

Prosedding Effectivenes of Vitamin A

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Submission date: 15-Nov-2022 10:18AM (UTC+0700)

Submission ID: 1954347443

File name: Prosedding_Effectivenes_of_Vitamin_A.pdf (367.82K)

Word count: 4276

Character count: 20586

Effectiveness of Vitamin A and Vitamin C in Inhibiting Progresifitas Patients with Minus Eye Disorders in Public High School 1 Bitung Students

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ABSTRACT

The eye is a body element or sensory that is very important in our lives. Eye health can be disrupted due to several factors that cause myopic disease and diseases that can cause blindness. the results of survey data on visitors to the Community Eye Health Center of North Sulawesi, on average every day there are 200 patients who suffer from eye pain. Patients who come from children, adolescents to adulthood, and adults, on average, are 45 years or older.

Type in Research Quasi experimental with one group pre and posttest design research design. This research was conducted in Bitung 1 Public High School in September - November 2018. The method of sampling was carried out proportionally stratified random sampling. Data analysis of the effect of giving Vitamin A and vitamin C to changes in minus and Plus eye diseases was analyzed using the Wilcoxon test.

Research Results Samples were 40 with eye categories minus -3 and lowest -1, vitamin A intake before the study 14.4 IU increased to 42.7 UI, and vitamin C intake before the study 3.65 mg increased to 32.95 mg. There is an effect of giving vitamin A and vitamin C to people with minus eye disorders in students of SMA 1 Bitung.

Keywords: Effectiveness of Vitamin A, Vitamin C, Patients with Minus Disorders

INTRODUCTION

Vitamin A is the first fat soluble vitamin found. Broadly, vitamin A is a genetic name that states all retinoids and precursors/provitamin akarateoids that have biological activity as retinol. Vitamin A is essential for the maintenance of health and survival. In addition, vitamin A deficiency increases the child's risk of infectious diseases such as respiratory diseases and diarrhea, increasing the mortality rate due to measles, as well as causing a delay in growth.

The nature of vitamin A is a yellow and fat soluble alcohol or fat pelrut. In dietary vitamin A is usually present in the form of reynyl ester, which is bound to long-chain fatty acids (Almatsier, 2009 the problem of less nutrition that occurs in groups of teenagers include the prevalence of lean, vitamin A deficiency, less vitamin C and iron nutritional anemia. WHO (2006), reporting the diet in India and Bangladesh shows that all teenagers in the country have a deficiency in almost all nutrients, especially iron, calcium, Vitamin A and vitamin C. Kirana and Kartini (2011) examined the intake of nutrients with the incidence of anemia pad 79 respondents obtained the results of 36.7% of the respondents had anemia, intake of vitamin A 53.2%, and vitamin C intake%. 41.8

The results of the study of micro nutrition problem in 10 provinces conducted nutrition and food Research, Depkes RI year 2006 showed serum retinol of less than 20 µg/dl by 14%, the results of the study describing A decrease in the survey of vitamin A year 1992 2009, where known 50% of infants have a serum retinol of less than 20 µg/dl

Indonesia as one of the developing countries to date is still experiencing various nutritional problems both macro and micro. The problem of macro nutrition is less energy Protein (KEP) While the problem of micronutrition is less Vitamin A (KVA), Iron Nutrient Anemia (AGB) and disorders resulting from less Iodium (GAKI) (Arisman, 2009).

Less nutritional problems that occur in groups of teenagers include skinny prevalence, vitamin A deficiency, less vitamin C and iron nutritional anemia. WHO (2006), reporting the diet in India and Bangladesh shows that all teenagers in the country have a deficiency in almost all nutrients, especially iron, calcium, Vitamin A and vitamin C. Kirana and Kartini (2011) examined the intake of nutrients with the incidence of anemia pad 79 respondents obtained the results of 36.7% of the respondents had anemia, intake of vitamin A 53.2%, and vitamin C intake%. 41.8

Budiyanto (2004) says that vitamin C plays a role in metalloenzyme for the formation of norepinephrine, carnitine, elastin and nucleoside, which work as a reduction of metal components necessary for the Cathalik activity

of the enzyme associated. This reduction ability plays a role in assisting iron absorption, inhibiting the formation of nitrosamine, assisting drug metabolism, immune response, anti-inflammatory steroid synthesis, and wound healing. These roles show that vitamin C has functions as an anti-oxidant, although some effects are only seen in pharmacological doses.

