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RESEARCH ARTICLE

The Influence of Ship Engine Noise Levels on Work Stress Levels of Ship Technicians

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Abstract: Unnoticed high-intensity noise causes serious impacts on people ABK. Measuring noise levels in engine rooms on ships. Provide a solution how reduce noise and impact noise. The research aims to determine the level noise in the engine room. Excessive noise can cause an impact on employee health. Formulation of the problem in. This research is the relationship between noise intensity and stress levels worked as a ship technician The research was carried out using a sound level meter, measurement tool carried out in the engine room and measurements work stress level

Keywords: Level, hearing, stress.

1. Introduction

Noise is a sound or sound that is unwanted and can be annoying health, comfort and can cause deafness. Noise is a quite an important issue, especially in relation to comfort Level Excessive noise can have very dangerous negative impacts, namely impacts from a health perspective as well as from a psychological and technical perspective. Damage to hearing aids is one of the impacts from a health and physical perspective The psychological impact that can be caused is emotional disturbance High intensity noise that is not realized causes impacts. Hearing health as an aspect of quality of life and by Therefore hearing needs to be protected so as not to disturb the peace workers due to excessive noise. Excessive noise can has an impact on the health of the workforce which includes increasing blood pressure, pulse becomes rapid, emotions increase, vaso construction ant blood vessels), muscles become tense or the body's metabolism increased stress, and hearing loss.

Noise affects humans in two ways. First, Noise can damage hearing, ranging from deafness to deafness temporary (taste time for a certain time) to reduced sensitivity powerful at certain sound frequencies. Second, more stress response general includes changes and swings in mood, motor function and intellectual damage as well as changes in behavior and physical condition This is proven by several literatures that have shown that certain elements such as noise from the engine, air temperature, which is too high or too low, and many other inhibiting conditions exist potential as a cause of stress in the work environment.

Several surveys regarding work stress resulting from noise have been conducted done. Survey conducted by Northwestern National Life stated that 25% of workers who work in noisy places admitted experiencing very severe stress. Meanwhile, a survey from Families and Work. The Institute states that 25% of workers are often and very often stressed by noisy work environment. Yale University announced that 29% of workers reported that they felt sick or very stressed at workplace due to noisy machines.



1.1. Research Focus

This research aims to find out about the influence of noise intensity on labor and input materials for the company regarding danger of noise exposure to technicians in particular on the impact of work stress. So the ship provider company is expected can make efforts to control noise against work environment and workforce so that working conditions become more comfortable and healthier so that it can improve company productivity.

2. Literature Review

a. Noise Intensity

Sound or voice is defined as a series of waves propagates from a vibration source as a result of changes in density and also The air pressure that the human ear can perceive is within the range of 16-20,000 Hz. Workplace noise has become an occupational hazard (occupational hazard) when its presence is felt to be disturbing or not desired physically (hurts the worker's ears) and psychologically (annoys the worker concentration and smooth communication) which will be a pollutant for environment, so noise is defined as environmental pollution caused by sound Management as a specific process consisting of activities for planning, organizing, actuating and controlling human or other resources, all of which are carried out to determine and achieve organizational goals Management as a science, management is also universal and uses a systematic scientific framework. Management science can be applied in all human organizations, companies, government, education, social, religious and others.

b. Health Relationships

The main relationship of noise to health is damage to the listener's senses, leading to progressive deafness. First effect Hearing noise is temporary and recovery occurs quickly after being stopped from working in a noisy place. noise relationship to workforce are:

- Reduces comfort at work.
- Disturbs communication or conversations between workers.
- Reduces concentration.
- Stress.
- Blood Pressure Rises.
- Dizziness and sleepiness.
- Heart rate increases.
- Reducing work productivity.

c. Port Services and Facilities

In the Minister of Transportation's regulations regarding the operation of sea ports, there are basic facilities and port supporting facilities in the land area and in the sea area of the port which become the port master plan in each port that is built.

