



Original Research

Factors Related to Hearing Complaints Due to Noise on Furniture Workers in Medan City – Indonesia

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ABSTRACT

Every workplace has always various potential risk that can affect the health of the workers or can cause work-related illnesses. One of the physical conditions and work environment that is dangerous is noise. The higher intensity of noise and the longer the workers are exposed to noise, the higher the risk of workers experiencing hearing loss. The purpose of this study was to determine the relationship of risk factors with noise due to hearing disorder in furniture workers along Jalan Pahlawan in Medan City, Sumatera Utara Province, Indonesia, 2019. This study was an observational analytic study with a cross sectional research design. This study uses a population of furniture workers along Jalan Pahlawan and using accidental sampling in the sampling method of 30 respondents. Data was carried out by measuring the noise intensity in the work area of furniture production and give questionnaires to 30 respondents who are working. Data analysis techniques used are univariate and bivariate analysis. The results of the study show that there is a relationship between noise intensity and hearing disorder ($p=0,001<\alpha=0,05$); there is a relationship between the age of the worker and hearing disorder ($p=0,000<\alpha=0,05$); there is a relationship between period of work with hearing disorder ($p=0,025<\alpha=0,05$); there is a duration of work relationship with hearing disorder ($p=0,010<\alpha=0,05$); there is a relationship between the use of ear protector and hearing disorder ($p=0.001<\alpha=0,05$) in furniture workers along Jalan Pahlawan in Medan City.

INTRODUCTION

Every workplace always contains various potential hazards that can affect the health of the workforce or can cause occupational diseases. One of the physical conditions and a dangerous work environment is noise. Noise that exceeds the threshold value can cause occupational diseases, which can be in the form of hearing loss or damage to the ear either temporary or permanent after exposure for a certain period of time without adequate protection. The higher the noise intensity and the longer the worker is exposed to noise, the higher the risk of the worker to experience hearing loss (Tarwaka, 2008).

The Government of Indonesia through the Minister of Health No. 1405 of 2002 has provided a work environment health requirement which states that the noise level in the workspace is a maximum of 85 dB with an average time of 8 hours per day (Keputusan Menteri Kesehatan Nomor 1405/menkes/sk/xi/2002 tahun 2002 – persyaratan kesehatan lingkungan kerja perkantoran dan industry).

World Health Organization (WHO) estimates that in 2001 there were 250 million people in the world with moderate and severe hearing loss, and this increased to more than 275 million people in 2004. This figure has continued to increase since the initial research conducted by WHO in 1986 (WHO, 2007).

According to the World Health Organization report which states that the prevalence of hearing loss or damage in Indonesia reaches 4.2% and countries in the world state that Noise Induced Hearing Loss (NIHL) is a type of disease that has the potential to affect the risk of hearing loss (WHO, 2007).

The results of interviews conducted by Anggita at PT Bakrie Metal Industri Bekasi in February 2015 showed, average noise

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Table 1: Relationship of noise Intensity with hearing complaints.

		Hearing complaints		Total	P	
		Yes	No			
Noise Intensity	High	Count	9	1	10	0,001
		% within Noise Intensity	90%	10%	100%	
	Low	Count	5	15	20	
		% within Noise Intensity	25%	75%	100%	
TOTAL		Count	14	16	30	
		% within Noise Intensity	47%	53%	100%	

in Fabrication area 1 ± 79.7dB, Fabrication 2 ± 79.3dB, Fabrication 3 ± 73.5dB, Fabrication 4 ± 79.1dB, Pressshop ± 84.2dB, Galvanize ± 78.1dB, Generator ± 94, 3dB and ± 98.3dB in area using wood cutting machine. Noise that arises in the production area is one of the risk factors for hearing loss for workers (Praditami, 2016).

In Rahmawati's research in 2015, based on the results of measurements using a Sound Level Meter (SLM) in the Metal Forming and Heat Treatment department it was found that the average noise level at point A of the furniture location in the sheet press forming section was 90.46dB and at point B the cutting location at the sheet press forming section was 89.2dB, when compared with the Regulation of the Minister of Manpower of 2011 concerning the threshold value of physical factors in the workplace, the noise has exceeded the permissible threshold value of 85dB. The noise in this department is continuous. Based on direct observation of workers who do not

use ear protection while working or some workers are seen taking off their APT (Ear Protective Equipment), then reuse the APT even if the noise in the workplace has exceeded the threshold value (NAV) (Rahmawati, 2015). Based on this background, it is necessary to conduct research on furniture workers who are along Jalan Pahlawan and located in Medan City.

