula C, with the resulting taste is a slightly sour taste from salak flour and taste of tolo beans. Judging from the level of liking, the formula that can be developed into emergency food is formula C. The best formula was C.

For *cookies* per 50 grams obtained the result that the nutritional content of *cookies* produced is energy 247-248 kcal, protein 8.06 - 8.09 %, fat 47.17 - 47.36 % and carbohydrates 45.16-45.35%. Formulas A, B, C, D, and E have qualified emergency foods for energy and carbohydrate content.

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**EFFECTIVITY OF COMPLEMENTARY FEEDING GUIDELINES ON
MOTHER'S KNOWLEDGE BABIES IN ARGASUNYA VILLAGE, CIREBON CITY**

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Abstract

Complementary feeding (MP-ASI) with the right amount and quality of nutrition is an important factor in overcoming nutritional problems. Complementary feeding of 6-12 months of age is on stage important in determining the character and food habits of children to adulthood. There are still a lot of mothers' knowledge that is still lacking and the practice of giving inappropriate complementary foods. This study aims to determine the effect of implementation with practical guidelines of complementary feeding.

This research is experimental with one *group pre and post-test design* with the treatment in the form of implementation using the Practical Guidelines. The implementation is carried out for 2 (two) weeks with a frequency of four times of implementation (*home visit*). At the end of the implementation, all 50 mothers of babies were re-evaluated by giving the same questionnaire at the beginning of implementation. The success of implementation is measured by knowledge and practice of complementary feeding.

The practice of complementary feeding shows that there are still many inaccuracies in term of the shape/texture parameters, frequency, quantity and type of food given. 41,0-62,2 % of mothers have not provided complementary feeding as recommended to their babies.

This practical guidelines to feeding babies 6-12 months needs to be implemented in community nutrition development, there are still many mothers who have insufficient knowledge about complementary foods and inappropriate practices in providing complementary foods to their babies.

Keywords: babies, fomplementary feeding, knowledge, practice, practical guidelines.

INTRODUCTION

Nutrition is an important requirement in the process of growth and development of infants and children. Toddler nutrition needs to be considered especially by the mother of the toddler because the mother is the determinant of the intake or nutrition given to the child. Nutritional status and intake are still problems in infants after six months of age.

The nutritional status and intake of complementary feeding for infants are influenced by maternal and non-maternal factors such as economic status, support from husbands, and health workers. Maternal factors include knowledge, education, and work. Giving complementary feeding too early to babies can cause the baby does not suck all the milk produced by the mother, resulting in the baby being deficient in high-quality nutrients. The providing of complementary foods can also cause excess or deficiency of nutrition.

Delay in complementary feeding after the baby is 6 months old also causes malnutrition. Most cases of malnutrition can be avoided if you have sufficient knowledge of how to maintain nutrition and manage children's diets. Ignorance of how to feed babies and children, and the existence of habits that are detrimental to health, directly and indirectly, are the main causes of malnutrition and infection in children, especially those under 2 years of age. According to the 2012 IDHS, only 41.2% of infants aged 6-24 months are given food according to recommendations, namely complementary feeding (Khosman, 2007 in Mufida et al, 2015).

Complementary feeding must be given at the right age according to the needs and digestibility of the baby at the age of 0-6 months should be given breast milk only then aged 6-24 months will be given complementary feeding. In Ciledug Village, only 27% were given exclusive breastfeeding and those who had been given complementary feeding before the baby 6 months old, 73%. If the baby is given complementary feeding under 6 months the baby's digestive tract is not yet perfect, this will have an impact on the incidence of infections in babies such as diarrhea, respiratory infections, allergies to growth disorders.

Sometimes the information a mother gets is very minimal, because she doesn't have knowledge. Knowledge is the result of knowing, and this occurs after people sense a certain object (Notoatmodjo, 2010). Mother's behavior in giving complementary feeding, both in terms of frequency, texture, and quantity of food needs attention. Knowledge influences mothers in determining, selecting, processing, and promising daily complementary feeding (Kemenkes, 2013). Mother's knowledge will influence the practice of complementary feeding. It can be obtained by various means and media of nutrition education, including implementation, counseling, reading sources, magazines, the role of health cadres, and so on.

Nutrition education is designed to facilitate the community to be able to choose nutritious foods and to adopt other behaviors related to food and nutrition that can support the realization of community status. One of the nutrition education that can be carried out is training and providing Complementary Feeding Guidelines. Many guidelines on complementary feeding have been published, but the content emphasizes knowledge and theories that are not easily understood by mothers of toddlers, so it is necessary to make a guide that is simpler and easier to understand.

Argasunya village is the working area of Puskesmas Sitopeng, which is one of the sub-districts in Cirebon City which is used as a target area for the Health Polytechnic of the Ministry of Health, Tasikmalaya in the Cirebon region. Nutritional problems in Argasunya Village still need to be addressed, including in children under five with malnutrition. Based on data from the Sitopeng Health Center in 2015, from 2003 under five, 33 (1.65%) with very poor nutritional status (index weight / age), 132 (6.59%) very short (index TB / U) and 3 (0, 15%) very thin (index weight / height). In giving exclusive breastfeeding of 231 babies aged <6 months, only 175 (75.75%) were given exclusive breastfeeding. This means that there are still the babies who are given other foods besides breastfeeding at the age of <6 months.

From the description above, the researcher is interested in researching "The Effect of Implementation and the use of Guidelines on Knowledge and Practices of providing

complementary feeding to Mother babies (babies aged 6-12 months) in Argasunya Village, Cirebon City".

This study aims to determine the effect of implementing the practical guide on feeding babies 6-12 months on the knowledge and practice of giving MP-ASI in Argasunya Village, Cirebon City.

METHODS

Study design

The research is experimental with one *group pre and post-test design* with the treatment given the implementation of the Practical Guide to Feeding Babies 6-12 Months, for 2 (two) weeks with a frequency of four times of implementation (home visit). The success of implementation is measured by knowledge and practice of complementary feeding.

Setting

The implementation is carried out for 2 (two) weeks with a frequency of four times of implementation (*home visit*). At the end of the implementation, all 50 mothers of babies were re-evaluated by giving the same questionnaire at the beginning of implementation process was carried out by Posyandu cadres and Cirebon Nutrition D.III Study Program students who had technical training for implementation and the contents of the guidelines.

Participant/Subject

The research subjects were mothers (who have babies 6-12 months) in RW.04 Surapandan and RW.10 Kedung Jumleng, Argasunya Village. The implementation process was carried out by Posyandu cadres and Cirebon Nutrition D.III Study Program students who had technical training for implementation and the contents of the guidelines consisted of: WHO recommendations, understanding of complementary foods, stages of giving according to age, giving complementary foods based on the amount, frequency and texture, examples food ingredients for the manufacture of complementary foods along with pictures, delivery schedules, and complementary feeding recipes along with pictures.

As many as 50 subjects, selected by *systematic random sampling*. Selected subjects fulfill the following inclusion criteria; having babies aged 6-12 months in good health, mothers can read, willing to be the subject of research.

Main and secondary outcome measure

The success of implementation is measured by the knowledge and practice of complementary feeding.

Data management and statistical analysis

Maternal knowledge is measured by 10 questions that have been tested for validity and reliability on mothers of toddlers with the same characteristics as the subject, including texture/shape of complementary feeding, frequency of provision, amount, and type of complementary foods given. The weighted value of each question is 10 points. The practice of giving complementary foods by assessing; texture, frequency, amount, and type of complementary feeding.

The data obtained were analyzed statistically using the t-test for numerical data and the Wilcoxon test for categorical data. Statistical tests were carried out to determine whether or not there was a significant difference between before and after implementation using the guidelines.

RESULTS

Table 1. Maternal Subject's Knowledge About Complementary Feeding in Argasunya Village

Knowledge	\pm SD	Min	Mak	<i>p</i> -value
Before Implementation (Pre)	48.72 \pm 13.01	20	80	0.000
After Implementation (Post)	70.77 \pm 18.41	40	100	

Table 1 shows that after implementation, the mean value of subject knowledge increased by 22.5 points and there was an increase in the minimum and the maximum score of 20 points. The mean of subject knowledge before implementation was "lacking", but after implementation, it increased to "sufficient"

The results of measuring the mother's knowledge with 10 simple questions about complementary foods showed that the average was only able to answer 4-5 questions correctly, some even answered 2 questions correctly. (Figure 1).

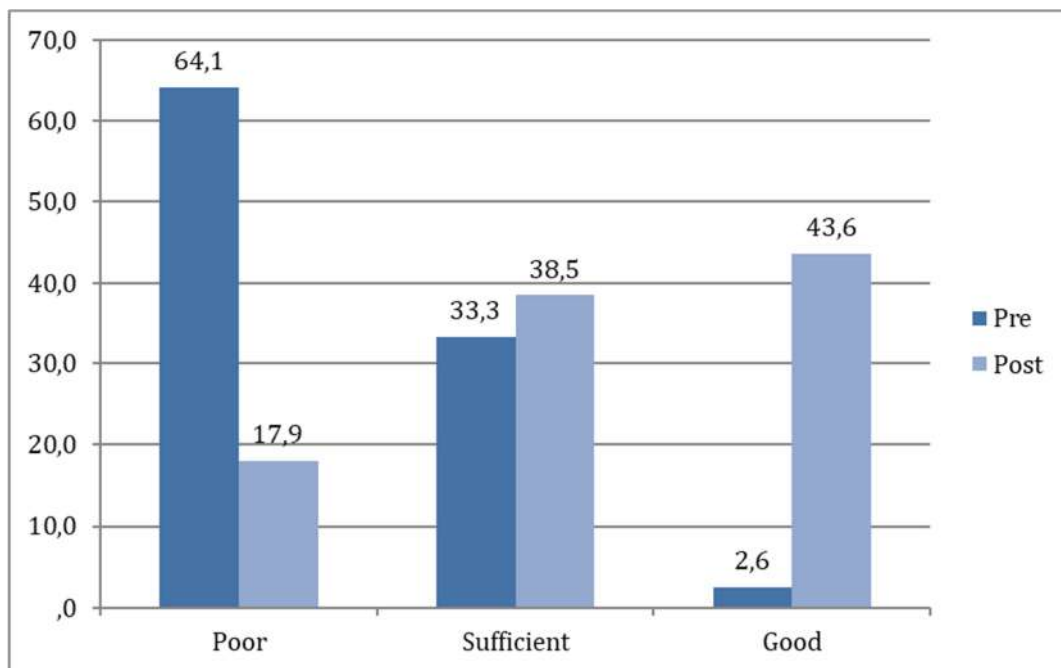


Figure1.Categories of Subject Knowledge Levels
Before and After Implementation Activities

Complementary Feeding Practices

Table 2. The Complementary feeding practices for the subject's mother before and after implementation in Argasunya Village

Complementary feeding practices	before		after		<i>p-value</i>
	n	%	n	%	
Texture					
Good	23	59.0	31	79.5	0.021
Poor	16	41.0	8	20.5	
Frequency					
Good	21	53.8	27	69.2	0.083
Poor	18	46.2	12	30.8	
Amount					
Good	12	30.8	21	53.8	0.020
Poor	27	69.2	18	46.2	
Type					
Good	18	46,2	33	84,6	0,000
Poor	21	53,8	6	15,4 The	

Description of the practice of complementary feeding by mothers for their babies does not differ from their knowledge. The practice of complementary feeding shows that there are still many inaccuracies in terms of the shape/texture parameters, frequency, quantity, and type of food given (Khosman, 2007) as many as 41.0-69.2% of mothers have not provided complementary foods as recommended to their babies. The limitation of this research is that is only taken from one city with a limited sample, so that it cannot be generalized to all problem of complementary feeding.

DISCUSSIONS

The results showed that the implementation process which was carried out four times was able to increase the mean value of the subject's knowledge by 22.5 points and also an increase in the minimum and maximum value of the subject. The average level of subject knowledge before implementation was "poor", but after implementation, it increased to be in the "sufficient" category. Wahyuningsih's (2014) research on the effect of the educational model on knowledge of complementary foods and the nutritional status of children under five, shows that the education model has a positive effect on the knowledge of the subject/mother ($p = 0.030$). Azzahra's (2015) research on the effect of counseling on the knowledge and attitudes of mothers about complementary feeding shows a good effect and statistically, the increase in knowledge is significant ($p = 0.005$).

Subjects with the level of knowledge about complementary feeding in the "poor" category decreased from 64.1% before implementation to 17.9% after implementation. The level of "good" knowledge increased from 2.6% to 43.6%. The result *t-test* shows *p* (0.000) which means that there is a significant difference between the knowledge before and after implementation. The Wilcoxon test for the category of subject knowledge before and after implementation shows a significant difference with value *p* (0.000).

These results show that if an intensive approach and education is carried out, the knowledge of the desired program targets will increase. It remains only the willingness to provide nutrition education to the community, it can be done continuously with sufficient intensity or not. If not, then don't hope that nutrition problems in the community will be resolved. Edgar Dale's cone theory which states that the reception of information will be more optimal when using images or videos captured by the senses of observation. The same was expressed several researchers associated effect of using the media to increase knowledge such as research Sugiyono (2006) in Puskesmas Jetis, Bantul on the knowledge and practice of giving breastfeeding increases with counseling methods

Complementary Feeding Practices

The practice of distributing breastfeeding is measured through interviews and observations. The practice of giving complementary foods include; suitability of texture or shape, the suitability of frequency of administration, the suitability of quantity, and suitability of species with complementary feeding recommendations.

The implementation process using practical guidelines generally has an impact on improving the practice of complementary feeding in all parameters, an average increase of 24.4%. The texture or shape parameter of the "good" category of food increased by 20.5%. The "good" frequency parameter increased by 15.4%. The number or portion parameter in the "good" category increased by 23.1%. Parameters for species in the "good" category increased by 38.5%. The Wilcoxon test results showed a significant difference in the practice of complementary feeding by subjects before and after implementation, except for the frequency parameters of complementary feeding.

CONCLUSIONS

The response of the subject's mother to the implementation activity using practical guidelines showed a very good and enthusiastic response. The subject stated the contents that were easy to understand and useful for increasing knowledge about how to provide complementary feeding to babies.

The suggestion from this research is complementary feeding practices can be disseminated to communities in collaboration with the government.

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Conflict of interest

This study does not have a conflict of interest for either the researcher or the funding institution.

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MORINGA LEAF BUBBLE DRINK INCREASES HEMOGLOBIN LEVELS IN ADOLESCENT GIRLS

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ABSTRACT

Anemia is a common nutritional problem in the world, especially in developing countries. The proportion of anemia is more common in the female sex. This is because women experience menstrual cycles every month, causing blood loss. Consuming Moringa leaf powder can increase hemoglobin because it contains non-heme iron. Moringa leaf powder can be used as a drink such as bubble drink Moringa leaves. This study aims to determine the effect of giving Moringa leaf bubble drink on hemoglobin levels in adolescent girls. This research is an with a quasi-experimental design with a pretest-posttest design. The study was conducted on 51 samples taken by the stratified random sampling method. Moringa leaf bubble drink is given 2 times a week for 1 month. Data collection was obtained from the results of 24-hour food recall measurements, questionnaires, and hemoglobin levels. Data analysis using Paired t-Test and Anova. The results showed that giving Moringa leaf bubble drink could increase hemoglobin levels in adolescent girls. The increase in hemoglobin has an influence on adolescent girls to help meet the nutritional needs, especially iron (Fe). recommended for young women to be able to consume foods that contain iron more often, such as Moringa leaf burble drinks.

Keywords: *Hemoglobin, iron (Fe), Moringa leaves, adolescent girls.*

INTRODUCTION

Indonesia needs teenagers who are productive, creative, and critical for the progress of the nation. This can only be achieved if adolescents are healthy and have good nutritional status. Anemia is a common nutritional problem in the world, especially in developing countries. It is estimated that more than 30% of the world's population or 1500 million people suffer from anemia and most of them live in the tropics (Shariff and Akbar, 2018). Based on data from Riskesdas (2013), adolescent girls are one of the groups that are prone to suffering from anemia. Based on age group, patients with anemia aged 5-14 years were 26.4% and those aged 15-24 years were 18.4% (Kementerian Kesehatan RI, 2013).

The provision of blood-added tablets (TTD) to adolescent girls is carried out through School Health Enterprises in educational institutions (junior high school and high school). or the equivalent) by determining the day of taking the TTD together. The dose given is one tablet every week for a whole year. The coverage of giving iron tablets to adolescent girls in Indonesia in 2018 was 48.52%. This has met the 2018 Strategic Plan target of 25%. However, in North Sulawesi Province, it only reached 26.72%, not far from the 2018 target (Ministry of Health of the Republic of Indonesia. 2019), (Kementrian Kesehatan RI. 2019).

Iron intake can be obtained through food sourced from animal protein such as liver, fish, and meat. In addition to animal protein, vegetable protein also contains a lot of iron, for example in spinach and Moringa leaves (Paputungan et al, 2016). The addition of spinach to cupcake products shows that the higher the amount of spinach added, the higher the iron (Fe) content of the product (Sam, et al, 2018). Besides spinach, Moringa is also a plant that contains a lot of iron. Absorption of non-heme iron is affected by the body's iron stores and dietary

components. Because not everyone can consume these foods or foodstuffs, additional iron intake must be needed from blood-added tablets (TTD), (Kementrian Kesehatan RI. 2019).

Based on the data above, it is known that the incidence of anemia in adolescent girls is quite high and is caused by various factors, including inadequate iron intake and the provision of blood-added tablets has not been fully administered in all regions. One of the efforts that can be done is the provision of foods that are sourced from iron (non-heme) such as Moringa leaves which are made into Moringa leaf bubble drinks. This study aims to determine the effect of giving Moringa leaf bubble drink on hemoglobin levels in adolescent girls.

METHOD

This study used a quasi-experimental research design with a pretest-posttest design without a control group. The research was conducted in May and June 2021. The research location is in Kalawat Village, North Minahasa Regency. The population in this study were young women aged 12-17 years. Samples were taken by stratified random sampling method so that a sample of 51 people was obtained. The type of data collected is an examination of Hb levels, height, weight, and food consumption with a 24-hour recall form through interviews. Statistical analysis using Paired Sample t-Test and Anova. Moringa bubble drink made in one serving contains the following nutrients. Moringa leaf bubble drink is given 2 times a week for 1 month (8 times).

Table 1. Nutritional Content of Moringa Bubble Drink Formula in 1 Serving

Nutrients	Moringa Bubble Drink Formula
Energi	317,6 kkal
Carbohidrat	46,4 gr
Protein	2,5 gr
Fat	12,5 gr
Iron (Fe)	1,19 mg
Vitamin C	2,5 mg

RESULT

This study was conducted on young women aged 12-17 years who did not experience menstruation at the time of measuring Hb. More young women are 17 years old (60.8%). More details can be seen in table 2.

Table 2. Age Distribution of Adolescent Females

Age (years)	N	%
12	4	7,8
13	3	5,9
14	4	7,8
15	6	11,8
16	3	5,9
17	31	60,8
Total	51	100

The nutritional status of adolescent girls is generally normal (78.4%), but some are overweight (9.8%).

Table 3. Distribution of Nutritional Status of Adolescent Females

Nutritional Status	n	%
Normal	40	78,4
Overweight	5	9,8
Obesity	6	11,8
Total	51	100

The hemoglobin levels of adolescent girls before drinking were generally normal (83.4%) and those with mild anemia were 17.6%. After being given the drink, there was a change in the amount of mild anemia which was reduced by 5.9%.

Table 4. Distribution of Subjects According to Hemoglobin Level Status Before and After Intervention in Adolescent Girls

Classification of Hb Level Status	Hb Level (g/dL)	Before		After	
		n	%	n	%
Normal	>12 g/dL	42	82,4	48	94,1
Anemia	10-11,9 g/dL	9	17,6	3	5,9
Total		51	100	51	100

Changes in hemoglobin levels in each adolescent girl varies from -1.5 g/dl to 2.5 g/dl. The most changes were at 0 – 0.5 g/dl, which was 60.79%. More details can be seen in table 5.

Table 5. Distribution of Changes in Hemoglobin Levels

Changes in Hb Levels	Respondent	
	N	%
-1,5 - -1,1	2	3,92
-1,0 - -0,6	2	3,92
-0,5 - -0,1	2	3,92
0 – 0,5	31	60,79
0,6 – 1,0	9	17,65
1,1 – 1,5	4	7,84
1,6 – 2,0	0	0
2,1 – 2,5	1	1,96
Total	51	100

It is known that there are 6 people experiencing a decrease in Hb at the time of the intervention and 45 others experiencing a significant increase.

