

The Influence of Noise, Workers Age and Working Period to Occupational Stress

Observational Study in Processing Section Workers Perkebunan Nusantara XIII PMS Pelaihari Company in Tanah Laut Regency

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ABSTRACT--- *Perkebunan Nusantara (XIII PMS Pelaihari Company Tanah Laut Regency is one of the State-Owned Enterprises in the processing of palm oil. This work process using noise machines which exceed the Threshold Limit Values and it causes workers get headaches, easy to get accident and some problem in indigestion. This study aims to describe the influence of noise, workers age and working period to occupational stress among processing section workers. This is an observational analytic study by cross-sectional approach. Sampling technique used purposive sampling as many as 36 people. Instrument of this study used Sound Level Meter and questionnaire. Independent variables were noise, workers age and working period, while the dependent variable was level of occupational stress. The result of research show 21 respondents (58.3%) work in the environment which exceed the TLV (> 85 dB), most of workers have younger age (20-35 years) about 32 respondents (88,9%), most of workers had working more than 2 years is about 31 respondents (86,1%) and 19 respondents (52.8%) have moderate stress. Based on the analysis of Spearman test with 95% confidence level show that there is a significant influence of noise ($p=0.000$) on the level of occupational stress. In contrast, there is no significant influence between workers age ($p=0.348$) and working period ($p=0.408$) on the level of occupational stress. Processing section workers expected to make efforts to reduce noise exposure and handling work stress using personal protective equipment.*

Keywords--- *noise, workers age, working period, work stress*

1. INTRODUCTION

Safety and health occupational play an important role in guaranteeing the protection of workers. Within the scope of employment, occupational stress is an issue for employee health who increase in risk of work accident that will lead to many financial loss matter and to decrease productivity as a whole. This makes the concept of safety and health occupational culture also provides protection against occupational stress on workers^{1,2}.

Based on study of Nadhiroh (2011) showed that the stress is caused by some factors such as age, as the condition of individual worker, gender, temperamental, genetics, education and culture introvert or ekstrovert personality like features and social relationships. Besides, there are environmental factors that might affect the work of the stress, such as noise lighting, ergonomics and the other².

According to *National Institute for Occupational Safety and Health (NIOSH)*, more than half of the workers in America considers that occupational stress as the big problem. *The American Institute of Stress* estimates that stress and pain that they have, make the business world in America losses of 300 billion dollars a year. An European Community of officially assert that stress is related largest work health problems faced by workers in Europe³.

Third European Survey on Working Conditions 2000 from *the European Foundation for the Improvement of Living and Working Conditions* identify 29 % of workers in Europe where they are exposed to noise^{4,5}. When employee suffers a long exposure can cause learned helplessness syndrome, namely a situation characterized by employee suffers depression helplessness in the form of work due to stress and reduced motivation derived from long exposure of noisy⁶.

Based on studies of Budiyanto (2010) and Ismar (2011), there is a meaningful relationship between the working period against the occupational stress level. Environmental factors that affect the research is noise, which means that as longer as period of workers will increase the exposure of noise workers, so these factors will support the occurrence of occupational stress^{1,7}. Research of Fitri (2013) states that the age of workers is a factor that can influence occupational stress level. Workers with older age will have more experiences than younger age⁸. Oktarini (2010) research results showed there was significant influence between the noise to occupational stress⁹. In research Nadhiroh (2011) also showed the existence of significant influence between the noise exposure with the occupational stress level¹. Recent research by Sukmono (2013) there's significant correlation was obtained between the intensity of noise to occupational stress³.

Perkebunan Nusantara (XIII PMS Pelaihari Company Tanah Laut Regency is one of the State-Owned Enterprises in the processing of palm oil. The work process include of weighing, loading ramp, boiling, beating, presses, clarification, kernel and demint plant. In this work process used machinery such as beat machine, sterilizer, digester and press machine which average noise intensity exceeding the TLV, which is 85-108 Db^{4,10}.

