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Issue 1 Volume 1 December 2017 DIFFERENCES IN WORK FATIGUE OF SHIFT SYSTEM WORKERS AT THE RECEIVING AREA OF "X" COMPANY Bongakaraeng1, Natalia Lalela2
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Bongakaraeng68@gmail.com ABSTRAC Fatigue is a condition of weakening energy to do a job or the occurrence of tremor or muscle pain.

The research **aims to find out** the level of work fatigue in terms of morning and night shift works and to know the difference of work fatigue according to morning and night work shift at the receiving section of "X" company, in Bitung. The type of this research is descriptive analytic with cross sectional approach. The sample of this research was 45 people, consisting of 14 morning shift workers and 31 night shift workers.

Measurement of work fatigue using L- 77 fatigue reaction timer. Process of measuring fatigue was using light and sound stimuli. Data was analyzed using unvairat analysis to know the level of work fatigue and bivairat to know the difference of work fatigue by using the **independent sample T test.**

The results showed that some shift workers had low fatigue and there was a difference in work fatigue between morning shift and night shift, indicated by light stimulation ($p = 0.036$) and with voice stimulation ($p = 0.017$). The conclusion is that fatigue among night shift workers is higher than the morning shift workers. Keywords: Fatigue, Work Shift
INTRODUCTION Working regularly needs to be considered in order to obtain a comfortable state of work.

The human body can be regarded as a machine and the human ability to carry out activities depends on the physical structure of the body composed of bone structure,

skeletal muscle, nervous system, and metabolic processes. All activities of the human body require energy, while energy is obtained from the chemical process that converts food into two forms, mechanical and heat work (Sedarmayanti, 2009). Work in the broadest sense can be interpreted as main activity done by humans. Work is an activity most often performed by a person.

In carrying out its activities, people often work regardless of working time, workload position and working environment conditions that result in fatigue. Continuous work **more than eight hours** per day is designed for shift system work to be morning shift, afternoon shift and evening shift. Tarwaka (2004) suggests that fatigue is a mechanism of body protection in order to avoid further damage resulting in recovery after rest.

In general, symptoms of fatigue are closer to the understanding of physical fatigue and mental fatigue. Sedarmayanti, (2009) suggests that work-related fatigue will reduce work capacity and body resistance. Faigue **can be differentiated from** becoming muscular or physiologic fatigue and fatigue feeling (psychological).

Physiological fatigue is fatigue arising from the physiological changes of the body. Continuous physical work, influencing the physiological mechanism of **Proceeding Manado Health Polytechnic 1st International** Conference. ISSN : 2599-2031 475 Issue 1 Volume 1 December 2017 the body, either individually or simultaneously.

Fatigue occurs because the accumulation of this product is limiting the continuity of muscle activity. This residual product affects the central nervous system, causing the employee to be slow to work when he/she is fatigue (Sedarmayanti, 2009). Workers as working on evening shifts have a higher risk of working accidents than those who work in the morning shift (Ramandhani, 2003).

The research results Sumigar (2003) at PT. Sinar Pure Foods International Bitung shows that there is **a significant difference between** labor fatigue that work morning shift and evening shift means that work force on evening shift experience fatigue faster than those in morning shift.

Work fatigue for morning shift is categorized as mild and moderate fatigue, while for evening shift is categorized as moderate and severe fatigue. "X" company is a company in Bitung city which is engaged in canning tuna fish. The company has 1000 employees with 14 parts of work namely; production, cold storage / ice plant, purchasing, accounting, finance, HRD, electricity, work shop, fishmeal, warehouse, labeling, quality assurance, can making, and PPC (planning production control).

The production section consists of 7 work areas, which are receiving, screening, loining, packing, refort, case up and sanitation. Receiving area has 45 employees, 80 employees for screening, 480 employees for loining, 75 staffing, 15 employees for refort, 20 employees for case up and 12 employees for sanitation. This study is only done in the receiving area because of accident risk that often occurs.

The job in the receiving area is done in a standing position and is divided into two shift turns i.e. morning and evening shifts. The morning shift starts at 07:00 and ends at 15:00 while the evening shift starts at 23:00 and ends at 7:00. Within one shift there are about 20 workers. Cited from the available sources, risk of accidents most often occurs in the receiving area when work is done on the evening shift and in the morning.

Accidents that often occur while fish bone is impaled and cutting with a knife. **The purpose of this** research is to know the level of work fatigue in morning shift and to know the difference of work fatigue **between morning and evening** shifts at the receiving area of X company, in Bitung.

Hypothesis in this research is there is difference of work fatigue among workers of evening and morning shifts at the receiving area at X company, in Bitung. **METHOD** The type of this research is descriptive analytic research with cross sectional approach. The research variable consists **of the independent variable** is the work shift and the dependent variable is the level of work fatigue. The population is 727 employees.