Analysis of the difference in hemoglobin levels before and after the intervention can show an increase that occurred during the intervention. These differences can be shown in the following table 6.

Table 6. Analysis of Differences in Hb Levels Pre-test and Post-test

Treatment	
N	51
Mean Pre-test Hb	13,002
Mean Post-test Hb	13,349
Sig. (2-tailed)	0,000

There is a significant difference in hemoglobin levels in respondents with a p value <0.05. The results of the Hb measurement showed that there was an increase in the average Hb of 13.002 g/dL at the initial measurement and 13.349 at the final measurement.

The average intake of Fe (iron) in the adolescent girls respondents still experienced an intake deficit. The severe intake deficit was 35.3%, and the moderate deficit was 19.6%. While the good as much as 35.3%. More details can be seen in table 7.

Table 7. Adequate Fe Intake of Adolescent Girls

Intake Fe	N	%
Weight Defisit	18	35,3
Medium Defisit	10	19,6
Mild Defisit	4	7,8
Well	18	35,3
More	1	2,0
Total	51	100

Adequacy of iron (Fe) in Moringa leaf burble drink at one time contains 4.07 mg. While the need for non-heme iron for adolescent girls is 3.75 mg/day. When compared with intake, the percentage of Fe adequacy is 108.5% in the good adequacy category.

DISCUSSION

Adolescent girls who are the subjects in this study are in the age range of 12-17 years, including in the adolescent age group. Hemoglobin is the pigment that makes red blood cells red, which in turn makes human blood red. According to its function, hemoglobin is a medium for transporting oxygen from the lungs to body tissues. Hemoglobin also functions to carry carbon dioxide as a result of metabolism from body tissues to the lungs for further expulsion when breathing (Adnani, 2011).

Anemia occurs due to several factors known as nutritional and non-nutritive factors. Nutritional factors are low food intake (nutrition), while non-nutritional factors are infection, blood loss (menstruation and bleeding), malabsorption, genetic disorders, metabolic disorders, socioeconomic, and type of family size (Patimah, 2017). In female respondents, it is known that 9 people have mild anemia and 42 people are normal. All respondents were given Moringa leaf bubble drink. After the intervention, there was an increase in hemoglobin levels in 45 people and 3 people who still had mild anemia despite an average increase of 0.1-0.5 g/dl from these 3 people. There were 6 teenage girls who initially experienced anemia turned normal after drinking Moringa leaf bubble.

From the intervention given, there were 45 people who experienced an increase in hemoglobin after giving the product. However, there were 6 other people who experienced a decrease in Hb due to irregular eating patterns so that adequate iron intake was included in the category of severe deficit. They prefer to consume instant noodles when compared to rice and almost every day they consume instant noodles. From direct interviews they also said that their sleep time was irregular and not enough. Of the 45 people who experienced an increase, it was proven that consuming Moringa leaf bubble drink can increase hemoglobin levels in the blood so that Moringa leaves are good for young women, especially those with anemia.

Moringa leaf flour has several hypotensive, anti-cancer, and antibacterial substances, including niacin and pteroglycospermin. Moringa contains iron as much as 28.2 mg/100 grams of dry leaves, 25 times more than spinach, 3 times more than almonds and 1.77 times more absorbed into the blood. In addition, Moringa leaves also have antioxidants, including sitosterol and glukopyranoside, Guevara et al. (Krisnadi, 2015). The Latin name for Moringa leaves is *Moringa oleifera* Lam. Common names of Moringa leaves known in the UK are Moringa, Ben-oil tree, Clarifier tree, and Drumstick tree (Krisnadi, 2015).

Treatment in the form of giving Moringa leaf bubble drink can increase hemoglobin levels in adolescent girls. Adolescent hemoglobin levels in respondents who consumed Moringa leaf bubble drink increased by 0-0.5 g/dL in 31 people, 0.6-1.0 g/dL in 9 people, 1.1-1.5 g/dL in 4 people, and 2.1-2.5 in 1 teenager. While the other 6 people experienced a decrease of 0.1-1.5 g/dL during the 1 month intervention.

Research from Ponomban, et al (2013) also stated that Hb levels after 12 weeks of treatment with Moringa leaf powder (500 mg) there were 19 pregnant women (54%) Hb levels increased by 2 g/dl, 14 respondents (40%) Hb levels increased by 1 g/dl and 2 respondents (6%) increased Hb levels by 3 g/dl. Yulianti's research, et al (2016) also proved that in the intervention group of high school students of Muhammadiyah Kupang who consumed Moringa leaf extract, it could increase hemoglobin levels in the blood, so it was best given to young women.

Anemia can occur in all life cycles, which of course has a negative effect on a person's health. Anemia has a detrimental impact on children's health in the form of impaired growth and development, decreased endurance and concentration power, and decreased learning ability, thereby reducing learning achievement in

school. In growth, the body requires nutrients in large quantities, and one of them is iron. If the iron used for growth is less than what the body produces, anemia will occur (Citrakesumasari, 2012).

From the theory above, the researchers saw the effect of increasing hemoglobin on young women. The results of the tests carried out showed that there was an effect of increasing hemoglobin levels on adolescent girls with a Sig value. 0.046 ($p < 0.05$). In Arini's research (2018), it was also found that there were differences between the intervention groups, so it can be concluded that there is an effect of giving Moringa leaf flour on hemoglobin levels.

CONCLUTION

Giving Moringa leaf bubble drink can increase hemoglobin levels in adolescent females. There is a significant effect on increasing hemoglobin levels in adolescent girls. Recommended for adolescent girls, it is expected that they can consume foods that contain iron more often, such as Moringa leaf burble drinks.

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The Test Of Acceptance And Nutritional Contents Of *Telle Fishball* Formulation As An Alternative Snack For Pre-school Age Children With Picky Eater Risks Of PEM And VAD

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ABSTRACT

Preschool age children experience the *golden age* periode. This research is motivated by the risk of deficiency of protein and vitamin A. The purpose of this study was to determine the acceptability of catfish meatballs with the addition of carrots for picky eater children. This study used an experimental method with a completely randomized design and consisted of three treatment variations. The treatments in this experiment included the addition of carrots to catfish meatballs with a formulation of 20%, 40% and 50%. The acceptability test in the form of an organoleptic test was carried out by 25 moderately trained panelists and located at the Laboratory of the Department of Nutrition, Health Polytechnic of Surabaya. The results of the acceptability test were then analyzed using the *Kruskal Wallis* test and the results showed that the three formulas had significant differences. Meanwhile, the *Mann Whitney* test shows that the panelists preferred fishballs with the addition of carrots by 20% from the aspect of color, aroma, flavour and texture of fishballs. Based on the nutritional contents analysis, it was found that F1 contains 37.2 grams of protein and 378.4 RE of Vitamin A. While F2 contains 33.8 grams of protein and 434 RE of Vitamin A and F3 contains 27 grams of protein and 473 RE of Vitamin A. It is suggested to use catfish as a nutritious source of animal protein. Therefore a variety of snack can fulfill the protein needs of picky eater preschoolers with the risk of PEM and VAD.

Keywords: catfish, carrots, picky eater, organoleptic test

INTRODUCTION

The period of growth and development in toddlerhood is a determining period for future growth and development. Therefore, in order to support the growth and development of toddlers, especially preschoolers, it is necessary to fulfill adequate nutritional needs. Adequate nutrition is a good stimulus to support the growth and development of preschool-aged toddlers until toddlers have optimal affective and cognitive abilities according to their age (Jaji, 2019). This difficulty eating factor is experienced by about 25% at the age of children, and 50% of them who are children aged 18-23 months experience picky eater behavior, as well as the prevalence of picky eaters at the age of toddlers reaching 33.6%. (Mascola et al., 2010).

Preschool age children are a group of children who need adequate nutrition to support optimal growth. However, the preschool age group also tends to have a decreased appetite (Wirjatmadi, 2012). This is a concern for parents not to just allow picky eater behavior in children because it can cause chronic nutritional deficiencies in children (Ong, 2014). Eating is a learning process to introduce new variation of foods to children. It should be done slowly and gradually. With modernization that makes it easier for people to process food instantly, it will form a stimulus for children to imitate it. This is based on the behavior of preschool-aged children who tend to imitate the behavior of those closest to them. (Mascola, 2010).

Errors in eating patterns for preschool children who are not balanced are one of the main causes of poor nutritional status in children. The preschool toddler period, which is the golden period, greatly influences their growth and development. Malnutrition in this period has a negative impact, namely the risk of disability, susceptibility to disease, weight loss, tissue depreciation, digestive disorders and diseases that are lethal or lead to mortality (Khalimatus Sa'diya, 2016).

Protein Energy Malnutrition (PEM) is still a nutritional problem in Indonesia. PEM will have an impact on the growth of toddlers and cause a decrease in the immune system that cause toddlers becomes susceptible to disease (WHO, 2002). The 2010 Basic Health Research (Riskesdas) reported that the prevalence of PEM in Indonesia based on weight-for-age measurements was 17.9%, with the percentage of undernutrition category being 13% and poor nutrition category being 4.9%.

Protein and Energy Malnutrition (PEM) and vitamin A deficiency have a close relationship. PEM in children can cause vitamin A deficiency due to low protein intake which is usually followed by low intake of vitamin A, besides that it can cause inhibition of absorption, transportation, and conversion of vitamin A which causes vitamin A deficiency lowering the immune system thereby increasing the risk of infectious diseases that can worsen the incidence of PEM (Imandira and Ayustaningwarno, 2013). In a study conducted by Marliyati, children with sufficient Vitamin A in the sufficient category were 54.8% while those in the less category were 45.2% (Sri Anna Marliyati, Aji Nugraha, 2014). This shows that there are still many children whose daily intake of Vitamin A is not sufficient so that this can become a nutritional problem in the future. According to USIOM 2000, chemically beta-carotene can be converted to vitamin A as much as 12- μ g -carotene in food. In 1 Retinol activity Equivalent equal to 12- μ g -carotene.

Special attention is needed to prevent the occurrence of PEM and VAD in toddlers. Picky Eater behavior causes intake that should be sufficient to be insufficient thereby increasing the risk of both diseases. Currently, the trend of the meatball industry has shifted to creative innovation. Meatballs can not only be made from beef, but also from other animal products such as chicken, shrimp, and fish. One type of meatball that is quite in demand today is fish ball.

Fish is one of the foods that are often consumed by the public because it contains unsaturated fats and proteins, namely essential amino acids that have an important role for the body (Salman and Syainah, 2018). Fish meatballs generally contain high protein and Omega 3 fatty acids (Susanto, 2012). These nutrients can improve brain development in children.

Currently, the catfish industry is still focused on fresh fish and not many processed products. As a result, the results of catfish farming can not be used optimally so that the stock is still more than the level of consumption. This causes the remaining catfish stock to be left in the pond until its size increases. However, the market share for large catfish is very limited and causes the price of large catfish to fall, so that it often causes losses for catfish farmers. According to Asriani, there are 10% of large sized catfish in each production cycle. In this case, efforts are needed to take advantage of the food potential contained in the supply of large catfish so as to minimize losses for catfish cultivators (Asriani, Santoso and Listyarini, 2019)

Catfish is one of the most desirable fishery commodities to be cultivated by the Indonesian people, but the processing of catfish-based food products is still limited (Aprilianti, 2016). Catfish is one of the leading aquaculture commodities. Catfish farming is increasingly being carried out after the Ministry of Maritime Affairs and Fisheries (KKP) made this commodity a leading commodity in the Minapolitan program (Lindawati, 2013). In addition, catfish is relatively easy to find in various regions and the market price is relatively affordable. Thus, fish can be one of the best choices of animal protein products for families, especially children.

In addition, carrots can also be created into a variety of processed foods. One of them is a mixture of meatballs. Carrots have an attractive color and are easy to soften when cooked, so the addition of carrots to processed fish balls can improve the quality of fish balls from the aspect of appearance, texture, flavour and the nutrients contained in the meatballs. (Kristanti, 2016).

This meatball processed product will be made with 3 formulations with different proportions of catfish and carrots. From this formulation, its purpose is to find a food product that contain high levels of Vitamin A and protein and preferred by toddlers with picky eating behavior. Therefore, these food product can be used as alternative snacks for preschool-aged toddlers who have picky eater behavior to help fulfill the protein and Vitamin A daily needs that may not be fulfilled from main food.

METHODS

This research will be conducted using an experimental research type. The treatments in this study were organoleptic tests and panelists' acceptance of *Telle Fishball* products. This study applied a one-treatment design, that is addition of carrots into the fishball product with three different sub-treatments. The difference in treatment was in the form of random formulations of catfish meatball products as much as 80%, 60%, and 50% of the total percentage of the main ingredients of fish ball products. This research was conducted in November 2020 – April 2021. The manufacture and implementation of the *Telle Fishball* Organoleptic Test of Catfish Meatballs with the Addition of Carrots was carried out at the Laboratory of the Department of Nutrition, Health Polytechnic of Surabaya, Ministry of Health, Surabaya. This study used three formulations with Completely Randomized Design (CRD) on catfish and carrot meatball samples.

Table 2.1 Formulation of *Telle Fishball* Products

Keterangan	F0	F1	F2	F3
Catfish Meat	100%	80%	60%	50%
Carrots	0%	20%	40%	50%

Samples of The Research

The sample used in this study was a processed product of catfish meatballs with the addition of carrots using 3 different formulas. The three treatment samples of catfish and carrot meatballs were then subjected to an organoleptic test to see the panelists' preference for meatball products. After the standard recipe that has been prepared can produce a product with the quality as expected, it can be continued with the acceptance test by the panelists (Wulan Puspita Sari, 2015).

The formulation of catfish meatballs with the addition of carrots to be tested consists of 3 treatments to determine consumer acceptance. In treatment I, catfish meatballs were given with the addition of carrots with a ratio of catfish 80 : 20 carrots. In the second treatment, catfish meatballs will be given with the addition of carrots with a catfish ratio of 60 : 40 carrots. While in treatment III, catfish meatballs will be given with the addition of carrots with a ratio of catfish 50 : 50 carrots. The three formulas will be mixed into the dough with additional ingredients whose composition is homogeneous. Each formula weighs 10 grams each, so that the control formula and the treatment formula were 3 formulas, while all formulas were tested on 25 panelists so that the tested formulas had a total weight of 1000 grams.

Variables of The Research

This study uses the independent variable in the form of variations in the formula for adding catfish and carrots with the following variations:

1. Catfish : carrots = 100% : 0%
2. Catfish : carrots = 80% : 20%
3. Catfish : carrots = 60% : 40%
4. Catfish: carrots = 50% : 50%

This study used the dependent variable in the form of organoleptic properties and nutritional value of each type of fish ball sample formulation.

Procedures of Organoleptic Test

Acceptance testing with organoleptic tests was carried out in several separate rooms consisting of several parts, namely the preparation room, the flavour test room, and the waiting room. Samples of fish balls were presented to the panelists randomly so that the panelists only made an assessment and compared the products 1 time (once). The three variations of samples then placed in one container. Each container is assigned a sample code. The fishball sample was then presented to the panelists to be given an assessment of the organoleptic quality. Research data collection was carried out using the hedonic scale method (*Hedonic Scale Test*) to determine the level of preference and acceptance of the product formula provided by direct observation by the panelists. The results of the observations were then entered into the available form sheet with 4 scales, namely strongly like, like, dislike and dislike very much.

The data were analyzed by conducting organoleptic tests which included color, texture, aroma and flavour parameters contained in the meatball product formulation. Protein and Beta-carotene value in this meatball sample

were calculated using the TKPI (Indonesian Food Composition Table) calculation. Then proceed with statistical analysis with the *Kruskal Wallis* test 0.05 used to determine the difference in the effect of catfish and carrot substitution on the acceptability of meatballs and *Mann Whitney* 0.05 to determine the most significant difference in each formula.

Research Instruments and Tools

- Stove
- Scales
- Steamer
- Meat Mincer
- Dough basin
- Knife
- Food Processor
- Filter

Ingredients

- Catfish meat raw
- Carrot
- Tapioca flour
- Egg white
- Garlic
- Salt
- Pepper

- Spoon

RESULTS

The results of the study include the *Telle Fishball* acceptance test carried out in the flavour test laboratory of the Department of Nutrition, Health Polytechnic of the Ministry of Health Surabaya with a number of moderately trained panelists as many as 25 people. The number of panelists in this study were in the age range of 19-21 years as many as 1 person and the panelists who were in the age range of 22-24 years were 24 people. The *Telle Fishball* formulation used is 3 forms of treatment formula hereinafter referred to as F1, F2 and F3.

Table 3.1 Table of Results of Panelists Likeness Level for *Telle Fishball*

<i>Telle Fishball</i> Formulation					
No	Indicators	Control Formula 100% : 0%	Formula I 80% : 20%	Formula II 60% : 40%	Formula III 50% : 50%
1.	Color	2,32	3,72	3,24	3,76
2.	Aroma	2,72	3,64	3,00	3,44
3.	Flavor	2,64	3,94	2,92	3,64
4.	Texture	2,68	3,84	2,96	3,48
Rata – rata		2,59	3,78	3,03	3,58

Sumber : Penelitian, 2021

From the table above, it can be seen the results of the hedonic test and the level of preference of the panelists on TELLE FISHBALL based on the parameters of color, flavour, aroma and texture. The formula that has the best level of preference is Formula F1 with a percentage ratio of 80%: 20%. Amounted to 3.78. Meanwhile, the least preferred fish ball formula was Formula F2 with a percentage ratio of 60%: 40% of 2.59. The results of fishball products have different organoleptic quality characteristics. This is influenced by the proportion of the main materials, namely catfish and carrots which have different proportions.

1. Color

Based on the results of the analysis of the average level of preference for meatballs on the color aspect, it is known that F3 with a ratio of 50%: 50% gets the highest mean value of 3.76. Meanwhile, the formula that the panelists did not like from the color aspect was F0 (control formula) with a mean value of 2.32.

2. Aroma

Based on the results of the analysis of the average level of preference for meatballs on the aroma aspect, it is known that F1 with a percentage ratio of 80%:20% gets the highest mean value of 3.76. Meanwhile, the formula that the panelists did not like from the aroma aspect was F0 (control formula) with a mean value of 2.64.

3. Flavour

Based on the results of the analysis of the average level of preference for meatballs on the flavour aspect, it is known that F1 with a percentage ratio of 80%:20% gets the highest mean value of 3.64. Meanwhile, the product formula that the panelists did not like from the flavour aspect was the control formula (F0) with a mean value of 2.72.

4. Texture

Based on the results of the analysis of the average level of preference for meatballs on the texture aspect, it is known that F1 with a percentage ratio of 80%:20% gets the highest mean value of 3.78. Meanwhile, the product formula that is less favorable from the texture aspect according to the panelists is the control formula (F0) with a mean value of 2.59.

Table 3.2 Results of Kruskal Wallis Test on *Telle Fishball* Formulation

Variables	Asymp. Sig
Color	0,00
Aroma	0,00

Flavour	0,00
Texture	0,00

Source : Primary Data, 2021

From the table above, it can be seen that all the significance values for the color, aroma, flavour and texture variables are 0.00. When compared with the p value (<0.05), H_0 is rejected, which means that there is a significant difference between the color, aroma, flavour and texture of the treated product.

Table Results of Mann Whitney Test

No	Indicators	Man Whitney Test Value		
		F1-F2	F1-F3	F2-F3
1.	Color	0,007	0,093	0,029
2.	Aroma	0,000	0,186	0,009
3.	Flavor	0,000	0,121	0,000
4.	Texture	0,000	0,096	0,045

Source : Primary Data, 2021

The table above shows the results of the Mann Whitney test on the *Telle Fishball* product. The Mann Whitney test was used to determine the difference between each formula. In color indicators, the formulations F1, F2 and F3 have p value <0.05 . Therefore it can be concluded that both formulations have significant color differences. While the formula F1 and F3 has a p value > 0.05 and H_0 is accepted. Therefore it can be concluded that the formulas F1 and F3 do not have a significant difference both in color, aroma, flavor and texture.