Eyes are a very important body or sensory element in our lives. Eye health can be interrupted due to a number of factors that result in myopia or diseases that can cause blindness. Based on the results of a survey of the World Health Organization (WHO), it is estimated that twelve people become blind every minute in the world and four of them are from southeast Asia, while in Indonesia is estimated every minute there is one person to be blind.

The prevalence of national blindness was 0.4 percent, much less than the prevalence of 2007 (0.9%). Prevalence of population blindness of 6 years and above is found in Gorontalo (1.1%) Followed by East Nusa Tenggara (1.0%), South Sulawesi, and Bangka Belitung (0.8%) respectively. The lowest prevalence of blindness found in Papua (0.1%) Followed by West Nusa Tenggara and Yogyakarta (0.2%) respectively.

Prevalence of severe low vision population aged 6 years and above nationally amounted to 0.9 percent. The prevalence of severe low vision is the highest in Lampung (1.7%), followed by East Nusa Tenggara and West Kalimantan (1.6%). The province with the prevalence OF low vision Severe lowest is IN Yogyakarta (0.3%) Followed by West Papua and Papua (respectively 0.4%). The pterygium prevalence, corneal turbidity, and the nationally consecutive cataract are 8.3 percent; 5.5 percent; and 1.8 percent. The highest pterygium prevalence is found in Bali (25.2%), followed by Maluku (18.0%) and West Nusa Tenggara (17.0%). DKI Jakarta Province has the lowest pterygium prevalence, which is 3.7 percent, followed by Banten 3.9 percent.

Indonesian people have a tendency to suffer from cataracts 15 years faster than people in the subtropics. It is thought to be closely related to degenerative factors due to nutritional problems. From the survey of visitor data of North Sulawesi People's Eye Health center, every day the average patient comes as much as 200 people who suffer from sore eyes. Patients coming from children, adolescents to adults, and on average adults aged 45 years and above. The purpose of this research is to know the effectiveness of vitamin A and vitamin C in inhibiting the progresifitas of patients with minus eye disorders in SMA Negeri 1 Bitung.

MATERIALS AND METHODS

Type in experimental Quasi research with one group pre and posttest design research design. The research was conducted at SMA Negeri 1 Bitung in September-November 2018. The population in this study is all students of the state of Bitung High School, a proportional stratified sample of random sampling which amounted to 40 samples. Samples that meet the inclusion criteria for the respondent in this study are 1). Willing to participate in the research, 2) age between 14-17 years. In this study conducted: A. Vitamin A (200 IU) give in capsule Form 1 capsule per week and administered for 4 times (4 weeks). Nominal scale, B. Vitamin C tablets (500 mg) give 1 time within 1 week, nominal scale. C. evektivty is the average difference in the degree of eye health before and after administering vitamin A and Vitamin C. D. High school students aged 14-17 years at the time of research expressed in the full year, the scale ratio. The processing and analysis of data begins with editing, and coding data to facilitate the process of entering data and then proceed with entry data in the statistical software program, the next step is to perform the Univariate data analysis (Variable frequency distribution) to determine the change in eye visibility.

RESULTS AND DISCUSSION

A. Research location

The research was conducted at SMA Negeri 1 Bitung, which is one of the state high schools in North Sulawesi province, Indonesia with the task letter of director of the Poltekkes Manado N0. PP. 04.01/2/3668/2018 starting from 20 September 2018 until completion of research. SMA Negeri 1 Bitung is equal to high school in Indonesia who owns NPSN: 40103090, with decree of school establishment: 96/SK. III/B/65 with the address: Jl. Wolter Monginsidi, Postal code: 95543 is located in village Girian Weru Satu, Bitung City.

SMAN 1 Bitung has a total student number of 1,174 students where men 448 students and women 726 students, traveled within three years of the lesson, ranging from class X to class XII, with the principal of Dra. Fonny Tumundo, MPd and is assisted by 33 teachers.

