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The Effect Of Occupational Factors On Symptoms Of Acute Respiratory Tract Infections in Workers Furniture Industry

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Abstract: Every workplace has various potential hazards that can affect the health of the worker. One of potential hazard in the workplace can cause health problems is caused by dust. This is can cause an Acute respiratory tract infection. One of job that has a risk of getting Acute respiratory tract infection disorders are furniture workers. This is because around 10 to 13% of the wood sawing and sanding will be in the form of wood dust. So that the workers are always exposed to wood dust which can interfere with breathing. The purpose of this study aimed to determine the effect of occupational factors and environmental factor on symptoms of Acute respiratory infections in furniture workers. This research method uses quantitative methods with observational and cross-sectional research using logistic regression test analysis. The population in this study were workers in the industry on Semarang street City of Surabaya with a total of 57 people, with a sample of 37 furniture workers. The results of this study indicate that most workers have symptoms of Acute respiratory tract infection. This happens because it is influenced by occupational factors such as the length of work every day and the work period of workers who are mostly more than 5 years. Therefore, many factors influence the occurrence of Acute respiratory tract infection symptoms in furniture industry workers. So the need to do, prevention such as minimizing exposure with dust to obedient in the use of Personal Protrctive Equipment such as respirators.

Keywords: Acute respiratory tract infection Symptoms, Occupational Factors, Furniture Workers, Dust Exposure

Introduction

Every workplace always contains various potential hazards that can affect the health of the workforce or can cause work-related illnesses. One potential hazard at work can be the most common and dangerous chemical factor in the workplace is dust. Dust is one of the materials often referred to as suspended particulate matter (SPM). Dust is a solid chemical, which is caused by natural or mechanical forces such as processing, pulverizing, softening, rapid packing, blasting and other things, both organic and inorganic. Particulate matter (PM) or also called dust, which is a collection of inanimate and micro-life objects that have an inter-diameter of 0.1 micron to 500 microns. Generally particles that can enter the respiratory tract are particles smaller than 10μm. Particles of this size are also called PM10 (Rohilla, 2012).

The International Labor Organization (ILO) explains the causes of death caused by work are cancer by 34%, occupational accidents 25%, respiratory diseases 21%, cardiovascular disease 15%, and 5% are caused by other factors (Hutama, 2013). Acute respiratory infection (ARI) is a major health problem as evidenced by the prevalence of ARI in Indonesia as much as 25.5% (around 17.5% - 41.4%) with 16 provinces of which have a prevalence above the national rate and pneumonia of 2 , 1% (range: 0.8% - 5.6%)

The wood furniture industry is one industry that is growing very rapidly. The physical process of processing raw materials for furniture is likely to produce pollution such as wood dust particles. This is because around 10 to 13% of the wood sawing and sanding will be in the form of wood dust. Wood dust can be produced through mechanical processes such as sawing, shredding and removal (sanding). Wood undergoing a mechanical process will take the form of wood dust floating in the air. This wood dust will pollute the air and its environment so that wood furniture industry workers can be exposed to dust (Halim, 2012). Dust levels that exceed the TLV (Treshold Limit Value) will cause health

problems such as respiratory problems, one of which is a risk factor for acute respiratory infection (acute respiratory tract infections). High concentrations of pollutants can damage the lung defense mechanism so that it will facilitate the emergence of ARI. Even dust exposure can be a cause of ARI even though wood dust levels are below the TLV. (Indonesian Ministry of Health, 2012).

ARI always ranks first out of 10 most diseases in Indonesia. Based on the results of Riskesdas in 2013, the prevalence of ARI was found to be 24.0%. The highest characteristics of the population with ARI occurred in the age group 1-4 years which amounted to 25.8%. In 2014 ARI cases in infants were recorded at 657,490 cases (29.47%) (Mutiara, 2014). Based on this background, this study aims to analyze the effect of occupational factors on the symptoms of Acute respiratory tract infections in furniture workers on the road in Semarang city of Semarang.

2. Methodology

This study uses quantitative research methods with observational research and cross-sectional approaches. This research was conducted in Jalan Semarang, Surabaya City, East Java. The population in this study were workers in the furniture industry on Jalan Semarang, Surabaya City with a sample of 31 furniture workers. The sampling technique in this study was done by simple random sampling.