Table 3.3 Nutritional Content of F1 Formula Per 100 Grams

Ingredients	F1 Formula (gr)	Calories (kkal)	Protein (gr)	Fats (gr)	Carbohydrates (gr)	Vitamin A (RE)	Beta-carotenes (mcg)
Catfish meat	80	163,2	11,9	9,88	5,8	0	0
Carrot	20	7,2	0,2	0,12	1,58	0	756,8
Tapioca flour	20	72,6	0,22	0,1	17,64	0	0
Egg white	5	2,5	0,54	0	0,04	0	0
Total	125	245,5	12,86	10,1	25,06	0	758,6

Source : Indonesian Food Composition Table, 2021

From the table above, it can be seen the amount of nutritional content contained in 100 grams of F1 fish balls. This fish ball weighs 10 grams per fruit. As for every 100 grams of F1 fish ball, it contains 12.86 grams of total protein and 758.6 mcg of beta-carotene or equivalent to 63.2 mcg of vitamin A RE.

Table 3.4 Nutritional Content of F2 Formula Per 100 Grams

Ingredients	F2 Formula (gr)	Calories (kkal)	Protein (gr)	Fats (gr)	Carbohydrates (gr)	Vitamin A (RE)	Beta-carotenes (mcg)
Catfish meat	60	122,4	8,95	7,41	4,35	0	0
Carrot	40	14,4	0,4	0,24	3,16	0	1513,6
Tapioca flour	20	72,6	0,22	0,1	17,64	0	0
Egg white	5	2,5	0,54	0	0,04	0	0
Total	125	211,9	10,11	7,75	25,19	0	1513,6

Source : Indonesian Food Composition Table, 2021

From the table above, it can be seen the amount of nutritional content contained in 1 F2 fish ball. This fish ball weighs 10 grams per fruit. As for every 100 grams of F2 fish ball, it contains 10.11 grams of total protein and 1513.6 mcg of beta-carotene or equivalent to 126 mcg of vitamin A RE.

Table 3.5 Nutritional Content of F3 Formula Per 100 Grams

Ingredients	F3 Formula (gr)	Calories (kkal)	Protein (gr)	Fats (gr)	Carbohydrates (gr)	Vitamin A (RE)	Beta-carotenes (mcg)
Catfish meat	50	102	7,46	6,17	3,63	0	0
Carrot	50	18	0,5	0,3	3,95	0	1892
Tapioca flour	20	72,6	0,22	0,1	17,64	0	0
Egg white	5	2,5	0,54	0	0,04	0	0
Total	125	195,1	8,72	6,57	25,26	0	1892

Source : Indonesian Food Composition Table, 2021

From the table above, it can be seen the amount of nutritional content contained in 1 F3 fish ball. This fish ball weighs 10 grams per fruit. As for every 100 grams of F1 fish ball, it contains 8.72 grams of total protein and 1892 mcg of beta-carotene or the equivalent of 157 mcg of vitamin A RE.

DISCUSSION

The results of the consumer acceptance test of the formulation of catfish and carrot meatballs obtained different average values for each organoleptic quality parameter. In the control formula (F0), each organoleptic parameter including color, aroma, flavour and texture obtained the lowest average value when compared to the treatment formula. The presence of characteristics of fish balls that are less favorable or less attractive to panelists causes the level of preference for the control formula to be low.

Based on the results of the acceptability test on the color parameter, the F1 formula of catfish and carrot meatballs with a percentage ratio of 80%: 20% obtained an average value of 3.72. So it can be seen that the F1 fish ball on the color parameter gets a fairly high level of preference. This is in line with the statement of Winarno (2002) where color is the first stimulus seen from a product.

The description of each characteristic is described as follows.

1. Color

According to Winarno, color is the first organoleptic parameter in presentation. Color is the first impression produced by the product because it looks visually. Attractive colors will invite panelists or consumers to taste the product (Winarno, 1997). The resulting fish balls have a bright orange color. The resulting orange color comes from adding carrots to fish balls.

From the analysis of the average level of preference for meatballs on color, it is known that F3 with a ratio of 50%: 50% is the formula that has the most preferred color by the panelists. This is because the orange color seen in F3 fish balls is attractive to consumers. Meanwhile, F0 is the least preferred formula by the panelists. This is due to the pale white color seen in F0 fish balls which is less attractive to consumers.

2. Aroma

According to Soekarto (1985) aroma is also called remote tasting because humans can recognize the taste of food only by smelling the aroma from a distance, humans can smell the odor produced by food because of the presence of olfactory epithelial cells in the upper wall of the nasal cavity which are sensitive to light. odor component. The aroma of the meatballs is influenced by the aroma of fish meat, the aroma of flour, fillers, spices and other added ingredients. Processing of fish balls with a high temperature medium can affect the color, smell, taste and meat products (Sudrajat, 2007).

The aroma contained in the fish ball product has a characteristic fish aroma but does not smell fishy. From the analysis of the average level of preference for meatballs on aroma, it is known that F1 with a percentage ratio of 80%:20% is the formula that has the most preferred aroma by the panelists. This is because the aroma produced in F1 fish balls is not too strong and causes a fishy smell. Meanwhile, the F0 fish balls were not liked by the panelists because there was a slight fishy smell typical of fish, causing the panelists' level of preference for the product to be low.

3. Flavour

Flavour is one of the determining factors whether the product can be accepted by consumers or not. Flavour is something that is received by the sense of taste. There are four main flavours in the human sense of taste, namely sweet, bitter, sour and salty and different responses when modified (Zuhra, 2006). The taste contained in fish balls has a characteristic that tends to be savory, typical of fish.

From the analysis of the average level of preference for meatballs on flavour, it is known that F1 with a percentage ratio of 80%:20% is the formula that has the most preferred aroma by the panelists. This is because the flavour contained in F1 fish balls has a savory taste that is just right and not too strong. Meanwhile, the fish ball formula that the panelists did not like in terms of taste was F0. This is due to the fact that F0 fish balls have a strong taste and tend to be salty, causing the panelists' preference for F0 fish balls to be low.

4. Texture

The content of water, fat and carbohydrates determines the texture of the resulting meatballs. Meatballs with a mushy texture are generally influenced by their high water content, while meatballs with holes are affected by their high fat content (Octavianie, 2002). The rough or smooth shape of the resulting meatball product is an aspect that is assessed from the texture (Soeparno, 2005).

Texture is also influenced by flour as a filler, where when cooked the shrinking meat protein will be filled with starch molecules that can compact the texture. The gluten content of this type of flour can affect the texture of the meatballs. The higher the gluten content of the flour used, the better the texture of the meatballs produced (Maharaja, 2008). The texture contained in fish balls has a characteristic texture that tends to be soft and chewy. From the analysis of the average level of preference for meatballs on texture, it is known that F1 with a percentage

ratio of 80%:20% is the formula that has the most preferred texture by the panelists. This is due to the texture produced in F1 fish balls which has the appropriate level of elasticity.

Meanwhile, the fishball formula that the panelists did not like based on the texture aspect was F0 fish ball. This is caused by the texture contained in F0 fish balls has an inappropriate elasticity and the texture is a little hard, causing the panelists to dislike F0 fish balls.

Based on the results of the *Kruskal Wallis* test, it was found that there were significant differences between the three available formulas. So it can be concluded that each treatment in the formula causes different characteristics of the product so that it also affects the acceptability of the product. Meanwhile, the *Mann Whitney* follow-up test showed that there were significant differences in the parameters of color, aroma, flavour and texture in formulas F1 and F2 and formulas F2 and F3. However, there were no significant differences in the parameters of color, aroma, flavour and texture in the formulas. F1 and F3.

The nutritional value contained in each treatment formulation also contained significant differences. In 100 grams of F1 Telle Fishball contains 245.5 kcal of energy, 12.86 grams of protein, 10.1 grams of fat, 25 grams of carbohydrates and 63.2 RE of vitamin A. The protein content in Telle Fishball F1 is able to meet half the protein needs of preschoolers. Generally, the daily protein requirement for preschoolers is around 20-25 grams. Meanwhile, the beta-carotene content of Telle Fishball F1 is insufficient for the daily intake of preschoolers. This is due to the low proportion of beta-carotene sources in F1 which is only 20%.

In 100 grams of F2 Telle Fishball contains 211.9 kcal of energy, 10.11 grams of protein, 7.75 grams of fat, 25.19 grams of carbohydrates and 126.1 RE of vitamin A. In addition, there was a decrease in the value of fat and carbohydrates caused by the addition of the proportion of carrots to 40%. This also affects the increase in the value of vitamin A to 126 RE.

In 100 grams of F3 Telle Fishball contains 195.1 kcal of energy, 8.72 grams of protein, 6.57 grams of fat, 25.26 grams of carbohydrates and 157.6 RE of vitamin A. In Formula F3, there is a significant decrease in the value of energy, protein, fat and carbohydrates. This is due to the addition of the proportion of carrots to 50%. So that the value of vitamin A also increased to 157 RE.

From the above analysis, it can be concluded that the intake of the three treatment formulas of the *Telle Fishball* product as much as 100 grams did not meet the daily protein and vitamin A needs for preschool-aged children. However, based on the results of the acceptability analysis, the level of preference for the *Telle Fishball* product obtained a fairly high value. Thus, preschool-aged children who experience picky eating can help optimizing protein and vitamin A intake in order to support optimal growth. In addition, the role of parents is also very important in introducing new food variations to children so that children can meet their nutritional needs with various kind of foods.

CONCLUSION

Based on the acceptability analysis on the color parameter, the most preferred meatball formula by the panelists was Formula F3 with a percentage of catfish and carrots of 50% each. On the aroma, flavour and texture parameters, the most preferred meatball formula by the panelists was Formula F1 with a percentage of catfish by 80% and carrots by 20%. Therefore, it can be concluded that the most preferred *Telle Fishball* product is F1 formula with a percentage ratio of catfish and carrots of 80%: 20%. The effect of adding carrots to the three formulations is to give a natural orange color from the beta-carotene substances contained in carrots and to increase the nutritional value of beta-carotene as provitamin A. The nutritional content of *Telle Fishball* has a significant difference between each formulation.

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ACCEPTANCE TEST AND ANTIOXIDANT LEVELS
CAT TONGUE COOKIES
“RED ROSELLA FLOWER FLOUR”
AS AN ALTERNATIVE Snack for HYPERTENSION PATIENTS

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ABSTRACT

Background Hypertension is a condition where systolic blood pressure is more than 140 mmHg and diastolic is more than 90 mmHg. Hypertension often causes no symptoms, while persistently high blood pressure over a long period of time can cause complications. Hypertension often occurs in Indonesia, lifestyle habits such as physical activity, stress factors and food consumption patterns that exist in the community are the main causes of high hypertension sufferers in Indonesia. Therefore, it is necessary to have an innovative snack with antioxidant content, namely rosella flower petals. The purpose of this study was to determine the acceptability and antioxidant level of the Cat's Tongue Pastries "Flour Kelopak Bunga Rosella" as an Alternative Snack for Patients with Hypertension. The experimental design method is 4 formulations of rosella flower petal flour with wheat flour, formulations HR0 (0:150), HR1 (10:140), HR2 (15:135), HR3 (20:130). Using a hedonic scale test based on indicators of color, taste, aroma and texture given to 25 panelists. In testing the antioxidant levels of cat's tongue cookies (rosella flower petals) using the DPPH method on the HR0 formulation (control) and the best formulation was the result of organoleptic tests. The results showed organoleptic properties, the most preferred formulation by panelists was the formulation with code HR1 with a ratio of rosella flower petal flour to wheat flour (10:40). Meanwhile, the antioxidant content in the formulation preferred by the panelists was the HR1 formulation of 21.49% with an IC50 value of 4.309 mg/mL.

Keywords: Antioxidants, hypertension, cake, dry cat's tongue, red rosella flower petals.

INTRODUCTION

Food is a major factor in the emergence of various degenerative diseases, besides that there are other factors that cause this degenerative disease, one of which is lack of physical activity. Why is that because all needs can be met through online media. One of the degenerative diseases is hypertension. Hypertension is a condition of increased systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg. Hypertension often does not cause symptoms, while persistently high blood pressure in the long term can cause complications (Yonata & Satria, 2016). Complications that can arise include coronary heart disease, stroke, kidney failure and diabetes mellitus (Kurniawati, 2019).

Data obtained from the WHO (*World Health Organization*) in 2015 shows that around 1.13 billion people in the world have hypertension, the number of people with hypertension continues to increase every year, it is estimated that in 2025 there will be 1.15 billion people affected by hypertension and it is estimated that every year there will be 1.15 billion people with hypertension. Every year 10.44 million people die from hypertension and its complications (Indrawati, 2020). One of the food ingredients that has the potential to be developed for food fortification is red rosella flower (*Hibiscus sabdariffa*). Red rosella flower (*Hibiscus sabdariffa*) contains gossypetin, anthocyanin and hibiscin glycosides. Red rosella (*Hibiscus sabdariffa*) contains bioactive compounds, namely antioxidants (Yulita et al., 2017). Red rosella flower (*Hibiscus sabdariffa*) is known as a traditional medicine in Indonesia which can lower blood pressure, prevent cancer, boost the immune system and as an antidiabetic (Haidar, 2016). From various studies conducted on the manufacture of products using the basic ingredients of red rosella flowers (*Hibiscus sabdariffa*) the types of processing are still limited.

The nutritional content of fresh red rosella petals per 100 grams, namely 1.145 grams of protein, 2.61 grams of fat, 12 grams of fiber, 1.263 grams of calcium, 273.2 mg of phosphorus, 8.98 mg of iron, 3.31% malic acid, fructose 0.82%, sucrose 0.24%, carotene 0.029%, thiamine 0.117 mg, niacin 3.765 mg, vitamin C 244.4 mg (P & Jamaluddin, 2017). Seeing the many benefits of red rosella flowers (*Hibiscus sabdariffa*) on the human body, it is necessary to develop a processed food product from this plant where the product can be liked by many people and is beneficial for health. One alternative processed from red rosella flowers (*Hibiscus sabdariffa*) that can be

developed is cat tongue cookies. Objective (a) To identify the results of the acceptance test of cat's tongue cookies made from red rosella flower petal flour for patients with hypertension. (b) Analyzing antioxidant levels in cat's tongue cookies made from red rosella flower petal flour for hypertension sufferers

METHODS

This type of research uses an experimental research design because this study provides treatment to a sample under study and has the aim of knowing the effect of the treatment given. This type of research is true experimental because the subject group is chosen by the researcher randomly or randomly, and in this study a laboratory test is carried out to determine the levels of antioxidants in the product made.

The laboratory test used is the antioxidant test. The research design used is a Completely Randomized Design (CRD) with 1 type of treatment and 4 forms of sub-treatment, namely by substitution of red rosella on cat's tongue cookies as much as 20,15,10 and 0 with a ratio of wheat flour each. treatments were 130,135,140 and 150. Testing of organoleptic properties with a target of 25 moderately trained panelists, knowing the results of organoleptic tests which included color, taste, aroma and texture. The data from the organoleptic test were tested using Kruskal Wallis, if it showed different results, it was continued using the Mann Whitney test to determine the differences between each product formulation made.

RESULTS

The making of cat's tongue cookies (red rosella flower petal flour) consists of several ingredients such as egg whites, margarine, flour and sugar. The difference in composition lies in the use of red rosella flower petals, the difference in these 4 formulations aims to determine the characteristics of each product. The characteristics of the organoleptic tests that have been carried out on the cat's tongue cookies (red rosella flower petal flour) can be seen in the table below.

**Table 1 Characteristics of Cat's Tongue Cookies Formulation
(Red Rosella Petals Flour)**

Cat's tongue cookie formulation (red rosella flower petal flour)				
Indikator	HR0 (Wheat flour: red rosella flour=150:0)	HR1 (Wheat flour: red rosella flour=140:10)	HR2 (Wheat flour: red rosella flour=135:15)	HR3 (Wheat flour: red rosella flour=130:20)
Color	yellowish white	pale yellow slightly reddish purple spots	Reddish pale purple spots typical of rosella quite a lot	Deep reddish purple typical of rosella
Scent	Typical of typical margarine cat tongue cookies	Rosella and a little bit of margarine	Special Rosella	Rosella is very special
Texture	Very crispy, not easily brittle	Crunchy, slightly brittle	Crunchy, not easily brittle	Crunchy, not easily brittle
Flavor	Typical cat tongue cookies	A little bit of sour rosella	Rosella's Special Acid	Very sour, typical of rosella

The HR0 formulation based on organoleptic test results produces a yellowish white color with a distinctive aroma of margarine cat tongue cookies, the texture is very crunchy and not easily brittle, the taste of HR0 cat tongue cookies is typical of cat tongue cookies. The HR3 formulation based on organoleptic test results produces a thick reddish purple color typical of rosella with a very distinctive aroma of rosella, the texture is crispy and easily brittle, the taste of the HR3 cat tongue cookies is very sour, typical of rosella. The HR2 formulation based on the results of organoleptic tests produces a pale reddish-purple color, typical of rosella, quite a lot with a distinctive rosella aroma, the texture is crispy and not easily brittle, the taste of the HR2 cat tongue cookies is the typical acid of rosella. The HR1 formulation based on the results of organoleptic tests produces a pale yellow color with a few reddish purple spots with the aroma of Rosella and a slightly distinctive margarine texture, which is Crunchy, slightly brittle, the taste of HR1 cat tongue cookies is slightly sour, typical of Rosella.

Average Organoleptic Test of Cat's Tongue Cookies (Rosella Flower Petals Flour). Cat's tongue cookies (red rosella flower petals) were given 4 formulations of wheat flour: red rosella flour with 150:0, 130:20, 135:15

and 140:10 formulations. Furthermore, the panelists were asked to conduct an assessment of the cat's tongue cookie (red rosella flower petal flour).

The results of the panelists' assessment are as follows:

Table 2 Distribution of Average Ratings for the Formulation of Cat's Tongue Cookies (Red Rosella Flower Petals)

Cat's Tongue Cookie Formulation (Red Rosella Flower Petals Flour)				
Indikator	HR0 (Wheat flour: red rosella flour = 150:0)	HR1 (Wheat flour: red rosella flour = 140:10)	HR2 (Wheat flour: red rosella flour = 135:15)	HR3 (Wheat flour: red rosella flour = 130:20)
Color	2,96	3,48	3,76	3,96
Scent	2,96	3,72	3,88	3,25
Texture	2,88	4	3,84	3,68
Flavor	3,04	4,32	3,64	3,16
Average	2,96	3,88	3,78	3,51

Description of Assessment Criteria:

1= Strongly Dislike; 2= Dislike; 3= Neutral; 4= Like; 5= Really Like

Based on the table above with the four formulations of the cat's tongue cookie (red rosella flower petals) with a total organoleptic test assessment using a hedonic test scale so that the panelists' general preference results can be seen based on the color, aroma, taste and texture of the cat's tongue cookie (petal flour). red rosella flower) which is the panelist's favorite, namely the formulation with the HR1 code with an average rating of 3.88 which is included in the like category.

Kruskal wallis test results Cat's Tongue Cookies (Red Rosella Flower Petals) can be seen below:

Table 3 Kruskal Wallis Test Results Cat Tongue Cookies (Red Rosella Petals Flour)

No	Indikator	Score Mann Whitney Test
1.	Color	0,001
2.	Scent	0,002
3.	Texture	0,000
4.	Flavor	0,000

Based on table 5.3 the results of the *Kruskal Wallis* test on all indicators which include color, aroma, texture and taste have a p value <0.05, which means that there are differences in color, aroma, texture and taste. The results of the *Kruskal Wallis* test showed that there was a difference between the color, aroma, texture and taste of food followed by the *Mann Whitney* test.

Table 4 Mann Whitney Test of Cat's Tongue Cookies (Red Rosella Flower Petals)

No	Indikator	Score Mann Whitney Test					
		HR0:HR3	HR0:HR2	HR0:HR1	HR3:HR2	HR3:HR1	HR2:HR1
1.	Color	0,000	0,002	0,052	0,424	0,113	0,365
2.	Scent	0,031	0,000	0,002	0,133	0,351	0,533
3.	Texture	0,000	0,000	0,000	0,521	0,141	0,377

4.	Flavor	0,002	0,000	0,000	0,046	0,000	0,004
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Based on the results of the *Mann Whitney test* for indicators of color, aroma and texture, it can be concluded that the comparison between the control red rosella flower petals flour cookies (HR0) when compared to the red rosella flower petals flour cat's tongue pastries formulations (HR1, HR2, HR3, HR4) has a P value <0.05 indicating that the hypothesis is accepted, which means that there are differences in color, aroma and texture in the formulation. Meanwhile, the comparison between formulations has a P value > 0.05 which indicates that the hypothesis is rejected, which means that there is no difference in color, aroma and texture in the formulation.

