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Article

Relationship between Occupational Safety and Health (OSH) and Work Accidents among Fire and Rescue Officers in Pekanbaru City

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ABSTRACT

Occupational Safety and Health (OSH) is essential for creating a safe, comfortable, and healthy work environment. Its main goal is to prevent workplace accidents and occupational diseases that can endanger lives and reduce productivity. This study examines the relationship between OSH and workplace accidents among firefighters in Pekanbaru City from 2022 to 2024. Using an observational method with a quantitative analytic approach and a cross-sectional design, 163 respondents participated. Data analysis included univariate and bivariate techniques. The results show significant relationships between workplace accidents and OSH knowledge ($p=0.014$), OSH training ($p=0.013$), availability of Personal Protective Equipment (PPE) ($p=0.002$), and implementation of Standard Operating Procedures (SOPs) ($p=0.011$). However, work fatigue showed no significant effect ($p=0.531$). Based on these findings, it is recommended that institutions enhance OSH training, education, PPE provision, and consistent SOP enforcement to reduce workplace accidents and improve overall safety and health among firefighters.

1. Introduction

Occupational safety and health are conditions that prevent hazards while performing work. Occupational safety is one of the factors that must be considered during work. Occupational safety is highly dependent on the type and environment in which the work is carried out. Occupational safety and health are efforts to ensure workers remain healthy and safe while working in the workplace (Primasanti & Indriastiningsih, 2019).

The Government of the Republic of Indonesia Law No. 1 of 1970, occupational safety and health are conditions in the workplace and factors that affect the health and safety of workers in the work environment. In article 1 it states that the workplace is defined as a space where workers carry out tasks for the purposes of a business and where there are sources of danger which are explained in more detail in article 2, In this article it states that all workplaces whether on land, underground, on the surface of water, in water, or in the air, are within the applicable legal area. In Law No. 1 of 1970 article 3 there are 10 occupational safety requirements regarding prevention (Presiden Republik Indonesia, 1970).

The implementation of Occupational Health and Safety (OHS) is an effort to create a safe and healthy work environment, free from pollution, thereby reducing or even eliminating workplace accidents and occupational diseases. This ultimately increases work efficiency and productivity (Gultom, 2018).

Factors influencing the risk of occupational health and safety hazards include human factors, including age, length of service, attitude toward work, knowledge of occupational health and safety, compliance with procedures, and the occurrence of workplace accidents. Environmental factors also play a role, including noise, temperature, lighting, slippery floors, the availability of work facilities and equipment, and the use of personal protective equipment (PPE) (Anasari & Trisnawati, 2024).

Article 23 of Law No. 17 of 2023 concerning Health stipulates that occupational health and safety efforts must be implemented responsibly, safely, with quality, equitably, and fairly. This aims to ensure that occupational safety procedures are implemented in the workplace, particularly in workplaces with high risk of hazards that could lead to work accidents or occupational diseases (Pemerintah, 2023).

Based on the Ministry of Manpower Regulation No. 3 of 1998, an accident is an unwanted and unexpected event that can cause human casualties and/or property damage, and other dangerous events are potential events that can cause work accidents or work-related illnesses except fires, explosions and hazardous waste disposal (Kementrian Tenaga Kerja, 1998).

According to the ILO (International Labor Organization) in 2021, every year there are more than 250 million work accidents, more than 160 million workers experience diseases due to hazards in the workplace, and around 1.2 million workers die from work-related accidents and diseases. Based on the Social Security Administration Agency (BPJS) Employment reported that the number of work accidents in Indonesia reached 234,270 cases in 2021, an increase of 5.65% compared to the previous year and 221,749 cases in 2020, SDI (One Data Indonesia) Employment Priority Data, in 2023, there were 370,747 cases of work accidents in Indonesia (Putri & Lestari, 2023).

Based on data from the Riau Manpower Office, the number of work accidents increased by 3,300 in 2023 compared to 2022. In 2024, the Head of the Manpower and Transmigration Office asked all companies in Riau to reduce work accidents (Rachmat, 2023). From BPJS employment data from Riau, in 2023 the number of accidents increased from 7,900 people to 11,200, an increase of 41%. In the fire incidents in Pekanbaru City from 2022 to 2024, based on data from the Pekanbaru City Fire Department, there were 346 fire incidents (Kota, 2024).

Based on PP No. 50 of 2012, the implementation of an occupational safety and health management system is part of the company's overall management system in order to control risks related to work activities aimed at creating a safe, efficient and productive workplace. Occupational Safety and Health Management System (SMK3) in article 5 every company that employs more than 100 workers is obliged to implement SMK3 by referring to this government regulation and the provisions of laws and regulations and can pay attention to international conventions or standards (Pradipta, 2012).