The research variable consisted of independent variables namely occupational factors including work period and length of work, and dependent variables, namely symptoms of Acute respiratory tract infection. Data collection techniques using interview techniques with the help of questionnaires, observation with the help of a checklist. The test used in this study is the logistic regression test.

3. Results

Results of Distribution of Acute respiratory tract infection symptoms

Based on a questionnaire regarding the distribution of workers who experience Acute respiratory tract infection symptoms, it can be seen in the table below:

Table 1. Distribution of Acute respiratory tract infection symptoms in furniture workers

Personal Characteristics of the Respondents

Variable	Description	n	%
Acute respiratory tract infection symptoms	No	13	35
	Yes	24	65
	N	37	100

source: primary data 2019

Based on the results of Table 1 it is known that the number of workers who experienced symptoms of Acute respiratory tract infections was as many as 24 people from 37 respondents or by 65%. From these data it can be concluded that the majority of workers have symptoms of Acute respiratory tract infections.

Results of Analysis of Work Period Factors for Symptoms of Acute respiratory tract infections

The results of the analysis in the study of the working period of workers who influence the symptoms of acute respiratory tract infections in respondents using partial logistic regression tests or bivariate that can be seen in the table below:

Table 2. Results of Analysis of Period of Work Factors on Symptoms of Acute Respiratory Tract Infection.

Variable	B	Wald	Df	Sig	Exp(B) CI 95%	Cox & Snell R Square
Working Period	1,569	4,496	1	0,034	4,800	.121

source: primary data 2019

Based on the results of the logistic regression test in Table 2, the results of the analysis of years of service with criteria ≤ 10 years and > 10 years old have a significant influence on the symptoms of Acute respiratory tract infections. These results can be known from the significance value or P value < of alpha value (α) (0.05), which is 0.034. Based on these results it can also be known the level of risk of working period for the occurrence of symptoms of Acute respiratory tract infections in furniture workers based on an exp (B) value of 4,800. This can be interpreted that workers who work for > 10 years of work have a 4.8 times higher risk of developing symptoms of Acute respiratory tract infections compared to workers with ten years of kerja 10 years of work.

Results of long-acting factor analysis of symptoms of Acute respiratory tract infection

The results of the analysis on the study of the length of work in a day (hours) that affect the symptoms of Acute respiratory tract infections in respondents By using a partial logistic regression test or bivariate that can be seen in the table below:

Table 3. Results of Analysis of Long Work Factors for Symptoms of Acute respiratory tract infections.

Variable	B	Wald	Df	Sig	Exp(B) CI 95%	Cox & Snell R Square
Length of Work	1,910	6,251	1	0,012	6,750	,171

source: primary data 2019

Based on the results of the logistic regression test in Table 3, the results of the analysis of work duration with criteria of 8 hours and > 8 hours have a significant effect on the symptoms of Acute respiratory tract infections. These results can be known from the significance value or P value < of alpha value (α) (0.05), which is 0.012. Based on these results it can also be known the level of risk of working time against the occurrence of symptoms of Acute respiratory tract infections in furniture workers based on an exp (B) value of 6,750. This can be interpreted that workers who work with a length of work > 8 hours have a risk of 6.75 times more at risk of experiencing symptoms of Acute respiratory tract infections compared to workers with a work duration of 8 hours.

4. Discussion

Symptoms of Acute Respiratory Infection

Acute respiratory tract infections are acute inflammation of the Acute or lower respiratory tract caused by microorganic or bacterial, viral, or rickets infections, without or accompanied by inflammation of the lung parenchyma (Trisnawati & Juwarni, 2012). ARI according to WHO is Acute or lower respiratory tract disease, usually contagious which can cause various spectrum of diseases ranging from asymptomatic or mild infections to severe deadly diseases (WHO, 2010). ARI is an infectious disease that attacks one part and or more of the airways, starting from the nose (Acute channel) to the alveoli (lower channel) including adnexanya tissue, such as sinus, middle ear cavity and pleura (Aditama, 2012).