Based on the taste indicators, it can be concluded that the comparison between the control red rosella flower petals flour cookies (HR0) when compared to the red rosella flower petals powdered cat tongue pastries formulation (HR1, HR2, HR3, HR4) has a P value <0, 05 indicates that the hypothesis is accepted, which means that there is a difference in taste in the rosella flower petal cat tongue cookies. Meanwhile, when compared between formulations having a P value of <0.05, it indicates that the hypothesis is accepted which means that there is a difference in taste in rosella flower petal cat tongue cookies.

The results of the analysis of antioxidant levels in the Cat's Tongue Cookies (Flour Petals Rosella Merah) the control group and the formulation with the code HR1 in 100 grams.

The results of the antioxidant activity test and IC₅₀ value can be seen as follows:

Table 5 Antioxidant Activity Test Results and IC₅₀ Value in 100 grams of cat tongue cookies (red rosella flower petals)

Sample	Antioxidan Activity	IC ₅₀ Value (ppm) (mg/ml)
Control (HR0)	20,41	1,513
Formulation (HR1)	21,49	4,309

The results of the analysis of antioxidant levels showed that the highest levels were found in the formulation of cat's tongue cookies with the formula HR1 code (140:10) with an antioxidant activity value of 21.49% inhibition, with an IC₅₀ value of 4.309 mg. While the results of the analysis of antioxidant levels in the red rosella flower petal cat tongue cookies product in 1 recipe.

The antioxidant content in 1 recipe can be seen as follows:

Table 6 Antioxidant Content in 1 Recipe Total Weight 400 grams of Cat Tongue Cookies Red Rosella Flower Petals

Product	Weight (grams)	Amount	Antioxidan Activity
Cat's tongue cookies (HR0)	400	75 Pieces	81,64
Cat's tongue cookies (HR1)	400	75 Pieces	85,96

In 1 cat's tongue cookie recipe, 75 seeds of cat's tongue cookies (rosella flower petals) weigh 5.3 grams each. In accordance with laboratory examinations, the antioxidant levels in red rosella flower petals cat tongue cookies are 21.49, which means that in 100 grams of red rosella flower petals cat tongue cookies there are 21.49

grams, while in 1 recipe with a total weight of 400 grams has an antioxidant activity of 85, 96. The higher antioxidant activity was due to the addition of red rosella flower petals in the cat's tongue cookies with code HR1.

The antioxidant content in 1 serving for snacks is as follows:

Table 7 Antioxidant Content in 1 Snack Serving

Product	Needs in 1 Snack	Amount	Antioxidan Activity
Cat's tongue cookies (HR0)	255 Kkal	6 Pieces	6,43
Cat's tongue cookies (HR1)	255 Kkal	6 Pieces	6,87

One snack requires 255 kcal of calories with 6 red rosella flower petals cat tongue cookies in each serving with a total antioxidant content of 6.43 in the code (HR0) the ratio of wheat flour: red rosella flower petals flour (150:0). While the code (HR1) has an antioxidant level of 6.87 of the ratio of wheat flour: red rosella flower petals (140:10).

Table 8 Contents of Energy, Protein, Fat and Carbohydrates in 1 Snack Serving

Product	Energy Content	Protein content	Fat Content	Carbohydrate Content
Cat's tongue cookies (HR0)	255 Kkal	4,2 gram	12,3 gram	24,2 gram
Cat's tongue cookies (HR1)	255 Kkal	4,2 gram	12,3 gram	24,2 gram

The content of red rosella flower petals cat tongue cookies with codes (HR0) and (HR1) in 1 serving is 6 seeds with 255 kcal calories, 4.2 grams protein, 12.3 grams fat and 24.2 grams carbohydrates.

DISCUSSION

Antioxidants are substances that inhibit oxidation reactions by free radicals which can cause damage to unsaturated fatty acids, cell wall membranes, blood vessels and DNA, causing degenerative diseases. Antioxidants can inhibit oxidation reactions by free radicals or neutralize free radicals so that they can reduce the possibility of deteriorating conditions due to degenerative diseases, with that need support from sufferers to maintain a healthier and better lifestyle to obtain results from the benefits of these compounds (Islam et al. , 2020). antioxidant compounds will decrease due to the influence of temperature variations during the drying process because these compounds are sensitive to light and heat. Therefore, with the benefits arising from this compound, in handling or processing, including in the washing process, drying process, the temperature used for the processing of a product must be considered so that the content of this compound is maintained properly (Jurian, 2018)

Based on the results of the organoleptic test, the panelists liked the taste of HR1 cat tongue cookies which had a slightly sour taste, as evidenced by the organoleptic results with a value of 4.32. Based on the texture indicator of the formulation with the HR1 code which is the panelists' favorite with a value of 4 which is included in the like category, which has a crunchy texture and is slightly brittle. Based on the distribution of the average assessment of the formulation of the cat's tongue cookie (red rosella flower petal flour), the HR1 formulation had the highest value of 3.88, with assessment indicators including color, aroma, texture and taste. The results of the antioxidant test in the formulation preferred by the panelists were HR1 with an antioxidant activity value of 21.49%. While the control formulation HR0 has an antioxidant activity value of 20.41%. This indicates that the HR1 formulation has a higher antioxidant content than HR0 due to the addition of 10 grams of red rosella flower petal flour in HR1 while in HR0 there is no addition of red rosella flower petal flour.

From the various studies conducted with the manufacture of products using the basic ingredients of red rosella flowers (*Hibiscus sabdariffa*) there are still limited types of processing, processing into tea or brewing directly with water is very much done. in patients with hypertension in Banjar Sulangi, Sulangi Village as

evidenced by the number of patients before not being given boiled red rosella flowers (*Hibiscus sabdariffa*) hypertension degree I amounted to 12 respondents (36.3%), hypertension degree II amounted to 19 respondents (57.6%) and degree III amounted to 2 respondents (6.1 %). After being given a decoction of red rosella (*Hibiscus sabdariffa*) flowers, 10 respondents (30.3%) high normal blood pressure and 23 (69.7%) grade I hypertension were given. Success in research must be balanced with patterns of changing eating habits and activities carried out daily by respondents in order to obtain accurate results, (Nurlina, 2019).

The mechanism of the red rosella flower (*Hibiscus sabdariffa*) in lowering blood pressure because it contains antioxidants that have the ability to maintain the elasticity of the walls of blood vessels in the body, the more elastic the walls of the blood vessels, the smaller the systemic resistance. With less systemic resistance, the body does not need a lot of energy or high pressure to circulate blood throughout the body. Red rosella flowers (*Hibiscus sabdariffa*) have a high antioxidant content which has the benefit of maintaining and stimulating the capillaries in the body so that the blood pressure in the body will improve (Afitasari et al., 2017).

From various studies conducted with the manufacture of products using the basic ingredients of red rosella flowers (*Hibiscus sabdariffa*) there are still limited types of processing, Seeing the many benefits of red rosella flowers (*Hibiscus sabdariffa*) to the human body, it is necessary to develop a processed food product from this plant where the product can be liked by many people and beneficial for health. One alternative processed from red rosella flowers (*Hibiscus sabdariffa*) that can be developed is cat tongue cookies. Cat's tongue cake is a type of pastry that has a long shelf life. The shape of this cookie is oval and thin, it tastes sweet when combined with red rosella flowers (*Hibiscus sabdariffa*) will bring out a sour and sweet taste so it doesn't get bored quickly. In addition, the manufacture of these processed products can also be used for snacks that are rich in nutrients and beneficial for the body.

CONCLUSION

In the results of the study, 25 panelists liked the cat's tongue cookies (rosellamerah petals) with the HR1 code. Wheat flour formulation: rosellamerah flower petals (140:10) with color, aroma, texture and taste indicators, the average result was 3.88. with likes category. The results of the antioxidant test in the formulation preferred by the panelists were HR1 with an antioxidant activity value of 21.49%. Cat's tongue cookies with rosella flower petals flour with a higher antioxidant content is one of the good snacks for people with hypertension.

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Food Behavior chosen among communities in preventing of COVID-19 infection in East Java

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Abstract.

Covid-19 prevention including food behavior must be promote to increase body immunity and decrease the spread of infection. The aim of this study was to describe the prevention behavior of Coronavirus Disease (COVID-19) among communities and to examine their food behavior during pandemic. We did analysis from secondary data. Data was derived from online survey with self-administered questionnaire did by Nutrition Laboratory. A 721 respondent aged 19-60 years old who lived in East Java province was included. Respondents characteristics, information resource and food behavior regarding with covid-19 prevention were collected. The most of respondent was educated and worked in private sector with the mean age of 33 years old. We showed that washing hand both using soap and handsanitizer was the most prevention behavior which was done by 97% respondents followed by limiting outdoor activities (85%) and eat balanced diet (82%). Online health information was the most trustworthy resources regarding their prevention behavior which was chosen by 75% respondents, followed by health-care worker information (70%). Increasing fruits consumption was the food behavior change during pandemic, beside reducing buying food outside. Guava, banana and dried date was the three top vitamin A rich-fruits chosen by respondents. We concluded that increasing fruits consumption should be promoted as education among communities in East Java by online media as the education channel for communities.

Keywords: COVID-19, food behavior, prevention, fruits consumption

INTRODUCTION

Coronavirus Disease (COVID-19) is an infectious disease caused by the novel coronavirus namely SARS-CoV-2. Globally, the number of confirmed positive cases has reached 8,860,331 on the middle of June 2020 and the death number reached 465,740 [1]. These numbers could

increase over the time. Currently, there are no vaccines or specific pharmaceutical treatments available for COVID-19. Therefore, public health intervention should slow transmission and spread of COVID-19 infection through personal protective, environmental, and social distancing [2].

WHO recommends eight steps of community protection from COVID-19 infections. Those recommendations include 1) regularly and thoroughly clean hands with an alcohol-based hand rub or wash hands with soap and running water, 2) maintain physical distance at least 3 feet between others, 3) avoid crowded places, 4) avoid touching eyes, nose, and mouth, 5) follow good respiratory hygiene, 6) stay home and self-isolate even with minor symptoms such as cough, headache, mild fever until recover, 7) seek medical attention if having a fever, cough, and difficulty breathing, 8) keep up to date on the latest information from trusted sources [3].

According to the latest situation, East Java placed the third province which has the most positive cases in Indonesia, replacing Indonesia capital city DKI Jakarta. East Java province confirmed 11,178 positive cases and the death cases reach 813 in the end of June 2020 [4]. Adult is at risk of developing COVID-19 symptoms because the prevalence of chronic diseases were high within this age-group [5]. Given above situation, we aimed to study the prevention behavior of COVID-19 among communities in East Java. Furthermore, we would like to research the media sources that communities trust regarding the information of those preventions.

METHOD

Materials

This present research is secondary data from a descriptive online survey. The variables of interest were asked using an online question form and self-administrated. Each question was closed question and optional answers were provided.

Procedure

This online survey was sent as a link into website, social media, and WhatsApp group channels. Common people could have an access on it when click the link given. Random people could have an access into the link. However, people aged 19-60 years old who live in East Java Province were our inclusion criteria.

All the variables of interest including respondents' identity, prevention behavior towards COVID-19 infection, and the information source they trust were asked using the online survey questionnaire. The online form of questionnaire was able to automatically record the answers collected from the respondents. This record then downloaded in the form of Ms. Excel. Data check and clearance was made for any double respond and to exclude the respondents from other area of East Java Province. We calculated the number and the percentage of the responds from each variable and present those descriptively using tables.

RESULT

We involved 721 respondents through this present online survey, consist of 79% female and 21% male with the mean age of 33 years old (see table 1). The online questionnaire was able to collect the data from 37 cities/ districts in east java province and only one city was not represented in this survey. Surabaya becomes the city whose respond the most of all.

The most education background hold by respondent is bachelor degree (43%) and almost an half of them work as employee in private sector (41%, see table 1).

Table 1. Respondent Characteristics

No.	Characteristics	n	%
1	Gender	Female	79
		Male	21
2	Age	19-28 years	44
		29-38 years	22
		39-48 years	21
		49-60 years	12
3	Education level	Primary school	2
		Junior High School	2
		Senior High School	18
		Diploma degree	25
		Bachelor degree	43
		Post-graduate degree	10
4	Employment status	Unemployed/ housewife	17
		Students	8
		Kader posyandu	0.1
		Farmer	0.1
		Doctor	0
		Teacher/ lecturer	3
		Private sector	41
		Online driver	0.1
		Civil servant	24
		Entrepreneur	6

First of all, we asked the respondents about the behaviors they conducted to prevent COVID-19 infection. Respondents were allowed to choose more than one option of prevention behavior given in questionnaire.

As depicted from table 2, the most practiced behavior by the respondents is hand washing both using soap and alcohol based-sanitizer (97.5%). Next, limiting outdoor activities and well-balanced diet consumption become the second and the third behavior that mostly practiced respectively by 85.2% and 82.4% of our respondents. Break pattern (53.6%), supplement consumption (36%) followed by physical activity improvement (6.8%) are the fourth and fifth prevention mostly done by respondents. Only 53% respondents reported wearing masker as their preventive behavior to COVID-19. And we found that most of the respondents said that they used cloth mask more than medical mask due to availability and affordability of the mask.

It is also interesting that we found still a little presentation person reported to have no action regarding COVID-19 prevention.

Tabel 2. Health-related behavior to prevent COVID-19 infection reported by respondents.

No.	Health related behavior to prevent Covid-19	(n)	Percentage
1.	Hand washing	709	97,5
2.	Eat well-balanced diet	595	82,4
3.	Supplement consumption	262	36,0
4.	Physical activity improvement	49	6,8
5.	Wear mask	387	53,6
6.	Limiting outdoor activity	615	85,2
7.	Sun bathing	1	0,1
8.	Do nothing	2	0,3

Furthermore, we asked the respondents in regard the source of COVID-19 information they trust. Online sources such as social media and website became the media our respondent trust the most followed by information from health care worker (see table 3). Television and information from relatives or neighbors are the third respondents' preferred sources of information. Newspapers, magazine and scientific journals are not the choice of respondents in seeking information related to COVID-19.

Tabel 3. Information resources regarding COVID-19 prevention

No.	Information resource	(n)	Percentage
1.	Television	91	13.0
2.	Newspaper/ magazine	32	4.0
3.	Online sources (social media and website)	538	75.0
4.	Health care worker and RT, RW, lurah	506	70.0
5.	Family and peer (Neighbour, friends)	96	13.0
6.	Scientific articles and seminar	6	0.01

To prevent the covid-19 virus from entering a person's body, it is necessary to have adequate and optimal food intake according to balanced nutrition guidelines. Therefore, we also asked about what eating behaviors were carried out by respondents during this covid-19 pandemic. Increasing fruits consumption, decreasing food bought from outside and increasing protein source in main meal were the three big food behaviour chosen by people during covid-19 pandemic in east Java. As can be seen in table 4 the other behave people did were decreasing consume instant food and increasing vitamin supplements. Nevertheless, there was less than 5% people did not do anything special during this pandemic.

Tabel 4. Food Behavior during Covid-19 pandemic

No.	Information resource	Frequency (n)	Percentage
1.	Increasing fruits consumption	576	79,9
2.	Decreasing food bought from outside	447	62
3.	Increasing protein source in meal	324	45

4.	Decreasing instant food	209	29
5.	Increasing vitamin supplements	21	3
6.	The same before covid-19	14	2

DISCUSSION

Our present result suggested that almost all of the respondent behaved properly and demonstrated several actions to prevent themselves from COVID-19 infection. Several of those actions were related to WHO recommendation to prevent COVID-19 infection [6]. This finding is relevant because more than an half of the respondents hold higher degree on education. Education has associated positively with health behavior. The more educated people found easier to obtain and evaluate information [7]. However, there is an interesting thing that we need to pay attention, that there are only half of the respondents who use masks in their daily activities. This of course needs to be watched out for because masks are the initial protection for the transmission of the Covid-19 virus, especially when they used the cloth mask. In the beginning of covid-19 pandemic, as the result of the survey found that respondents more often used cloth mask than medical mask. The medicine mask became a superior things to be found and bough by respondents. According to Chughtai AA, et al study (2020) about the effevtiveness of cloth mask in preventing diseases found that “ Cloth mask have been used in the healthcare and community setting to protect from the repiratory infection include during covid-19 pandemic, even it was debatable. The filtration effectiveness of cloth masks is usually lower than medical masks, however, if the community only had the cloth mask, it may give some protection if it is used properly and correctly”[12].

The habit of washing hands in this study is indeed visible. But how were the community wash their hand properly according to the right regulation of handwashing is being asked. That is the limitation of this study, which had not ask about the step of respondents in washing their hand. It was showed that almost one hundred persen of the community had already hand washing, but the prevalence of covid-19 transmission also still high at that study period. It might due to unproper handwash habit in the community[5]. According to WHO,2020 recommended to all people around the world to do handwash properly and frequently especially if have outdoor activities. Communities should be stay at home to keep safe during this pandemic, but if supposed have to go outside, they should do the health protocol hardly [2].

Talking about covid-19 information which are trusted by community, our result was inline with another study from Nemati, et al. (2020) which suggested that social application and WHO website played the most important role as the information resource regarding COVID-19 [8]. Due to globalisation, internet was widely used by many people including Indonesians. The development in mobile phone and device nowadays enable people to access internet. According to previous studies, Indonesian people spend 4-6 hours daily to access internet [9]. Moreover, it was also noticeable that 28% of the Indonesian population or nearly 72.7 million of Indonesian have active social media [10].

Covid-19 situation had effect to change in every aspect of people’s live around the world, including Indonesia. Covid-19 has not only changed in health sector, but also in the economic, education, culture, and indeed in food behaviour. Our research found that more than third quarter of respondents choosed to take fruits consumption more than before civid-19 pandemic. This result was inline with other survey from Indonesia Horticulture Research Center, which stated that as much as 37.48% of the adult population in Indonesia increased their consumption of fruits during this COVID-19 pandemic. Meanwhile, vegetable consumption only increased by about 29.45%. There are 3 highest fruits consumed by the community, namely bananas, papayas and oranges [11]. This is slightly different from the results of studies conducted in Germany, Denmark and Slovenia where during the lockdown period due to the COVID-19 pandemic, it was shown that there was an

overall reduction in the consumption of fresh foods, but an increase in the consumption of food with a longer shelf life in Denmark and Germany [7]. Meanwhile, for changes in respondents' eating behavior during the COVID-19 pandemic, which occupies the second largest percentage, it is to reduce buying food from outside the home. The public is aware of the large number of exposures to COVID-19, which can be transmitted through the air, saliva splashes or other unsanitary behavior, including food sold on the streets or stalls. Therefore, they prefer to cook their own food at home and reduce the frequency of buying food from outside the home or stall. Many people who have a high risk of being exposed to the Covid-19 virus, which include having comorbidities such as hypertension, diabetes, coronary heart disease and obesity and smokers, should be extra careful in their activities. It was in accordance with WHO recommendation also that stay at home for all ages to take steps to protect themselves from the virus, for example by following good hand hygiene, good respiratory hygiene and maintain social distancing, it is particularly important for people who are within these high-risk groups to avoid crowded places and close contact with anyone with respiratory symptoms, and practice regular hand washing and other protective measures [2].

Increasing protein source and food supplement are also one of the behavior taken by the communities in this study, and conversely they reduce the amount of instant food in their daily menu. This is a good change in eating behavior to increase their immune system and protect against the entry of viruses into the body. Animal protein is able to increase the body's positive response in preventing infection and supplements of several vitamins such as vitamins A, C and D are recommended by the government during this covid-19 pandemic. This is of course also very in line with the nutritional messages conveyed in the Indonesians Guidelines for Balanced Diet for where there are restrictions on the use of sugar and salt in food processing, especially instant food [4].

CONCLUSION

Our present study indicates that almost all communities in East Java province who became our respondents showed preventive action towards COVID-19 infection. But not all of them behaved properly according to health protocol recommended by WHO. There was people still did not used masker properly. Fortunately most of them behave to consume more fruits than usual. Guava, banana, and dried date were vitamin A-rich fruits was chosen by them. Internet plays the important role as the trusted information accessed by communities regarding prevention to COVID-19. As COVID-19 is still spreading through nation, health information and education could be done using internet as the most trusted resource among communities.

