International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878 (Online), Volume-8, Issue-1, May 2019

Relationship of Dust Level with Use of Self Protective Equipment on Acute Respiratory Infection Disorders in Furniture Workers in Solok District

Linda Handayuni, Ali Amran, Abdul Razak, Dedi Hermon

Abstract*: *Furniture workers are people who are always exposed to dust in their work environment, which is obtained from the initial survey on 2 furnishings with a total of 6 workers, there are 4 people (75%) workers who experience acute respiratory respiratory infections. This research was conducted to look at the relationship of dust levels with the use of personal protective equipment against acute respiratory infections in furniture workers in Solok Regency. Quantitative research design with cross sectional approach. The research population is furniture workers totaling 47 workers, while the sample uses total sampling with a minimum sample of 42,058 workers. Data analysis using univariate analysis, bivariate analysis with chi-square statistical test with 95% confidence level (α = 0.05). The results of the study on univariate analysis showed ARI frequency distribution 66.0% of respondents suffered ARI disorders, high dust levels 74, 5%, the use of personal protective equipment is 36.2%, while in bivariate analysis there is a significant relationship between the level of dust (p-value = 0,000), personal protective equipment (p-value = 0,003) and ARI in furniture workers. Dust levels, years of service and use of personal protective equipment show a significant association with ARI disorders. It is recommended to the furniture to provide personal protective equipment, especially masks, and the regular monitoring and inspection of furniture workers by the Health Office.

Index Terms*: *Dust Levels, Personal Protective Equipment (PPE) and Acute Respiratory Tract Infection

I. INTRODUCTION

Air pollution consists of two, namely pollution originating from natural processes or activities (volcanic eruptions, gusts of dust by wind) and pollution originating from human activities or activities (furniture dust particles, building material asbestos, vehicle fumes and industrial processes). Air pollution that occurs both through natural and human activities forms chemical substances in the form of SOx, NOx, COx and particulates. [1] One activity or activity that produces dust is furniture. The parts of furniture that produce dust include parts of kriding, cutting, sandpaper, finishing and packing. The room or part of the production on furniture or furniture mostly produces dust so that it can cause respiratory problems [2]. There are several causes of acute respiratory infections in humans as follows: smoking, exposure to contaminated (polluted) air, alcohol, genetics, and the use of drugs that have side effects of coughing will usually be more susceptible to lung cancer. Based on the statement submitted by the International Agency for Research on Cancer (IARC) in 2010, around 223,000 people died from air pollution. [3] According to Rudan, ARI that occurs in the world per year is 156 million per year, of which 151 million (96.7%) suffer from ARI in countries in developing countries. Most cases of ISPA sufferers occur in India (43 million), China (21 million), Pakistan (10 million) and countries such as Indonesia, Bangladesh, and Nigeria, each with 6 million sufferers of ARI per year. Of all cases in the community, 7-13% are severe cases requiring hospital care. ARI is one of the main causes of patient visits in Puskesmas (40% -60%) and hospitals (15% -30%). [4] Based on research carried out in the Textill Industry Pt. Unitex by Alya Mutiara Basti in 2014, from 2 measured locations, dust levels were found ranging from 188.6 to 379.4 mg / m3 exceeding the NAB that had been set. From the results of the study as many as 54 respondents found 57.4% of respondents suffering from ARI, as many as 74.1% of respondents were male and only 25.1% female respondents, of 54 respondents there were 37% of respondents who smoked and as many as 9 (16.7% of respondents whose duration of exposure was ≥8 hours and the working period of workers ranged from 1 to 32 years with a median value of 12.92 years. [5] This is also in line with the research conducted by Reni Wijayanti in 2014, from the 2 locations measured, the dust levels obtained ranged from 4.3 -7.6 mg / m3 exceeding the predetermined NAB. From the results of the study the relationship of respondents who smoke with decreased lung vitality obtained P value <0.000 (-0.422 <0,000) means that there is a relationship with smoking habits with decreased vital lung capacity and there is a relationship between years of work with decreased lung vital capacity with a value of P value <0.000 (-0,407 <0,000) [6]. Based on the health profile of Solok City in 2017 the number of ARI cases in Solok City was 21,243 (48%) cases.

