

The Factors Related to the Usage of Ear Protectors at Weaving Industry Workers

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Abstract— Ear protection hardware for workers is needed with the aim of preventing work accidents. 19% reported hearing loss; Hearing loss rates uniquely increase with age. Among those with hearing loss, 29.9% reported that they were associated with noise-induced hearing loss in the workplace. The purpose of this study was to determine the relationship between worker's factors (knowledge and attitude) and management factors (training and supervision) with the use of ear protection equipment at weaving industry workers of Bogor. This type of research is descriptive analytic with a cross sectional approach. With a total population of 381 participants. The sampling method in this study was the accidental technique with a sample of 130 participants. Data collection was obtained through the distribution of questionnaires in the form of questionnaires. The data analysis technique used chi square test. The results of the study were that most workers used ear protector at work (87.7%), most workers lacked of knowledge about the usage of ear protector (59.2%), most workers were good at using ear protector (73.1%), most of the workers answered good training using ear protector at works as much as (63.8%), most of workers using ear protector at due to good supervision as much as (71.5%). The results showed that there was a relationship between knowledge and ear protectors usage (p value = 0.033), there was a relationship between attitude and the usage of ear protectors (p value = 0.002 with OR 5.933), there was a relationship between training and use of ear protectors (p value = 0.026 with OR 3.468), and there was a relationship between supervision and usage of ear protectors (p value = 0.003 with OR 5370).

Keywords— Ear Protector, Knowledge, Attitude, Training, Supervision.

I. INTRODUCTION

The International Labor Organization (ILO) report lists Indonesia as the country with the second largest number of work accidents in the world. The report is based on a survey of 53 countries in 2017, according to ILO data, there were 65,474 work accidents in Indonesia. Among these, 1,451 workers died. In addition, 5,326 workers with permanent disabilities and 58,697 recovered without disability.¹

Data from the National Occupational Safety and Health Council shows that the tendency of occupational accidents to increase from year to year is 82,456 cases, increasing to 98,905 cases, and rising again to reach 104,774.² Of the work accident cases, 9.5% (5,476 workers) were permanently disabled.³ Most of this happened due to the lack of awareness of the workers to wear ear protection, meaning that every working day there are 39 workers who get new disabilities and 17 people die due to work accidents.⁴

About 19% of hearing loss; the proportion of visual acuity increases with age. Among those with hearing loss, 29.9% reported that they were associated with work-related hearing loss.⁵ Along with the development of science and technology, most industries in producing products use machine power which does not have a bad impact, in the form of hearing loss due to negative sounds that come from production machines and have an impact on workers around the workplace reducing hearing, therefore the company or workplaces must provide Ear Protective Equipment.⁶

The factors related to the usage of ear protective equipment, namely, knowledge of workers about the

importance of wearing Ear Protective Equipment at work to avoid accidents due to work and occupational diseases, attitudes of workers towards the use of Ear Protective Equipment, proper supervision carried out by the work management section of the company itself, and also training held by the management section of the company whether related to the use of Ear Protective Equipment or not.⁷

As for the impact of not using Protective Equipment, splashes of chemicals or liquid metal, dust, powder catalyst, projectiles, gases, vapors and radiation can cause eye pain or blindness in the eyes, sound with an increase level of more than 85 dB can cause a decrease in hearing level, falling objects falling, hitting hard objects, hair entangled in rotating objects, extreme temperatures, inclement weather, splashes of chemicals or molten metal,⁸ bursts of pressure leaks, penetration of sharp objects, contaminated dust, extreme temperatures, sharp objects, falling by heavy objects, electric shock, chemicals, skin infections, slippery floors, wet floors, sharp objects, falling objects, splashes of chemicals and molten metal, aberrations.⁹

II. MATERIAL AND METHOD

The research was carried out at Weaving Industry Workers of Bogor during October 2021-February 2022. Total population of 381 participants. The sampling method in this study was the accidental technique with a sample of 130 participants. Data collection was obtained through the distribution of questionnaires in the form of questionnaires. The data analysis technique used chi square test.¹⁰

III. OBSERVATION AND RESULT

This study uses T-Test in processing bivariate analysis with the fulfillment of the data normality test requirements. The following are the results of this research data processing:

TABLE 1. Frequency Distribution of Knowledge, Attitude, Training, Supervision, and Usage Ear Protector At Weaving Industry Workers

S.No	Variable	Frequency	Percentage(%)
1	Knowledge		
	Good	9	6.9
	Medium	44	33.9
2	Attitude		
	Good	95	73.1
	Low	35	26.9
3	Training		
	Good	83	63.8
	Low	47	36.2
4	Supervision		
	Good	93	71.5
	Low	37	28.5
5	Usage Ear Protector		
	Use	114	87.7
	Don't use	16	12.3
	Total	130	100

Based on the results of table 1 above, it is known that the frequency distribution showed that out of 130 participants, 44 participants (33.9%) were medium knowledge in use of ear protection. 95 participants (73.1%) were good attitude in use of ear protection. 83 participants (63.8%) were good training in use of ear protection. 93 participants (71.5%) were good supervision in use of ear protection, and 114 participants (87.7%) use ear protectors.