ACNOWLEDGEMENTS

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Nutrition Knowledge and Frequency of Food Consumption During COVID-19 Outbreak

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ABSTRACT

Nutrition recommendation is expected to provide better knowledge and eating behavior so that it can help to maintain nutrition and healthy lifestyle during COVID-19 outbreak. The purpose of this study is to determine the relationship between the knowledge of nutrition recommendation and the frequency of food consumption during COVID-19 outbreak. This research was a descriptive study with a cross sectional design and sampling technique used was purposive sampling. Participants were asked to fill out a survey about the nutrition knowledge during COVID-19 outbreak and frequency of food consumption using FFQ Questionnaire. Nutrition knowledge data consist of 13 questions regarding the nutrition recommendation during the COVID-19 outbreak using the nutrition knowledge Questionnaire. All collected data was analyzed by descriptive test and Chi Square test ($p < 0.05$). The results showed that 70.2% knowledge about nutrition recommendation during COVID-19 pandemic was in the good category. There was a significant relationship between nutrition knowledge and frequency of healthy foods (fruit, vegetable, meat) and unhealthy foods (fast food, instant products, savory snacks and sweet snacks). The knowledge of nutrition recommendation during the COVID-19 outbreak can affect the selection of healthy and unhealthy foods.

Keywords: nutrition recommendation, food frequency, COVID-19 outbreak

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a respiratory disease caused by a new type of coronavirus, namely Novel Corona Virus 2019 or SARS-CoV-2 which emerged in December 2019 from Wuhan, China. The number of cases of this disease continues to grow and becomes a viral pandemic that has infected several countries in the world ^{(1) (2) (3) (4) (5) (6) (7) (8)}.

The first COVID-19 case was announced in Indonesia on March 2020. The distribution data of COVID-19 sufferers as of March 2021 globally amounted to 2,735,133 confirmed cases with 62,944 death cases and a mortality rate of 2.30%. The number of regional cases in Southeast Asia was 167,809 confirmed cases and 1,898 death cases (1.13%). This case has infected 215 countries worldwide and declared 195 countries as local transmission. The number of cases is categorized as very high global risk. Indonesia is one of the countries affected by the local transmission. Data on the distribution of patients in Indonesia in the same month showed 45,028 positive confirmed cases with 1,100 death case (2.44%). The number of affected districts and cities in Indonesia was 416 with 128 local transmissions.

Magetan District is one of the districts with a fairly high increase in COVID-19 cases, as many as 6,680 positive confirmed cases with 159 deaths (2.38%) as of March 1, 2021 ⁽⁹⁾. This increase in cases is due to the lack of adherence of the Magetan people in applying the health protocols, especially when leaving the house, so the risk of being exposed to COVID-19 is greater. In addition, most of those who have been confirmed positive for COVID-19 come to the puskesmas or hospital already in moderate and even tend to be severe status, with oxygen saturation of less than 80%. Even though the Magetan government has imposed The Public Activity Restrictions (PPKM/Pemberlakuan Pembatasan Kegiatan Masyarakat), the social life which is still thick with a culture of community service, social gathering, and feast which are usually carried out in gatherings, is a habit that is still difficult to avoid so that it becomes one of the factors that causes an increase in COVID-19 cases in Magetan ⁽¹⁰⁾.

PPKM is a restriction of public activities in an area suspected of being infected with COVID-19 so that it is expected to help reducing and preventing the spread of COVID-19 ⁽¹¹⁾. Some activities that are restricted during PPKM include learning activities, only done from home and workplace, restrictions on religious activities, and restrictions on activities in public facilities ⁽¹²⁾. PPKM that applies in the long term can affect eating patterns, food availability and food choices in individuals ⁽¹³⁾. This results in the frequency of buying ready-to-eat food becomes more often than cooking it by yourself ⁽¹⁴⁾. A research by Di Renzo *et al.*, and Górnicka *et al.*, (2020) showed that during a pandemic, people have a tendency to consume foods high in fat, sugar, and salt such as fast food, ready-to-eat cereals, and snacks because of limited access to fresh vegetables, fruit, and fish. The result of the research

by Scarmozzino and Visioli (2020) also stated that as many as 42.5% of respondents experienced an increase in consumption of comfort food, such as ice cream, chocolate, desserts and savory snacks.

During the current COVID-19 outbreak, it is very important to know and understand what recommendations for food intake and good eating behavior like. The Ministry of Health issues the balanced nutrition guidelines during the COVID-19 pandemic, one of which is by maintaining a balanced nutritional foods⁽¹⁸⁾. This food intake recommendation is expected to improve knowledge and eating behavior so that it can help maintaining the nutrition intake and healthy lifestyle during the COVID-19 outbreak⁽¹⁹⁾. Based on this study, the researchers are interested in studying how the knowledge of nutrition recommendation and the frequency of food consumption during the COVID-19 outbreak. This study aims to determine the relationship between the knowledge of nutrition recommendation and the frequency of food consumption during the COVID-19 outbreak

METHODS

This research is a descriptive study with a cross sectional design. Sampling was done by purposive sampling technique in which selecting the sample using the criteria that have been determined by the researcher. The inclusion criteria in this study are adults aged 26-45 years who live in the Magetan District area and are able to read, type, and access the internet. While the exclusion criteria are samples of those who are unemployed, have noncommunicable diseases, and have been confirmed positive for COVID-19 and have received/sought for information on healing COVID-19 disease. Determination of the number of participants used the Slovin formula with a population of 144,133 people with a tolerable accuracy percentage of sampling error of 0.1 so that the estimated number of required participant is 120 people with a reserve of 20%.

Data collection was done directly by researchers through filling out online questionnaires using Google Form, the data included: 1) nutrition knowledge data with the total of 13 questions related to the meaning of food intake recommendation; what foods should be increased and limited; servings of carbohydrates, animal side dishes, vegetable side dishes, vegetables and fruit in a day; types of vitamins and minerals that play a role in boosting the immune system, and 2) frequency of food consumption of vegetables, fruit, nuts, animal products, milk, fast food, instant food and snacks (savory and sweet snacks).

Instrument data for nutrition knowledge had been tested for validity and reliability with valid categories. Nutrition knowledge data is given a value of 1 for each correct answer and is categorized as good knowledge if it is able to answer more than 56% of the correct answers from the total questions (or correctly answered 8-13 questions) and lack of knowledge if less than 56% of the correct answers. Data on frequency of food consumption collected using FFQ Questionnaire and grouped based on food ingredients with a frequency of > 3 times a day (score 50), 1 time a day (score 25), 3-6 times per week (score 15), 1-2 times per week (score 10), 2 times a month (score 5) and never (score 0). Frequency of food consumption was categorized as frequent, that is, if the average frequency of food consumption of the subject is more than the average frequency of food consumption of the population. Furthermore, the data obtained were analyzed using SPSS 17 software using the Chi-Square Test.

Data collection that has been carried out from April to May 2021. Penyebaran kuesioner online dilakukan pada sosial media. The online questionnaire was distributed on social media. The research information form and informed consent are shown on the first page of the form. All data was collected anonymously and there was no charge for completing the form. This research has received approval from KEPK FK UNSOED with KEPK Registration No: 082/KEPK/III/2021.

RESULTS

Data collection that has been carried out from April to May 2021 obtained 158 participants who filled out online questionnaires. The researcher selected the participants according to the inclusion criteria. The excluded participants are those who are more than 26-45 years old, live outside the Magetan district, are unemployed, have an infectious disease, and had been confirmed positive for COVID-19. The final result of the number of participants that match the inclusion is 124 participants as presented in Figure 1.

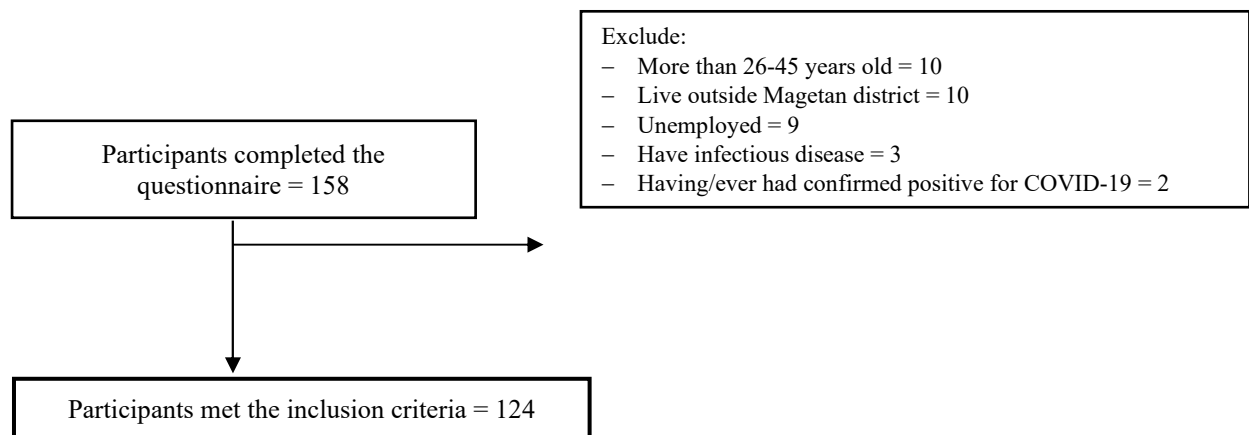


Figure 1. Flowchart of the Process of Collecting Participants

The characteristics of the subjects in this study include gender, weight change, nutritional status, education background, ways of working during the COVID-19 pandemic, average monthly income and eating behaviours during COVID-19 outbreak. The frequency distribution of the participants characteristics can be seen in Table 1.

Table 1. Participants Characteristics

Characteristics	Frequency (n=124)	Percentage (%)
Gender		
Male	52	41,9
Female	72	58,1
Weight Change		
Static/No weight change	69	55,7
Decrease of weight	5	4,0
Increase of weight	50	40,3
Nutritional status		
Underweight	8	6,5
Normal	58	46,8
Overweight	54	43,5
Unknown	4	3,2
Education Background		
Diploma/Bachelor/Master	92	74,2
SMA/equal	32	25,8
Working ways during COVID-19 pandemic		
Full time working at distance	45	36,3
Regular working (directly to workplace)	79	63,7
Average Income per Month (in rupiah)		
≥2.500.000	59	47,6
1.000.000 - <2.500.000	37	29,8
500.000 - 1.000.000	28	22,6
More food portions		
Yes	43	34,7
No	70	56,4
Not sure	11	8,9
Frequency of mealtimes per day		
1-3 times	106	85,5
4-5 times	18	14,5
Snacking more frequent		
Yes	46	37,1
No	63	50,8
Not sure	15	12,1
Frequency of snacking per day		
1-2 times	90	72,6
3-4 times	17	13,7
Never	17	13,7
Cooking more frequent		
Yes	71	57,2

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No	42	33,9
Not sure	11	8,9

Most of participants in this study are female as many as 72 participants (58.1%) and the rest are male, as many as 52 participants (41.9%). Subjects felt that there was an increase in body weight (40.3%) and most did not feel any change. Nutritional status was calculated using Body Mass Index (BMI) based on reports or recognition of the participant's weight and height. Most of the participants had normal nutritional status as many as 58 people (46.8%) and the lowest distribution is undernutrition status, as many as 8 participants (6.5%). A total of 3.2% of participants did not know BMI because they did not do routine weighing. The smallest BMI is 16.3 kg/m² and the largest BMI is 35.5 kg/m². The distribution of the education background is mostly Diploma/Bachelor/Master graduates as many as 92 participants (74.2%) and the rest graduated from high school/equal that is 32 participants (25.8%). The way of working during the COVID-19 pandemic, most of them worked regularly (directly to the workplace) as many as 79 participants (63.7%) and the rest worked full-time at a distance, as many as 45 participants (36.3%) with the most average income of them are 2,500,000 rupiahs, which are 59 participants (47.6%) and the rest is 500,000 - 1,000,000 rupiahs, as many as 28 participants (22.6%).

Most of the participants felt that there was no change in the food portions during the COVID-19 outbreak (56.4%) and the mealtimes frequency of participants was mostly 1-3 times per day (85.8%). Likewise with snacking, half of them felt that there was no change in snacking frequency (50.8%) with the frequency of eating snacks 1-2 times per day. Most of the participants became more frequent in cooking during the COVID-19 outbreak (57.2%).

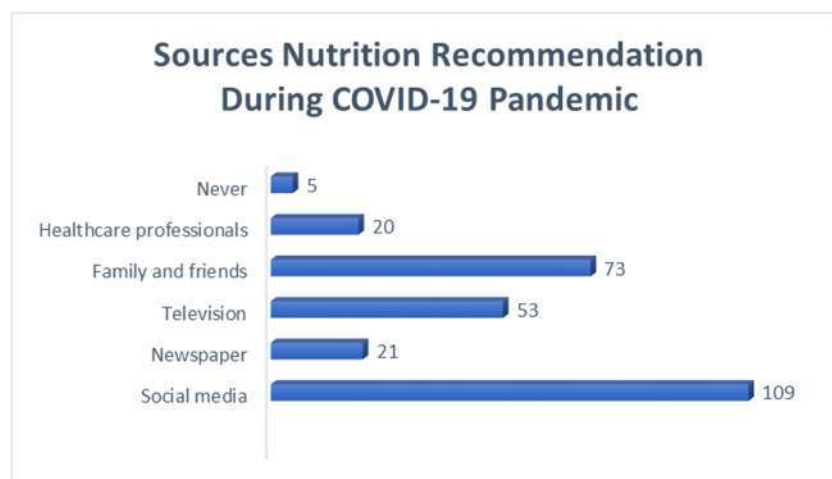
Nutrition Knowledge

The Indonesian Ministry of Health has provided recommendation for Balanced Nutrition Guidelines during COVID-19 Pandemic Outbreak. Most of the subjects have ever read, obtained or sought for the information regarding the food intake recommendations during the COVID-19 outbreak, as many as 119 participants (96.0%) and the rest have never done that as many as 5 participants (4%) as presented in Table 2.

Table 2. The Exposure of Information on the Nutrition Recommendation During COVID-19 Outbreak

Exposure of Information	Frequency (n)	Percentage (%)
Ever	119	96,0
Never	5	4,0
Total	124	100

Most participants had ever read, obtained or sought for the information through social media the most are 109 participants and at least 20 participants are from health workers/nutritionists (Figure 2)*)



Picture 1. The Source of Information

*)multiple responses

Good nutrition knowledge category if they understand: the meaning of food intake recommendation; what foods should be increased/limited; servings of carbohydrates, animal side dishes, vegetable side dishes, vegetables and fruit in a day; types of vitamins and minerals that play a role in boosting the immune system. Based on table 3, it can be seen that the level of knowledge of the participants is mostly in the good category as many as 87 participants (70.2%).

Table 3. The Level of Nutrition Knowledge

Level of Nutrition Knowledge	Frequency (n)	Percentage (%)
Low	37	29,8
Good enough	87	70,2
Total	124	100

The results of this study indicate that most of the participants already understand what exactly is meant by food intake recommendations, what foods should be increased or limited during the COVID-19 outbreak, each of which answered correctly regarding the question, as many as 119 participants (91,1). %, 87 participants (70,2%), and 88 participants (71,0%). However, most of the samples did not know how much of the recommended serving of vegetables, fruit, and carbohydrates consumed in a day so that most of the samples answered incorrectly regarding the question, as many as 97 participants (87,2%), 113 participants (91,1%), and 107 participants (86,3%).

Frequency of Food Consumption

Frequency of food consumption of the participants is measured through the FFQ (Food Frequency Questionnaire) which aims to determine eating habits related to how often the sample consumes types of food ingredients in a certain period of time. The distribution of food frequency based on the groups of food ingredients can be seen on Table 4.

Table 4. The Distribution of Food Frequency Based on The Groups of Food Ingredients

Food Ingredients	Not Frequent		Frequent	
	(n)	(%)	(n)	(%)
Fruits and Vegetables	59	47,6	65	52,4
Nuts	64	51,6	60	48,4
Grains	81	65,3	43	34,7
Meat	48	38,7	76	61,3
Milk and Dairy Products	55	53,2	58	46,8
Fast Foods	63	50,8	61	49,2
Instant Foods	65	52,4	59	47,6
Sweet snacks and sugar	66	53,2	58	46,8
Savory snacks	48	38,7	76	61,3

Based on table 4, it can be seen that as many as 65 participants (52.4%) frequently consumed fruits and vegetables, 76 participants (61.3%) frequently consumed meat, and 58 participants (46.8%) frequently consumed milk and dairy products. From the results above, it can be assumed that the participants frequently consumed these food ingredients because during the COVID-19 outbreak, these food ingredients are in sufficient availability or easy to find, another reason may be that most of the participants have an average monthly income of 2,500,000 rupiahs so it is easy to meet some of these types of food ingredients. On the other hand, most of the participants still frequently consumed savory snacks, as many as 76 subjects (61.3%).

Nutrition Knowledge and Frequency of Food Consumption

Nutrition recommendation based on the Balanced Nutrition Guideline during COVID-19 outbreak that has been issued by the Indonesian Ministry of Health aims to protect families from transmission of the corona virus and how to increase immunity with balanced nutrition. The guideline recommends adequate portions of vegetables and fruit, increasing foods containing nutrition that play a role in increasing body immunity and limiting the consumption of certain foods to reduce the risk of chronic diseases and infections ⁽¹⁸⁾. Table 5 presents the relationship between knowledge of nutrition recommendation and the frequency of food consumption. There was

a significant relationship between knowledge of nutrition recommendation of vegetables, fruit and meat with the frequency of frequent consumption of these foods ($p < 0.05$). This means that good knowledge can increase the nutrition as an effort to prevent COVID-19. Likewise with certain food restrictions. There was a significant relationship between knowledge of nutrition recommendation and restrictions on fast food, instant food products, sweets, sugar and savory snacks ($p < 0.005$). There is a tendency of good knowledge to have frequent consumption of nuts although not statistically significant ($p > 0.05$). The researcher assumed that the frequency of grains and milk consumption is rare because the lifestyle and habits of the Indonesian people do not routinely consume these foods so that statistically there was no relationship between knowledge and the food frequency of grains and dairy products ($p > 0.05$).

Table 5. The Relationship between Nutrition Knowledge and Frequency of Food Consumption

Knowledge of Food Ingredients	Food Frequency				Total		p-value
	Not frequent		Frequent				
	n	%	n	%	n	%	
Fruits and Vegetables							
Less	25	42,4	12	18,5	37	29,8	0,004*
Good	34	57,6	53	81,5	87	70,2	
Nuts							
Less	21	32,8	16	26,7	37	29,8	0,455
Good	43	67,2	44	73,3	87	70,2	
Grains							
Less	21	25,9	16	37,2	37	29,8	0,191
Good	60	74,1	27	62,8	87	70,2	
Meat							
Less	6	12,5	31	40,8	37	29,8	0,001*
Good	42	87,5	45	59,2	87	70,2	
Milk and Dairy products							
Less	16	24,2	21	36,2	37	29,8	0,146
Good	50	75,8	37	63,8	87	70,2	
Fast foods							
Less	10	15,9	27	44,3	37	29,8	0,001*
Good	53	84,1	34	55,7	87	70,2	
Instant foods							
Less	11	16,9	26	44,1	37	29,8	0,001*
Good	54	83,1	33	55,9	87	70,2	
Sweet snacks and sugar							
Less	9	13,6	28	48,3	37	29,8	0,000*
Good	57	86,4	30	51,7	87	70,2	
Savory snacks							
Less	8	16,7	29	38,2	37	29,8	0,011*
Good	40	83,3	47	61,8	87	70,2	

DISCUSSION

The global COVID-19 outbreak that has occurred since December 2019 has forced governments in all countries to implement certain policies to prevent the transmission. These policies, including lockdown, isolation, quarantine, social distancing, physical distancing and PPKM implemented in Indonesia have caused several sectors such as education, places of worship, sports facilities and gathering places to be limited. This forces everyone to do activities at home and do online communication and education activities. As a result, there are changes in mental health, lifestyle and diet. Limited activities outside the home can lead to a lack of physical activity⁽²⁰⁾. In addition, prolonged stress due to limited social activities can interfere the eating habits and changes in body weight⁽²¹⁾. A total of 40.3% of study subjects reported an increase in body weight during the COVID-19 pandemic. Similar to research Cheikh Ismail *et al* (2020), Alhusseini *et al* (2020) and Gornicka *et al* (2020) Di Renzo *et al.*, dan Górnicka *et al.*, (2020) who reported that the increase in body weight during the pandemic was due to an increase in the frequency of primary meals and a lack of physical activity⁽²¹⁾⁽²⁰⁾. Several recent studies have also mentioned the same thing regarding this problem during the COVID-19 outbreak.