The factors that influence a person's risk of getting ARI, namely environmental factors, individual characteristics and employee behavior. Environmental factors include air pollution (dust, cigarette smoke, air pollution due to industrial products and smoke from burning fuel). Individual factors such as age, sex and education level can also affect the risk of susceptibility to ARI. Worker behavior includes smoking and the use of masks (Sormin, 2012). Exposure to dust can cause acute or chronic respiratory distress. One of the dust particles that can cause acute respiratory problems is industrial products that can pollute the air such as wood dust, coal, cement, cotton, asbestos, chemicals, poisonous gas, and others. Various factors affect the onset of disease or disorders of the airways due to dust. These factors include dust factors which include particles, shape, concentration, solubility and chemical properties and duration of exposure. Individual factors include pulmonary defense mechanisms, anatomy and physiology of the respiratory tract (Cahyana et al., 2012).

The results of the study on furniture industry workers about the symptoms of Acute respiratory tract infections, showed the number of workers who experienced symptoms of Acute respiratory tract infections as many as 24 people from 37 respondents if the percentage of 65% of workers experienced symptoms of Acute respiratory tract infections. From these data it can be concluded that the majority of workers have symptoms of Acute respiratory tract infections. Many symptoms of ARI that are not examined properly so that many cases of ARI that cause complications, access to health services on time will reduce the risk of severity and even death. Therefore the need for supervision of Acute Respiratory Tract Infection symptoms in workers.

Effect of Factors of Work Period on Symptoms of Acute Respiratory Tract Infection

The analysis that was carried out in this study obtained the results of the analysis of work period with criteria ≤ 10 years and> 10 years, had a significant influence on the symptoms of Acute respiratory tract infections. These results can be known from the significance value or P value <of alpha value (α) (0.05), which is 0.034. Based on these results it can also be known the level of risk of working period for the occurrence of symptoms of Acute respiratory tract infections in furniture workers based on an exp (B) value of 4,800. This can be interpreted that workers who work for> 10 years of work have a 4.8 times higher risk of developing symptoms of Acute respiratory tract infections compared to workers with ten years of kerja 10 years of work. Based on studies showing that the working period of more than 10 years has a risk of lung obstruction in dusty industrial workers (Yusnabeti, 2011).

The longer a person is at work, the more he has been exposed to the danger posed by the work environment. Someone who works in an industrial environment that produces dust or exhaust gas will have a risk of health problems. The longer a person is exposed to dust at work which can be seen from the length of work, the dust will most likely be buried in the lungs. This is the result of accumulation of inhalation during work. Years of work can worsen workers' health conditions because of the frequent frequency of exposure (Rohilla, 2013).

Effect of long-acting factors on symptoms of Acute respiratory tract infection

The results of the analysis in this study obtained the results of the analysis of the length of work with the criteria of 8 hours and> 8 hours, having a significant influence on the symptoms of Acute respiratory tract infections. These results can be known from the significance value or P value <from the value of alpha (α) (0.05), which is 0.012. Based on these results, it can also be known the level of risk of long-term work on the occurrence of symptoms of Acute respiratory tract infections in furniture workers based on exp value (B) which is 6.750. This can be interpreted that workers who work for longer than 8 hours have a risk of 6.75 times more risk of experiencing symptoms of Acute respiratory tract infections compared with workers who work 8 hours long.

Long exposure to dust is at risk of affecting the severity of respiratory distress suffered by workers. Because the longer the exposure, the more accumulated dust. Based on research on the effect of urea dust exposure on ISPA workers, it was found that workers who experienced dust exposure times> 8 hours experienced higher symptoms of Acute respiratory tract infections (Arief, 2013).

CONCLUSION

Based on the results it is known that workers in the furniture industry on the Semarang street surabaya city have a risk of experiencing symptoms of Acute respiratory tract infections. Risk factors that cause symptoms of Acute respiratory tract infections from occupational factors are work period (years) and length of work (hours a day). These factors have a high risk of the occurrence of symptoms of Acute respiratory tract infections. workers who work with a tenure of > 10 years have a risk 4.8 times more likely to experience symptoms of Acute respiratory tract infections compared to workers with a tenure of ≤ 10 years. Then, workers who worked for more than 8 hours had a risk of 6.75 times more at risk of experiencing symptoms of Acute respiratory tract infections compared to workers with 8 hours of work.

5. Recommendation

The entrepreneurs in the furniture industry in general technically should need to increase periodic monitoring of the working environment and work processes of the workers, especially in less clean environmental conditions and large amounts of dust. Furniture workers or workers are expected to adhere to the use of personal protective equipment, namely the use of PPE such as a mask to protect themselves from health hazards, in addition to checking their health regularly and adopting a healthy lifestyle.

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