Based on earlier observation from the employees who had experienced headaches, a disorder of digestive such as an ulcer stomach of the symptoms of stress. There are a number of workers that noisy companies receiving more TLV. The workers at the company are about 20-49 years old which 1-20 years of working period. According to the description, the researchers were interested to know, the influence of noise, workers age and working period to occupational stress among processing section workers Perkebunan Nusantara (XIII) PMS Pelaihari Company Tanah Laut Regency

2. METHODS

This study was observational analytic, which aims to determine the effect of noise, age and working period to occupational stress on workers. The study design is *cross-sectional*, which studies have looked at the subject with approaches time⁴. The population is all of *processing section workers* of PMS Pelaihari PTPN XIII Tanah Laut as many as 45 people.

Sampling technique used purposive sampling with inclusion criteria did not suffer from hypertension or hypotension and did not have a history of stress management training on the occupational. Based on the sampling technique used was obtained sample of 36 people. The instrument used is the *Sound Level Meter* to measure the intensity of noise and a questionnaire to identify the age of the workers, working period and occupational stress. The questionnaire was made based on the symptoms of occupational stress which consists of physical symptoms, psychological and behavioral¹¹. The independent variables are intensity of the noise, workers age and working period, while the dependent variable is that occupational stress occurs in workers.

Data analysis was performed using statistical computer programs and data analysis in this study using univariate analysis to figure noise, workers age, working period and occupational stress were analyzed using descriptive statistical test through a frequency distribution table. Used bivariate analysis to determine the influence of noise, age and working period to occupational stress in *processing section workers* of PMS Pelaihari PTPN XIII Tanah Laut using *Spearman Rank Correlation* test with significance level $\alpha = 0.05$

3. RESULT AND DISCUSSION

3.1 Univariate Analysis

In this research study focused on the intensity of noise, workers age, working period and occupational stress in *processing section workers* of PMS Pelaihari PTPN XIII Tanah Laut. Description of noise, age, working period and occupational stress on the 36 respondents in the study can be seen that the frequency distributions are presented in Table 1.

Table 1: Distribution and Frequency

Variables	Total	Percentage (%)
Noise		
Appropriate threshold values (≤ 85 dB)	15	41.7
Exceeds the threshold value (> 85 dB)	21	58.3
Age Workers		
Early adulthood (20-34 years)	32	88.9
Late adulthood (35-50 years)	4	11.1
Years Of Service		
Not long (0-2 years)	5	13.9
Long (> 2 years)	31	86.1
Work Stress		
Very mild stress	1	2.8

Variables	Total	Percentage (%)
Mild stress	13	36.1
Moderate stress	19	52.8
Heavy stress	3	8.3
Very Heavy stress		
Total	36	100

Source: Primary Data

Table 1 shows that most *processing section workers* in an environment that exceeds the threshold value (> 85 dB), as many as 21 respondents (58.3%). The distribution and frequency of working age the majority of respondents were early adulthood (20-34 years), which amounted to 32 respondents (88.9%). Early adulthood will be susceptible to high stress symptoms because they are dealing with a competitive targets and is influenced by expectations that are unrealistic when compared with their older^{3,14}. Distribution and frequency of working period most of the respondents have a long working period (> 2 years), as many as to 31 respondents (86.1%). Working period can be defined as a period of a person's work, calculated from the start to work until now still working. As many as longer of the employee works, they are also exposed to working conditions that may interfere with their health, and prone to boredom in the monotonous work routine and experienced tensions over the workload that accumulate both physical and psychological, such as occupational stress. Most respondents experiencing moderate stress. Occupational stress can harm themselves workers, company, and society. Excessive work stress will lower a person's productivity at work. Consequences that may occur as a result of occupational stress is the disruption of physical health, psychological health, *performance* and affect individuals in decision-making¹⁵.

3.2 Bivariat Analysis

The influence of noise, workers age and working period to occupational stress by using *Spearman Rank Correlation* test can be seen in Table 2.

