



Dust Exposure and Symptoms of Respiratory Disorder on Worker of the Sikatak Bridge Development Project

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Abstract

Respiratory disorders are health problems that are often suffered by workers who are in the work environment or types of work that are at risk of being exposed to high levels of dust. Dust that inhaled for a long period of time will be deposited in respiratory tract and cause symptoms of respiratory disorders such as coughing, shortness of breath, or both. This study aimed to identify the factors

associated with symptoms of respiratory disorders on workers of Sikatak bridge construction project workers. This research was an observational analytic study using a cross sectional approach in October to December 2019. Samples in this study were taken from all population as many as 50 people with a total sampling technique, total sampling is a sampling technique where the number of samples is equal to the population. Based on interviews, 22 respondents (44%) experienced coughing, 13 respondents (59%) experiencing regular coughs and 9 respondents (41%) experiencing phlegm coughing, asphyxiation as many as 22 respondents (44%), and coughing and shortness of breath as many as 11 respondents (22%) and the majority of workers on the project did not wear masks. Statistical test results found that there was no association at all variable to the incidence of symptoms of respiratory disorders on workers of *Sikatak* bridge construction project. To avoid the risk of respiratory disorders, it can be done by regulating lifestyle, eliminate the smoking habit, and using personal protective equipment.

Keywords: Dust Exposure, Symptoms of Respiratory Disorders, Project Workers

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INTRODUCTION

The construction of bridges to be built must follow the specified standards in construction to avoid problems arising from infrastructure development activities such as air pollution which has become a major environmental health problem in the world, especially in developing countries, both indoor and outdoor ambient air pollution.

A project worker in a construction project is an example of work who is often directly exposed to dust while doing his job. This has a risk level for experiencing health symptoms and diseases, both infectious and non-infectious. Respiratory problems are the most common health problems in construction activities (Arif:2008)

In theory, symptoms of respiratory distress are symptoms that are felt in the form of a cough with both a cough with phlegm and no phlegm, shortness of breath, chest pain, and wheezing in the morning, during the day, and at night. Symptoms of respiratory distress are events that have various causes (Mirza:2010).

When a preliminary study was conducted, it was found that 7 out of 10 respondents experienced coughing and congestion due to the dust in the work area tends to be a lot, especially the majority of workers did not use personal protective equipment because masking was only given at the beginning of the project, the number of masks given to each worker was disposable.

Other than that, workers think the use of masks makes it difficult because the respiratory tract becomes obstructed by masks and has decreased concentration due to not being accustomed to wearing masks. Research conducted by Pradesi in 2018 states that the working period, smoking habits, and use of personal protective equipment can be modified so that it can minimize the incidence of respiratory symptoms.

The dust measurement was carried out in the morning with sunny and windless weather. The total dust yield in the bridge construction area is $263 \mu\text{g} / \text{Nm}^3$ and the measurement of inhaled dust in one of the samples is $17 \text{ mg} / \text{m}^3$ so that the measurement exceeds the threshold value in Government Regulation Number 41 of 1999 which states that the threshold value for dust a total of $230 \mu\text{g} / \text{Nm}^3$ and inhaled dust or unclassified particulates of $3 \text{ mg} / \text{m}^3$.



According to epidemiological studies, each addition of $10\text{mg}/\text{m}^3$ PM10 can increase the risk of chronic cough by 10-25%. Even though they feel these symptoms, the worker has never undergone a medical examination because these symptoms are considered normal and consider these two factors due to the worker's age (Soedjono, Setiani, Wahyuningsih:2003).

According to estimates by the International Labor Organization, there are 2.2 million work related deaths each year, 350,000 of which are fatal accidents and 270 million are non-fatal work accidents. Every year, 160 million workers suffer from occupational diseases. With a range of 30- 40% of these occupational diseases are seeds of chronic disease and 10% can become permanent disabilities (ILO:2015).

From the results of these observations, the researcher want to identify the factors that were related to respiratory symptoms among the workers of the Sikatak bridge construction project. The results of this study can be used by workers as a source of knowledge about the impact of environmental dust exposure on health and can be used by initiators as information on the impact so that preventive measures can be taken to minimize the occurrence of respiratory symptoms.

RESEARCH METHOD

This research is a quantitative research applying analytic observational method with crosssectional approach. The population of this observation is all the workers of the Sikatak bridge construction project. The sampling method in this research is using total sampling technique. The sample in this study were 40.