- Basic port facilities in land areas
- Port supporting facilities in land areas include
- Basic port facilities in the water area
- Port supporting facilities in water areas

d. Effects of Noise Intensity

Noise intensity has a major influence on human health and if exposed for too long it will cause health problems. Disturbance This health is not only about hearing loss but also cause hypertension. Hypertension is triggered by unstable emotions can cause stress. Continuous stress will cause narrowing of blood vessels, thereby encouraging the heart to work more Kersa pumps blood throughout the body. If this happens continuously over a long time, blood pressure will rise and this increase is what called hypertension The influence of noise

intensity on humans depend on physical characteristics, time in progress, and time the incident. This influence takes the form of interference that can reduce human health, comfort and security. Some form of interference caused by noise are as follows :

- Physiological Disorders
- Psychological disorder
- Organic Pathological Disorders

e. Job Stress Level

Stress is defined as a process with events threatening environment or loss of the organism's well-being elicits several responses from the organism. This response can be profound form of coping behavior (adaptive behavior) to threats. Incident -Environmental events that cause this process are called sources of stress (stressors) which include natural and technological disasters, noise, and commuting, while the reaction that arises due to a stressor is called a response from stress. Job stress in general can be said to be that if someone is faced with on work that exceeds the capabilities of the individual, the individual who concerned experiences work stress. Someone can be categorized as experiencing work stress if it also involves the company organization where the person is concerned work

f. Sources of job stress levels

Some sources of stress:

- Work environment
- Workload (Overload)
- Deprivational Stres
- High Risk Jobs
- Type A Environment

g. Symptoms of job stress levels

Unresolved stress causes physical, mental and physical symptoms social and its types can be mild, moderate, to severe. Indirect stress give consequences or impacts at that very moment, even though there are many of them which immediately shows its manifestation over a period of days, weeks, months or a year later

h. Mechanism of occurrence of work stress levels due to intensity noise in the workplace

Stress arises every time because of a change in balance a complexity between man-machine and the environment. Because of complexity it is an interactive system, so the resulting stress exists between several system components. Thus, stress occurs in components- physical components. One of them is work or a usually noisy environment can cause tension in humans, so that stress will arise and in turn, feelings of dissatisfaction will influence more or less productivity and work performance. And many other inhibiting conditions have inevitable possibility as a cause of stress in the environment Work.

3. Research Method and Materials

In this research there are two variables, namely dependent variable and independent variable. The independent variables in this study are noise intensity, while the dependent variable is the level of work stress. Based on the existing problems, the researchers made a hypothesis, namely that there is a relationship between noise intensity and the level of work stress in ship technicians. This type of research is an analytical survey, namely research that tries to explore how and why health phenomena occur. This research uses a crosssectional approach. In this research, 57 ship technicians at Tanjung Priok port were surveyed.

4. Results and Discussion

To determine the exposure to noise intensity that has been received The workforce is measured using a Sound Level Meter in the position of employees working in each section. Noise intensity measurements were carried out on ships docked at Tanjung Priok harbor and are presented in the following table :

Table 1. Results of noise intensity measurements on ships at Tanjung Priok port

Ships	Noise Intensity Value (dBA)
Ship 1	73.1
Ship 2	74.6
Ship 3	72.6
Ship 4	74.7
Ship 5	76.3
Ship 6	75.1
Ship 7	73.6
Ship 8	75.2
Ship 9	74.3
Ship 10	72.6
Ship 11	73.6
Ship 12	72.2
Ship 13	69.5
Ship 14	72.2
Ship 15	70.2
Ship 16	76.3
Ship 17	75.1
Ship 18	73.6
Ship 19	74.6

Based on Table 1 regarding the results of measurements on ships at Tanjung Priok port, the average noise level is 73.6 dBA. The results of noise intensity measurements by ship technicians at Tanjung Priok port can be seen in the Table 2.

Table 2. Distribution of Noise Intensity Values for ship technicians

No.	Noise Intensity	Frequency	Percentage (%)
1	Noisy	30	52.7
2	Not Noisy	27	47.3
	Total	57	100

Based on Table 2, it can be seen that the noise intensity value received by technicians in noisy places was 30 people or 52.7%, while in quiet places there were 27 people or 47.3%. From the results of research on the work stress level of ship technicians at the port of Tanjung Priok shown on the Table 4.