MATERIALS AND METHOD

This study uses an analytical observational method with a cross sectional design, namely by observing the factors associated with hearing complaints due to noise in furniture workers (Arikunto, 2006). This research was conducted along Jalan Pahlawan, Medan Perjuangan District, Medan City, North Sumatra Province, Indonesia. specialized in wood processing. This research was conducted on February 16, 2019.

Table 2 Relationship of age worker with hearing complaints.

		Hearing Complaints		Total	P	
		No	Yes			
Age Worker	< 40 Years Old	Count	16	5	21	0,000
		% Within Age Worker	76.2%	23.8%	100.0%	
	≥ 40 Years Old	Count	0	9	9	
		% Within Age Worker	.0%	100.0%	100.0%	
Total		Count	16	14	30	
		% Within Age Worker	53.3%	46.7%	100.0%	

Samples were taken by accidental method as many as 30 respondents. The instrument in this study was a closed questionnaire and a measuring instrument for noise intensity, namely Sound Level Meter (SLM).

The data obtained will be analyzed by Univariate and Bivariate, with the chi-square test at a significant level of $\alpha=0.05$ or 95% (Notoatmodjo, 2010).

test activities at PT. Pertamina Geothermal Energy Area Kamojang (Primadona, 2012). Another study on the effect of electronic machine noise on hearing loss in workers. This study shows that workers who work at high noise intensity (>85 dB) have a greater risk of suffering from hearing loss, compared to workers who work at low noise intensity (<85 dB) (Hardini Tjan et al. 2012).

Table 3 Relationship period of work with hearing complaints.

		Hearing Complaints		Total	P	
		No	Yes			
Period of Work	< 5 Years Old	Count	2	7	9	0,025
		% within Period of Work	22.2%	77.8%	100.0%	
	≥ 5 Years Old	Count	14	7	21	
		% within Period of Work	66.7%	33.3%	100.0%	
Total	Count	16	14	30		
	% within Period of Work	53.3%	46.7%	100.0%		

RESULT AND DISCUSSION

The results of the Chi-Square statistical test analysis showed that the p value was lower than the α value (0.05), which was 0.001. That the noise intensity variable has a relationship with the variable hearing complaints. Based on this statistical test, it is known that noise intensity plays a role in the emergence of hearing complaints. The higher the noise intensity, the greater the potential for workers to experience hearing complaints.

The noise threshold value according to the Decree of the Minister of Manpower No.51 of 1999 is 85dB with a maximum time of 8 hours per day. And if exposure to noise continuously in the workplace it will cause various health complaints and hearing loss (Keputusan Menteri Tenaga Kerja Republik

The results of the Chi-Square statistical test analysis showed that the p value was lower than the α value (0.05), which was

0.000, this shows that there is a significant relationship between the age of the workers and the hearing complaints of workers in the furniture production division. This is influenced by age, degeneration of the hearing organ can occur and its function decreases. especially with high noise levels can accelerate the decline of a worker's hearing organ.

Several previous studies have shown that the relationship between age and the incidence of hearing loss with a p value = 0.003 smaller than an alpha value of 0.05 at PT. Japfa Comfeed Indonesia (Ibrahim, 2014). In a subsequent study which stated that the variable that had a significant relationship with the incidence of hearing loss was the age variable (Primadona, 2012).

Table 4 Relationship length of work with hearing complaints.

		Hearing Complaints		Total	P	
		No	Yes			
Length of Work	< 8 Hours	Count	11	3	14	0,010
		% within Length of Work	78.6%	21.4%	100.0%	
	≥ 8 Hours	Count	5	11	16	
		% within Length of Work	31.3%	68.8%	100.0%	
Total	Count	16	14	30		
	% within Length of Work	53.3%	46.7%	100.0%		

Indonesia, 1999). In line with several other studies, that the main risk factor that has the potential to cause hearing loss in workers exposed to noise is the very high noise level from production

Further research conducted at PT. Indonesia Power UBP Semarang which shows that there is a significant relationship at the age of more than 40 years with noise-induced hearing loss

Table 5 Relationship of ear protection with hearing complaints.

