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Factors Associated With Complaints of Disorders Hearing In Workers In The Machine Section of PT. Fertilizer Iskandar Muda Lhokseumawe In 2022

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ABSTRACT

Introduction: *Technological advances in the machinery sector, have succeeded in creating a variety of machine products that in operation often produce noise that must be faced by employees in doing work. Objective: The purpose of this study was to determine the factors associated with complaints of hearing loss in workers at PT. Pupuk Iskandar Muda Lhokseumawe.* ***Method:*** *This study used descriptive with a cross sectional approach. The study population was all workers as many as 200 workers with a sample of 133 workers taken using simple random sampling techniques. Data analysis using univariate, bivariate analysis with statistical logistic regression tests.* ***Results:*** *The variables worker age = 0.000, length of exposure = 0.000, working period = 0.000, noise intensity = 0.000, ear protection equipment = 0.000, which means worker age, length of exposure, noise intensity, ear protection equipment (APT).* ***Conclusion:*** *This study is that there is a relationship between worker age, length of exposure, length of service, noise intensity and ear protection equipment with complaints of hearing loss in machine part workers. It is expected that workers can comply with the regulations set by the factory and pay more attention to occupational safety and health.*

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1. INTRODUCTION

Occupational safety and health is an idea and effort to ensure integrity and perfection, both physical and spiritual. Occupational safety and health are also expected to prevent work-related accidents and diseases. Occupational safety and health cannot be separated from the production process of a company, every person who works in a company is considered to be at risk of accidents and occupational diseases, therefore every worker is obliged to pay attention to and implement safety and health when working (1).

Work safety is a safe and conducive condition in the work environment. One aspect of work safety includes protection against the risk of accidents and work-related diseases. Work safety can be realized by working using personal protective equipment in accordance with Standard Operating Procedures (SOP). Occupational health is everything related to increasing productivity for every employee and workforce in the workplace. Good health conditions also have the potential to increase work productivity (2).

The work environment can influence employee performance because a worker will be able to carry out his activities well, so that optimal activity results can be achieved if the environmental conditions are healthy, safe and comfortable. The work environment is all conditions that can influence each person in carrying out work. The work environment includes physical and non-physical environments. One of the physical factors that can cause health problems for workers is temperature, lighting, noise, mechanical movements, etc., which in this case greatly influence employee work results (2).

Advances in technology in the machinery sector have succeeded in creating various kinds of machine products which in their operation often produce noisy sounds that employees have to deal with when doing their work. Noise is something that cannot be separated from current industrial developments, both in the formal and informal sectors. Noise is a mixture of various sounds that are unwanted or that damage health. Currently, noise is one of the causes of environmental disease. Meanwhile, noise is often used as a term to describe unwanted sounds caused by human activities or natural activities. Noise affects health, including causing damage to the sense of hearing and even deafness. In this case it can affect the health of workers and will cause occupational diseases which are diseases caused by work. What affects workers' health is hearing loss caused by noise (3).

Hearing loss or what is called noise induced hearing loss is hearing loss caused by exposure to loud noise over a long period of time and is usually caused by noise in the work environment. Hearing loss will reduce the ability to receive information and communicate through sound, making it difficult to carry out work. However, exposure to a noise intensity of 85 dB for a certain period of time can cause temporary deafness. one of them is a complaint of ringing in the ears. The noise intensity that affects hearing health is above 60 dB. Therefore, employees who work in factories with noise intensity above 60 dB in the machinery area must be equipped with ear protection to prevent hearing loss (1).

In the Indonesian government's labor regulations no. Per.08/MEN/VII/2010 states that ear protection is protective equipment that functions to protect the ears against noise or pressure. The use of ear protective equipment (APT) can reduce the danger of noise to the sense of hearing, so that workers who wear hearing protective equipment (APT) will have a smaller potential to be exposed to noise hazards compared to workers who do not wear hearing protective equipment (APT) at all. (4).

Based on the World Health Organization (WHO) report in 2021, it is stated that more than 5% of the world's population (432 million adults and 32 million children) experience hearing loss. It is estimated that by 2050 there will be an increase in people with hearing loss to more than 700 in the world population. Furthermore, data from the International Labor Organization (ILO) in 2019, every year around 380,000 workers or 13.7 percent of the 2.78 million people die every year due to work (7).