Table 2: Analysis of influence of noise, workers age and working period to occupational stress

Variables	P-value	Spearman correlation	Information
The influence of noise to the occupational stress	0,000	0.801	There is the influence of noise to the occupational stress
The influence of age workers to the occupational stress	0.348	0.161	There is no influence the ages to the occupational stress
The influence of working period to the occupational stress	0.408	0,142	There is no influence the working period to the occupational stress

Based on result of Table 2, Spearman correlation test with a confidence level of 95% to see the influence of noise to occupational stress in processing section workers was found that the value of R = 0.801 and P = 0.000. R value indicates that there is a strong positive correlation between the noise level to occupational stress, it means increasing the noise, the more potential for the occurrence of occupational stress. Of the value of P in the statistical test results obtained Ho decision rejected ($p < 0.05$), which means a significant difference between the noise to the occupational stress on processing section workers. This happens because the noise as stressors for workers who are in a noisy environment so that workers get extra pressure.

The results of the study with 36 respondents, one respondent (2.8%) experiencing occupational stress is very mild, 13 respondents (36.1%) experienced mild occupational stress, 19 respondents (52.8%) experienced moderate occupational stress, 3 respondents (8,3%) heavy occupational stress, while respondents who very heavy stress does not exist. Of the 19 respondents who experienced moderate stress, 17 respondents working at the station which has an intensity of noise > 85 dB and 3 respondents who have heavy stress also worked at the station that has the intensity of noise > 85 dB.

Processing/production section is the most vital part in an industry. This section is a place to process products ranging from raw materials to be semi-finished products or finished products. In processing products, industry uses a variety of work machines working continuously causing the noise. Noise intensity is highest in the engine room station/*power house* that reaches 95 dB.

The results are consistent with research Sukmono (2013) which concluded that there is an influence of noise with the occupational stress. Research Ajala (2012) states that noise is one of the main causes of employee disruption, decreased productivity, serious inaccuracies and increased work-related stress. It is also supported in the research Akbari (2013) which states that the noise exposure in the work environment has a negative effect on the performance of the human cause psychological stress^{16,17}.

Noise can cause temporary or permanent interruption of hearing can also be a source of stress that causes an increase of alertness and psychological imbalance workers, thus make emergence of accident conditions. According

Ivancevich & Matterson in Budiyanto (2010) found that excessive noise (80 dB) were repeatedly heard, for long periods of time can cause stress. Noisy by the factory workers assessed as generating harmful stress¹.

Occupational stress can be controlled in several ways such as optimizing the break time and the development of a healthy lifestyle. If not possible to change the work environment factors, it can be a way to develop a healthy lifestyle for workers, especially in processing section that has the intensity of noise which exceeds TLV. A healthy lifestyle is the key to a get stress free. Stress can be controlled with a food containing vitamin B complex such as beans and grains. In addition, reducing fatty foods, multiply eat fruits and vegetables and exercising regularly can also reduce the level of stress¹⁵.

Based on result of Table 2, Spearman correlation test with a confidence level of 95% to see the influence of age workers to occupational stress in processing section workers was found that the value of $R = 0.161$ and $P = 0.348$. R value indicates that there is a weak influence between the ages of workers against occupational stress levels. The P value in the statistical test results obtained H_0 acceptable decision ($p > 0.05$), which means there is no significant influence between age workers to occupational stress in processing section workers. This can be caused by the incidence of occupational stress in this study is not only experienced by workers at a young age, but also experienced by older workers. Moreover, the dominant factors causing stress in this study is a working environment conditions, such as noise.

These results are consistent with research Oktaviana (2009) and Giriwati (2011) which also concluded that there was no relationship between age to the occupational stress. In Giriwati (2011) study, age is not a major cause of occupational stress factor because stress will occur if they disable to solve a problem and does not depend on the worker's age. Moreover, according to Vierdelina (2008), workers age is an individual intrinsic factor can be used as a cause of stress, but the work environment factors that play a role in causing the stress¹⁵. Environmental work factors in companies where research on the influence of occupational stress is noise. This is evidenced in the analysis of the influence of noise on the occupational stress in this company stating the influence of noise with work stress.

