



Factors Associated with The Risk of Eye Injury on Industrial Welding Workers in the Informal Sector in Barumun District, Padang Lawas Regency

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ABSTRACT

Eye injury is an infection or inflammation caused by the entry of objects, substances or other particles into the eye, and can also be caused by continuous exposure to radiation to the eye. One of the jobs that have a potential risk of eye injury is workers in welding workshops in the informal sector. This study uses a quantitative method with a cross sectional approach. Using purposive sampling technique with a population of 44 workers and a sample of 30 workers. Collecting data using questionnaires and interviews. The statistical test in this study used the chi-square which aims to determine the factors associated with the risk of eye injury. The results showed that there was a relationship between the variables of working period and the risk of blindness (0.009) (0.005), there was a relationship between the variable length of exposure and the risk of eye injury (0.001) (0.05), there was no relationship between the variable level of knowledge and the risk eye injury (1.000) (0.05), and there is a relationship between the use of PPE and the risk of eye injury (0.001) (0.05). And it can be concluded that of the 4 (four) variables there are 3 variables that have a potential risk of eye injury to welding workers, and it is hoped that the welding workshop manager will pay more attention to his workers in terms of the use of PPE at work, especially when doing the welding process to minimize the risk. unwanted injury.

Kata kunci:

Masa Kerja
Waktu Paparan
Tingkat Pengetahuan
APD

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ABSTRAK

Cedera mata adalah infeksi atau peradangan yang disebabkan oleh masuknya benda, zat atau partikel lain ke dalam mata, dan dapat juga disebabkan oleh paparan radiasi yang terus menerus pada mata. Salah satu pekerjaan yang memiliki potensi risiko cedera mata adalah pekerja bengkel las di sektor informal. Penelitian ini menggunakan metode kuantitatif dengan pendekatan cross sectional. Menggunakan teknik purposive sampling dengan populasi 44 pekerja dan sampel 30 pekerja. Pengumpulan data menggunakan kuesioner dan wawancara. Uji statistik dalam penelitian ini menggunakan chi-square yang bertujuan untuk mengetahui faktor-faktor yang berhubungan dengan risiko cedera mata. Hasil penelitian menunjukkan bahwa ada hubungan antara variabel masa kerja dengan risiko kebutaan (0,009) (0,005), ada hubungan antara variabel lama paparan dengan risiko cedera mata (0,001) (0,05), ada hubungan tidak ada hubungan antara variabel tingkat pengetahuan dengan risiko cedera mata (1,000) (0,05), dan ada hubungan antara penggunaan APD dengan risiko cedera mata (0,001) (0,05). Dan dapat disimpulkan bahwa dari 4 (empat) variabel terdapat 3 variabel yang memiliki potensi risiko cedera mata pada pekerja las, dan diharapkan pengelola bengkel las lebih memperhatikan pekerjaannya dalam hal penggunaan APD di tempat kerja, terutama saat melakukan proses pengelasan untuk meminimalkan risiko. cedera yang tidak diinginkan.



INTRODUCTION

The development of increasingly modern development has an impact on the advancement of industry in the informal sector. The informal sector industry is a sector of marginal or small-scale economic activity. One example is in the manufacture of iron door services, iron roof frames, stainless plate racks, etc. In this case, of course, it cannot be separated from welding activities during the assembly process. The emergence of the informal sector is the result of an enlarged labor force on the one hand, and a narrowing of job opportunities on the other. The informal industrial sector in Indonesia has a very large role, because it is able to provide job opportunities for workers who are not accepted in the formal sector. At present, there are still many community groups who work in the informal sector who have not received attention in terms of occupational health. So far they have only received public health services, but no services are provided with their work (Asyhar, 2015).

In general, safety and health service facilities are mainly used by workers engaged in large-scale industries. In small and medium-sized industries, occupational safety and health facilities are still partially, maybe even non-existent. Based on data from the International Labor Organization (ILO) in 2020, it is found that every year more than 250 million accidents occur in the workplace and more than 160 million workers become ill due to hazards in the workplace, and 1.2 million workers die due to accidents and illness. at workplace.

Data (NIOSH) states More than 2,000 cases of eye injuries occur in the workplace every day. one in ten workers with eye injuries will need to recover until recovered. In fact, 10-20% of the total workers who suffer eye injuries as a result of work-related injuries experience blindness or permanent vision loss and vision loss. Throughout 2019, BPJS Ketenagakerjaan obtained data for 77,295 work accident cases. Based on data from the Central Statistics Agency (BPS) in 2018 it was found that 58.76% of the total workers in Indonesia, among others, were graduates of junior high school education and below (Ministry of Manpower, 2020).

Workers are ranked second in terms of the proportion of workers who experience eye injuries. Found about 1390 cases of eye injury caused by welding sparks and causing photokeratitis (inflammation of the eye). Based on data from the U.S Bureau of Labor Statistics (BLS), every year there are more than 20,000 cases of eye injuries in the workplace. These eye injuries vary from mild to severe, and from decreased vision to causing blindness (Zahrah, 2019).