Indonesian data from the Ministry of Health in 2019 explains that the prevalence of deafness is quite high, namely 4.6%, ear disease 18.5%, hearing loss 16.8% and severe deafness 0.4%. Furthermore, according to WHO, if it is not treated quickly, by 2030 it is estimated that as many as 630 million people will suffer from total hearing loss; so that by 2050 this figure could increase

to more than 900 million people. Various factors show the increasing rate of hearing loss throughout the world, namely the increase in global population and the increase in the proportion of the population in the elderly category (5).

PT. Pupuk Iskandar Muda Lhokseumawe (PT PIM) is a subsidiary of PT. Pupuk Indonesia (Persero) which operates in the urea fertilizer industry in Lhokseumawe-Aceh. PT. Pupuk Iskandar Muda Lhokseumawe is divided into two factory divisions. The Iskandar Muda-1 Fertilizer Factory was completed in 1984 while the Iskandar Muda-2 Fertilizer Factory was completed in 2005. Both factories have several of the same units, including the Ammonia unit, Urea unit and Utilities unit and each unit is equipped with large machines which produce noisy. This sound usually comes from turbines, compressors, pumps and other processes.

The urea production process has 1 unit of compressor machine. This type of compressor is a centrifugal compressor. The compressor machine found in the urea production process is a CO2 compressor. The msein compressor functions to compress carbon dioxide gas through 4 stages (synthesis, separation, absorption and evaporation) until the pressure becomes 145 kg/cm.

PT. Pupuk Iskandar Muda Lhokseumawe has three areas (green, yellow and red). The green area is an office and parking area. The yellow area is the border area between the factory and the office area and the red area is the factory area. Where everyone who enters the area is required to wear personal protective equipment (PPE) such as helmets, safety shoes, earplugs and glasses. If one of the PPE is not used then entry is not permitted.

Based on preliminary survey data obtained in February 2022 at PT. Pupuk Iskandar Muda Lhoukseumawe has a total of 600 employees in the factory, 200 workers in the machine section, then workers who work in the machine section are made into shifts, namely shifts A, B and C with predetermined times from 08:00-16:00 WIB morning to evening, 16:00-24:00 WIB afternoon to evening and 00:00-08:00 WIB evening to morning. Based on the data obtained, there were 45 workers who experienced hearing loss in 2019, 45 workers in 2020, and 46 workers in 2021. PT. Pupuk Iskandar Muda Lhokseumawe uses audiometric equipment as a method for measuring hearing loss in workers, in this case the examination is carried out once a year or what is called a Medical Check Up.

The factors related to complaints of hearing loss due to noise are various factors such as noise intensity, length of work, length of service, health condition, and use of ear protection. According to Soeripto M (2008) Noise intensity is the amount of pressure (energy) emitted by a sound source. The nature of sound/sound is determined by its frequency and intensity, which originates from production process equipment or other work tools which can cause disturbances to the recipients of the noise, in this case the workers. Noise levels are expressed in decibel units (dBA) which are measured using a sound level meter (6). According to Bashiruddin (2010), a person's hearing sensitivity will decrease from the age of 40 years. As we get older, hearing loss can occur and its function also decreases. With noise, a person will experience a decline in their sense of hearing more quickly (7). According to Soeripto M (2008), health conditions are also related to hearing loss, one of which is that the condition of the ears causes different hearing effects. Workers who have a history of conductive deafness, namely experiencing problems with the outer ear or middle ear which makes it difficult for the worker to hear. The most common causes of conductive deafness are congenital conductive deafness, otitis, media perforation due to traumatic eardrum, perforation due to infection in the eardrum, and osteosclerosis. According to Suma'mur (2009), exposure time is closely related to working time. Extending working hours beyond the capacity for working hours is usually not accompanied by optimal work efficiency, effectiveness and productivity, and in fact usually shows a decrease in the quality and results of work and

working for prolonged periods creates a tendency for fatigue, health problems, disease and accidents. Normally the work time permitted for each worker is no more than 8 hours per day (7).