The independent variables in this study were individual risk factors with details of age, history of lung disease and smoking habits, occupational risk factors with details of work period, length of exposure, type of work, and compliance in the use of personal protective equipment (PPE). The dependent variable in this study is the symptoms of respiratory distress which is measured using a questionnaire containing several questions that will be processed to produce a conclusion whether the worker is experiencing respiratory symptoms or not.

The location of this research is the Sikatak bridge construction area located on Jl. Prof. Sudarto, which connects Jl. Lkr. Utara with a location behind the Faculty of Animal Sciences



and Agriculture, Diponegoro University and Jl.Prof. Sudarto. The category used for the age variable comes from the book Health Sciences which states that maximum respiratory muscle strength occurs between the ages of 20-40 years. The category of lung disease history in this study is calculated if the worker has a history either congenital or not due to pulmonary problems. has a small vital lung capacity.

The cut-off used for the working period variable refers to the book Company Hygiene and Occupational Health which explains that the categorization of working tenure is divided into 2, namely less than 5 years and more than equal to 5 years because the longer a person works, the more exposure is received. refers to Law No.13 of 2013 concerning Manpower which explains that working time is not more than 7 hours per day or 40 hours per week. risky if the job has more frequent direct contact with polluters.

Univariate analysis using frequency distribution tables to describe the characteristics of research respondents. Bivariate analysis using the chi square test and fisher exact alternatives with a significance level of $p = 0.05$. The significant level used is 95% so that if the p value less than 0.05 then H_0 is rejected, which means that there is a relationship between the independent variable and the dependent variable.

RESULTS AND DISCUSSION

The infrastructure development for the Sikatak Bridge tends to have a high level of dust exposure, especially when doing work that produces a lot of dust, such as land acquisition, use of heavy equipment, carrying building materials, and casting processes. Characteristics of respondents in this study included age, history of lung disease, smoking habits, years of work, length of exposure, type of work, and compliance with the use of personal protective equipment (PPE). The distribution will be shown in the following table:

Tabel 1. Distribusi Frekuensi Karakteristik Responden

Variabel Penelitian	f (Orang)	%
Age		
≥ 40 Years	3	7,5
< 40 Years	37	92,5
History of Lung Disease		



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There are a History	10	25
There are no History	30	75
Smoking Habit		
Smoking	23	57,5
Not Smoking	17	42,5
Years of Services		
≥ 5 Years	25	62,5
< 5 Years	15	37,5
Duration of Exposure		
≥ 7 Hours/Day	24	60
< 7 Hours/Day	16	40
Type of Work		
Risky	24	60
No Risky	16	40
Use of PPE		
Not Using PPE	22	55
Using PPE	18	45

Table 1 shows that of the 40 workers in the Sikatak bridge construction project 7.5% of the workers have an age of ≥ 40 years, which means that there are more workers aged <40 years than workers with age ≥ 40 years. 25% have a history of lung disease, which means that there are more workers who do not have a history of lung disease than those who have a history of lung disease. 57.5% have a smoking habit, which means that workers who smoke more than those who do not smoke. 62.5% have a work period of ≥ 5 years, which means that workers with a work period of ≥ 5 years are more than those with a work period of <5 years. 60% were exposed to ≥ 7 hours / day, which means that workers with ≥ 7 hours / day were more than workers with length of exposure <7 hours/day. 60% of workers who do risky work, which means that workers who do work at risk are more than workers who do work that is not noisy. 55% do not use PPE, which means that more workers consider to not using PPE than those who using PPE.

The distribution of the incidence of respiratory distress symptoms among workers in the sikatak bridge construction project is shown in the following table:

Table 2. Frequency Distribution of Occurrences and Types of Respiratory Disorders in the Sikatak Bridge Construction Project Workers

Symptoms of Respiratory Disorder	f (People)	%
There are Symptoms	28	70
Cough	22	79



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Common Cough	13	59
Cough with Phelgm	9	41
Blown	18	64
Cough and Blown	12	43
There are no Symptoms	12	30

The results of table 2 show that most respondents in doing work experience symptoms of respiratory disorders in the form of coughing, shortness of breath, or both with a total of 28 respondents with a percentage of 70% and 12 other respondents who do not experience symptoms of respiratory disorders with a percentage of 30%. The results of the interviews showed that 22 respondents (79%) had coughs, 13 (59%) had regular coughs and 9 (41%) had coughs with phlegm, 18 respondents (64%) had coughs and experienced coughing. shortness of breath as many as 12 respondents (43%)

Table 3. Association between Individual and Occupational Risk Factors and Symptoms of Respiratory Disorder.