B. Sample characteristics

This study obtained a sample of 40 samples with charateristic as described in table 3 follows the most male gender (77.5%), the most samples seated in X-grade (42.5%), and the most age 15 years (42.5%), the more charateristic samples can be seen in the following table 3:

Table 3. Characteristics of sample Research

Characteristics	n	%
Gender		
1. Male	9	22,5
2. Women	31	77,5
Amount	40	100
Class		
1. Class X	17	42,5
2. Class XI	15	37,5
2. Class XII	8	20
Amount	40	100
Age		
1. Age 14 years	n	%
2. Age 15 years	5	12,5
3. Age 16 years	17	42,5
4. Age 17 years	16	40
1. Age 14 years	2	5
Amount	40	100

C. Difference in Vitamin A and Vitamin C intake

The plot in this study is the measurement of vitamin A and Vitamin C intake as a preliminary step to control the intake variables of vitamin A and Vitamin C outside of treatment. In this study vitamin A was given as much as 200 IU and Vitamin C 500 mg in the form of capsules, with the administration time 1 Capsule 1 week (4 times in 1 month) starting with the administration of vitamin A, hereinafter in the supply of Vitamin C.

Based on the results of the recall 24 prior to the study and after the introduction of Vitmin A tablets and vitamin C in obtaining vitamin A and C intake as stated in the following table 4.

Table 4. Average intake of Vitamin A and Vitamin C before and after treatment

Variable	Treatment		P
	Average before	Average after	
Vitamin A Intake	14,3	42,7	0,007
Vitamin C Intake	3,65	32,95	0,036

Based on table 4 above, it is known that the average intake of vitamin A before the study of Vitamin A 14.3 IU and after research increased to 42.7 IU, subsequent intake of vitamin C before study only 3.65 mg, and after research became 32.95 MG wherein there is increased intake of both vitamin A and vitamin C, based on the statistical test value $P = 0.00$ IE There is a difference in intake before and after the research took place.

D. Visus return distribution and degree of eye damage

In this research the samples found were with the eyeballs minus, and not found the sample with the eye criteria plus. Based on the results of visus as found in table 5, known half of the samples have the left eye damage at-3 at the beginning of the research, the complete presented in the table below.

Table 5. Distribution of Visus and left eye degrees before research

Visus	Degree of damage	n	%
20/200	-3	20	50,0
20/150	-2	7	17,5
20/80	-1.5	4	10,0
20/70	-1.25	4	10,0
20/160	-1	5	12,5
Amount		40	100,0

The results of table 6, indicating the degree of damage to the right eye before the research carried out is 52.5% or -3, more clearly presented in the following table 6 description.

Table 6. Distribution of Visus and right eye degrees before research

Visus	Degree of damage	n	%
20/200	-3	21	52,5
20/150	-2	5	12,5
20/100	-1.75	4	10,0
20/80	-1.5	3	7,5
20/70	-1.25	3	7,5
20/260	-1	4	10,0
Amount		40	100,0

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E. Visus return distribution and degree of eye damage

In this research the samples found were with the eyeballs minus, and not found the sample with the eye criteria plus. Based on the results of visus as found in table 7, known half of the samples have the left eye damage at -3 at the beginning of the research, the complete presented in the table below.

Table 7. Distribution of Visus and left eye degrees before research

Visus	Degree of damage	n	%
20/200	-3	13	32,5
20/150	-2	8	20,0
20/100	-1.75	4	10,0
20/80	-1.5	3	7,5
20/70	-1.25	4	10,0
20/160	-1	8	20,0
Amount		40	100,0

The results also provide information that there is 27.5% of the sample has a right eye -3 degrees, where the change compared to before the study was conducted, more clearly can be seen in the following table 8.

Table 8. Distribution of Visus results and right eye degrees After the research

Visus	Degree of damage	n	%
20/200	-3	15	27.5
20/150	-2	9	27.5
20/100	-1.75	3	7.5
20/80	-1.5	7	17.5
20/70	-1.25	2	5.0
20/260	-1	4	10.0
Amount		40	100.0

Based on the results of statistical tests on changes in the degree of eye damage before and after research, there is a very meaningful difference between the left eye before and after research ($P = 0.00$), as well as the right eye differences occur Before and after the research, namely, there is a decrease in the average degree of damage to the left eye from -2.25 to -1.98 with the value $P = 0.00$, then in the eye there is thus a decrease in the average value of the eye minus -2.30 to -2.13 with the value $P = 0.04$.