According to Bashiruddin (2010), work period is the period of time or length of time the workforce works at a worker's place. According to Suma'mur, the longer a person works, the more he or she is exposed to the dangers posed by the work environment. Hearing loss in workers exposed to noise usually occurs after a work period of 5 years or more. According to the use of APT, noise control is primarily aimed at workers who receive noise in their daily lives. Because the main area of damage due to noise in humans is hearing (inner ear), the control method is to use tools that can reduce the level of noise entering the outer and middle ear before it enters the inner ear, thus the use of APT in the work area Noisy noise can reduce the exposure received by workers and reduce the risk of hearing loss due to noise, and vice versa, provided that the Ear Protective Equipment is worn disciplinedly and correctly by workers (8).

The results of research conducted by Ibrahim in 2014 at PT. Japfa Comfeed Indonesia, Tbk. The Makassar Unit stated that there was a relationship between noise intensity (p=0.000), length of work (p=0.05), length of service (p=0.002), worker age (p=0.003) and use of ear protection (p=0.029) with complaints of hearing loss among production workers (9). Then Ulandari's research in 2014 at the Makassar city hospital laundry installation stated that there was a significant relationship between noise intensity (p=0.019 and r=0.319), length of service (p=0.002 and r=0.408) and hearing loss in workers (10). Then Chaerunnisa's research in 2020 at the Marioriawa rice factory, Soppeng Regency, showed a significant relationship between noise intensity (p=0.000), length of service (p=0.026), and length of work (p=0.000) with complaints of hearing loss (11).

Based on the results of an initial survey of 200 workers in the machinery section of PT. Pupuk Iskandar Muda Lhokseumawe found that 14 workers had hearing problems in February 2022. Based on the results of interviews with 14 workers, 7 workers complained of ringing in their ears due to the noise produced by machines. There are 7 workers who experience temporary deafness, in this case the workers in the machine section also have difficulty communicating directly. Another factor that can influence the workers' hearing is age. There are several people who work in the machine section aged 30-40 years and over with their respective education levels having graduated from high school. Then the noise level experienced by workers in the machine section exceeds the threshold value.

Based on all the descriptions above, researchers are interested in conducting research on factors related to hearing complaints among workers in the mechanical department of PT. Pupuk Iskandar Muda Lhokseumawe in 2022.

2. RESEARCH METHODE

This type of research is descriptive research with a quantitative approach. The design used is cross sectional to determine factors related to complaints of hearing loss among workers in the PT machine section. Iskandar Muda Lhokseumawe Fertilizer for 2022.

The location of this research was carried out at PT. Pupuk Iskandar Muda Lhokseumawe 2022. This research was carried out from the initial survey in February to October 2022.

The population in this study was all research subjects, namely all workers in the PT machine section. Pupuk Iskandar Muda Lhokseumawe in 2022 will have 200 workers. The number of samples in this study was 133 people. Sampling in this study used a simple random sampling technique, namely taking samples from members of the population randomly without paying attention to the strata in the population.

Univariate analysis aims to explain or describe the characteristics of each research variable. The form of univariate analysis depends on the type of data. In general, this analysis only produces a frequency and percentage distribution of each variable (12).

Bivariate analysis aims to determine the relationship (correlation) between the independent variable and the dependent variable. To prove the existence of a bound relationship (dependent variable). To prove the existence of a significant relationship between the independent variable and the dependent variable, Chi-Square analysis was used, at the statistical significance limit of p value (0.05).

3. RESULT AND ANALYSIS

Table 1. Frequency Distribution of Respondent Characteristics for Machinery Workers at PT. Iskandar Muda Fertilizer for 2022

Characteristic	Frequent (n)	Percentage (%)
Gender		
Man	123	92,5
Woman	10	7,5
Total	**133**	**100**
Age		
≥ 40 years	65	48,9
≥ 40 years	68	51,1
Total	**133**	**100**
Level of education		
High school/equivalent	107	80,5
S1/D3	26	19,5
Total	**133**	**100**

The research results showed that the respondents in the research sample were 123 workers (92.5%) male, then the sample was 10 workers (7.5%). It is known that the age of the respondents in the research sample was > 40 years old, as many as 65 workers (48.9%). It is also known that respondents aged <40 years were 68 workers (51.1%). Furthermore, the last level of education of respondents was high school/equivalent as many as 107 workers (80.5%), and the last level of education of respondents was S1/D3 as many as 26 workers (19.5%).