Risk Factors		Symptoms of Respiratory Disorder						p value	Prevalence Ratio (PR) and CI 95%
		There are Symptoms		There are no Symptoms		Total			
		n	%	n	%	n	%		
Individual Risk Factors	Risk								
Age									
≥ 40 Years		3	100	0	0	3	100	0,541*	1,480 (1,184-1,850)
< 40 Years		25	68	12	32	37	100		
History of Lung Disease									
There are a history		8	80	2	20	10	100	0,693*	1,200 (0,804-1,790)
There are no history		20	67	10	33	30	100		
Smoking Habit									
Smoking		17	74	6	26	23	100	0,530*	1,142 (0,754-1,750)
Not Smoking		11	65	6	35	17	100		
Occupational Risk Factors	Risk								



Year of Services								
≥ 5 Years	19	76	6	24	25	100	0,285*	1,267 (0,793- 2,023)
< 5 Years	9	60	6	40	15	100		
Duration of Exposure								
≥ 7 Hours	18	75	6	25	24	100	0,398*	1,200 (0,700- 1,871)
< 7 Hours	10	63	6	37	16	100		
Type of Work								
Risky	18	75	6	25	24	100	0,490*	1,200 (0,700- 1,871)
Not Risky	10	63	6	37	16	100		
Use of PPE								
Not Using PPE	16	73	6	27	22	100	0,677*	1,148 (0,746- 1,767)
Using PPE	12	67	6	33	18	100		

Keterangan : (*) = Uji Statistik Chi-Square, (**) = Uji Statistik Alternatif Fisher's Exact

The test results in table 3 show that the seven variables do not have a relationship with the incidence of respiratory distress symptoms in the work of the Sikatak bridge project, both individual risk factors and occupational risk factors. Meanwhile, when viewed in theory, each variable has an influence to cause respiratory symptoms

Association between Ages and Symptoms of Respiratory Disorder

The results showed that there was no relationship between the age variable and respiratory symptoms in construction project workers (p value = 0.541). The average age of workers is 35 years, with the youngest being 28 years old and the oldest being 43 years old and the symptoms complained of include coughing, shortness of breath, and both.

In theory, people with the age of 40 will experience a decrease in the function of body organs including the respiratory organs so that it can cause respiratory problems if they do not take precautions such as exercise and maintain a healthy lifestyle. The older a person is, the more likely it



is that there will be a decrease in lung function with the symptoms of breathing becoming heavier and breathing capacity decreases.

Research conducted by Putra in 2014 shows that age has no relationship with the onset of respiratory problems but in theory people over 40 have a higher risk of developing respiratory problems because the vital capacity of the lungs decreases with age (Suma'mur:1998).

The age variable in this study has no relationship but in theory it is related, so what can be done to reduce the risk of respiratory symptoms at young and old is to maintain a healthy lifestyle such as doing regular exercise, not smoking, and getting enough rest.

People who maintain a healthy lifestyle such as not smoking, having adequate rest time, and doing regular exercise have an influence on the vital capacity of the lungs. Research conducted by Chendra in 2019 states that doing regular exercise, both light and strenuous activities, has a function so that the respiratory tract becomes slower and deeper because physical exercise will cause the respiratory muscles to become more elastic and stronger.

People who have a smoking habit indirectly damage the structural organs of the body including the respiratory organs due to a buildup of chemicals in the lungs and respiratory tract so that if they are not stopped, the person is likely to experience respiratory symptoms (Darmanto:2007).

Association between History of Lung Disease and Symptoms of Respiratory Disorder

The results showed that there was no relationship between the variable history of pulmonary disease with respiratory symptoms in the Sikatak bridge construction project workers (p value = 0.693). There are 12 project workers who have pulmonary symptoms with a history of asthma and bronchitis.

In theory, respondents who have a history of lung disease have a higher risk of experiencing respiratory symptoms. This is because if someone has or has temporarily suffered from a respiratory system disease, it will increase the risk of developing respiratory disease if exposed to dust.