Some studies suggest that as young as the age of the respondent, the more likely to experience work stress and the older age of the worker so might that lower possibility to suffering from work stress. Workers with older age tend to have a mental health condition better than working with younger age. With older workers will be able to show the maturity of the soul, in the sense that the more thoughtful, more capable of rational thought, the more able to control the emotions, the more tolerant of different views and behavior of himself and increasingly the intellectual and psychological manner^{8,20}. While research Nadhiroh (2011) states that the older workers will be susceptible to the stress of work, this is due to the presence of indicators of adrenaline and blood pressure which increases the potential for occupational stress by working groups elderly (> 40 years). Moreover, in old age will be a change of physiological factors such as visual deterioration, the ability to think, remember and heard, this is the increasing occurrence of work stress on older workers²¹. From these statements, occupational stress can be experienced by all categories of age, so age is not a major factor that can influence the occurrence of occupational stress. This is because there are other factors more influential, such as work environment, the ability to cope with stress and physiological factors of workers. In companies where research has work environment factors such as noise. In addition, the ability to cope with stress in workers processing can be done through a break due to the linkage with the work process, which breaks depending on the workings of the machine, equipment or work procedures²².

Based on Table 2 showed Spearman correlation test with a confidence level of 95% to see the influence of working period to occupational stress in processing section workers was found that the value of $R = 0.142$ and $P = 0.408$. R value indicates that there is a weak influence between working period to occupational stress. Of the value of P in the statistical test results obtained H_0 acceptable decision ($p > 0.05$), which means there is no significant influence between working period to occupational stress in processing section workers.

The period of a person's work related to his experience making it easier for workers solve problems and work stress control. In addition, the ability of workers in solving the problem can be influenced by education and social relations. In general education aims to develop and expand their knowledge, experience and understanding of individuals. The higher one's education is the easier one thinks broadly, the more high initiative and the easier it is to find efficient ways to get the occupational done properly so that it can control the stress^{23,24}.

Social relations can be seen from the good relationship between the workers in the workplace, such as improving cooperation in solving difficult problems or easy way to state in the workplace. Based on the observations of researchers in the field, labor relations and social relationships occur with both among workers in the workplace. It can be seen from always an interaction between workers while at work. It can control the occurrence of work stress on workers¹⁵.

The results are consistent with research Giriwati (2011) and Sarwono (2006) which concluded that there was no relationship between the period of employment with the work stress. In Sarwono study (2006) noted that work stress can be directly influenced by many factors so as to determine the tendency of other factors need to be examined later^{16,25}.

Work period is the length of a worker to donate energy at a particular company. The extent to which workers can achieve satisfactory results in the work depends on the abilities, skills and specific skills in order to perform their occupational well. The period of a person's work related to his experience. Workers who have long worked in a particular company has had a variety of experiences related to their respective fields, in the day-to-day implementation of the workers will receive a variety of inputs and trying to solve a variety of problems²⁶. On the other hand, the longer the person works the longer they are also exposed to working conditions that can interfere with health. In addition, workers

who have long working time will be susceptible to boredom in the monotonous work routine. In individuals with prolonged working life can also experience more tension caused by the workload that accumulate both physical and psychological²⁷.

4. CONCLUSION

Most processing section workers works in an environment that exceeds the threshold value (> 85 dB), as many as 21 respondents (58.3%), Most processing section workers have young age (20-35 years), ie a total of 32 respondents (88.9%), most processing section workers have long (> 2 years), as many as 31 respondents (86.1%) and most processing section workers have moderate stress, as many as 19 respondents (52.8%). There is significant influence of noise to the occupational stress in processing section workers ($p = 0.000$). There is no significant influence of age workers ($p = 0.348$), and working period ($p = 0.142$) to the occupational stress in processing section workers.

The company is doing expected technical control in order to reduce the risk of noise so as not to exceed the NAB by way of treatment machines in the production process routinely. Processing section workers is doing expected to reduce exposure to noise and stress management work using personal protective equipment. Processing section workers at the station with high noise intensity should develop a healthy lifestyle by eating nutritious food and rest enough to minimize the symptoms of stress that may occur. Further research should be done on the effects of noise, workers age and years of service with the stress of work, but with a more sample and longer time to obtain a good overview of the problem. In addition, further research is expected to further examine the factors that influence job stress, such as worker's personality, vibration and temperature of the working environment, family conditions, economic conditions and social change in workers processing section PTPN XIII Pelaihari PMS.

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