Table 2. Cross Tabulation of Factors Associated with Hearing Loss Complaints in Machinery Workers at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022

No.	Variable	Hearing Loss Complaints				Total		p-value
		Light		Weight				
		f	%	f	%	f	%	
	Age							
1	> 40 Years Old	4	3,0	61	45,9	65	48,9	0,000
2	< 40 Years Old	66	49,6	2	1,5	68	51,1	
	Length of Exposure							
1	≥ 8 hours /Day	38	28,6	15	11,3	53	39,8	0,000
2	<8 Hours /Day tahun	32	24,1	48	36,1	80	60,2	
	Years of service							
1	≥ 5 Years	22	16,5	47	35,3	69	51,9	0,000
2	<5 Years	48	36,1	16	12,0	64	48,1	
	Noise Intensity							

1	≤ 85 dB	34	25,6	9	6,8	43	32,3	0,000
2	> 85 dB	36	27,1	54	40,6	90	67,7	
	Ear Protection Equipment							
1	Never	35	26,3	9	6,8	44	33,1	0,000
2	Sometimes	35	26,3	54	40,6	89	66,9	
	Total	**70**	**52,6**	**63**	**47,4**	**133**	**100,0**	

Based on the results of the cross tabulation research above between worker age and hearing loss complaints. It is known that of the 133 respondents, those aged > 40 years experienced complaints of hearing loss as many as 65 workers (48.9%), hearing loss in the severe category as many as 4 workers (3.0%), hearing loss in the mild category as many as 61 workers (45, 9%), while respondents aged <40 years experienced complaints of hearing loss as many as 68 workers (51.1%), as many as 66 workers (49.6%) had severe hearing loss, as many as 2 workers (1.5%) experienced hearing loss in the mild category.). The results of statistical tests using chi square with a confidence level of 95% (α = 0.05) show p value = 0.000 < α = 0.05, so the hypothesis in this study is accepted, which means that there is a relationship between worker age and complaints of hearing loss in section workers. machine at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022.

Based on the results of cross-tabulation research between exposure time and complaints of hearing loss. It was found that 133 respondents were exposed to noise for ≥ 8 hours, 53 workers experienced hearing loss (39.8%), 38 workers had hearing loss in the severe category (28.6%), while 15 workers in the mild category (11.3%). Furthermore, respondents who were exposed to noise < 8 hours experienced hearing loss as many as 80 workers (60.2%), respondents who experienced hearing loss in the severe category were 32 workers (24.1%), and respondents who experienced mild hearing loss were 48 workers. (36.1%). The results of statistical tests using chi square with a confidence level of 95% (α = 0.05) show p value = 0.000 < α = 0.05, so the hypothesis in this study is accepted, which means there is a relationship between exposure time and complaints of hearing loss in workers. machine at PT. Pupuk Iskandar Muda Lhokseumawe.

Based on the results of the research, the cross tabulation above between length of service and complaints of hearing loss, it is known that of the 133 respondents who had worked ≥ 5 years, 69 workers (51.9%) experienced complaints of hearing loss, with 22 workers (51.9%) having hearing loss in the severe category (16.5%), hearing loss in the mild category was 47 workers (35.3%), while respondents who had worked < 5 years experienced complaints of hearing loss as many as 64 workers (48.1%), with hearing loss in the severe category as many as 48 workers (36.1%), 16 workers (12.0%) had mild hearing loss. The results of statistical tests using chi square with a confidence level of 95% (α = 0.05) show p value = 0.000 < α = 0.05, so the hypothesis in this study is accepted, which means there is a relationship between length of service and complaints of hearing loss in department workers. machine at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022.

Based on the research results, the above tabulation between noise intensity. It is known that of the 133 workers, those exposed to noise intensity ≤ 85 dB experienced hearing loss as many as 43 workers (32.3%), 34 workers experienced hearing loss in the severe category (25.6%), and 34 workers experienced hearing loss in the mild category. 9 workers (6.8%), while of the 133 workers who were exposed to noise intensity > 85 dB experienced hearing loss, 90 workers (67.7%), 36 (27.1%) experienced hearing loss in the severe category. There were 54 people who experienced hearing loss in the mild category (40.6%). The results of statistical tests using chi square with a confidence level of 95% (α = 0.05) show p value = 0.000 < α = 0.05, so the hypothesis in this study is accepted, which means there is a relationship between noise intensity and complaints of hearing loss among workers. machine at PT. Iskandar Muda Fertilizer for 2022.

