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FACTORS RELATED TO PRACTICE OCCUPATIONAL SAFETY AND HEALTH AT GAS STATION OPERATION IN MEDAN CITY

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Abstract

The implementation of occupational safety and health is essential to create a safe working environment, especially for gas station operators working at gas stations with the risk of chemical exposure and potential explosions. This study aims to analyze factors related to the practice of implementing occupational safety and health in gasoline station operators in Medan City. This study used a quantitative approach with a cross-sectional design and data collection through questionnaires of 100 respondents. The results in this study test were obtained that knowledge (p = 0.007), attitude (p = 0.005), working mass p = (0.016) and occupational safety and health training (p = 0.001), had a significant relationship with the application of occupational safety and health in gas station operators in Medan City. Meanwhile, the variables of work duration (p = 0.104), and shift division (p = 0.714), did not have a significant influence on the implementation of occupational safety and health in gas station operators in Medan City. The results of the study showed that occupational safety and health training had a significant influence on the implementation of occupational safety and health (OR=3,609). It can be concluded that occupational safety and health training is the dominant factor that affects the implementation of occupational safety and health. It is recommended that the management of petrol stations routinely hold occupational safety and health training and evaluation to improve operator work safety.

Keywords: Implementation of Occupational Safety and Health, Work Duration, Knowledge, Shift, Training

INTRODUCTION

Occupational safety and health is a crucial aspect in the world of work that aims to protect workers from the risk of accidents and occupational diseases. In the era of globalization and increasingly fierce industrial competition, the implementation of occupational safety and health

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is an important indicator in ensuring the welfare of workers and the sustainability of company operations. Along with technological advancements, companies are required to improve the quality of human resources, especially in terms of understanding occupational safety and health.

Work accidents not only have an impact on the physical of workers, but can also lead to financial losses and company productivity. Based on ILO data in 2019, every year there are around 2.78 million deaths due to work accidents and occupational diseases, as well as around 374 million cases of non-fatal injuries (ILO, 2019). In Indonesia, according to the Central Statistics Agency in 2022, there were 139,258 cases of work accidents, including 28,131 cases that led to death (Statistics, 2024).

One of the work sectors that has a high risk to occupational safety is Public Fuel Filling Stations (SPBU). Petrol station operators as the spearhead of services at petrol stations are very vulnerable to chemical hazards, explosions, and exposure to carcinogenic gasoline vapors (Mahdanie et al., 2023). This makes the implementation of occupational safety and health an important step in preventive and promotive efforts to ensure work safety at petrol stations (Yulianto & Tejamaya, 2022).

In the city of Medan, as a metropolitan city that has many petrol stations, the case of work accidents at petrol stations shows a fairly worrying trend. Data from the Directorate General of Oil and Gas recorded an increase in the number of accidents at petrol stations between 2016 and 2019. One of the real cases occurred at the Jl. Jamin Ginting petrol station, where a fire incident resulted in injuries to two workers even though they did not cause any casualties (Faeza, 2020).

Several studies have shown that workers' knowledge and attitudes towards occupational safety and health have a significant relationship with the implementation of good occupational safety and health practices. However, it is still found that workers' knowledge is often low, even though attitudes and behaviors tend to be good (Mahdanie et al., 2023). Other factors such as working period, work duration, shift system, and training also play a role in supporting or hindering the optimal implementation of occupational safety and health (Aeni & Fermania, 2020).

Initial observations made by researchers at five petrol stations in Medan City show that there are still many operators who do not understand the importance of using Personal Protective Equipment (PPE) and do not fully follow the safety procedures that have been set. This is exacerbated by long workloads and night shifts that increase the risk of fatigue and decrease alertness (Prasetyono, 2023).

Based on this background, this study was conducted to identify and analyze factors related to the practice of implementing occupational safety and health in gas station operators in Medan City. This research is expected to be the basis for the management of petrol stations and related agencies to develop a strategy to improve the implementation of occupational safety and health in a comprehensive and sustainable manner.

IMPLEMENTATION METHOD

This study uses a quantitative approach with the type of explanatory research. Explanatory research or explanation aims to describe and explain the relationship between variables, namely between factors such as knowledge, attitude, working period, work duration, shift division, and training on the practice of implementing occupational safety and health in gas station operators in Medan City. The research design used was cross-sectional, where all variables were measured simultaneously at one time, without intervention from the researcher. This design was chosen because it is suitable for quickly and efficiently identifying cause-and-effect relationships in real conditions.

