

## Work-Related Injury among Welders Working in Metal Workshops of Johan Pahlawan Districts, Aceh Barat

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### Abstract

A work accident is an unexpected event or event that can cause harm to the work process, causing human and property casualties. Therefore prevention must be carried out by reducing hazard factors that lead to accidents, taking into account unsafe action, unsafe conditions, and safety management: system, the worker's mental condition, and the worker's physical condition. The method in this research is descriptive-analytic with a cross-sectional design. We took a sample of 45 respondents. The sampling technique is the total population. We performed a logistic regression test using the Stata 14 application in this study. Results study could conclude there is a significant relationship between the use of PPE ( P-value: 0.001, OR: 14.14, CI:2.86–60.21 ) and unsafe acts (P-value: 0.015, OR: 5.5, CI: 1.39–21.71) with work accidents in the District Johan the Hero of West Aceh Regency in 2022. We suggest that welding workshop owners provide protective equipment for their workers to create comfort, work safety, and reduce potential hazards while working. We also recommend using n methods to increase self-confidence so that you can focus and be careful when welding.

**Keywords:** Personal Protective Equipment; Occupational Health and Safety; Unsafe Action

### Introduction

The occurrence of work accidents is a big problem for the continuity of a business. The losses suffered were not only in the form of substantial material losses, but more than that, there were not a few fatalities. This loss of human resources is vast because humans are the only resource that cannot be replaced by any technology (bhakti, 2021)

Occupational Health and Safety (K3) is essential. Apart from protecting workers, it also plays a role in protecting company assets. RI Law No. 1 of 1970 explains occupational safety. Every worker has the right to preserve safety in doing work for the welfare of life and increasing national production and productivity to guarantee security. Work accidents occur in an unsafe work environment or human error (Balqis, 2020).

According to Agency, the Employment Social Security Provider (BPJS) recorded that during 2020, there were 177,161 cases of work accidents. Meanwhile, as a result of the accident, the number of BPJS Employment participants who died was 3,093 workers, 15,106 workers were sick, 158,516 workers were injured, and 446 workers died suddenly. As

many as 34.43% of the causes of work accidents are due to unsafe or ergonomic positions, and as many as 32.12% of workers do not use safety equipment (Kemenkes RI, 2018). Based on BPJS Employment data, the number of work accidents in Aceh Province throughout 2018 amounted to 22,438 cases with a claim amount of Rp. 89.75 billion (Kemenkes RI, 2018). Many work accidents are caused by the non-optimal supervision and implementation of K3 and OSH behavior in the workplace.

According to Suma'mur (2014), it is said that work accidents are influenced by Unsafe Actions (unsafe actions) 88%, 10% by Unsafe Conditions (unsafe conditions), and 2% are unavoidable (things that cannot be avoided). Dangerous actions mean actions that do not meet safety standards so that they are at risk of causing work accidents. Accidents are caused mainly by unsafe actions (man), including age, education, years of service, knowledge, and management factors in using PPE while working.

Welders Working are one of the informal workplaces that are at risk for eye injuries and other health problems. During the welding process, workers can be directly exposed to foreign objects, sparks, infrared rays, and ultraviolet rays that impact

the eyes. Trauma events also often occur, such as mechanical trauma that can injure the eyelids, lacrimal system, conjunctival lacerations, corneal erosion, chemical trauma, and physical trauma such as burns and radiation injuries (Apriliyanti, 2019).

The risk of work accidents is not only an incident of injury but also results in losses for business owners such as material losses, damage to tools and machines, but for workers, it results in physical and material losses, lack of productivity, financial losses, causing disability and even death (Reni 2021). Seeing the explanation above, the researcher was interested in researching the factors related to work accidents at the welding workshop, Johan Pahlawan sub-district, West Aceh district, in 2022.

**Methods**

This research is a quantitative study with a cross-sectional approach conducted on February 14-17, 2022, using one person as an enumerator. Before going to the field, enumerators were given directions to have the same perception as the researchers. The population in this study were all-electric welding workshop workers in the Johan hero sub-district, Aceh Barat district, in 2022, spread across 11 Welders Working. The workers studied were workers in Welders Working. If you are not an intern at that place, you will get 45 people, taking the sample using a total population of 45 respondents.

The data used are primary data with the method of collecting data through a questionnaire instrument

**Results**

**Table 1.** Distribution of The Frequency of Welding Workshop Workers in Johan Pahlawan Sub-District, West Aceh District in 2022

Research variable	f	%
<b>Use of PPE</b>		
Complete	26	57.78
Incomplete	19	42.22
<b>Unsafe Action</b>		
Well	24	53.33
Not good	21	46.67
<b>Work accident</b>		
Never	30	66.67
Once	15	33.33

Source: *Primary data, 2022*

From table 1, the proportion of respondents who use personal protective equipment (PPE) in total is 57.78% greater than the incomplete. The balance of respondents who have safe actions at work is 53, 33% greater than workers who take unsafe steps. At work, the proportion of respondents who have never had a work accident is two times greater than that of respondents who have experienced a work accident, 66.67%.