Based on the research results, the above cross-tabulation between ear protective devices. It is known that of the 133 workers, 44 workers (33.1%) answered that they never wore ear protection, 35 workers (26.3%) had severe hearing loss, 9 workers experienced mild hearing loss (6.8%), while 89 workers (66.9%) answered that they sometimes wore ear protection. Those who experienced hearing loss in the severe category were 35 workers (26.3%), and those who experienced hearing loss in the severe category were 54 workers (40.6%). The results of statistical tests using chi square with a confidence level of 95% ($\alpha = 0.05$) show p value = 0.000 < $\alpha = 0.05$, so the hypothesis in this study is accepted, which means there is a relationship between ear protective equipment and complaints of hearing loss in workers machine parts at PT. Iskandar Muda Fertilizer for 2022.

DISCUSSION

The Relationship between Worker Age and Hearing Loss Complaints in Machinery Workers at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022

The results of statistical tests using chi square with a confidence level of 95% ($\alpha = 0.05$) show p value = 0.000 < ($\alpha = 0.05$) so the hypothesis in this study is accepted, which means there is a relationship between worker age and complaints of hearing loss in workers machine parts at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022.

This research is in line with research conducted by Hasbi Ibrahim with the title Factors Associated with Hearing Loss Complaints in PT Production Department Workers. Japfa Comfeed Indonesia, Tbk. Makassar Unit in 2014. The results of this research are in line with previous research by Amira (2012), where in this research it was revealed that the results showed that the variable that had a significant relationship with the incidence of hearing loss was the worker's age variable.

According to Bashiruddin Age, the most common cause of age-related hearing loss is presbycusis, characterized by decreased perception of high frequency sounds and decreased ability to differentiate sounds. Presbycusis is assumed to cause an increase in the hearing threshold of 0.5 dB every year, from the age of 40 years. The worker's age, which is intended in this research, is the age from the time the worker was born until the research was carried out, expressed in years. Age is an intrinsic factor, namely a factor that originates from within the worker's body. Age can give rise to subjective complaints from workers related to the physiological functions of the worker's body which will slowly decline.

Based on the findings of researchers aged 40 years with complaints of hearing loss caused by decreased perception of high frequency sounds and decreased ability to differentiate sounds. Age can give rise to subjective complaints from workers related to the physiological functions of the worker's body which will slowly decline. There are several physiological disorders, namely disorders in the form of increased pulse, construction of peripheral blood vessels, especially in the hands and feet, and can cause pallor and sensory disturbances.

According to researchers' assumptions, worker age is one of the factors that is closely related to complaints of hearing loss among workers in the machine department. Based on this, it is stated that workers aged 40 years have hearing loss, so workers must pay attention to their safety and health when working.

Relationship between exposure time and complaints of hearing loss among machine workers at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022

The results of statistical tests using chi square with a confidence level of 95% (α = 0.05) show p value = 0.000 < (α = 0.05), so the hypothesis in this study is accepted, which means there is a relationship between exposure time and hearing loss complaints in workers machine parts at PT. Pupuk Iskandar Muda Lhokseumawe.

This research is in line with research conducted by Indah Chairunnisa entitled Factors Associated with Hearing Disorder Complaints in Marioriawa Rice Factory Workers, Sopeng Regency.

This research is in line with research conducted by Hasbi Ibrahim with the title "Factors Associated with Hearing Loss Complaints in PT Production Department Workers. Japfa Comfeed Indonesia, Tbk. Makassar Unit in 2014". Based on the results obtained, there was a significant relationship between length of exposure and complaints of hearing loss, with a value of p = 0.005 < (α = 0.05).

According to Suma'mur (2009), exposure time is closely related to working time. Extending working time beyond the capacity for the length of work is usually not accompanied by optimal work efficiency, effectiveness and productivity, and in fact usually shows a decrease in the quality and results of work and working for prolonged periods creates a tendency for health problems, illnesses and accidents to occur. Normally the exposure time permitted for each worker is no more than 8 hours/day.

According to Yunita (2006). The duration of exposure is the longer the time spent working each day, meaning the longer the possibility of being exposed to noise in the workplace, this means that it is easier to experience complaints of hearing loss if the exposure time exceeds the permitted exposure time for noise contact. If the longer a worker is in a noisy room, the greater the potential for danger that the worker will receive.

This is in line with a study conducted by Khoirul (2012) which also supports the results of this study, which examined factors related to hearing loss in rice mill workers, with research results that length of exposure to noise was one of the factors that was significantly related to the incidence of hearing loss. worker hearing.