This research was conducted at several petrol stations in Medan City, North Sumatra, which were chosen because it is a location with a fairly large number of petrol stations and high operational activities. The time for the implementation of the research starts in May 2025 until it is completed, covering the process of data collection to analysis and reporting of results.

The population in this study is all gas station operators working at Medan City petrol stations. The sampling technique was carried out by purposive sampling, with the inclusion criterion being that operators who have worked for at least 6 months at the petrol station. The number of samples was determined using the Lemeshow formula, with an unknown population estimate, so that a sample number of 100 respondents was obtained.

Data collection was carried out using primary data and secondary data. Primary data were obtained through a structured questionnaire compiled based on research variables, including knowledge, attitudes, working periods, work duration, shift division, training, and occupational safety and health implementation practices. This questionnaire uses an ordinal scale and has been tested for validity and reliability before use. In addition, the researcher also used secondary data obtained from scientific journals, previous theses, and other relevant literature that supported the preparation of theories and conceptual frameworks in this study.

For data analysis, it is carried out through three stages. First, univariate analysis is used to describe the frequency distribution of each variable. Second, bivariate analysis uses the Chi-square (χ^2) test to see the relationship between independent variables (such as knowledge, attitudes, and training) and dependent variables, i.e. occupational safety and health implementation practices. Third, a multivariate analysis was conducted using logistic regression to see the dominant influence of independent variables on the implementation of occupational safety and health jointly and in a controlled manner (Sugiyono, 2017).

Each variable in this study has been defined operationally. For example, knowledge is assessed from respondents' understanding of occupational safety and health regulations, safety procedures, and the use of personal protective equipment (PPE). Meanwhile, the implementation of occupational safety and health was measured by the extent to which respondents implemented safety measures such as consistent use of PPE and adherence to safe work procedures.

With this method, it is hoped that the research can provide an objective picture of the factors that affect the practice of implementing occupational safety and health in gas station operators, as well as provide appropriate recommendations in an effort to improve work safety in the petrol station environment.

RESULTS AND DISCUSSION

Table 1 shows that out of 100 respondents who had bad knowledge, 46 people (46.0%), and 54 people (54.0%) had good knowledge. Respondents who had a bad attitude were 48 people (48.0%), and 52 people (52.0%) had a good attitude. In the variable working period, 45 people (45.0%) with a working period of <3 years, and 55 people (55.0%) with a working mass of >3 years. Respondents with <8-hour working duration were 21 people (21.0%), and <8-hour working duration were 79 people (79.0%). In the shift division, there were 91 people (91.0%), who had shifts and 9 people (9.0%) who did not have shifts. In occupational safety and health training, as many as 48 people (48.0%) have never participated in training and 52 people (52.0%) who have participated in occupational safety and health training. And the implementation of occupational safety and health was 34 people (34.0%) who did not meet the requirements for the implementation of occupational safety and health and 66 people (66.0%) who met the requirements for the implementation of occupational safety and health.

Table 2 of the results of the bivariate analysis shows that there is a significant relationship between occupational safety and health knowledge, attitudes, working periods, and training with occupational safety and health implementation practices in gas station operators in Medan City. Respondents with knowledge (p=0.007; OR=3.208), attitude (p=0.005; OR=3.429), working time (p=0.016; OR=2.827), and occupational safety and health training (p=0.001; OR=4,200) has a greater chance of implementing occupational safety and health well.

On the other hand, the duration of work (p=0.104; OR=0.382) and work shift division (p=0.714; OR=1.898) did not show a significant relationship with occupational safety and health implementation.

Table 3 results of multivariate analysis, it is known that the occupational safety and health training variable has an *Exp(B) value* of 3.609, which shows a higher chance of occupational safety and health implementation in respondents who participated in the training. However, the significance value ($p = 0.112$) > 0.05, so it is not statistically significant. Similarly, the variables of attitude ($p = 0.665$), working period ($p = 0.893$), and knowledge ($p = 0.837$) also did not show a significant influence on occupational safety and health practice in this multivariate model.

Thus, there were no variables that had a significant effect collectively on the practice of implementing occupational safety and health in this logistic regression model, although training had the strongest influence in practice.