Table 3. Distribution of Job Stress Levels for ship technicians at the port of Tanjung Priok

No.	Work stress level	Frequency	Percentage (%)
1	Not stressed	15	26.3
2	A bit stressful	24	42.2
3	Quite stressful	18	31.5
	Total	57	100

Based on Table 3, the distribution of work stress levels shows that there were 15 technicians who did not experience stress (26.3%), who were quite a bit stressed as many as 24 people (42.2%) and 18 employees who were quite stressed (31.5%). From the results of statistical processing using the Chi Square test, then the correlation results between noise and work stress levels were obtained presented on Table 4.



Table 4. Chi Square Correlation Test Results of noise intensity and level work stress on ship technicians at the port of Tanjung Priok

No.	Noise Intensity	Work Stress Level						Total	p	CC	
		Not stressed		A bit stressful		Quite stressful					
		Σ	%	Σ	%	Σ	%				
1	Noisy	3	10	16	53.3	11	36.6	30	100	0.028	0.351
2	Not Noisy	12	44.4	9	33.3	6	22.2	27	100		
	Total	15	26.3	25	43.8	17	29.8	57	100		

From the Chi Square Test, the significance value was obtained, p value $<0.028 < \alpha < 0.05$ then H_0 is rejected, H_a is accepted, which means there is a relationship between noise intensity with the level of work stress in ship technicians at the port of Tanjung Priok. Meanwhile, the Contingency Coefficient value is 0.351, which shows that there is a low relationship between noise intensity and the level of work stress in ship technician at Tanjung Priok port.

Based on the results of measuring the intensity of noise that occurs on ships at Tanjung Priok port, the results show that the noise value has exceeded the value The threshold (NAB) determined by Kep-51/MEN/1999 is 85 dBA with a working time of 8 hours/day (A. M. Sugeng Budiono, et al., 2003:33), namely with a range of 86.21 – 96.35 dBA, 30 were received people or 52.7%. Meanwhile, technicians who were not exposed noise exceeds NAB or below NAB, namely 27 people or 31.5%. From the description above, it can be concluded that the noise intensity on ships is very high. The ship owner has provided ear protectors but the employees don't want to wear them because technicians feel uncomfortable while working using personal protective equipment. Opinion A.M Sugeng Budiono (2003:100) stated that exposure to noise with intensity of more than 85 dBA received by employees during 8 working hours/day can affect employee health, one of which is: resulting in work stress. For this reason, researchers suggest to employees so that employees wear ear protection equipment provided by the Company during work and use rest time as best as possible with purpose restores the sound received by the ear during work.

Based on the results of research conducted on ship technicians at the port of Tanjung Priok as many as 57 people, it was found that 15 people or 26.3% did not experiencing work stress, technicians who experience less stress are 25 people or 43.8% and the remaining 17 people or 29.8% experienced quite a lot of work stress. This can be partly concluded by ship technicians in Tanjung Priok port experience a lot of work stress. J.M.'s opinion Atkinson (1991:65) states that the physical environment is often causing work stress is an unhygienic environment and has high noise. Noise can be felt and seen as a source stress if the noise is unwanted, sudden and disturbing to employees. Likewise with the opinion of A. Aziz Alimul H (2006:11) who states that several aspects that cause work-related illnesses are work stress, among others physical, chemical, infectious, physiological and psychological aspects. Noise is one of the causes of work stress in terms of the physical aspect. Companies are advised to use silencers at noise sources, blocking, moving, maintaining, or arranging space layout and use of personal protective equipment so that noise does not harm health or dangerous.

Research results on the relationship between noise intensity and the work stress level of ship technicians at the port of Tanjung Priok using the Chi Square test was obtained. The p value result is 0.028, which shows that there is a relationship between noise intensity and the level of work stress in ship technicians. Meanwhile, the CC value is 0.351, which shows there is a relationship low noise intensity and work stress levels for ship technicians. This low relationship is due to conditions work because the ship is docked at the port.

5. Conclusion

Based on the results of research, it can be concluded that there is a relationship low noise intensity with work stress levels for ship technicians at the port of Tanjung Priok because the ship is in a berthed position at the port, not when sailing at sea

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