Based on the researchers' findings, there are several workers whose exposure time exceeds 8 hours/day because workers in this case take more time to complete their work. without knowing that it can cause health problems such as hearing loss for workers in the machine section if in this case continuous exposure with a length of more than 8 hours/day will be a risk to their health.

According to researchers' assumptions, exposure time is one of the factors associated with complaints of hearing loss in workers. Based on this, it is stated that the exposure time for workers who work on machinery is stated to be 8 hours/day and can even exceed 8 hours/day.

Relationship between Working Period and Hearing Loss Complaints in Machinery Workers at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022

The results of statistical tests using chi square with a confidence level of 95% (α = 0.05) show p value = 0.000 < (α = 0.05), so the hypothesis in this study is accepted, which means there is a relationship between length of service and

complaints of hearing loss among machine workers at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022.

This research is in line with research conducted by Hasbi Ibrahim with the title "Factors Associated with Hearing Loss Complaints in Production Department Workers at PT. Japfa Comfeed Indonesia, Tbk. Makassar Unit in 2014. Based on the results obtained, there is a significant relationship between length of service and complaints of hearing loss with a p value = 0.002< (α = 0.05).

This research is in line with research conducted by Indah Chairunnisa entitled "Factors Associated with complaints of hearing impairment in Marioriawa Rice factory workers, Sopeng Regency". Based on the results obtained, there is a significant relationship between length of service and complaints of hearing loss with a p value = 0.26 < (α = 0.05).

According to Bashiruddin (2010), work period is a period of time or the length of time the workforce works at a worker's place. According to Suma'mur, the longer a person works, the more he or she is exposed to the dangers posed by the work environment. Hearing loss in workers exposed to noise usually occurs after a work period of 5 years or more.

Based on the findings of researchers, workers who work for 5 years continuously cause health problems, such as working in machine parts that produce strong noise. This will cause hearing problems for workers. The hearing disorders experienced by workers include physiological disorders, psychological disorders and communication disorders. There are workers who experience physiological disorders such as increased blood pressure, then psychological disorders, namely feeling uncomfortable, not concentrating while working, having difficulty sleeping, being irritable, feeling headaches, and finally, communication disorders, this disorder is caused by the masking effect or what is called noise. covering unclear hearing. Workers in the machine section communicate directly by shouting or making signs.

According to researchers' assumptions, length of service is one of the factors that is closely related to complaints of hearing loss in workers. Based on this, it is stated that workers who work for 5 years or more than 5 years working in the machinery sector must of course pay more attention to occupational safety and health.

The Relationship between Noise Intensity and Hearing Loss Complaints in Machinery Workers at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022

The results of statistical tests using chi square with a confidence level of 95% (α = 0.05) show p value = 0.000 < (α = 0.05), so the hypothesis in this study is accepted, which means there is a relationship between noise intensity and complaints of hearing loss in workers machine parts at PT. Iskandar Muda Fertilizer for 2022.

This research is in line with research conducted by Andi Anita with the title "The Relationship between Noise and Hearing Disorders in Makassar City Hospital Laundry Workers in 2014". This research is in line with research conducted by Indah Chairunnisa with the title "Factors related to Hearing Loss Complaints in Marioriawa Rice Factory Workers, Soppeng Regency in 2020 with the result of p value = 0.033 < α 0.05.

According to Suma'mur Noise Intensity is the amount of pressure (energy) emitted by a sound source, the nature of the sound/sound is determined by its frequency and intensity, which originates from production process equipment or other work equipment that can cause interference for noise recipients, expressed in units. decibels (dB) are measured using a sound level meter.

Basically, the higher the intensity of noise a person receives, the greater the risk of being affected by the noise itself. High noise intensity can have a direct impact on a person's health and can even directly damage the human sense of hearing. This is one of the risk factors for hearing loss.

This is in line with research conducted by Amira regarding risk factors associated with hearing loss. In this case it was found that the main risk factor that is most likely to cause a decrease in workers exposed to noise is very high noise levels originating from production activities.

Other research results that are in line with this research are Hardini et al. About the effect of machine noise on hearing loss in workers. This research shows that workers who work at noise intensity (> 85 dB) have a greater risk of suffering from hearing loss, compared to workers who work at noise intensity (< 85 dB).