F. Effect of administering vitamin A and Vitamin C on changing degrees eye Minus

Based on statistical tests to determine the influence of vitamin A and vitamin C to change eye minus, Diketehui occurs the degree of change in eye minus before and after the research meaningfully, both on the left eye and right eye.

Table 9. Average difference in eye degrees before and after research

Change	Before Treatment	After Treatment	<i>P</i>
Eye degrees	-2,25	-1,98	0,00
Left eye	-2,30	-2,13	0,04

DISCUSSION

Sharp vision is angular measurements that relate to the distance of the test to see the minimum object size at a certain distance. It is an ability to distinguish two separate stimuli in a space with a high contrast background. An eye refractive disorder is an eye disorder that is common to a person. This disorder occurs when the eye is not able to see/focus clearly on an open area so that the view becomes blurred and for severe cases, this disorder can make visual impairment (the weakening of the vision). Common refractive disorders include myopia (long-sightedness), Hypermetropia (short-sightedness), and astigmatism. In addition, presbyopia disorders are sometimes incorporated into refractive abnormalities (WHO, 2009).

Myopia disorder is a disorder characterized by difficulty to see distant objects (distance objects). Physiologically, this disorder is characterized by a state of the eye that has an excessive ray of refruse strength so that the parallel rays come out in front of the retina (Ilyas, 2001). Hypermetropia disorder is a disorder characterized by difficulty to see objects located near (Close objects) where the parallel rays come in the back of the retina. Meanwhile, astigmatism disorder is a disorder due to an irregular surface of the cornea (clear membrane) so that the sufferer is incapable of distinguishing the curved and straight lines while the presbyopia is a vision disorder caused by the aging factor.

According to the WHO report (2012), 285 million of the world's population are experiencing visual impairments where 39 million have been blindness and 246 million people have decreased vision (low vision). Ninety percent of visual impairment occurs in developing countries.

In general, uncorrected refractive abnormalities (long-sightedness, short-sightedness, and astigmatism) are the main causes of visual impairment, while cataracts are the primary cause of blindness in moderate and low income countries (WHO, 2012). The etymology of myopia is not known for sure. There are some circumstances that can cause myopia such as allergies, endocrine disorders, food shortages, hereditary, excessive close work and chemical deficiency (calcium deficiency, vitamin deficiency) (Desvianita CIT Slone, 1997).

In the eyes of the myopia eye focus system of the eyes is located in front of the retina, the parallel beam that enters the eye is focused inside the glass body. If a myopia sufferer without correction looks to a distant object, a

divergent beam will reach the retina so that the shadow becomes blurred. There are two causes: the refractive power is too strong or the eye axis is too long (Hoolwich, 1993).

The most common myopia is the axial myopia. Axial myopia is a falling shadow in front of the retina can occur if the eyeball is too long. The cause of axial myopia is a deviant development of normal that can be congenital at the beginning of birth, called the hereditary type. If due to an increase in the corneal curvature or lens, this abnormality is called myopia curvature (desvianita cit Slone, 1997).

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The optimal degree of public health is a high level of health condition and may be achieved if the conditions and situation and the ability of any member of the community and should always be sought improvement continuously. Therefore, it is always done various efforts in tackling various health problems.

One of the important factors in the effort to achieve optimal health degree in children is a good nutritional condition. However, in the fact that in society there are still many malnutrition in children. Direct cause of nutritional problems in the outline associated with food consumption is still lacking compared to the needs and the presence of infectious diseases. The need for nutrients for the body can be obtained through food intake containing a source of macro nutrients (energy, protein, fat) and micro (vitamins and minerals) that all play a role in the growth of children.