Based on a study conducted in Taiwan, found 283 cases of workers experiencing eye injuries due to work, namely male workers, young workers, and informal workers. The number of cases of eye injury that was most frequently found was around 33.12%, and the most cases were due to explosions of around 30.4%. However, epithelial treatment can be reversed because the epithelium has excellent regenerating power. Epithelial return will occur in about 36-72 hours. Usually the symptoms of eye injury (photokeratitis) will last for 6-24 hours but almost all symptoms will disappear within 48 hours (Yuda, 2018).

The results of Nurgazali's research (2016) on the Risk Factors of Photokeratitis Syndrome in Welding Workers at PT. The Indonesian Ship Industry (Persero) Makassar City in 2016, stated that: from 26 respondents there were 23 respondents (88.5%) who were affected by photokeratitis syndrome which based on the age variable (38.5%), and the working period variable (76). .,9%), and the variable

duration of exposure is all at risk for photokeratitis syndrome (eye injury).

There are many things that can cause eye injuries to workers, including flying particles, flying objects (chunks of wood, metal), light radiation, and fire glass hitting the eyes, and another contributing factor is unsafe action (unsafe behavior).) from the workers themselves (Alodokter, 2020). Therefore, the Occupational Safety and Health Administration (OSHA) requires workers to always use eye and face protection when working in areas with these potential hazards.

From the results of a preliminary survey conducted in all welding workshops in Barumun District, Padang Lawas Regency, it was found that several hazards occurred in the work environment, especially for production workers such as in the process of making iron doors, iron roof trusses, stainless plate racks, welding used cars, etc. . Researchers conducted interviews with 44 welding workers, it was found that 40 (90.9%) of 44 (100%) workers only used ordinary glasses, and only used personal protective equipment such as face coverings with cloth or clothing when working. But after a few years they felt complaints in the eyes and visual disturbances. This can lead to eye injuries and unwanted work-related accidents.

METHOD

This research was conducted using a quantitative method that is an observational analytic survey with a cross sectional approach. A cross-sectional study design was used because in this design all variables were measured and observed at the same time. In this way, researchers can conduct research more easily to find out the factors associated with the risk of eye injury in informal industrial sector workers in Barumun District, Padang Lawas Regency. The population in this study were all workers in the informal sector welding workshop in Barumun District, Padang Lawas Regency, which found 44 people. Sampling using purposive sampling technique that is based on certain criteria. Data collection uses primary data and secondary data. Primary data collection was obtained through interviews and direct observations of welding workers. Interviews were conducted based on the prepared questionnaire. While secondary data obtained from the welding workshop manager. After being collected and then processed using the chi-square test with a 95% confidence level (alpha = 5%). With the results of statistical tests, if the p value is (0.05) then the hypothesis (Ha) in this study is accepted which can be said that there is a relationship between the independent variable and the dependent variable.

RESULTS AND DISCUSSION

Table 1.
Distribution of Eye Injury Risk Factors Based on Years of Work in Welding Workers in the Informal Sector

Years of service	n	%	<i>p.value</i>
at risk	19	63	0,009
No Risk	11	37	
Total	30	100%	

Table 1 shows that of the 30 respondents there were 19 respondents (63%) with a risky working period (≥ 5 years), and 11 respondents (37%) with a non-risk working period

(≤5 years). The results of statistical tests using the chi-square test obtained a significant value of $P = 0.009$ 0.05 , which means that there is a relationship between years of service

and the risk of eye injury in informal sector industrial welding workers in Barumun District, Padang Lawas Regency.

Table 2.
Distribution of Eye Injury Risk Factors Based on Length of Exposure in Informal Sector Industrial Welding

Exposure Time	n	%	<i>p.value</i>
at risk	19	63	0,001
No Risk	11	37	
Total	30	100%	

Table 2 shows that from 30 respondents there were 19 respondents (63%) with long exposure to risk (≥ 7 -8 hours/day), and 11 respondents (37%) with long exposure not at risk (≤ 7 -8 hours/day). The results of statistical tests using the chi-square test obtained a significant value of $P =$

0.001 0.05 , which means that there is a relationship between the length of exposure and the risk of eye injury in informal sector industrial welding workers in Barumun District, Padang Lawas Regency.

Table 3.
Distribution of Eye Injury Risk Factors Based on Knowledge Level of Informal Sector Industrial Welding

Knowledge level	N	%	<i>p.value</i>
at risk	9	30	1,000
No Risk	21	70	
Total	30	100%	

Table 3 shows that from 30 respondents there were 9 respondents (30%) with knowledge level at risk, and 21 respondents (70%) with knowledge level at risk. The results of statistical tests using the chi-square test obtained a significant value of $P = 1,000$ 0.05 , which means that there is

no relationship between the level of knowledge and the risk of eye injury in informal sector industrial welding workers in Barumun District, Padang Lawas Regency.