Research conducted by Apsari in 2018 shows that a history of lung disease has no relationship with the onset of respiratory problems, but in theory it is related to lung conditions that can lead to health problems if the lung condition is damaged and no further follow-up is done (Apsari, Budiyo, Setiani:2018).



The incidence of respiratory symptoms in workers experienced by workers who have a history of lung disease can be caused by workers experiencing a reduction in the volume of their lung capacity which results in a decrease in oxygen levels.

Based on Apsari's research in 2018, it was found that the causes of respiratory symptoms in workers with a history of lung disease include a lack of maintaining a healthy lifestyle such as exercise and having time to rest and smoking habits because it will worsen lung conditions that have experienced previous problems.

The variable history of lung disease in this study has no relationship but in theory it is related, so what can be done to reduce the risk of respiratory symptoms is to adopt a healthy lifestyle such as exercise and adequate rest, eliminate smoking, and use personal protective equipment. Physical exercise will affect the organs in such a way that the work of the organs is more efficient and the maximum working capacity achieved is greater, people who perform physical activities have a slower and deeper breath flow. Doing adequate rest is necessary to provide rest time for body organs including respiratory organs (Boating et.al:2019).

Based on Putra's research in 2014 results show alternative solutions to reduce the risk of recurrence or the emergence of respiratory disease, workers use personal protective equipment, carry out routine checks to check the health of workers, especially those who already have a history of lung disease, and the last is to exercise regularly so that the lung muscles accustomed to pumping air when workers do heavy work (Putra:2014).

Association between Smoking Habit and Symptoms of Respiratory Disorder

The results showed that there was no relationship between smoking habits and respiratory symptoms among workers in the Sikatak bridge construction project (p value = 0.530). Workers who smoke are more likely to experience respiratory symptoms than workers who do not smoke.

In theory, habits have 4x the risk of causing obstruction than nonsmokers. Smoking can cause changes in the structure and function of the respiratory tract and lung tissue. Smoking habits will accelerate the decline in lung function. The annual decrease in forced expiratory volume was 28.7 mL for active smokers (Brinkman:1963).

Research conducted by Apsari in 2018 showed that smoking had no relationship with the incidence of respiratory problems, but it was stated that in theory, people who have a smoking habit



have a higher risk of experiencing respiratory problems because smoking will affect the workings of the pulmonary organs.

In smokers, large respiratory mucosal cells can enlarge and increase in mucus glands. Whereas in the small respiratory tract, mucus buildup can occur due to narrowing of the passages caused by cigarette smoke and dust from the work environment.

Research conducted by Putra in 2014 shows that the habit of smoking continuously will cause fatal damage to organs including the lungs if not stopped because the accumulation of chemicals in cigarettes will settle, causing narrowing of the respiratory tract.

The smoking habit variable in this study did not have a relationship with respiratory symptoms but in theory it was related, so things that can be done to reduce the risk of respiratory symptoms are to stop smoking, carry out health checks, and maintain a healthy lifestyle such as exercise and adequate rest. (Suharto:1978).

Quitting the habit of smoking will reduce the levels of harmful chemicals that enter the body so that organs including the lungs do not suffer more severe damage and can be minimized the possibility of respiratory symptoms if done early.

The next step is to carry out routine health checks which can also minimize the occurrence of respiratory symptoms because there can be directions from health workers if the results of the examination indicate disease in the respiratory organs.

Doing regular exercise can strengthen the lung and chest muscles because physical activity causes adaptation to the lungs to breathe deeply and at a slow tempo so that the oxygen needed for muscle work in the ventilation process is reduced, so that with the same amount of oxygen, the trained muscles will be more effective work (Atan, Akbol:2019).

Research conducted by Putra in 2014 provided alternative solutions to reduce the dangers of smoking, including listing the disadvantages and benefits of smoking, and not hanging out with people who were smoking. (Putra:2014)

Association between Year of Services and Symptoms of Respiratory Disorder

The results showed that there was no relationship between the working period variable and respiratory symptoms in the Sikatak bridge construction project workers ($p\text{ value} = 0.285$).



Respondents with a work period of ≥ 5 years experienced more respiratory problems. Disturbances complained by workers in the form of coughing, shortness of breath, or both.