Vitamin A deficiency problem is still one of the problems of community nutrition in Indonesia. Vitamin A deficiency can lead to blindness, reducing endurance so that it is easily infected with infections that can cause death. KVA has more suffered among children. This is because they have a high need for vitamin A as a result of increased physical growth and low food intake (Kapil & Sachdev 2013). Vitamin A is one of the nutrients of the vitamin group that is needed by the body that is useful for eye health (in order to see well) and for the health of the body (increase endurance to fight diseases such as measles, diarrhea and other infectious diseases).

If the body Kekurangan vitamin A, then the immune function becomes decreased, so it is easy to get infected. Besides that, the cell layer that covers the trachea and the lungs has a keratinization, not removing the ladders so that it is easy to get into the cause of respiratory tract infections. When occurring on the surface of the fine intestine can occur diarrhea. Changes in the surface of the urinary tract can cause infections of the kidneys and bladder. In children can cause complications in the measles that can result in death.

Deficiency of vitamin A (KVA) is also known as an Evening blind or xerophthalmia (dry eyes) that can continue on blindness. Since the 1980's, there has been an increase in the mortality rate of infants who are less vitamin A, even before the signs of Xerophthalmia. Less vitamin A can cause toddlers to become infants who are susceptible to infectious diseases (Baliwati et al., 2010). In addition, vitamin A deficiency can cause inflammation of the skin (dermatitis) and increase the likelihood of getting infected. Some sufferers have anemia. In vitamin A deficiency, vitamin A levels in the blood decreases to less than 15 micrograms/100mL (normal levels 20-50).

The results of the research carried out in nutrition and Health Status Monitoring survey (Nutrition & Health Surveillance System) for 1998-2002 showed, about 10 million children who are six months old to five years, meaning that half of the toddler population in Indonesia risk suffering from vitamin A deficiency.

According to research conducted Depkes works with Helen Keller International every three months this time, their daily food under the adequacy of vitamin A prescribed for toddlers, namely 350-460 Retino Ekivalen per day. It is further explained, that vitamin A deficiency relates to the high mortality rate in infants.

If the child is deficient in vitamin A, but does not receive treatment of his death rate of 49 percent higher than that of the vitamin. Medically there is a connection between vitamin A deficiency and death in infants.

One of the important factors in the effort to achieve optimal health degree in children is a good nutritional condition. However, in the fact that in society there are still many malnutrition in children. Direct cause of nutritional problems in the outline associated with food consumption is still lacking compared to the needs and the presence of infectious diseases. The need for nutrients for the body can be obtained through food intake containing a source of macro nutrients (energy, protein, fat) and micro (vitamins and minerals) that all play a role in the growth of children. Based on basic health Research Data (Riskesmas) in 2013.

Vitamin A, vitamin C, and zinc serve for the maintenance of health and survival through the immune system. Vitamin A, vitamin C, and zinc deficiency can increase children's risk of infectious diseases such as respiratory diseases, diarrhea, and fever. In addition, increased infectious diseases can cause growth delays. Deficiency of vitamin A in populations can be conducted biochemically examination by blood glucose retinol examination. Vitamin A deficiency indicators can be seen from the concentration of retinol. Children deficient in vitamin A at risk of respiratory diseases and increase the severity of diarrheal disease.

Total diet survey showed consumption of processed vegetables 57.1 g and green vegetables 79.1 g per person per day, while the fruit consumption and the results of new reach 33.5 g per person/day with the most widely consumed fruit is 15 banana fruit, 1%. Survey results also show the consumption of multivitamin new population reaches 0.3% (Libangkes, 2014).

CONCLUSION

1. Sample amounted to 40 with the highest minus eye category-3 and the lowest-1.
2. Intake of Vitamin A prior to research 14.4 IU increased to 42.7 UI.
3. Intake of Vitamin C before research 3.65 mg increased to 32.95 mg.
4. There is the influence of giving Vitamin A and Vitamin C to patients with minus eye disorder in the students of SMA Negeri 1 Bitung

SUGGESTIONS

1. Need to increase consumption of fruits and vegetables as a source of vitamins.
2. Need parent and teacher support on student food consumption pattern
3. Need the support of all parties to the UKS program well, parents, teachers, even governments.
4. Can use Rapid Test Snellen Card to detect if there have been changes in eye sharpness.
5. Need advanced research related to vitamin A content, and Vitamin C in Hemoglobin level, eye activity, and others.

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