The sample was taken as many as 45 people, determined based on purposive random sampling that is the determination of the sample based on the consideration that in the receiving area is the most frequent division of work accidents where as many as 14 people work in morning shift and 31 people in the evening shift. Measurement of work fatigue using working fatigue gauge, that is Reaction Timer L-77.

The research data was obtained from direct measurement of work fatigue using the Reaction Timer L-77 with the steps of usage: worker / respondent sitting quietly and listening to the checking instructions from the tester (operator) i.e. to **Proceeding Manado Health Polytechnic 1st International** Conference. ISSN : 2599-2031 476 Issue 1 Volume 1 December 2017 press the button or mouse when the worker heard or see the stimuli released by the tool.

Workers may not see what the tester / operator performs, the worker is allowed to see or listen to the stimuli displayed by the tester / operator. When the worker listens to the sound stimuli or sees the rays displayed by the operator / tester then the worker is asked to immediately press the subject or mouse button. **The reaction time is** done

according to the needs of the examiner in the morning, afternoon, or evening.

Criteria for measuring reaction time: Normal: 150- 240 milliseconds; Light weight: 241 - 409 milliseconds; Medium: 410-579 milliseconds; Weight: 580 ++ milliseconds Unvairat analysis with percentage to know the level of work fatigue on morning and evening shift workers. Bivairat analysis with independent sample T test is used to know the difference of work fatigue in the morning and evening shifts.

RESULTS The results showed that the work in the area was done with the position of ducking, standing and squatting. The work in the area is removing the fish's contents, arranged in trolley or on the train, then fish is cooked in precooker using steam with temperature 1000C. The results showed that the workers in the area were 20-40 years old with high frequency at the age of 21 - 25 years, as much as 38.7 percent.

The working period in the company is 1 to 6 years. Analysis of Unvairat Work fatigue with light stimulant. Table 1. Distribution Frequency of Work Fatigue Level with Light Stimulant on Shift Workers at the Receiving Area of X Company, Bitung Reaction Time (milliseconds) Level of Fatigue Frequency Morning Shift % Evening Shift % 150 - 240 Normal 4 29 7 23 > 240 - < 410 Light 10 71 19 61 > 410 - < 580 Medium -- 0 5 16 Amount 14 100 31 100 On table 1 can be seen that of 11 workers, 4 people (29%) in the morning shift and 7 people (23%) in the evening shift are on normal fatigue.

Meanwhile, of 29 workers, 10 people (71%) in the morning shift and 19 people (61 %) in the evening shift are on light fatigue, and moderate fatigue amounted to 5 people (16%) of evening shift workers. Work Fatigue with Voice Stimulant. Table 2. Distribution Frequency of Work Fatigue Level with Voice Stimulant on Shift Workers at the Receiving Area of X Company, Bitung Reaction Time (milliseconds) Level of Fatigue Frequency Morning Shift % Evening Shift % 150 - 240 Normal 7 50 5 16 > 240 - < 410 Light 6 43 18 58 > 410 - < 580 Medium 1 7 7 23 Heavy -- 0 1 3 Proceeding Manado Health Polytechnic 1st International Conference.

ISSN : 2599-2031 477 Issue 1 Volume 1 December 2017 Table 2 shows that of 12 workers, 7 people (50%) in the morning shift and 5 people (16%) in the evening shift are on normal fatigue, while of 24 people, 6 people (43%) in the morning shift and 18 people (58%) in the evening shift are on light fatigue category. Of 8 workers, 1 person (7%) in the morning shift and 7 people (23%) in the evening shift are on moderate fatigue category and one person (3%) evening shift worker is in fatigue category. Bivariate Analysis Differences in Work Fatigue with Light Stimuli. Table 3.

Results of Fatigue Analysis With Light Stimuli No Group Mean Sd t p 1 Morning Shift

2.6346 40.40742 - 2.170 0.036 2 Evening Shift 3.0891 99.95105 On table 3, morning shift mean value = 2.6346 milliseconds with Sd = 40.40742 and evening shift mean value = 3.0891 milliseconds with Sd = 99.95105. The result of statistical test $t = 2.170$ ($p = 0,05$). So, **Ho is rejected and Ha is accepted.**

There is a significant difference of work fatigue level between the morning and the evening shift workers at the receiving area of Delta Pasific Indotuna company, in Bitung. Differences in Work Fatigue with Voice Stimuli Table 4. Results of Fatigue Analysis With Voice Stimulation On table 4, morning shift mean value = 2,719 milliseconds with Sd = 84.45339 and mean value of evening shift = 3.469 millisecond with Sd = 106.91637. Statistics obtained = $0.017 = 0.05$.