In theory, working tenure has a higher risk of experiencing respiratory symptoms is a work period of ≥ 5 years because it has a risk of being exposed longer than people who work <5 years, especially if the workplace has a high risk of pollution levels (Irjayanti:2012). Research conducted by Apsari in 2018 shows that tenure has no relationship with respiratory symptoms but in theory it is related to the incidence of respiratory symptoms.

Workers who have a work period of more than 5 years have a higher risk of experiencing respiratory symptoms because the longer a person's working tenure in a dusty work environment, the greater the possibility of damage to the lung organs and the period of exposure with a period of ≥ 5 years will result in disturbances. lungs (Irjayanti:2012).

Research conducted by Apsari in 2018 shows that tenure can cause respiratory symptoms because if someone does work where the place has a high level of pollution and is not equipped with personal protective equipment, it will increase the risk of respiratory problems or occupational diseases.

The working period variable in this study does not have a relationship with respiratory symptoms but in theory it is related, so what can be done to reduce the risk of symptoms of the disorder is to carry out routine health checks, use personal protective equipment, and do a healthy lifestyle such as exercise and getting adequate rest (Suharto:1978).

In addition, using personal protective equipment such as masks will protect yourself from exposure to pollutants such as dust so that the dust is not inhaled into the respiratory tract and accumulates in it so that it does not cause obstruction of the respiratory tract and cause respiratory problems.(Yulaekah:2007)

Research conducted by Ipmawati in 2018, alternative solutions to problems include medical check-ups carried out at the beginning of work acceptance to find out the health status of workers and provide Personal Protective Equipment to reduce inhaled dust levels.

Association between Duration of Exposure and Symptoms of Respiratory Disorder

The results showed no relationship between the variable length of exposure and respiratory symptoms in project workers (p value = 0.398). Workers who experience respiratory symptoms are more likely to workers who are exposed to ≥ 7 hours/day.



The results of observations and interviews found that the majority of workers did work ≥ 7 hours due to completing daily targets because there was a timeline that had to be followed by the construction party.

In theory, exposure time ≥ 7 hours per day has a higher risk of experiencing respiratory symptoms because these workers are exposed for longer, especially workers who do risky work, causing an increased risk of exposure.

Research conducted by Apsari in 2018 shows that there is a relationship between length of exposure and respiratory disorders. The possibility of differences in research results due to the characteristics of different workers and different environmental conditions (Apsari, Budiyo, Setiani:2018).

According to Law No.13 of 2013 concerning Manpower, the working time is not more than 7 hours per day or 40 hours per week. The length of exposure is related to the number of working hours spent by construction project workers.

The longer the worker does his job, the longer the dust exposure he receives, so that the possibility of experiencing pulmonary function disorders will also be greater, but it also depends on the existing dust concentration and the clearance mechanism of each individual, the chemical nature of the dust, dust size, dust particle content and individual susceptibility (Grobogan:2007).

The results of the interview showed that the causes of respiratory symptoms such as coughing, shortness of breath, or both are due to breathing air mixed with dust, smoking habits and not using personal protective equipment while working.

To reduce the level of risk of occurrence of respiratory symptoms for workers who do work for ≥ 7 hours or < 7 hours, preventive measures such as personal protective equipment in the form of masks can be taken to reduce the exposure received by workers and the amount of dust inhaled can be reduced so that the possibility of symptom occurrences Respiratory disorders can be minimized. (Yulaekah:2007)

Furthermore, the construction party can facilitate periodic health checks with the help of company doctors or call local health workers to find out whether the worker carrying out the project work has lung disease or not so that action can be taken against workers who have diseases and are at risk of experiencing respiratory symptoms.



Research conducted by Apsari in 2018 provides an alternative solution that can be done is the need to improve the work shift system to provide adequate rest time and reduce indications of disease symptoms due to exposure in the work environment.

Association Between Type of Work and Symptoms of Respiratory Disorder

The results showed that there was no relationship between the variable type of work and symptoms of respiratory disorders in the work of the Sikatak bridge construction project (p value = 0.490). The average type of work in a infrastructure development project is risky work.

The risky jobs in this discussion are jobs where the level of possibility of direct contact with pollutants is more than other jobs such as using heavy equipment, foundation work, land cleaning, and carrying building materials. Respondents who do work at risk have more symptoms of respiratory problems than those who do not risky work and the symptoms experienced are coughing, shortness of breath, or both.

In theory, people who do risky work have a higher risk of experiencing respiratory symptoms due to contact with exposure so that more pollutants enter the body than people who do not do risky work (Yulaekah:2007).