Revised Manuscript Received on 30 May 2019.
* Correspondence Author
Linda Handayuni, SKM., M.Si, Doctor Programe of Environmental Science, Padang State University and STIKES Dharma Landbouw Padang, Indonesia
Prof Ali Amran, Ph.D., Professor of Environmental Science – Padang State University, Indonesia
Dr. Abdul Razak, M.Si, Associate Professor, Ph.D., Environmental Science – Padang State University, Indonesia
Dr. Dedi Hermon, M.Pd, Associate Professor, Ph.D., Department of Geography – Padang State University, Indonesia

ARI incidence is the most community visit in 2017 and the most sufferers are in Solok Regency. Based on data obtained in 2 furniture industries in Solok Regency with a total of 6 workers there were 4 people (75%) workers who experienced acute respiratory respiratory infections and 2 people (25%) workers who did not experience acute respiratory infections during work on furniture.This study aims to look at the relationship of dust levels with the use of personal protective equipment against acute respiratory infections in furniture workers in Solok Regency.

II. STUDY OF LITERATURE

Air is the most important substance after water that provides life on the surface of this earth. In addition to providing oxygen, air also functions as a means of delivering air and sounds, cooling hot objects, and can be a medium for the spread of disease in humans. The air is a mechanical mixture of various kinds of gas, the normal composition of air consists of Nitrogen gas (78.1%), Oxygen (20.93%) and Carbon Monoxide (0.03%). While the advantages are in the form of Argon, Neon, Krypton, Xenon and Helium gases. Air also contains moisture, dust, bacteria, spores and plant residues. [7] Air pollution according to PP No. 29 of 1986 is the entry or inclusion of living things, substances, energy or other components into the air and / or changes in the air structure by human activities or processes by nature, so that air quality drops to a certain level which causes air to become less or unable to function accordingly with the allotment. [7]

According to the Minister of Manpower and Transmigration Regulation (PER.01 / MEN / 1981), occupational diseases are diseases caused by work or work environment. (1) In developed countries, specialization in medicine is such that work occurs so that an expert wrestles only one or two illnesses due to work throughout his life.[1] Work safety protection through technical efforts to secure places, machines, equipment and work environment must be prioritized. But sometimes the risk of an accident, is still not fully controlled, so personal protective devices are used. So the use of personal protective equipment is the last alternative, namely the completeness of all technical efforts to prevent accidents.[1] Especially for the source of the danger factor of dust, the body parts that need to be protected are the eyes, face, and breathing apparatus. where personal protective equipment consists of goggles, plastic face shields and respirators or special masks. [2]

copyright form and the form should accompany your final submission.

III. RESEARCH METHODS

This study uses a quantitative research design using a cross sectional study. The cross sectional study is that researchers only make observations and measurements of variables at one particular time. This study looked at the relationship between the independent variables and the dependent variable examined by looking at the relationship between the level of dust and personal protective equipment against acute respiratory infections in furniture workers.Sampling is done by the method of Non Probability Sampling (Judgment Sampling / Porpusive Sampling) used by determining specific criteria not based on strata, group or random, but based on certain considerations / objectives.[9] This technique is used with consideration of specific criteria for the sample, especially those people who are considered experts in the field of work. This study uses primary and secondary data. Primary data is obtained using PDS (Personal Dust Sampler) and uses questionnaires for interviews. Analysis of the study was carried out using univariate and bivariate analysis. Univariate analysis was performed to see the description of each characteristic in the research variable. Bivariate analysis was conducted to see the relationship between two variables between the independent variable and the dependent variable with dust levels, years of service and use of personal protective equipment against respiratory infection.

IV. RESULT AND DISCUSSION

A. *Relationship to Dust Levels with Acute Respiratory Tract Infection*

Table 1 Relationship to dust levels with acute respiratory tract infection

Dust Quantity	Upper Respiratory Infection				Total		*p-value*	*POR*
	Ilness		Not					
	f	%	f	%		%		
High	30	85,7	5	14,3	35	100		
Low	1	8,3	11	91,7	12	100	0,000	66,00
Total	31	66,0	16	34,0	47	100		

Based on table 1, it can be seen that furniture workers who have acute respiratory infections with high dust levels have a greater percentage of 30 (85.5%) workers, when compared to furniture workers who have a low dust content of 1 (8.3%) workers. The results of statistical tests between dust levels and acute respiratory infections obtained p value of 0,000 ($p < 0.05$) and obtained also Prevalence Odds Ratio of 66.00 means that workers with high dust levels 66.00 times more at risk of acute respiratory infections compared to workers with low dust levels. This shows that there is a significant relationship between the levels of dust with acute respiratory infections in furniture workers. The dust levels in workers are obtained from the measurement results using a Personal Dust Sampler (PDS). The high level of dust in workers is caused by the source of dust originating from the work itself, such as parts, cutting, sandpaper, finishing and packing.