Table 4.
Distribution of Eye Injury Risk Factors Based on the Use of PPE in Informal Sector Industrial Welding Workers

Use of PPE	n	%	<i>p.value</i>
at risk	17	57	0,001
No Risk	13	43	
Total	30	100%	

Table 4 shows that of the 30 respondents there were 17 respondents (57%) with the use of PPE at risk, and 13 respondents (43%) with the use of PPE without risk. The results of statistical tests using the chi-square test obtained a significant value of $P = 0.001$ 0.05 , which means that there is a relationship between the use of PPE and the risk of eye injury in industrial welding workers in the informal sector in Barumun District, Padang Lawas Regency.

in Welding Workers in Cilacap Tengah District, Cilacap Regency" which states that the calculation results are significant in the correlation test between years of service and incidence of conjunctivitis that is equal to 0.013 , which means that there is a relationship between years of service and the incidence of conjunctivitis in welding workers.

This research is also strengthened by research by Sahara, et al (2017) on Small Industrial Welding Workers in Tungkal Ilir District, West Tanjab Regency in 2017 where from 89 respondents there were 75 (84.3%) with risky tenures who had eye complaints and 15 respondents (15.7%) with no risky tenure who did not have eye complaints with a significant P-Value (0.000) (0.05) which means that there is a relationship between years of service and small industrial welding workers.

Based on the results obtained by the researchers, it is known that the description of the risk factors for eye injury in workers based on the length of exposure shows that there are 19 respondents (63%) who have a risk of eye injury with long exposure risk (≥ 7 -8 hours/day), and 11 respondents (37%) with a long exposure not at risk (≤ 7 -8 hours/day) with a significant value of $P = (0.001)$ (0.05) = H_a accepted, which means that there is a relationship between the length of exposure factor and the risk of eye injury in workers welding industry in the informal sector in Barumun District, Padang Lawas Regency.

DISCUSSION

Based on the results obtained by the researchers, it is known that the description of risk factors for eye injury in workers based on years of service shows there are 19 respondents (63%) who have a risk of eye injury with a risky tenure (≥ 5 years), and 11 respondents (37%) with working period is not at risk (≤ 5 years) with a significant value of $P = (0.009)$ (0.05) = H_a is accepted, which means that there is a relationship between years of service and the risk of eye injury in informal sector industrial welding workers in Barumun District, District Old Field.

The results of this study are also in line with Tri Wahyuni's research, 2013. In the journal of Public Health on "Risk Factors Associated with the Incidence of Conjunctivitis

This study is in line with research (Zahrah, et al, 2019) the results of the analysis of his research stated that there was a relationship between duration of exposure and subjective complaints of photokeratitis with the result of p value = 0.000 0.05 with an Odd Ratio of 55.4. His research suggests that workers who work for more than 8 hours per day or 40 hours per week have a 55 times greater risk of experiencing subjective complaints of photokeratitis (eye injuries) compared to workers who work less than 8 hours per day or 40 hours per week.

Based on the results obtained by researchers, it is known that the description of risk factors for eye injury in workers based on the level of knowledge of workers shows that there are as many as 9 respondents (30%) who have a risk of eye injury with a level of risk knowledge, and 21 respondents (70%) with a level of knowledge that is not at risk. with a significant value of $P = (1,000) (0.05) = H_0$ is accepted, which means that there is no relationship between the level of knowledge and the risk of eye injury in informal sector industrial welding workers in Barumun District, Padang Lawas Regency.

The results of this study are not in line with previous research which states that a person's level of knowledge is relevant to educational status which affects a person's behavior and way of thinking about his work. Most workers experience the risks and dangers of welding if they do not use PPE, but these workers do not know the function of PPE and assume the function of PPE is the same. For example, replace the protective equipment with regular glasses or cover the face with a cloth.

Based on the results obtained by the researchers, it is known that the description of the risk factors for eye injury in workers based on the use of PPE shows that there are 19 respondents (17%) who have a risk of eye injury with the use of risky PPE, and 13 respondents (43%) with the use of PPE that is not at risk (7-8 hours/day) with a significant value of $P = (0.001) (0.05) = H_a$ accepted, which means that there is a relationship between the use of PPE and the risk of eye injury in welding workers in the informal sector in Barumun District, Padang Regency. Old.

This study is in line with research assumptions (Zahrah, et al, 2019) which states that all workers who are bad at using PPE experience subjective complaints of photokeratitis (risk of eye injury) because PPE serves to protect the eyes from exposure to welding rays. Workers who do not use PPE and work with a distance of 60 cm are at risk of causing complaints because of the proximity of the source of exposure to the unprotected cornea, as well as prolonged and repeated exposure that can cause cumulative damage to the cornea of the eye.

CONCLUSION

The conclusions in this study are:

1. There is a relationship between years of service and the risk of eye injury in industrial welding workers in the informal sector in Barumun District, Padang Lawas Regency (P 0.009 0.05).
2. There is a relationship between the length of exposure and the risk of eye injury in informal sector industrial welding workers in Barumun District, Padang Lawas Regency (P 0.001 0.05).
3. There is no relationship between the level of knowledge and the risk of eye injury in informal sector industrial welding workers in Barumun District, Padang Lawas

Regency (P 1,000 0.05).

There is a relationship between the use of PPE and the risk of eye injury in industrial welding workers in the informal sector in Barumun District, Padang Lawas Regency (P 0.001 0.05).

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