		Hearing Complaints		Total	P	
		No	Yes			
Ear Protection	No	Count	5	13	18	
		% within Ear Protection	27.8%	72.2%	100.0%	
	Yes	Count	11	1	12	0,001
		% within Ear Protection	91.7%	8.3%	100.0%	
Total	Count	16	14	30		
	% within Ear Protection	53.3%	46.7%	100.0%		

with a P value of 0.036 and an OR value of 2,429, which means that ages over 40 years have a greater risk of 2,429 than those under 40 years of age (Septiana and Widowati, 2017). It can be seen in the table above that the relationship period of work with hearing complaints has a significant relationship with a P value of 0.025 which is smaller than a α value of 0.05. The longer a person works, the more exposed to the dangers posed by the work environment. Hearing loss in workers who are exposed to noise usually occurs after 5 years of work or more.

This result is reinforced by the theory which states that occupational diseases are influenced by period of work. The longer a person works in a place, the more likely they are to be exposed to physical and chemical work environment factors that can cause health problems or work-related diseases so that it will result in decreased work efficiency and productivity of a worker (Wahyu, 2003).

In another study, it was stated that workers who are in the category with a working period of more than 10 years will experience subjective complaints in the form of psychological, physiological, communication disorders and hearing problems. It can be concluded that the longer a person's working period, the greater the potential for damage to hearing or other sensory functions (Susanti Yunita, 2010). Based on statistical tests that have been carried out in this study, it was found that the length of work in the production department had a role in the onset of hearing complaints. The longer a worker is in a noisy room, the greater the potential danger that the worker will receive.

In another study, it was found that the length of exposure to noise experienced by train drivers was classified as abnormal and based on the results of the Spearman Rank correlation test and the Linear Multiple regression test, it proved that there was a relationship between the length of exposure in the train locomotive cabin per day and the occurrence of disturbances. the hearing perceived by the train driver (Kurniawan et al., 2012).

Factors related to the incidence of hearing loss in rice mill workers, with the results of research that length of exposure to noise is one of the factors that is significantly related to the incidence of hearing loss in workers. Length of work is one of the factors associated with the impact of noise. Length of work is the time a person is at work and does his work in one working day (Huda, 2011).

The results of this study found that the use of personal protective equipment (ear protection) is very helpful in preventing damage to the function of body organs (ears). the use of personal protective equipment (ear protection), does not mean that we are free and safe from negative exposure to the work environment, but must also be supported by discipline and structured work patterns. That the noise level affects the degree

of hearing loss with a P value = 0.003 = 0.05 and the use of ear protective equipment affects the degree of hearing loss with a P value = 0.003 smaller than the alpha value = 0.05 from 16 respondents. It was concluded that there was an influence between the noise level on the degree of hearing loss and there was also an influence between the use of ear protection equipment on the degree of hearing loss (Hartini, 2015).

Research on cooking oil factory workers showed that there were 19 people with mild hearing loss (38%) and 7 people with moderate deafness (14%), while 24 people (48%) (Yurensa, 2015). Rinawati in her research showed high hearing loss in workers exposed to textile industry noise in Surakarta who did not wear APT (Ear Protective Equipment), had a 3.35 times greater risk of hearing loss than those who wore APT ($p=0.002$) (Rinawati et al., 2015).

Research conducted by Umeda (2010) found that there was a tendency for every increase in not using personal protective equipment there was an increase in the percentage of hearing, besides that it was also found that the effect of the PPE variable on the decrease in workers' hearing power was the strongest (Umeda, 2010).

CONCLUSION

Based on the results of data analysis conducted and it is known that all risk factors have a significant relationship with hearing complaints in furniture workers along Jalan Pahlawan in Medan City. Those factors are Noise Intensity with $p=0.001$, Age of Worker $p=0.000$, Period of Work $p=0.25$, Length of Work $p=0.010$, use of ear protection equipment $p=0.001$.

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