TABLE 2. Relationship Between Factors Related To Ear Protectors' Usage

S.No	Factors	OR	95%CI	Usage Ear Protector (P value)
1	Knowledge	4.325	1.274-14.368	0.003*
2	Attitude	5.933	1.965-17.916	0.002*
3	Training	3.468	1.172-10.269	0.026*
4	Supervision	5.370	1.787-16.139	0.003*

The table above showed that factors related to the use of ear protectors which include knowledge, attitude, training, and supervision, where p value < 0, 05.

IV. DISCUSSION

A. Knowledge

Based on the level of knowledge, it can be seen that most of the participants have less knowledge, namely 96 participants (73.8%). From the results of the statistical test, it was found that there was a relationship between knowledge and the use of ear protector, and the result was a p value = 0.002, meaning that there was a relationship between knowledge and the use of ear protector.

In line to Mahdi Jahangiri and Ansari research in 2008 the results showed that only 20.3% of employees claimed to wear hearing protection all the time when they exposed to noise. There was a significant relationship between use of hearing protector and knowledge about hearing protection (p=0.009).¹¹

Knowledge is a very important factor for the formation of a person's behavior. From the research it is proven that behavior based on knowledge, awareness and positive attitude will be lasting, on the contrary if the behavior is not based on knowledge and awareness it will not last long.¹²

There are 6 levels of knowledge, namely knowing, understanding, application, analysis, synthesis and evaluation. The knowledge possessed by participants can be included in one of these levels of knowledge according to the level of questions on the knowledge variable about the use of era protector. In this study, the relationship between knowledge and behavior of participants is appropriate, that workers who have less knowledge about the use of ear protector can affect compliance with the use of ear protector.¹³

From the results of the research above, the researcher argues that most participants do not understand what ear protector is and what is the use of ear protector, need to increase knowledge about the use of ear protector at work.

B. Attitude

Based on the attitude of the participants, it can be seen that most of the participants have a good attitude at work, as many as 95 participants (73.1%). The results of statistical tests obtained p value = 0.002, meaning that there is a relationship between attitudes and the use of ear protector.

In line with the research conducted by Mahdi Jahangiri and Ansari research in 2008 about risk perception, knowledge and safety attitude and hearing protector use in petrochemical industry workers it was found that was the relationship between general attitude of workers to safety and risk perception was statistically significant (p=0.046).¹¹

Attitude is a person's closed response to a particular stimulus or object, which already involves the relevant opinion and emotion factors (happy-not happy, agree-disagree, good-bad, and so on). Newcomb, one of the social psychologists stated that attitude is a readiness or willingness to act, and not an implementation of certain motives. In other words, the attitude function is not yet an action (open reaction) or activity, but is a behavioral predisposing factor (closed reaction).¹⁴

Attitude is said to be an evaluative response. The response will only arise when the individual is faced with a stimulus that requires an individual reaction.¹⁵ The evaluative response means that the form of reaction expressed as an attitude arises based on an evaluation process within the individual that concludes the stimulus in the form of good-bad, positive-negative, pleasant-unpleasant values which then crystallize as a potential reaction to the attitude object.¹⁶

From the results of the study, the researcher argues that most of the participants are good but attitude is not yet an action or activity but a behavioral predisposing factor where a good attitude or lack of attitude cannot be a benchmark for someone to be said to have good or poor activity but a closed reaction from the person. Most of the participants behaved well because participants believed that wearing ear protector at work would reduce the occurrence of work-related accidents or occupational diseases as in the theory of attitude, that attitude towards objects is an orientation that is persistent

with components and participants' beliefs about using ear protector at the time of work into the cognitive component.

C. Training

Based on the training, it can be seen that most of the participants stated that the training was good as many as 83 participants (63.8%). Statistical test results obtained p value = 0.026, meaning that there is a relationship between training and the use of ear protector.