Firefighters face high risks during their journey to extinguish fires and while at the fire site, due to hazards such as electricity, high temperatures, flames, working at heights, the use

of firefighting equipment, explosions, sharp objects, and being struck by falling materials. The hazards faced by firefighters are divided into three categories: high, medium, and low. An example of a high risk, for example, is a broken bone due to a fall during a wasp-catching operation. A medium risk could be slipping when climbing into a fire engine due to rushing, while a low risk includes slipping during extinguishing due to a slippery floor. Workplace accidents are events that cause harm to humans, processes, and damage to property involved in industrial activities. The occurrence of workplace accidents is influenced by a series of previous events and factors, which include unsafe actions and unsafe condition (Selfi et al., 2022).

Based on the background, the general objective of this study is to determine "The Relationship between Occupational Safety and Health (OHS) and Work Accidents Among Firefighters at the Pekanbaru City Fire and Rescue Service

2. Literature Review

Occupational safety and health are crucial aspects of workplace safety, especially in areas with a high risk of hazards. Occupational safety comes from, by, and for each worker and everyone else in general. Occupational safety supports the creation of a safe working environment, both in terms of material and non-material aspects (Supriyanto, 2020).

Regulations regarding fire extinguishers in the implementation of occupational safety and health in Indonesia are regulated in several regulations, including the Decree of the Minister of Manpower No. Kep. 186/Men/1999 which regulates fire fighting units in the workplace. In addition, Law No. 1 of 1970 also serves as an important legal basis in this regard. In the Decree of the Minister of Manpower No. Kep. 186/Men/1999, a worker is every person who is able to perform work both inside and outside of an employment relationship, in order to produce services or goods to meet the needs of society (Indonesia, 1999).

3. Research Methodology

3.1 Location and research design

This type of research uses a quantitative method with a cross-sectional design. This research was conducted at the Pekanbaru City Fire and Rescue Service and was implemented in March-May 2025. The population in this

study were all selected firefighters and met the inclusion criteria totaling 163 respondents. The sampling technique used Proportional Random Sampling. The Independent Variables in this study are Occupational Health and Safety Knowledge, Occupational Health and Safety Training, Personal Protective Equipment (PPE), Standard Operating Procedures (SOPs), and work fatigue. While the Dependent variable is work accidents. The type of data used is primary data which includes independent variables obtained through questionnaires and secondary data obtained through the Fire Department. Data analysis used is univariate analysis and bivariate analysis using the chi-square test. This research has gone through an ethical review procedure with the number: 138 / KEP / UHTP /

3.2 Population and sample

The population in this study was all firefighters at the Pekanbaru City Fire Department, totaling 277 officers.

4. Results and Discussion

4.1 Table 1. Frequency Distribution of Respondent Characteristics :

Karakteristik	N	%
Jenis Kelamin	163	100
Laki-Laki		
Agama		
Islam	155	95,1
Kristen	8	4,9
Pendidikan		
SMA	109	67,3
Perguruan Tinggi	54	32,7
Lama Bekerja		
<1 Tahun	2	1,2
1-10 Tahun	136	136
>10 Tahun	25	15,4

Based on the research results in Table 1, all respondents were male, 163 respondents (100%). The majority of respondents were Muslim, 155 (95.1%), and 8 (4.9%) were Christian. In terms of educational level, 109 respondents were high school graduates (67.3%), while 54 respondents (32.7%) had a college education. The majority of respondents had a working period of 1-10 years, 136 (83.3%). Respondents with a working period of <1 year were 2 (1.2%), while 25 respondents with a working period of >10 years were 25

(25%).

Table 2. Frequency Distribution of Research Variables.

Variable	Frequency (N)	Precent (%)
OHS Knowledge		
Poor	79	75,2
Good	32	55,2
OHS Training		
Never	81	75,0
Ever	30	54,5
Occupational Fatigue		
Riskable	46	64,8
Not Risky	65	70,7
PPE		
Incomplete	80	76,9
Complete	31	52,5
SOP		
Not Compliant	92	73,6
Compliant	19	50,0

Based on the results of statistical tests, this study found that there is a relationship between knowledge of OHS and work accidents in firefighters at the Fire and Rescue Department of City X. Based on the results of the Chi-square test, it shows a p Value = 0.014, which means that the p Value α (0.05) means that there is a relationship between knowledge and work accidents. With an Odds Ratio (OR) value of 2.469 (CI95%: 1.249-4.879), which means that respondents with poor knowledge have a risk of 2.4 having experienced a work accident. This is in accordance with Lawrence Green's theory which states that compliant behavior is influenced by predisposing factors, one of which is respondent knowledge. Based on the data obtained, it is known that most respondents have poor knowledge and have experienced work accidents.

5. Conclusion

Based on the results of the research and discussion, it can be concluded that there is a relationship between knowledge of OHS, OHS training, PPE, and SOP with work accidents in firefighters and rescue workers in City X in 2025. Work fatigue does not show a significant relationship with work accidents in firefighters and rescue workers in City X in 2025. It is recommended that the Fire and Rescue Service of City X improve the OHS knowledge program and education regarding occupational safety and health (OHS), OHS training needs to be

carried out for all firefighters and in work shift arrangements it is carried out consistently, for the availability of PPE according to the stand and the SOP is expected to be able to reduce the risk of work accidents and improve work safety.

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