B. *Relationship to the Use of Personal Protective Equipment (PPE) with Acute Respiratory Tract Infection*

Based on table 2, it can be seen that furniture workers who have acute respiratory infections by not using personal protective equipment have a greater percentage of 25 (83.3%) workers, compared to furniture workers who wear personal protective equipment while working, namely 6 (35 , 3%) workers.

The results of statistical tests between the use of personal protective equipment and acute respiratory infections obtained p value of 0.033 (p <0.05) and also obtained a Prevalence Odds Ratio of 9.16 means workers who do not use personal protective equipment are 9.16 times more at risk of infection acute respiratory tract compared to workers using personal protective equipment. This shows that there is a significant relationship between years of work with acute respiratory infections in furniture workers.

Table 2 Relationship to the use of personal protective equipment (PPE) with acute respiratory tract infection.

Use Personal Rotective Equipment	Upper Respiratory Infection				Total		*p-value*	*POR*
	Ilness		No					
	f	%	f	%		%		
No	25	83,3	5	16,7	30	100		
Yes	6	35,3	11	64,7	17	100		9,16
Total	31	66,0	16	34,0	47	100	0,003	

V. CONCLUSION

1. More than half of furniture workers in Solok Regency experience Acute Respiratory Tract Infection
2. More than half of furniture workers in Solok Regency have high dust content.
3. More than half of furniture workers in Solok District do not use personal protective equipment while working.
4. There is a significant relationship between the levels of dust with acute respiratory infections in furniture workers in Solok Regency with a Prevalence Odds Ratio of 66 times.
5. There is a significant relationship between the use of personal protective equipment and acute respiratory infections in furniture workers in Solok Regency with a Prevalence Odds Ratio of 9,167

ACKNOWLEDGMENT

Thank-you note acknowledgementto the Directurerthe Postgraduate of Padang State University, who has supported us I conducting this research. I also express our gratitude to all those who have helped with the administration process as well as those who helped I in the field.

REFERENCES

1. Suma'mur. Higiene Perusahaan Dan Kesehatan Kerja (Hyperkes). Jakarta: Cv. Sagung Seto; 2009.
2. Fardiaz S. Polusi Air dan Udara. Yogyakarta: Kanisius; 1992.
3. Departemen Tenaga Kerja RI. Buku Pedoman Penerapan Hyperkes, Keselamatan Kerja dan Ergonomi Untuk Industri Sektor Rotan. Jakarta: Departemen Tenaga Kerja; 1992.
4. Sumantri A. Kesehatan Lingkungan. Ke-2, editor. Jakarta: Kencana; 2013.
5. Kementrian Kesehatan RI. Pedoman Pengendalian Infeksi Saluran Pernapasan Akut. Jakarta: Kementrian Kesehatan; 2014.
6. Basti AM. Kadar Debu Total Dan Gejala ISPA Ringan Pekerja Department Pemintalan Di Industri Textil Pt. Unitex. Universitas Islam Syarif Hidayatullah (UIN) Jakarta. 2014.
7. Wijayanti R. Kadar debu, Kebiasaan Merokok, Masa Kerja Dan Volume Ekskresi Paksa Pada Tenaga Kerja Industri Mebel Cv.Bandengan Wood Desa Kalijambe Sragen. Hasil Penelitian Dan Pengabdian LPPM UMP. 2014.
8. Chandra B. Pengantar Kesehatan Lingkungan. Jakarta: ECG; 2012.

AUTHORS PROFILE

Linda Handayuni, M.Sc as the head of research assigned in the main research design as well as contributing to the study of literature and research data.

Ali Amran, Prof as the team members of research assigned in the main research design as well as contributing to the study of literature and research data.

Abdul Razak, Ph.D as the team members of research assigned in the main research design as well as contributing to the study of literature and research data.

Dedi Hermon, Ph.D as the team members of research assigned in the main research design as well as contributing to the study of literature and research data.