Based on the researchers' findings, noise intensity that exceeds the threshold value will result in risks to the sense of hearing. In the results of the researchers' findings there, by using a measuring instrument, namely a sound level meter, noise intensity that exceeds the threshold value above 85 dB means workers will be at risk of hearing problems. When researching in the machine section, the noise was very loud even though the researchers and employees were wearing ear protection equipment such as ear muffs or ear plugs, not only that, in the room you could also hear very loud noises from the sound produced by the compressor machine, while the room was made airtight. sound but still penetrates the noise from the machine outside the office. Researchers also measured noise using a sound level meter to find out how many decibels of noise or noise frequency were felt by workers and whether it was in accordance with operational standards (SOP). In this case, some workers also find it easy not to wear ear protection for their reasons

It is not comfortable to wear these devices but it is more comfortable not to wear ear protection. In this case, when employees finished working on machines with an intensity of 85 dB and above, they experienced ringing in their ears and headaches.

According to researchers' assumptions, noise intensity is one of the factors associated with complaints of hearing loss among workers in the machine section. Based on this, it states that the noise intensity experienced by workers exceeds the threshold value of above 85 dB, in this case workers are obliged to implement occupational safety and health by wearing ear protection equipment properly and correctly.

The Relationship between the Use of Ear Protectors and Hearing Loss Complaints in Machinery Workers at PT. Iskandar Muda Lhokseumawe Fertilizer for 2022

The results of statistical tests using chi square with a confidence level of 95% ($\alpha = 0.05$) show p value = 0.000 < ($\alpha = 0.05$), so the hypothesis in this study is accepted, which means there is a relationship between ear protection equipment and complaints of hearing loss in machine worker at PT. Iskandar Muda Fertilizer for 2022.

This research is in line with research conducted by Hasbi Ibrahim with the title "Factors Associated with Complaints of Hearing Disorders in Production Department Workers at PT. Japfa Comfeed Indonesia Tbk, Makassar Unit in 2014".

In line with research conducted by Puspitasari, Laksono, and Indraswari (2017), the results of the Kolmogorov-Smirnov statistical test obtained p = 0.000, so p < α 0.05, so it can be concluded that ho is rejected and ha is accepted, meaning there is a relationship between the use of APT and hearing loss in employees at PT. ISCM Liang Anggang Village, Bati-Bati District, Tanah Laut Regency.

Ear Protective Equipment is equipment that must be used to protect work-related deafness and reduce noise from the source. Consisting of ear plugs or ear muffs which function to protect the ears from noise. The effectiveness of using Ear Protective Equipment (APT) to reduce noise so as to prevent hearing loss in workers. High enough noise levels can damage hearing, so hearing protection is very important because the process of hearing loss occurs gradually and is often invisible. Using APT in workplaces that generate noise will prevent the effects of hearing loss on workers.

Many occupational diseases originate from human factors with unsafe actions. Controlling recipients is one way to reduce this potential danger. Employers are required to provide PPE for workers at the workplace to carry out the obligation to wear PPE. The use of PPE, especially APT, is the last method that must be used to control sources of danger (noise) so that it can reduce the impact of noise in the workplace.

Based on the researchers' findings, hearing loss in employees is caused by a lack of supervision of employees who carry out procedures using ear protection equipment and a lack of self-awareness among workers to always use ear protection equipment when working. Because some employees are more comfortable working without using ear protection, so workers don't care about the dangers and risks that will have a negative impact on their health.

According to researchers' assumptions, the use of ear protection is a factor that has an influence on hearing loss in employees. The factor of using ear protection can cause hearing loss, because employees who work in noisy work areas who do not regularly use ear protection have a bad chance of hearing loss. This means that the use of ear protection can pose a risk of hearing loss to employees

4. CONCLUSION

Based on the research that has been carried out, it can be concluded that: There is a relationship between worker age and hearing loss in PT machine workers. Pupuk Iskandar Muda Lhokseumawe in 2022, with p value = 0.000 < α 0.05. There is a relationship between long exposure and hearing loss in machine workers at PT. Pupuk Iskandar Muda Lhokseumawe in 2022, with p value = 0.000 < α 0.05. There is a relationship between length of service and hearing loss in machine workers at PT. Pupuk Iskandar Muda Lhokseumawe in 2022, with p value = 0.000 < α 0.05.

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