Changes in eating habits have also been reported during COVID-19 outbreak due to the implementation of these policies. Changes in eating habits due to this policy are due to the limited access to food and limited market and supermarket facilities so that it can affect eating habits⁽²⁰⁾ Di Renzo *et al.*, dan Górnicka *et al.*, (2020). Limited dining facilities as a result of the implementation of the policy forced a person to process food independently (57.2%). As many as 33.9% of the participants in this study did not process their own food because they could buy food online. During the implementation of the COVID-19 transmission prevention policy, restaurants and diner only serve online orders. This is thought to be the cause of the subjects of this study not processing their food independently. Research by Alhusseini *et al* (2020) stated that there was an increase of 28.6% in buying food online⁽²⁰⁾.

The concept of changing food consumption during the COVID-19 outbreak is complexly presented in Figure 2. In addition to these government policies, each individual has their own perception of food consumption during the pandemic. There are those who pay attention to disease prevention so they will increase food nutrition which can increase immunity. Meanwhile, someone who is worried about COVID-19 is likely to increase the consumption of comfort food. Meanwhile, at the household level, the COVID-19 pandemic will be able to change the ability to prepare and process food⁽²²⁾.

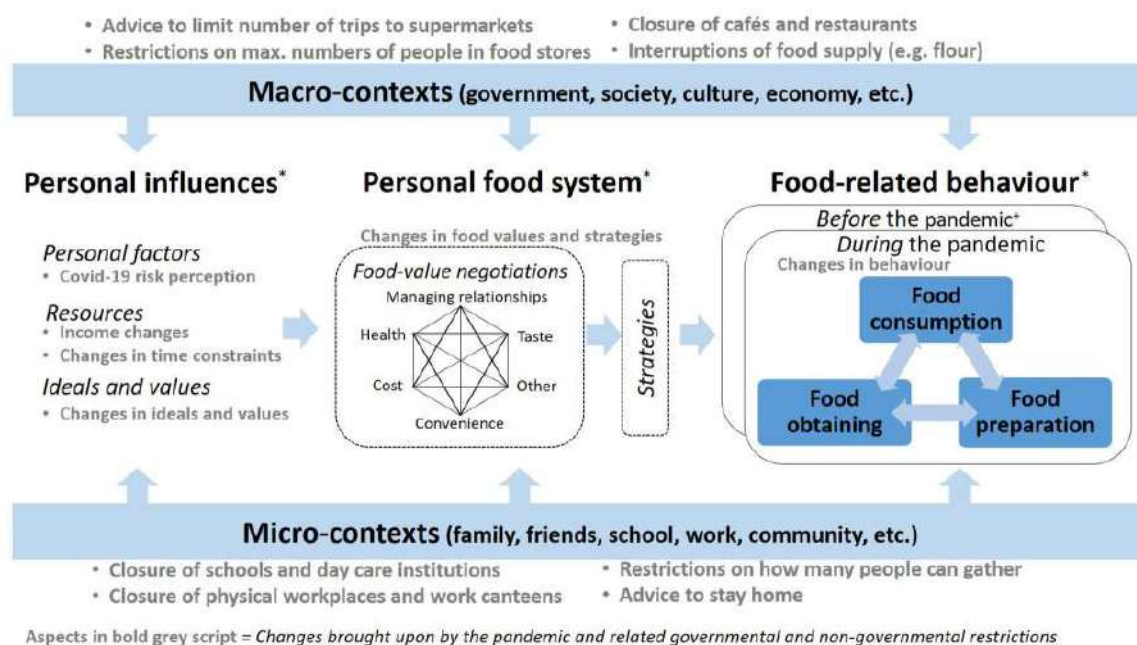


Figure 2. The Concept of Changes on Food Consumption During COVID-19 Pandemic⁽²²⁾

Up to now, there is no cure for COVID-19, so it is necessary to recommend a healthy, safe and balanced nutrition followed by regular physical activity and mental health management. Most of the information on nutrition recommendation during the COVID-19 pandemic in this study was obtained from social media. This is in accordance with a research by Cheikh Ismail *et al* (2020)⁽²¹⁾ which stated that social media is the main source of information. Social media has become one of the Ministry of Health's information media, including the Balanced Nutrition Guideline during the COVID-19 pandemic. It contains the guideline for maintaining a healthy diet during the COVID-19 pandemic and maintaining a balanced nutritional diet in improving the immune system and preventing non-communicable diseases⁽¹⁸⁾. Nutrition is one of the important pillars in creating immunity and preventing from viruses. Balanced nutrition can help to improve the immune system during the COVID-19 pandemic⁽²⁰⁾.

The incessant information from social media is thought to be able to cause the participant's knowledge of nutrition recommendation during the pandemic to be in the good category (79.2%) so that a tendency for an increase in the frequency of consumption of healthy food and a decrease in unhealthy food is reported in this study. Frequent repetition of information about food recommendation during the COVID-19 pandemic can change one's eating habits and food purchasing behavior⁽²³⁾. This is similar to a study by Alhusseini *et al* (2020)⁽²⁰⁾ which compared eating habits before and during the COVID-19 outbreak that there was a significant increase in choosing healthy food and processing their own food.

This study shows that good knowledge can affect the frequency of consumption of certain foodstuffs. Similar to the research conducted by Yilmaz *et al* (2020) and Saah *et al* (2021)⁽²³⁾⁽²⁴⁾ that most of the subjects experienced an increase in knowledge related to healthy food choices and was followed by an increase in consumption of vegetables and fruit. That is, someone who has increased knowledge or has good knowledge will be followed by an increase in consumption of vegetables and fruit. Further research by Yilmaz *et al* (2020)⁽²³⁾ stated that increasing consumption of vegetables, fruit, red meat, and fish can help to boost the immune system and prevent the transmission of COVID-19. Increasing fruits and vegetables as a source of antioxidants is one of the recommendations in eating arrangements during the pandemic⁽²¹⁾. Vegetables are rich in vitamins A, C, B, K, folic acid, iron, potassium, zinc, calcium, beta-carotene, and other antioxidants that can boost the immune system. While nuts contain vitamin E and zinc which can improve a person's immune function⁽²⁵⁾. It is in contrast to research which stated that there is a tendency to decrease fresh foods from vegetables, fruit, meat, fish, milk and bread. Similar to that study, instant food products in this study experienced an increase in consumption during the COVID-19 pandemic. This is thought to be due to the limited availability of fresh food every day, so there is tendency to choose instant food products Di Renzo *et al.*, (2020). In addition, each individual's perception of COVID-19 is different so that it will change one's eating habits.

On the other hand, most of the subjects also frequently consumed savory snacks as many as 76 participants (61.3%). Research conducted by Skotnicka *et al.*, (2021) showed an increase in the consumption of sweet foods and tea before and during the COVID-19 pandemic in Austria with the percentage from 17.85% to 24.36% and from 54.11% to 58.36%, respectively. Another study conducted by Ruiz-Roso *et al.*, (2020) dan Pietrobelli *et al.*, (2020) found an increase in the consumption of comfort foods such as potato chips, fried foods, cakes, chocolate, and sweet drinks during the lockdown due to COVID-19 because people are more often at home so they have more time to consume comfort food. According to Bennett *et al.*, (2021) in a literature study, it was stated that consuming savory and sweet snacks was used to help overcome the anxiety that arose during the lockdown.

The food frequency during the COVID-19 outbreak is not only related to knowledge about nutrition recommendation; there are many other factors that can influence it including food shopping frequency, COVID-19 perception, COVID-19 anxiety, closure of workplace, closure of office canteens, closure of cafe and restaurant, income loss due to pandemic and eating frequency before the pandemic. Changes in shopping frequency will reduce the frequency of shopping for fresh food ingredients such as vegetables, fruit, meat, fish, milk, thereby shifting the purchase of frozen and instant food products. Perceptions about COVID-19 will also affect one's eating frequency. There is someone who has the perception of increasing the nutrition of healthy food to increase immunity, on the other hand there is someone who feels anxious about COVID-19 so they prefer comfort food in the form of sweet, savory snacks and alcohol. Reduced income during the pandemic led to a decrease in consumption of fruit vegetables, food preparation and processing independently, thus shifting to the consumption of bread and sweet foods⁽²²⁾

This study is limited to the data on food frequency during the COVID-19 outbreak, without comparing the differences before the pandemic. The data collected based on the self-reported questionnaire could be one of the biases in data collection or errors in reporting the data personally. Online data collection is limited to subjects who can access the questionnaire, yet have not been able to include subjects who are not reached by the internet or able to fill out research forms. Future research can analyze nutrition knowledge and changes in eating habits and also food frequency before and during the pandemic, both in terms of quality and quantity

CONCLUSION

Good nutrition knowledge about nutrition recommendation during pandemic is able to change a healthy lifestyle by increasing the food frequency which can help the immune system and limiting unhealthy food which can cause negative effects on other health during the COVID-19 pandemic. The results of this study can be used as information related to minimizing the negative effects of the pandemic on the nutrition. The COVID-19 pandemic is still ongoing, the data in this study is to be informed in future studies with larger population.

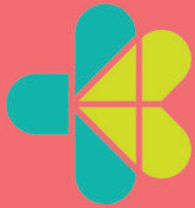
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The Influence of Information Technology-Based Toddler Dental Health Care Model (AGITA) on Mothers towards Teeth Brushing Skills of Children

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ABSTRACT

Toddlers are vulnerable group to dental and oral health since they still need help from other in doing daily activities. Strategies to prevent dental caries in children can be done through behavior changes by involving the role of parents, especially mothers. A new method relate with the mitigation of pandemic Covid 19 need to be developed which this method can reach the goal to increase tooth brushing skill of toddlers. This study used Research and Development (R&D) and model trials using one group pre-experimental pretest and posttest design. There are 5 stages of research namely 1) information collection, 2) model design, 3) expert validation and revision, 4) product/model trials, 5) product results. The mother and child study subjects was 82 samples, given interventions by applying AGITA for 10 days. The data was tested using intra class correlation and Wilcoxon tests. AGITA model validation test obtained an average value of 95.1 is categorized very decent ($p=0.016$) and increased child's teeth brushing skills ($p=0.001$) after the mother applied AGITA in guiding the child in brushing teeth. When mother's knowledge about tooth brushing is increase it will influence their children's skill. The application of information technology-based AGITA model in mothers is effective to increase the child's teeth brushing skills. Recommendation for this software named AGITA can be socialized and applied to more mother and their children in Indonesia.

Keywords: AGITA, Asuhan Gigi Balita, tooth brushing skills

INTRODUCTION

Dental caries is one of the most common chronic diseases of children that can interfere the masticatory system and the quality of life of children so that the growth and the development of the children can be disrupted.¹ The results of Riskesdas 2013 proved that the prevalence of dental caries in children aged 1-4 years is 10.4% and the results of Riskesdas 2018 showed that the prevalence of dental caries in children aged 3-4 years is 36.4%. The data from Riskesdas from 2013 to 2018 experienced an increase in the prevalence of dental caries in children by 26%.^{2,3}

One of the cause of the increasing prevalence of dental caries in children is due to the behavior in maintaining dental and oral hygiene that is not optimal, it is evidenced by the behavior of brushing teeth with the correct category in Indonesian population is only reaching 2.8% and in Central Java Province by 2.0%.² Strategies to prevent dental caries in children can be done through maintaining the dental hygiene by brushing their teeth after having a breakfast and before going to bed at night.⁴

The activity of brushing teeth for toddlers needs to emphasize the role of the mother because the children have not been able to independently maintain their dental and oral hygiene.⁵ The care of dental and oral hygiene in children from an early age will reduce the risk of dental and oral diseases.⁴ The age of toddlers is an age that is vulnerable to the behavior formation to maintain dental and oral hygiene in the form of bad habits such as consuming sweet foods and drinks, using bottles at bedtime, and not brushing teeth after using bottles at night.⁶

Such bad habits of children is a risk factor for dental caries. The prevention that can be done is the active role of mothers in assisting the children in brushing their teeth. In maintaining dental and oral hygiene, the role of the mother is very necessary, because the mother can provide motivation, provide facilities, and guide the children. Behavior changes of brushing teeth of children depend on the stimulus provided and adapted to the development of children.⁷ Stimuli given to children can be in the form of promotive and preventive efforts with the active role of mothers which can be found in the implementation of dental and oral health care for individuals and communities, but there are no special rules for children under five as it is regulated in Permenkes No. 284 of 2016.⁸

Researchers create a model of information technology-based dental health care for toddlers which includes comprehensive continuous activities and evaluations covering the promotive and preventive fields by using effective and targeted communication, information, and education media. The implementation of the model was carried out for 10 days with the active role of mothers using the behavior change theory, before the implementation began, all mothers were given training aimed to form the same perception of mothers by providing stimulus in the form of counseling, simulation, and practice of brushing teeth using power points and videos.

The model stages: the first day is the assessment stage, which aimed to determine the risk factors for the occurrence of dental caries in children, at this stage the mothers input data in the form of children's behaviors that can possibly affect the occurrence of dental caries, the second day is the diagnostic stage, which aimed for mothers to be able to do early detection of dental caries in children by looking directly at the condition of the children's oral cavity and inputting data into the system, the third day is the planning stage, carried out by the dental and oral therapist to determine the material that will be carried out by the mother in the next stage, the fourth – ninth day is the implementation stage which aimed to change the behavior of children's brushing teeth which is carried out for 6 days with the active role of the mother in the form of promotive efforts by providing material to children and preventive efforts by accompanying children to brush their teeth after having a breakfast and before going to bed at night, then the last day, which is the tenth day of the evaluation, aimed for mothers to identify the progress of their children's tooth brushing ability from day to day through the system. The model of dental health care for children under five with a 10-day intervention was named "AGITA". The objective is to improve children's tooth brushing skills.

METHODS

The research design used was Research and Development (R & D) with a pre-experimental one-group pretest-posttest design. This study aimed to develop a promotive and preventive model for toddlers. The research and development have five stages namely: 1) information collection, 2) model design, 3) expert validation and revision, 4) product/model trials, 5) product results.

The sample used in this study amounted to 90 people with details: Sample I for the information collection stage was taken by purposive sampling totaling 5 people. Sample II for the expert validation stage was taken by purposive sampling totaling 3 people. Sample III for the model trials on mothers and children was taken by purposive sampling totaling 41 mothers and 41 children in one group. The data for measuring children's teeth brushing skills was carried out by applying statistical tests. The research data used an interval scale. Statistical test was used to test paired variable data in the intervention group using the Wilcoxon test because the data were not normally distributed.

RESULTS

A. Information Collection

From the results of information collection, it was concluded that to form children's independence in brushing their teeth, it is necessary to have the appropriate educational method and also supported by the active role of the mother as a correct exemplar for children.

B. Model Design

The data obtained from the results of information collection is used to make the model design. The results of information collection revealed that in improving children's tooth brushing skills, an active role of mothers who supported them in promotive and preventive efforts was needed, so the researchers made an AGITA information technology-based model as an effort to improve the children's tooth brushing skills.

C. Expert Validation

Table 1. Expert validation statistic test

Expert Validation					
	N	F (%)	Total	Category	<i>p-value*</i>
Relevant	3	100	95,1	Very good	0,016
Not Relevant	0	0			

**interclass correlation coefficient*

The results of expert validation showed that the p-value = 0.016 which means that the AGITA information technology-based model is proper to be applied in the implementation of dental health care for toddlers.

D. Product/Model Trials

Table 2. Respondent characteristic data

No.	Characteristics of Children	n	%
1	Gender		
	Male	18	43,9
	Female	23	56,1
2.	Age		
	3 years	15	36,6
	4 years	26	63,4

Table 2 shows that the distribution of the frequency of children based on gender is 56.1% with the highest percentage of 23 female children.

Table 3. Table 3. The average value of children's tooth brushing skills before and after given the AGITA model

Variable	Statistic				
	Mean	Delta	SD	Min	Max
Children's tooth brushing skills pre-test	16,12	6,1	2,900	11	25
Children's tooth brushing skills post-test	22,22		3,054	18	29

Table 3 shows that the average value of the children's tooth brushing skill variable pre and post given the information system increased from 16.12 to 22.22. Before proceeding with the next test, the researcher has tested the normality of the data and the result is that the data is not normally distributed, so for the next test will be using non-parametric analysis.

Table 4. The results of the paired data test of children's tooth brushing skills before and after the application of the AGITA model

Variable	Statistic		
	Before	After	p-value*
Children's tooth brushing skills			
a. Mean ±SD	16,12±2,900	22,22±3,054	0,001
b. Min-Max	11-25	18-29	

**Wilcoxon*

Table 4 shows that there is a significant difference in children's tooth brushing skills between before and after the application of the AGITA model as evidenced by a significance value of <0.05. The average result shows that the value after the application of the AGITA model is greater than before the application, so it can be concluded that the application of the AGITA model is effective in improving children's tooth brushing skills.

E. Product Result

The product results are in the form of an information system that can be accessed at <http://AGITA.online/> and a guidebook of information technology-based dental health care for toddlers (AGITA) that contains procedures for using the information systems. The implementation of the AGITA model emphasizes the active role of mothers

in assisting their children to brush their teeth through an information system where mothers play a major role in implementing promotive and preventive efforts in children such as 1) mothers have a role as a mediator to distribute the dental health materials to children, 2) mothers input the data on the system in the form of reports of children's activity of tooth brushing in the morning after having a breakfast and before going to bed at night, and 3) mothers put the schedules of brushing teeth on the system.

Figure 1. Guide book for toddler dental health care model (AGITA)



DISCUSSION

From the results of information data collection, it was concluded that in order to increase children's skill in brushing their teeth, the effort of providing educational methods that were right on target and supported by the active role of the mother as an example for children was necessarily needed. It is in accordance with the results of the previous studies that the educational method of children's tooth brushing activity with the stimulus and the right response for children's growth and development can affect changes in children's behavior and it must emphasize promotive and preventive efforts and also involve the role of the mother.^{9,10} The appropriate model for brushing teeth education to achieve those objectives is the toddler dental health care model (AGITA). The results of expert validity show that the $p\text{-value} = 0.016$, which means that the AGITA model is proper to use in the implementation of dental health care for toddlers. The expert validation process is important in developing the model so that it can produce a model that is useful in improving the quality of education, in accordance with the results of previous studies that media able to convey information clearly, concisely, briefly, and on target will support the process of forming children's tooth brushing behavior.^{11,12}

Toddlers have certain characteristics, they have not been able to independently maintain dental and oral hygiene so that they are categorized in the age group susceptible to dental caries, so children really need special attention from mothers on maintaining their dental and oral hygiene.¹³ Mothers play a fundamental role as parents who are fully responsible for children's dental health and have an important role in children's learning processes such as teaching and assisting children to brush their teeth, which will have an effective impact on children's tooth brushing skills.¹⁴

The mothers are given a training in the form of dental health counseling, so that mothers have knowledge about dental and oral health and can deliver the knowledge gained to their children through brushing their teeth activity, it is in accordance with the result of the previous research that the more effective the training provided to respondents, the more respondents have information about their oral health.¹⁵ The AGITA model was implemented on both mothers and children for 10 days using the behavior change theory of *tedi behavior change* as an effort to build children's teeth brushing skills. The stages of implementing the AGITA model are as follows: the first day of the assessment, the second day of diagnosis, the third day of planning, the fourth to the ninth day of implementation, and the tenth day of evaluation.

The results of the effectiveness test of paired variable data showed a p-value of 0.001, it means that the AGITA information technology-based model was effective in improving children's tooth brushing skills. Children's tooth brushing skills are improved after being given interventions in the form of dental health counseling and animated videos demonstrated by mothers to their children, this is in accordance with previous research that animated video media makes children concentrate more on counseling activities because both the senses of hearing and vision are used simultaneously and in building teeth brushing skills, it is necessary to involve interaction between children and their mothers.^{16,17}

CONCLUSION

Based on the results of the study, it can be concluded that the toddler dental health care model (AGITA) for mothers is feasible and its application is effective as an effort to improve children's tooth brushing skills. A recommendation is given to the Health Authority to support the software for UKGS program in Community Health Service especially in the pandemic of Covid 19 which need a program with software.