**Table 2.** Relationship Between Personal Protective Equipment and Unsafe Actions with Work Accidents

Variable	Work Accident				Total		P- value	Odds Ratio
	Not Once		Once		f	%		
	f	%	f	%				
<b>Personal Protective Equipment</b>								
Complete	23	88.46	3	11.45	26	100	0.001	13.14 (2.86-60.21)
Incomplete	7	36.84	13	63.16	19	100		
<b>Unsafe Action</b>								
Well	20	83.33	4	16.67	24	100	0.015	5.5 (1.39-21.71)
Not good	10	47.62	11	52.38	21	100		

Source: *Primary Data, 2022*

Table 2. Proportion of respondents who used personal protective equipment (PPE) completely never had a work accident was 88.46% greater than respondents who did not use personal protective equipment (PPE) who never had a work accident that was 36.84, while the proportion of respondents who were incomplete using personal protective equipment (PPE) had a work accident 63,16% greater than respondents who thoroughly used personal protective equipment, namely 11.45%.

OR = 13.14 means that respondents who do not use personal protective equipment (PPE) are 13 times

more likely to have work accidents than respondents who use complete personal protective equipment (PPE). This variable is a risk factor for work accidents. Statistically, it also shows that there is a significant relationship between the use of personal protective equipment (PPE) with work accidents in welding workshop workers in Johan Pahlawan District, West Aceh Regency, with a P-value = 0.001

The proportion of respondents with good actions who never had a work accident was 83.33% greater than respondents with evil acts who never had an accident at work, namely 47.62%. In comparison, the proportion of respondents with wrong actions who



had a work accident was 52.38% greater than respondents with suitable activities who have experienced a work accident, namely 16.67%.

OR = 5.5 means that respondents who have wrong actions are five times more likely to have work accidents than respondents who have suitable activities, and this variable is a risk factor for work accidents. Statistically, it shows a significant relationship between unsafe acts and work accidents among welding workshop workers in Johan Pahlawan District, West Aceh Regency, with a P-value = 0.015.

## Discussion

### Relationship of Use of Personal Protective Equipment (PPE) With Work Accident

The results showed that the proportion of respondents who used personal protective equipment (PPE) completely never had a work accident was 88.46% greater than respondents who did not use personal protective equipment (PPE) who had never had a work accident, namely 36.84. In comparison, the proportion of respondents who do not complete personal protective equipment (PPE) during a work accident was 63.16%, more significant than respondents who use entirely personal protective equipment, namely 11.45%.

OR = 13.14 means that respondents who do not use personal protective equipment (PPE) are 13 times more likely to have a work accident than respondents who use complete personal protective equipment (PPE). This variable is a risk factor for work accidents. Statistically, it shows a significant relationship between personal protective equipment (PPE) and work accidents in welding workshop workers in Johan Pahlawan District, West Aceh Regency, with a P-value = 0.001.

This study aligns with Junita's research (2018), which states a relationship between personal protective equipment and work accidents with a P-value of 0.000. The practice of personal protective equipment is an action by workers to protect part or all of the body's limbs from the possibility of exposure to potential hazards of the work environment to work accidents, even though the PPE itself has not guaranteed a worker to avoid accidents while working because its function is only to reduce the danger due to work accidents, such as electric shock and burns.

Personal Protective Equipment (PPE) is beneficial for workers to minimize the risk of work accidents such as glasses, gloves, shoes to protect them from being punctured by sharp objects and the

danger of electric shock because the shoe base is made of rubber even though all PPE cannot guarantee 100% percent there are no work accidents but can minimize work accidents and the level of danger caused by electric shock, burns on the skin, damage/disturbances to the eyes and ears.

### The relationship between unsafe acts and work accidents.

The proportion of respondents with good actions who never had a work accident was 83.33% greater than respondents with wrong actions who never had an accident at work, namely 47.62%. In comparison, the proportion of respondents with sinful activities who had a work accident was 52.38% greater than respondents with good actions who have experienced a work accident, namely 16.67%.

OR = 5.5 means that respondents who have wrong actions are five times more likely to have work accidents than respondents who have suitable activities, and this variable is a risk factor for work accidents. Statistically, it shows a significant relationship between unsafe acts and work accidents among welding workshop workers in Johan Pahlawan District, West Aceh Regency, with a P-value = 0.015.

This research is in line with research by Nikhmatul Huda (2020), which shows that workers who act unsafely while working are 42 people (77.8%) compared to workers who work with safe actions, which is 0.002, indicating that there is a relationship between unsafe acts and the incidence of work accidents.

According to Fauziah (2019), human factors are divided into four broad lines: Coverage of human factors, positive aspects about several factors that can improve work attitudes, negative factors about several factors that are likely to increase work risk, and individual factors.

The types of unsafe actions that can cause losses or accidents, among others, are failing to warn fellow workers, using inappropriate tools, do not use PPE properly, failing to follow procedures, and operating machines that are not under their expertise, a position not working correctly. Safe, joking, playing games, excessive joking, and unsafe acts are human errors in taking attitudes and actions.

## Conclusion

Based on the results of research conducted at a welding workshop in the District of Johan Pahlawan, West Aceh Regency, on 45 respondents, it can be concluded from several factors that have a significant

relationship, among others, there is a relationship between PPE users (P-value = 0.001) unsafe acts (P-value = 0.015) with work accidents in the District of Johan Pahlawan, West Aceh Regency in 2022.

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### Author Contributions and Competing Interest

Interest All writers contribute the smallest to the essential things in collecting and analyzing data, including compiling the manuscript. The author ensures that there is no conflict of interest in the activities and preparations

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