In line with the research conducted by Yeşiltepe, Akgün and Karadağ, Güendam in 2022, it was determined that workers pre training did not use ear protectors (100%) and there were some noise-related health complaints. There was an increase in using ear protectors (57.8%) and a decrease in their health complaints post training. It was also found that the workers' pre-training hearing health information questionnaire mean score was 11.46 ± 3.20 , and post training was 13.77 ± 3.42 in the first month and 15.77 ± 2.88 in the fourth month. Occupational training provided to the workers increased the workers' awareness level and their rate of wearing ear protectors, and health problems caused by work-related noise started to recover.¹⁷

Training is part of a formal educational process whose purpose is to improve the ability or work skills of a person or group of people. While practice is one way to acquire certain skills. Training or training is one form of the educational process, through training the learning objectives or educational targets will gain learning experiences which will eventually lead to changes in their behavior.¹⁸

From the results of the research above, the researcher argues that most of the participants have good training, this is because most of the participants have attended previous training, because training is part of a formal education process.

D. Supervision

Based on the supervision, it can be seen that most of the participants stated that the supervision was good, as many as 93 participants (71.5%).

Statistical test results obtained p value = 0.003, meaning that there is a relationship between supervision and use of ear protector.

In line with the research conducted by Ahmad Chandra in 2015 showed that most of the workers (72.2%) in maintenance section of PLTD Ampenan had the compliance of wearing ear protector. There were significant correlation supervision, and positive reinforcement with the compliance of wearing ear protector. Supervision has a very strong correlation (coefficient 1,000). The more workers feel himself under supervision, the better their behavior will be. It is recommended that the company can perform all forming behavior factors especially improve the supervision method in order to make all workers have the compliance of wearing ear protector.¹⁹

Supervision is the process of determining performance measures and taking actions that can support the achievement of the expected results in accordance with the applied performance.²⁰

Supervision can be said to be good if during working hours

or when the production process is being carried out, supervision of the use of ear protector is carried out, giving warnings to workers who do not use ear protector, and can also provide direction to workers, both new and old workers about the importance of using ear protector at work.²¹

From the results of the research above, the researcher argues that most participants state that supervision is good, this is because the company always supervises workers in terms of using ear protector because they do not want work accidents to occur in workers and according to good supervision theory, when they come to work or are at work, supervision is held, by means of officers going around the workplace to workers so that they can support the achievement of the expected results in accordance with the applied performance.

E. Usage of Ear Protectors

The use of ear protector at Weaving Industry Workers of Bogor based on 130 participants studied, the researchers found that most of the participants used ear protector at work, as many as 114 participants (87.7%).

In line with the research conducted by Ahmad Chandra in 2015 showed that most of the workers (72.2%) in maintenance section of PLTD Ampenan had the compliance of wearing ear protector.¹⁹

According to control efforts, Personal Protective Equipment is a last resort in protecting safety and health against potential hazards that may occur when carrying out work, after technical and administrative controls are no longer possible to apply.²

To determine the type of protective equipment that is in accordance with the potential hazards in the workplace with the right criteria, according to the body part that is protected, does not have additional hazards to the work, and is comfortable to wear by the workforce is not easy because it requires knowledge and experience of its own, training in the use of personal protective equipment is one way to gain this knowledge and experience.²²

Ear protection is required if the noise level in the workplace has reached 85 dB above 8 hours/day. Ear protection devices function to protect hearing (ears) due to noise, and protect the ears from sparks or hot metals that exist in the workplace and prevent productive work-related diseases.²³

From the results of the research above, the researcher argues that to increase the use of ear protector at Weaving Industry Workers of Bogor is by reinforcing existing regulations by imposing sanctions and rewards on workers and increasing knowledge and understanding of ear protection equipment, potential hazards and awareness of the importance of complying with regulations issued by the company, to ensure occupational safety and health work environment. And another thing that can be done is by installing work safety posters about protective equipment.

Most of the respondents wear ear protector at work because respondents know that ear protection equipment can protect the ears from noise and also protect from sparks or other objects as well as other symptoms that can be caused by

noise that exceeds the threshold value.

V. LIMITATION OF STUDY

The limitation of this study related to the number of samples in this study, that probably not describe the population. Furthermore, due to work schedule in the factory during Covid 19 pandemic whereas not all workers are allowed to work.

VI. CONCLUSION

From the results of this study, it can be concluded that there was a relationship between knowledge and use of ear protectors, there was a relationship between attitude and use of ear protectors, there was a relationship between training and use of ear protectors, and there was a relationship between supervision and use of ear protectors at Weaving Industry Workers of Bogor.

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