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**THE EFFECT OF GARGLING COCONUT ESSENTIAL OIL (*COCOS NUCIFERA* L)
WITH *OIL PULLING* METHOD AGAINST TOOTH CALCULUS INDEX AND
PAPILA BLEEDING INDEX IN WOMAN WITH GINGIVITIS DISEASE**

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ABSTRACT

Coconut oil is a pure coconut oil that can only be made with fresh non-copra coconut ingredients. This type of research is *research experiment* with *pre and post test randomized control trial* design by intervention of gargling coconut essential oil (*Cocos nucifera* L) with *oil pulling* method to the women with gingivitis disease. The control group is gargling using mouthwash betadine gargle. Data analysis using *Wilcoxon test*, and *kruskal wallis* test and to compare the final result of day 0, day 7, and day 14. The results showed that the index calculus value for group I given VCO 0.89 ± 0.35 which means light calculus, while group II of 1.42 ± 0.40 which means medium calculus. The papilla bleeding index of group I is 1.20 ± 0.29 or mild criteria, while group II is 1.91 ± 0.36 or moderate criteria. The conclusion of this study that the administration of VCO gargling therapy showed a more meaningful anti-inflammatory and antibacterial effect on the decrease in gingival bleeding index and plaque index in gingivitis patients which was characterized by a higher decrease in papilla gingiva (PBI) and plaque index (CI) bleeding index compared to the control group.

Keywords: Gingivitis, coconut oil, papilla bleeding index, calculus index.

INTRODUCTION

In the mouth there are many flora of our mouth consisting of a variety of organisms, including bacteria, fungi, mycoplasma, protozoa and viruses that can survive over time. These organisms usually live in harmony in a variety of habitats including teeth, gingival sulcus, tongue, cheeks, hard and soft palate and tonsils. However, many of these bacteria also harm teeth so that it can cause gingival irritation, bad breath, inflammation and bleeding of the gums. Mouthwash is one of the ingredients used to help fight bad breath, improve oral health, strengthen teeth and gums, prevent plaque buildup, treat mouth sores, and refresh breath. Gargling is an attempt to release the remains of food that sticks in between the teeth. Gargling after eating is highly recommended but should not always be with mouthwash (Ramadan, 2014).

Oil pulling method is an additional oral hygiene procedure performed by gargling using vegetable oil. Oil pulling is derived from traditional Indian medicine which lately is also considered to have benefits for systemic health and oral cavity. One of its benefits in the field of oral cavity health is to prevent the occurrence of gingival bleeding.

Cocos nucifera or coconut is one of the multipurpose plants that are widely marketed in Indonesia, including the world because it has a high economic value (Sutarmi, 2005). Coconut products are widely used in non-food industries, among others, coconut fiber industry, activated charcoal, oleochemicals and even handicrafts. Bioactive ingredients contained in coconut oil are caprylic acid, caprate, and lauric that act as antibacterial *ingredients*, *tocopherols* that act as antioxidants as well as *tocotrienols* and *flavonoids*. Oleic acid and linoleic acid are also present in coconut oil. These unsaturated fatty acids act as anti-inflammatories and can reduce fat peroxidation so that inflammatory tissues will be reduced.

Plaque control can be done mechanically by brushing your teeth. However, brushing your teeth alone is considered insufficient in maintaining the cleanliness of the oral cavity. Gingivitis treatment can be done by scalling, root planning and polishing. However, it will be difficult to clean all plaques and calculus perfectly in the pocket periodontal so additional procedures are needed in the form of antimicrobial therapy as an additional oral hygiene procedure to maintain the health of the oral cavity.

Recently, many studies have started to raise the topic of *oil pulling* in the field of dental health. Previous studies linking the role of *oil pulling* therapy in maintaining oral cavity health have been conducted. Bellinda et al (2008) in a 5-day study to find out the effectiveness of coconut oil against the growth of alpha streptococcus colonies in dental plaques of gingivitis sufferers showed that between 60% and 80% concentrations can inhibit the growth of colonies of *alpha streptococcus* bacteria and have the same effect as Hexetidine 0.1%.

Based on the results of observations or surveys in the village aras kabu District Beringin Deli serdang district reported that many people who come to the dental poly puskesmas aras kabu complain of gingivitis or gingivitis. Based on the analysis of the situation it is known that dental poly in puskesmas Aras Kabu Deli serdang does not have adequate facilities for scalling actions both manual and electric. Public dental health business activities are rarely carried out so that the follow-up of gingiva bleeding cases with scalling or root planning actions. On the basis of these considerations researchers feel interested to examine whether through gargling coconut essential oil (*Cocos Nucifera L*) with the

method of Oil Pulling effect from the dental plaque index and bleeding gingiva in women with complaints of gingivitis who visited Puskesmas Araskabu Beringin District Lubuk Pakam. The aim of this study was to find out the effect of gargling coconut essential oil (*Cocos nucifera* L) with *oil pulling* method against to the calculus index and papilla bleeding indeks in womens with gingivitis complaints who visited the Araskabu Health Center Beringin District Lubuk Pakam.

METHOD

1. Study Design

The type of research was *experimental research* with *pre and post test randomized control trial design* (Arikuntoro 2006). In this study intervention was gargling coconut essential oil (*Cocos nucifera* L) with *oil pulling* method to the women with gingivitis, while the control is gargling using betadine gargle containing povidon iodine 2%. The respondent were women with gingivitis whom come to the public health centre of Aras Kabu, Deliserdang for treatment.

The sample was randomly selected and divided into 2 groups. A total of 30 samples each per group with group I was the pure coconut oil intervention group whereas group II was the control.

2. Inclusion and exclusion criteria

The inclusion criteria consist of not in sick condition, cooperative, have not systemic diseases and has moderate-severe dental plaque indeks. the exclusion criteria were have not Diabetes mellitus, blood disorders or mallowmenstruation, never due to the treatment of periodontal, still in Taking drugs (anticoagulants and *calcium channel blockers*).

3. Clinical and laboratory measurements (Silaban, R, Hutopea , 2011)

Preparation stage :

- Preparing examination and measurement dental plaque indeks and gingival bleeding index by 2 examiners to obtain preliminary data (*baseline*).
- Explaining the implementation of the study to respondents and the respondents signing the *informed consent* sheet
 1. All respondents was given toothbrushes, toothpaste, intervention materials (coconut oil for group I and betadine gargle for group II), and mouthwash glasses.
 2. Demonstrating to the subject about gargling with *the Oil Pulling Method*
 - Group I: gargle using coconut oil with *oil pulling* method, then followed by brushing teeth with *roll* method. They gargling in the morning after breakfast and at night before going to bed. Gargling method as much as 1 tablespoon of coconut oil is accumulated in the oral cavity for 2 minutes characterized by oil becoming liquid and whitening like milk and then discarded from the mouth.
 - Group II: gargle as usual using betadine gargle then followed by brushing teeth using *roll method*. Gargle in the morning after breakfast and at night before going to bed. Gargling method is as much as 5 ml of betadine gargle is scattered in the oral cavity for 2 minutes and then removed from the mouth. This intervention lasts gradually for 7 and 14 days .

- Research Stage

Periodontal measurement by using *papilla bleeding index* that is probing around sulcus gingiva using *probes of the University of North Carolina (UNC) #15*.

Clinical measurements were recorded in 6 sextans at the location of the data tau index teeth in gingiva which had inflammation/redness. Sextan 1 is from molar teeth 3 upper right to Premolar teeth 1 upper right. Sextan 2 from upper right C tooth to upper left C. Sextan 3 from Premolar 1 top left to Molar 3 top left. Sextan 4 is from molar teeth 3 lower left to Premolar teeth 1 bottom left. Sextan 5 from lower left C tooth to bottom right C. Sextan 6 from Premolar 1 bottom right to Molar 3 bottom right. The test result is the base line or pre-intervention data, day 7, and the 14 recorded on the examination sheet.

DATA ANALYSIS

The data analysis was processing using statistical *package for social science* (SPSS) program. The results of the study were displayed in a frequency distribution table. Statistical analysis used *saphiro wilk* test to find out normal distributed data marked value $p > 0.05$. To compare Papila Bleeding Index data and Calculus Indeks data before and after intervention in each group I and II using *t*- test dependent if data distributed normally, or non-parametric test with *Wilcoxon* test if the data is not distributed normally. To see the difference in final data (H-14) between groups I and II after intervention using *the t test independent* or *Man whitney* test if the data is not distributed normally. To compare initial or pre intervention data, at the 7th day and 14th day in each group using *Anova's one way* test or the *Kruskal wallis* test if the data is not distributed normally. Significance is characterized by a *value of p* < 0.05 with a confidence level of 95%.

RESULT

The average of PBI and CI measurements along with the results of *saphiro –Wilk* data normality test are described as presented in the following table.

Table 1.

Baseline table of each group before intervention

Variable	Group I	<i>p value</i>	Group II	<i>p value</i>
	<i>Mean ± SD</i>		<i>Mean ± SD</i>	
Initial PBI	2.32 ± 0.34	0.004	2.23 ± 0.32	0.002
PBI day 7	1.76 ± 0.29	0.007	2.09 ± 0.30	0.000
Final PBI (H-14)	1.20 ± 0.29	0.000	1.91 ± 0.36	0.128*
Initial CI	1.66 ± 0.41	0.000	1.82 ± 0.35	0.030
CI day 7	1.28 ± 0.40	0.0788*	1.74 ± 0.44	0.002
Final CI (H-14)	0.89 ± 0.35	0.001	1.42 ± 0.40	0.200 *

*=*Data homogeneity* value : $p > 0.05$

The table above shows that the results of the *Saphiro wilk* test which shows that almost all of the data is not distributed normally ($p < 0.05$).

Table 2.

Average of Papila Bleeding Indeks/PBI values for each group (based on *Wilcoxon test*)

Group	n	PBI	(mean difference)	<i>p-value</i>
		<i>Mean ± SD</i>		

I (coconut Oil)				
Before	30	2.32 ± 0.34	1.12 ± 0.48	0.000*
After	30	1.20 ± 0.29		
II (betadine gargle)				
Before	30	2.23 ± 0.32	0.32 ± 0.19	0.000*
After	30	1.91 ± 0.36		

*=Significance value : $p < 0.05$

In the table above show that there was a very significant difference between PBI before and after the intervention ($p < 0.05$) in both groups I and II. However, based on the average difference before and after the intervention in the two groups, it is known that the difference changes of the decrease in gingival bleeding occurs most in group I, namely 1.12 ± 0.48 or the comparison of the difference in changes is 1:3.5 between groups I and II. .

Table 3
The Average of Calculus Index

Group	n	CI ()Mean ± SD)	Δ	p-value
I (Oil)				
Before	30	1.66 + 0.41		*
After	30	0.89 + 0.35		
II (betadin gargle)				
Before	30	1.82 ± 0.35	0.40 ± 0.23	0.000*
After	30	1.42 ± 0.40		

*= Significance value : $p < 0.05$

On the table 3 show that there was a very significant difference between CI before and after the intervention ($p < 0, 05$) both in groups I and II. However, based on the average difference before and after the intervention in the two groups, it is known that the most significant difference in changes occurred in group I (0.76 ± 0.26) while in group II it was 0.40 ± 0.23 . Comparison of changes in the average difference before and after the intervention in group I and group II was 1:1.9.

Table 4

The average comparison of CI from baseline, day 7 and day 14 between groups (Kruskal Wallis test)

Variable	Pre Mean \pm SD	Day 7 Mean \pm SD	post Mean \pm SD	p-value
Ex. I (gargle coconut oil	1.66 \pm 0.41	1.28 \pm 0.40	0.89 \pm 0.35	0.000*
Kel.II (gargle with gargle)	1.82 \pm 0.35	1.74 \pm 0.44	1.42 \pm 0.40	0.001*
p value	0.000	0.000*	0.000*	

*= Significance value: $p < 0.05$

Table 5

The average comparison of PBI from baseline, day 7 and day 14 between groups (Kruskal Wallis test)

Variable	Pre intervention Mean \pm SD	Day 7 Mean \pm SD	Post intervention Mean \pm SD	p-value
Ex. I (gargle coconut oil	2.32 \pm 0.34	1.76 \pm 0.29	1.20 \pm 0.29	0.000*
Kel.II (gargle with gargle)	2.23 \pm 0.32	2.09 \pm 0.30	1.91 \pm 0.36	0.001*
p value	0.000	0.000*	0.000*	

Based on the table above, it is known that after giving coconut oil (VCO) in group I and gargling with betadine gargle in group II both had a decrease in gingival papilla bleeding on day 14 from the value of papilla bleeding index in group I being 1.2 ± 0.29 (mild criteria) while in the second group to 1.91 ± 0.36 . Based on measurements of PBI and CI between groups H-0, H-7 and H-14 through the Kruskal Wallis it was known to have very significant changes. To compare the results of the final measurement of PBI and CI from groups 1 and 2, the data were tested using the test analysis *Man Whitney*. The results of statistical analysis *Man Whitney's* showed that there was a very significant difference between the two groups. The post hoc results also show that there is a very significant difference between Ho, H7 and H14. However, the average difference between coconut oil was higher than the control.

DISCUSSION

Gingivitis is an inflammation of the soft tissue around the teeth, namely the gingiva. This inflammation does not extend to the underlying alveolar bone, nor to the periodontal ligament or cementum. Gingival bleeding is one of the clinical signs of gingivitis and is the most common condition. Gingival bleeding on examination appears earlier than discoloration or other visual signs. The main cause of gingivitis is the microbiological build up found in plaque or calculus. Predisposing factors that can cause gingivitis include caries, iatrogenic factors, malpositioned teeth, mouth breathing and partial dentures, *overhangs*, and orthodontic use. Based on the results of this study, it is known that the calculus index value for group I was given VCO of 0.89 ± 0.35 which means mild calculus, while group II is 1.42 ± 0.40 which means moderate calculus. The value of papilla bleeding index in group I was 1.20 ± 0.29 . It means the bleeding index was mild, while in group II was 1.91 ± 0.36 , which meant the bleeding index was moderate. This

shows that in group II the inflammatory process is still ongoing even though its severity has decreased, while in group I, the infection and inflammation have been recovering/healing.

Coconut oil is pure coconut oil that can only be made with non-copra fresh coconut, and its processing does not use chemicals and does not use high heat and no further purification is carried out, because virgin coconut oil is very natural and very stable when used. in the next few years (Vala, & Kapadiya, 2014). The ability of virgin coconut oil to kill bacteria and viruses is based on the content of lauric acid and capric acid (6-7%). *Medium chain triglycerides (MCT)*, including monoglycerides of lauric acid, caprylic acid, capric acid, and myristic acid, which have antimicrobial effects. Antibacterial, antifungal (effects *fungus*), antifungal (*yeast*) and antiviral are mainly shown by monoglyceride derivatives. The content of oleic acid and linoleic acid and flavonoids also functions as an anti-inflammatory. The mechanism of unsaturated fatty acids or *Polyunsaturated Fatty Acid (PUFA)* in reducing inflammation is to reduce the production of eicosanoids, cytokines, and Reactive Oxygen Species (ROS). While the mechanism of flavonoids in reducing inflammation is that flavonoids are able to inhibit eicosanoids from producing enzymes including phospholipase A2, cyclooxygenase and lipoxygenase, thereby reducing the concentration of prostanooids and leukotrienes. Other mechanisms include inhibition of histamine release, phosphodiesterase, protein kinase and transcriptase activation (Rathee, *et al.* 2009 Ribeiro, 2015, & Calder. 2006). The uniqueness of therapy with lauric acid is that it is almost impossible to develop resistance to

The processes lauric acid into monolaurin which is responsible for destroying viruses, and bacteria, such as bacteria *Streptococcus*, *Staphylococcus aureus* which is very dangerous and causes gingivitis, including the fungus *Candida Albicans* which is very common in causing infections in humans, especially in the oral cavity (Robert, 2014). According to research by Sumiasih *et al* (2016) coconut oil can be used as medicine to help accelerate the healing of perineal wounds, dermatitis, and other infectious diseases. In the study of Tirta *et al* (2015) it was reported that coconut oil can treat disease *methicillin resistant staphylococcus sureus* (MRSA) because of its high antibacterial power. The incidence of infection in gingivitis is recorded at 5-10%. If the gingivitis is exposed to more than 105 microorganisms, it is very likely that infection will occur in the wound. Approximately 75% of the incidence of wound infection is a superficial infection.

In the analysis results, it can be seen that in the administration of gargling topical VCO therapy was higher decrease than the bethadine gargle as control. Based on these results, it appears that both VCO and bethadine gargle have anti-inflammatory and antiseptic properties for gingivitis, but VCO has higher anti-inflammatory and antiseptic and antibacterial properties than bethadine gargle.

CONCLUSION

Based on the results of the study, it can be concluded that the gingival papillary bleeding index in the group that gargled with coconut oil showed a better effect than betadine gargle. With coconut oil showed a better change in plaque accumulation than betadine gargle. The administration of coconut oil/VCO gargling therapy showed more anti-inflammatory and antibacterial effects and significant reduction in the gingival bleeding index and plaque index in gingivitis patients.

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Solubility of Calcium in Artificial Saliva Made from Golden Snail Shells for Tooth Remineralization

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ABSTRACT

Caries occurs due to the unbalanced process of demineralization and remineralization. The golden snail as one of the freshwater animals found in Indonesia or countries with tropical climates, has an important role in the process of tooth remineralization. The golden snail shell has the potential to affect the remineralization process because it has high levels of calcium carbonate (CaCO₃). Pasta made from golden snail shells is expected to be able to help the salivary buffer system by adding calcium carbonate for the remineralization process.

This study aims to determine changes in calcium levels in saliva at treatment 1 hour, 4 hours and 8 hours after the teeth were smeared with gold snail shell paste.

The type of research used in this research is an experimental laboratory with a pretest-posttest design using atomic absorption spectroscopy (AAS) and bivariate analysis of data with the kruskal wals statistic test. The ethical clearance of this research is from the Palembang Health Polytechnic

The results of the study concluded that the calcium in the paste made from the shell of the golden snail (*Pomacea canaliculata* Lamarck) was soluble and absorbed as seen with changes in calcium levels at 1 hour, 4 hours, and 8 hours in saliva.

Keywords: gold snail shell paste, calcium content, saliva

INTRODUCTION

In the current era, researchers are competing to conduct research related to raw materials in overcoming a disease. Similarly in the field of dental health, many natural, artificial or mechanically engineered materials are created to provide the best preventive measures against the etiology of dental diseases. The golden snail (*Pomacea canaliculata* Lamarck) is one of the natural resource commodities in Indonesia, most of which have not been optimally utilized, including the Mollusca group, has a soft body protected by a hard shell, reproduces quickly, and its food source is resistant to disease. Isnaningsih, 2011). The gold snail shell is almost entirely made of calcium carbonate. Calcium phosphate, silicate, magnesium carbonate, iron and other organic substances make up the rest of the composition of structural proteins, and phosphorus compounds (P) (Nopriansyah, 2016).

Calcium is a very vital mineral and is needed by the body in greater amounts than other minerals. Approximately 99% of calcium is found in hard tissues, in bones and teeth, while 1% of calcium is found in blood and soft tissues. The main function of calcium is to build and maintain bones and teeth, calcium also plays an important role in the body's enzyme activity (Edina, et al 2019).

Calcium carbonate (CaCO₃) which consists of calcium (Ca) and bicarbonate (HCO₃) is an inorganic component that can be found in saliva. These ions work in a buffer system which is the main element in maintaining the stability of the pH of the oral cavity. The mechanism of the ions in maintaining the stability of the pH of the oral cavity is the presence of a catalyst enzyme called the bicarbonate anhydrase enzyme. The enzyme catalyzes bicarbonate ions (HCO₃⁻) into water (H₂O) and carbon dioxide (CO₂) which will be released in the oral cavity so that the salivary pH slowly rises to normal levels (Mokoginta, et al 2017). Saliva which contains calcium and phosphate in sufficient concentration can protect the enamel from the demineralization process and accelerate the remineralization process.