Research conducted by Ipmawati in 2018 showed that there was no relationship between the type of work and symptoms of respiratory distress. But in theory, people with risky jobs have a higher risk of experiencing respiratory symptoms because risky jobs have a higher risk of being exposed to pollutants. Occupational diseases are caused by unsafe act and unsafe working conditions (Oviera Jayanti & Suroto:2007).

Variable types of work in this study do not have a relationship with respiratory symptoms, therefore alternatives that can be given to workers who do risky work in theory include construction facilitating personal protective equipment in the form of masks, making policies to use masks and not smoking, and stop smoking (Suharto, 1978;Iryanti, Nurjazuli, Suwondo:2012).

Using personal protective equipment that meets safety and comfort standards for workers can reduce the level of exposure to dust inhaled by workers in the work environment so as to minimize the accumulation of dust levels in the respiratory organs.

Then to maximize the preventive measures for respiratory symptoms, project workers must stop smoking because in a long time it can change the function of the human respiratory tract so that it can



result in increased alveoli damage and inflammation of cells in lung tissue. These changes lead to clinical abnormalities to the onset of obstruction that occurs continuously (Dorce;2006).

Research conducted by Ipmawati in 2018 shows that if respondents do risky work, they are required to use personal protective equipment in the form of masks to minimize the level of dust inhaled by respondents so as to minimize the possibility of respiratory symptoms due to work (Ipmawati:2018).

Association between Use of PPE and Symptoms of Respiratory Disorder

The results showed that there was no relationship between the compliance variable in the use of personal protective equipment and respiratory symptoms among the workers of the Sikatak bridge construction project ($p\ value = 0.677$). Workers who do not use PPE are more likely to experience respiratory symptoms such as coughing and tightness than workers who use PPE.

On average, workers who work on construction projects do not use personal protective equipment in the form of masks, which indirectly increases the risk of respiratory symptoms because workers have direct contact with pollutants, especially workers who do risky work with higher levels of pollutants (Yulaekah:2007).

In theory, compliance with the use of personal protective equipment is a risk factor that can cause problems if workers do not use it, especially doing work in a risky environment because it allows direct contact with dust levels so that the dust can be inhaled and settle in the respiratory organs and respiratory tract.

The majority of workers do not have the initiative to use masks independently, such as using masks made of cloth / clothes because the location of the area and the type of work that generates a lot of dust, however, the use of masks made of cloth / clothes has not been effective in blocking incoming dust because the dust particle size varies. Other factors that cause users of personal protective equipment to experience respiratory symptoms include smoking, a history of lung disease, and having a poor lifestyle (Ipmawati:2018).

The variable of using PPE in this study has no relationship with respiratory symptoms, therefore alternatives that can be given to workers who do not use PPE in theory include the construction party providing facilities in the form of masks to each worker, especially those that can be washed and reused. so there is no need to spend more to buy disposable masks (Dorce:2006).



Then the construction party can make a regulation requiring each worker to use personal protective equipment to reduce the incidence of respiratory symptoms or occupational diseases. Research conducted by Ipmawati in 2018 shows alternative solutions to problems, including recommendations for personal protective equipment that can be pursued as early protection measures against work-related accidents and diseases that arise in the workplace environment, then implementing basic policies regarding the application of occupational safety and health at work for minimizing the number of occupational diseases, especially dust (Ipmawati:2018).

Meanwhile in Permenakes No.48 of 2016 concerning K3 Standards that occupational health standards are one of which is the improvement of occupational health in the form of increased occupational health knowledge, so it is hoped that the construction party can provide information and education regarding the use of good and correct masks when working in dusty and possible health impacts (Permenkes:2016).

CONCLUSION

The results showed that there was no relationship between individual risk factors such as age, history of lung disease, smoking habits and occupational risk factors such as years of work, length of exposure, type of work, and use of PPE with respiratory symptoms.

The variable is not statistically significant due to the small number of samples and the answers that tend to be the same, resulting in data imbalance, causing the statistical value obtained to have no relationship with the dependent variable.

The statistical results do not show a relationship between all variables with the incidence of respiratory symptoms, therefore recommendations that can be given based on theory are to adopt a healthy lifestyle such as doing regular exercise, having sufficient rest time, not smoking, having regular health checks, and using personal protective equipment in the form of a mask.



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