So, **Ho is rejected and Ha is accepted**, meaning there is a significant difference in work fatigue level **between morning and evening** shift workers at the receiving area of X company, in Bitung. DISCUSSION Work fatigue is a pattern arises in a condition, that someone is generally **no longer able to** perform activities (Sedarmayanti, 2009).

This work fatigue was measured using the L-77 Reaction. Timer by giving stimulus to the worker. There are two kinds of stimulation given to the workers, which are excitatory light and sound stimuli. The workers were made focus on the tools by hearing the sound or seeing the light displayed by the tool and then giving a response. The response of the workers **measured based on the time** the reaction produced. The faster the response was given to the stimulus, the lower the value obtained.

Thus, the fatigue No Kelompok Mean Sd t p 1 Morning Shift 2.719 84.45339 -2.531 0.017 2 Evening Shift 3.469 106.91637 **Proceeding Manado Health Polytechnic 1st International** Conference. ISSN : 2599-2031 478 Issue 1 Volume 1 December 2017 experienced by the workers can be categorized. Based on the result of light stimulation measurement time, of 14 respondents in the morning shift and 31 respondents in the evening shift, there were 11 people (24%) included on normal category, 29 people (64%) on light category and 5 people (11%) on medium category.

For response time, there were 12 people (27%) on normal category, 24 people (53%) on light category, 8 people (18%) on medium category, and 1 person (2%) on weight category. The results of existing measurements, in general many workers who experienced mild category fatigue. The results showed that the level of work fatigue experienced by evening shift workers is higher than morning shift.

Naturally, the habit of human being from birth is doing activities during the day and sleep in the evening. But for workers in the evening shift, the evening rest is replaced by

work so it interrupts the cycle of day rhythm or commonly referred to as circadian rhythm. Shift work also affects bedtime and eating habits. Evening time shifts are the conditions that can the workers must adapt to in terms of biological and social aspects.

Evening work shifts negatively affect physical, mental and social health; disturbing homeostatic psychophysiology such as circadian rhythms, bedtime and eating habits; reducing workability, and increasing errors and accidents possibilities; impeding social and family relationships; and the presence of risk factors for the digestive tract, nervous system, heart and blood vessels. Based on the observation towards workers in the target area, the workers get tired faster.

Moreover, the work done in the area is monotonous and is done continuously, so that it can lead to fatigue. The result of analysis by using independent sample T test for light stimuli resulted in p value = 0.036 and the sound stimuli p 0.017 smaller = 0.05, so there is significant difference between morning and evening work shifts.

Differences in work fatigue between morning and evening shifts occur because of the difference in work time where the workers have to sleep during the day and work in the evening. This cycle will be very influential on the circadian rhythm. The work done in the night will be more severe than the work done during the day although the workload is the same because of interference of the circadian rhythm.

Previous research by Sumigar at PT. Sinar Pure Foods International Bitung in 2003 showed that there was significant difference of labor fatigue between workers in the morning and the evening shifts. Laborers worked in the evening shift experienced fatigue quicker than those working in the morning shift.

According to Suma'mur (1993) in Maurits (2008), there are two classes of causes of accidents: unsafe human acts and unsafe condition. From several studies that have been done, factors are done, the human factor occupies a very important position against the occurrence of work accidents that is between 80-85%. One of the main factors causing the work accident caused by humans is stress and fatigue.

Work fatigue contributes 50% to the occurrence of work accident (Setyawati, 2007). Fatigue can be caused by physical or mental stress. One cause of fatigue is sleep disturbance, among others can be affected by sleep deprivation and disturbances in circadian rhythms due to jet lag or work shift (Wicken, et al, 2004). Sharpe (2007) states that workers on night

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ISSN : 2599-2031 479 Issue 1 Volume 1 December 2017 shift have a 28% higher risk of injury or accident. Tired shows different physical and mental bodies, but they all result in decreased work force and reduced body resistance to work. There are two types of fatigue, namely muscle and general fatigue. Muscle fatigue is characterized, among others, by tremor or pain in muscles.

General fatigue is indicated by a loss of willingness to work, which is the state of central neurosis or psychological condition. The problem of general fatigue is the monotonous of work, the intensity and duration of mental and physical work that are inconsistent with the will of the workforce concerned, the circumstances of the environment which are different from the original estimation, unclear responsibilities, deep concerns, inner conflicts and ill conditions suffered by the laborer. Influence of the circumstances that cause fatigue is like gathering in the body and cause tired feelings (Suma'mur, 2009).

The burden of an employment activity determines how long a person can or is able to work in accordance with the capacity and ability of the workforce. The capacity of the workforce is measured by the value of the physiological variables about the maximum use of oxygen, the maximum heart rate, the rectal temperature and the speed of sweat. The more weight the physiological work load, the shorter the time a worker can work without fatigue or health problems. REFERENCE Budiono.

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