Demineralization occurs through a diffusion process, which is the process of moving molecules or ions that are soluble in water or from within the tooth enamel due to differences in the concentration of acidity on the surface of the tooth enamel. When the enamel is in contact with carbohydrates from food consumption, hydrogen ions (H⁺) will attack the surface of the tooth enamel so that demineralization will occur which causes the hydroxyapatite to dissolve

in the tooth enamel. Demineralization of teeth that occurs continuously will cause porosity on the surface of the enamel so that it becomes brittle so that it is vulnerable and caries occurs (Wirawan, 2017).

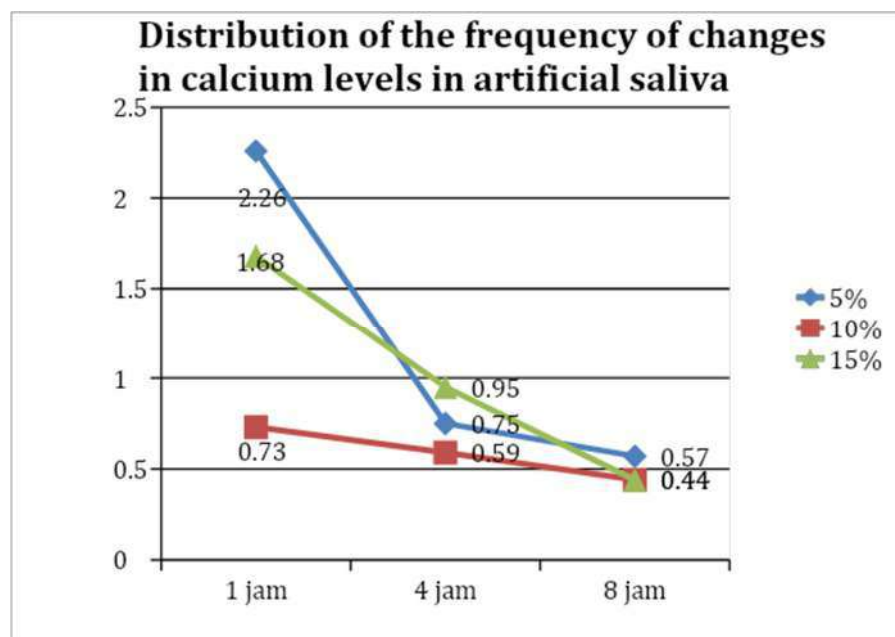
METHODS

This research is a laboratory experiment with a pretest-posttest design. The tools used are atomic absorption spectroscopy (AAS), Kern analytical balance, sieve, mortar and pestle, 100 mL volumetric flask, 250 mL beaker, 25 mL measuring cup, 10 mL volume pipette, 5 mL weighing pipette, glass bowl, rod stirrer, dropper and spray vial. The ingredients used were golden snail shell paste with concentrations of 5%, 10% and 15% (gold snail shell powder, Propelin glycol, Na CMC, Sorbitol, Tween 80, Methyl Paraben, Sodium chloride (NaCl), calcium carbonate (CaCO_3), saccharin, Papermint oil, menthol and Aquades, baking soda, Sodium bicarbonate (NaHCO_3), Monosodium phosphate ($\text{Na}_2\text{PO}_4\cdot 7\text{H}_2\text{O}$), Potassium Chloride (KCl), Magnesium Sulfate ($\text{MgSO}_4\cdot 7\text{H}_2\text{O}$) and Calcium Chloride (CaCl_2)) and artificial saliva (NaHCO_3 , $\text{Na}_2\text{PO}_4\cdot 7\text{H}_2\text{O}$, KCl, NaCl, $\text{MgSO}_4\cdot 7\text{H}_2\text{O}$, CaCl_2). The sample size of 10 normal and caries-free premolars at each concentration was determined by the ferderer formula. Using bivariate analysis with Krusskal Walls statistical test.

The procedure is as follows: 1. Soaking the sample with carbonate solution for 30 minutes, (demineralization process) 2. Rinse the sample with distilled water, 4. Rub the entire surface of the sample with gold snail shell paste. Group 1 (10 teeth) was smeared with paste with a concentration of 5%, group 2 (10 teeth) was smeared with paste with a concentration of 10%, group 3 (10 teeth) was smeared with paste with a concentration of 15%. 5. Soak the sample in a container containing artificial saliva for 3 groups of teeth (30 containers). 6. Measurement of calcium levels at 1 hour, 4 hours and 8 hours with a spectrometer.

RESULTS

The results of the measurement of calcium levels in artificial saliva using a spectrometer (AAS) after soaking samples for 1 hour, 4 hours and 8 hours with paste concentrations of 5%, 10% and 15%.



Graph: Frequency distribution of changes in calcium levels in artificial saliva with concentrations of gold snail shell paste 5%, 10% and 15% in 1, 4 and 8 hours immersion time

The results stated that there was indeed a calcium solubility process which was seen from the initial process of immersing teeth that had been smeared with gold snail shell paste in artificial saliva until soaking for 8 hours there was a decrease in the level of calcium in the saliva.

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Table 2 . statistical test results of changes in calcium levels in artificial saliva with concentrations of gold snail shell paste 5%, 10% and 15% in immersion time of 1, 4 and 8 hours

Ranks

Waktu		N	Mean Rank
Hasil	1JAM	3	7,33
	4 JAM	3	5,67
	8 JAM	3	2,00
Total		2	

Test Statistics^{a,b}

	Results
Chi-Square	9,701
Df	3
Asymp. Sig.	,021

a. Kruskal Wallis Test

b. Grouping Variable: Waktu

Statistical test showed that there was a difference in the solubility of calcium in saliva at all times with a P value = 0.021

DISCUSSION

The paste made from golden snail shells showed that smearing with concentrations of 5%, 10% and 15% with immersion times of 1 hour, 4 hours and 8 hours on the sample could dissolve in artificial saliva. Changes with a concentration of 5% 1 hour, 4 hours and 8 hours $p = 0.021$ means that there is a change in calcium levels in saliva. Gold snail shell paste can be dissolved and affect the level of calcium in saliva. From the results obtained, it can be stated that during the first 1 hour there was an increase in calcium levels in the saliva, indicating that the calcium in the paste was completely dissolved in the saliva, then in the next 4 hours the calcium levels decreased drastically, due to the successful diffusion of calcium ions into the tooth enamel, this is called the remineralization. The remineralization process (removal of ions and minerals into tooth enamel) takes 30-60 minutes compared to the demineralization process (releasing ions and minerals from tooth enamel) which only takes 3-6 minutes. The main role in the remineralization process is the calcium and water components that crystallize in tooth enamel. The results of research that has been carried out this process can trigger the return of ions and minerals into the enamel. One of them is calcium, therefore the composition of the paste used has a high calcium content so it has a high potential in accelerating remineralization (Rahardjo, 2015). If the demineralization process has occurred, the next result will be determined by the strength of the remineralization. The possibility that can occur can be the cessation of dental caries development if the remineralization ability is strong enough to overcome the demineralization process or chronic dental caries is formed if the demineralization process is slow while the remineralization process is active.

CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that the paste made from the shell of the golden snail (*Pomacea canaliculata* Lamarck) can be dissolved in saliva and with a concentration of 5% has been able to affect the remineralization process as seen by changes in calcium levels at 1 hour 4 hours and 8 hours in saliva.

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Determinants Of Dental And Oral Disease In Pregnant Woman From A Sociodemographic Aspect

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ABSTRACT

Introduction: Pregnant women are a group that is vulnerable to dental and oral disease. Recent research (2020) in the 65 pregnant women has proven that the DMF-T index with low criteria has a 43.08% and periodontal pocket 4-5mm with a 63.08%. This will have a negative impact on the health of both mother and baby. Sociodemography is one of the factors that influence the behaviour of pregnant women in taking oral health measures. **Aim:** The purpose of this study was to determine the determinants of dental and oral disease in pregnant women from a sociodemographic aspect. **Methods:** The data collection method used literature reviews obtained from 4 database : Google scholar, ProQuest, PubMed, and Science Direct. In this study, journals were filtered based on the last 5 years since their publication (2015-2020). **Results:** The literature review of 11 journals found that there is a significant corelation between the incidence of dental and oral disease in pregnant women and the aspect of sociodemography (age, gestational age, educational level, and income) as a risk factors.

Keywords : dental and oral diseases, pregnant women, sociodemography.

INTRODUCTION

Studies have revealed that the effects of hormonal changes in a pregnant women can be cause the dental and oral disease suchh as dental caries and periodontal disease. Frequently periodontal disease are gingivitis and periodontitis. Gingivitis is one of a variety of mild periodontal diseases that have clinical symptoms that are red, swollen and bleeding (Caranza, 2011) . Whereas periodontitis is the further damage from the periodontal ligament and the pocket or perhaps both. Periodontitis usually followed by gingivitis incident, although not all gingivitis developed to periodontitis. The composition of the pathogenic microorganisms of plaque changes from gingivitis to periodontitis and the ferocity of damaged periodontal tissue (Saini, et al., 2010).

Research conducted Pinanty et al. (2020) on 65 pregnant women is found that DMF-T index with low criteria has a 43,08% percentage. This suggests there is low dental status in pregnant women. The prenatal status of bad dental and oral will have a negative impact on both mother and the baby (Maria, et al., 2018) .

Not only are pregnant women affected by psychological and hormonal changes in her teeth and mouth but several factors influence her. Behavior of pregnant women has been shown to affect her dental and oral health status (Andreas et al., 2015) . The uneven behavior of pregnant women is influenced by sociodemography factors in taking action regarding her teeth and mouth health (Eni, 2016).

To date, the vast majority of research carried out focuses on the behavior of pregnant women toward the incidence dental and oral disease. Meanwhile, the analysis of the factors affecting pregnant women's behavior (risk factors) has not been discussed much. Therefore. It is necessary to study literature review on the one of subject sociodemography factors.

METHODS

The study uses a comprehensive summary method of literature review on determinants of dental and oral disease in pregnant women from a sociodemographic aspect. Protocol of literature review used the prism checklist for inspection and adjustments to the purpose of this literature review. Secondary data source acquired by both national and international journal articles from 4 academic database : Google Scholar, ProQuest, PubMed, Science Direct. The search for a journal article uses Boolean operator methods with the keywords “sociodemographic”, “pregnancy”, “periodontal disease”, “dental caries” followed by AND, OR and NOT that are used to enlarge or beautify the search to facilitate the article. The strategy for this article used PICOS framework with inclusion and exclusion. Criteria of population is pregnant women (without systemic disease) for inclusion and exclusion is except pregnant women (without systemic disease). Criteria of interventions is sociodemographic for inclusion and are not sociodemographic for exclusion. No criteria of comparator. The outcomes criteria is sociodemographics risk factors toward dental and oral disease in pregnant women for inclusion. The study design uses all kinds of study design and the publication type is original article and research article. The publication years is from 2015 until now. The languages are be used Indonesian and English.

RESULTS

Assesments of the inclusion and exclusion criteria were obtained of as many as 11 articles to be used in the literature review by topic dental and oral health disease from sociodemographic factors : age, gestational age, level of education and income. 10 articles presented a cross-sectional study and 1 article a case control study. Overall the journal uses the smallest respondents (48 respondents) to the largest (407 respondents). The characteristics of responders are 15-46 years old. In regard to the location, 3 studies were set in Indonesia, 2 studies were set in Pakistan, 2 studies were set in Morocco, 1 studies were set in Israel, 1 studies were set in Iran, 1 studies were set in Brazil, and 1 studies were set in Singapore.

Based on the 11 journals taken, a classification of risk factors from sociodemographic aspect : age, gestational age, educational level, and income.

Table 1. Summary of the studies included in this systematic review

No.	Author [Year]	Study design	Sociodemographic aspect			
			Age	Gestational age	Educational level	Income
1.	Pappen., et al. (2017)	Cross-sectional		✓	✓	✓
2.	Nataris., et al. (2017)	Cross-sectional			✓	
3.	Maryam., et al. (2017)	Cross-sectional	✓		✓	✓
4.	Adriansyah., et al (2017)	Cross-sectional			✓	
5.	Addi., et al. (2018)	Cross-sectional	✓			
6.	Balan., et al. (2018)	Cross-sectional	✓		✓	✓

7.	Kateeb., et al (2018)	Cross-sectional			✓	✓
8.	Puteri., et al. (2019)	Cross-sectional		✓		
9.	Deghatipour., et al. (2019)	Cross-sectional	✓	✓	✓	
10.	Benksim., et al. (2020)	Case control			✓	
11.	Khan., et al. (2020)	Cross-sectional			✓	✓

Age

Some journals found there is a link between dental and oral disease in pregnant women with age. In Morocco, pregnant women over 27 years have a significant DMFT index (gingiva recession) than women less age and a equivalent to 27 years (Addi, et al., 2018). In Pakistan, young women (20-20 years old) had better dental and oral hygiene than women more than 30 years (Maryam et al., 2017.). Pregnant women in Iran older than 35 years have 1.3 times more DMFT, 0.25 times damaged teeth, and 3.5 times more teeth lose than women at 25 years (Deghatipour et al., 2019). Something similiar is happening in Singapore to pregnant chinese women at an older age having dental problem (Balan et al., 2018.).

Gestational Age

The gestational age is devided into three trimester. There is trimester I, trimester II, and trimester III. The study from Brazil, the prevalence bleeding gingiva on pregnant women of trimester I (96.7%) is higher than trimester II (84.5%) and trimester III (81.0%) and also the prevalence CPITN trimester I (Pappen et al., 2017.). In Indonesia, the prevalence of BOP, PPD and OHI-S significant with increas og gestational age. In case, the pregnant women of trimester III had higher prevalence than trimester II and trimester I (Puteri et al., 2019). Pregnant women of trimester III in Iran also have significantly priodontal pocket >3.5mm compered with pegannt women of trimester II (Deghatipour et al., 2019)

Educational Level

Education levels less than or equal to 8 yearspregn in Brazil indicate a deeper periodontal in pregnant women (Pappen et al., 2017). In Indonesia, district of Brebes, the pregnant women with lower degrees in education have gingivitis incident (45.1%) than the pregnant women with high educational have gingivitis (39.4%) and without gingivitis (15.5%) (Nataris et al., 2017). Still in Indonesia, at the city of Banda Aceh, the pregnant women with lower education no one has good OHI-S status, the pregnant women with secondary education has good OHI-S status prevalence (22.2%) and the pregnant women iwth higher education has good OHI-S status prevalence (77.8%) and that is a significant impact (Adriansyah et al., 2017). A similiar in Singapore, which the pregnant women with non-bachelor that seem to have higher risk to dental and oral disease than the pregnant women with bachelor (Balan et al., 2018). Based on the level of education in Morocco, the pregnant women has a higher rate of illiteracy, so that is significantly higher with tooth decay, tooth abscess, tooth loss, periodontitis, and calculus (Benksim et al., 2020) . The status of education is also particularly influential on oral hygiene in Pakistan because women who are illiteracy and basic education significantly are related to have poor oral hygiene (the prevalence gingivitis is very high) compared to pregnant women with postgraduate (Maryam et al., 2017). Also in Pakistan's latest journal taht uneducated women have and 8.75 times higher of caries teeth than those educated women (Khan et al., 2020). Palestinian pregnant women in Jerussalem who postgraduate have a lower DMF- score than pregnant women that only completed a high school (Kateeb & Momany, 2018). Having more than 12 years of education in Iran is also associated with have a low dental and oral disease (Deghatipour et al., 2019).

Income

Pregnant women in Singapore who are in low-income groups have statistically higher dental problems during pregnancy than the higher income groups ($p=0.03$) (Balan et al., 2018). Like a deeper periodontal relationship in pregnant women in Brazil with a family's income minimum (US \$350-\$1050) to less than minimum ($< US \$350$) even if it is significantly only in crude analysis (Pappen et al., 2017). The pregnant women with poor economic status in Pakistan has been found significantly related to poor oral health status ($p=0.01$) compared to pregnant women with upper economic status have good oral health (Maryam et al., 2017). The odds of dental caries a low economic status are 2.24 times higher than the odds of dental caries a high economic status (Khan et al., 2020). In Israel, although monthly incomes are not directly linked to the DMFT score but can raise the MSL, whereon the psychological factors, MSL is a significant factor in raising the DMFT score (Kateeb & Momany, 2018).

DISCUSSION

Pregnancy is a natural process accompanied by physiological and hormonal changes. The most significant hormonal changes are an increase in estrogen and progesterone levels which can transform and any risk to the female body. Hence, a pregnant woman is susceptible to her oral cavity. In some cases, pregnant women may find many problems with her oral that are commonly known as gingivitis, dental caries, periodontitis, etc. This oral problem affects not only the mother but also the fetus. The development of the developing fetus in the condition of the infant will be low birth weight. Maternal behavior is a factor that can affect her dental and oral health. The behavior of a pregnant woman is indirectly affected by sociodemography in taking action regarding her oral condition, which suggests that it is a risk factor for her dental and oral disease.

Understanding the determinants of dental and oral disease in pregnant women is indispensable to risk reduction and increasing the prevention of disease. Several factors include sociodemographic factors, psychological factors and behavioral factors.

From the study of literature review based on 11 selected journals, there is a relation between dental and oral disease in pregnant women and sociodemography as a risk factor. The sociodemography factor consists of: age, gestational age, educational level, and income.

The age of a pregnant woman is listed as a safe age between 20-35 years. If a pregnancy occurs at over 35 years, it becomes more vulnerable to her pregnancy. Based on a few journals that have been reviewed, the age of a pregnant woman over 30 years will suffer poor oral health that resulting many tooth decay and disease from an increasing deterioration of the body (Maryam, et al. 2017 ; Addi, et al. 2018 ; Balan, et al. 2018 ; Deghatipour, et al. 2019). Well, pregnancy has an effect on dental and oral hygiene status. A rapidly declining body status can hinder activity in oral hygiene behavior. Currently, many tools can be used to consult a doctor in online order to make it easier for pregnant women who can not come at first hand.

Gestational age divided into 3 trimester with different oral conditions. A study in Brazil found poor oral cavities in the pregnant women of trimester I (Pappen, et al. 2017). On the other hand, studies in Indonesia and Iran, a pregnant woman will have bad oral conditions experience along with the gestational age (Puteri, et al. 2019 ; Deghatipour, et al. 2019). During each semester of pregnancy there are several procedures that can be balance with pregnant women's hormonal condition and the state of the fetus. A visit to the dentist to check the oral conditions tenable on trimester I, accordingly to reduce more fatal risk of infections from oral disease.

The educational level for a pregnant woman is a discussed factor in relation between dental and oral disease. Generally, the higher level of one's education is the higher one's social status (Karinanti, 2018). Evidently in existing journals, the higher of a pregnant woman's education the better condition of oral cavity. On the other hand, the lower of a pregnant woman's education the worse condition of oral cavity. That's because the level of education is a reflection of pregnant women's knowledge (Pappen, et al. 2017 ; Nataris, et al. 2017 ; Maryam, et al. 2017 ; Adriansyah, et al. 2017 ; Balan, et al. 2018 ; Kateeb, et al. 2018 ; Deghatipour, et al. 2019 ; Benksim, et al. 2020 ; Khan, et al. 2020). The higher the level of education a person has, the more information she receives and the more insight she gains. That information can be obtained either from personal experience or from others people.

The income of pregnant women's family are an economic proposition. When a pregnant woman's economic is high, her dental and oral health is good. When economic status is low, it is potentially dental and oral disease. This is happening significantly. When a pregnant woman has low income it will be difficult for her to visit dental and oral health services and choose these essentials first. On the psychological side, economic status affects the anxiety or actions of a pregnant woman (Pappen, et al. 2017 ; Maryam, et al. 2017 ; Balan, et al. 2018 ; Kateeb, et al. 2018 ; Khan, et al. 2020). Women with low economic status are more selective spending in their day-to-day. Therefore, it is best for the mother to keep her dental and oral health with keep the hygiene area by conventional or traditional way.

CONCLUSION

According to literature review, the incidence of dental and oral disease in pregnant women is significantly relation with the sociodemographic aspect of a pregnant women's age above 30 years old, pregnancy according to trimester increased, low educational level, and low income as a risk factors. It may be concluded that the aspect of sociodemography (age, gestational age, educational level, and income) is a risk factors in the incidence of dental and oral diseases in pregnant women.

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