Table 1 Univariate analysis results

Respondent Characteristics	Frequency (N)	Percent (%)
Knowledge		
Bad	46	46
Good	54	54
Attitude		
Bad	48	48
Good	52	52
Tenure		
<3 years	45	45
>3 years	55	55
Duration of Work		
<8 hours	21	21
8 hours	79	79
Shift Distribution		
There is *a shift*	91	91
No *Shift*	9	9
occupational safety and health Training		
Never Follow	48	48
Ever Followed	52	52
Application of occupational safety and health		
Not Eligible	34	34
Qualify	66	66

Table 2 Bivariate analysis results

Variable	Category	Application of occupational safety and health						OR	(CI95%)	*p-Value*
		Not Eligible		Qualify		Total				
		n	%	n	%	n	%			
Knowledge	Bad	22	47,8	24	52,2	46	100	3.208	(1.352-7.611)	0,007
	Good	12	22,2	42	77,8	54	100			
Attitude	Bad	23	47,9	25	52,1	48	100	3.429	(1.431-8.216)	0,005
	Good	11	21,2	41	78,8	52	100			
Working period	< 3 years	21	46.7	24	53.3	45	100	2.827	(1.203-6.643)	0,016
	> 3 Years	13	23.6	42	76.4	55	100			
Working duration	< 8 Hours	4	19	17	81	21	100	0.382	(0.118-1.25)	0,104
	8 Hours	30	38	49	62	79	100			
Shift Distribution	There is a shift	32	35,2	59	64,8	91	100	1.898	(0.372-9.682)	0,714
	No shift	2	22,2	7	77,8	9	100			
occupational safety and health Training	Never Follow	24	50	24	50	48	100	4.200	(1.721-10.284)	0,001
	Ever Followed	10	19,2	42	80,8	52	100			

Table 3 Results of multivariate analysis

Variable	B	Sig	Exp(B)	(95% CI)	
				Lower	Upper
Training	1.283	0.112	3.609	0. 234	3.548
Attitude	0.506	0.665	1.659	0.741	17.572
Mass of work	0.093	0.893	0.911	0.090	7.019
Knowledge	-0.229	0.837	0.795	0.168	16.395
Constant	**-1.475**	**0.050**	**0.229**		

This study aims to find out the factors related to the practice of implementing occupational safety and health in gas station operators in Medan City. Based on the results of the analysis, it was found that there are several variables that have a significant relationship with the implementation of occupational safety and health, namely knowledge, attitudes, working periods, and training. Meanwhile, work duration and shift division showed no significant relationship.

The knowledge variable has been proven to have a significant relationship with the implementation of occupational safety and health. This shows that operators who have a good level of knowledge about occupational hazards, the use of personal protective equipment (PPE), and safety procedures, tend to implement occupational safety and health better in their work. Knowledge is the starting foundation in the formation of safe work attitudes and behaviors, where a person who understands the risks and preventive measures will be more aware to protect themselves and those around them (Alfarizi, n.d.).

Attitude variables are also significantly related to the implementation of occupational safety and health. Operators who have a positive attitude towards occupational safety, such as compliance with safety procedures and awareness of the use of PPE, show better implementation of occupational safety and health. A good attitude reflects a worker's commitment to personal protection and safety of the work environment, which can ultimately reduce the potential for accidents (Sitorus, 2023).

The working period or length of work experience also has a significant effect. Operators who have been employed for more than three years show a higher rate of occupational safety and health adoption compared to those who are new to employment. Long work experience allows workers to better recognize work risks and how to handle them, as well as foster vigilance at work (Khairunnisa, 2019).

Furthermore, the occupational safety and health training variable was the dominant factor in this study. Operators who have participated in occupational safety and health training show much better implementation compared to those who have never participated in training. Training has an important role in improving operators' understanding and technical skills in implementing occupational safety and health correctly and consistently. In addition, training can also form a strong work safety culture in the petrol station environment (Alie, n.d.).

However, the work duration variable did not show a significant relationship with the implementation of occupational safety and health. This suggests that the length of working hours does not necessarily determine the level of awareness or compliance with safety procedures. Operators who work more than eight hours per day do not automatically have better

implementation of occupational safety and health, likely because the fatigue factor can actually lower their concentration and alertness.

Likewise with shift distribution, which also did not show a significant effect. Although night shifts are often associated with fatigue and decreased alertness, the results of this study did not find strong statistical evidence that the shift system has a direct effect on the implementation of occupational safety and health. This can be due to the existence of standard operating procedures (SOPs) that are applied consistently in all shifts, so that there are no noticeable differences in work practices (Amalia, 2023).

Overall, this study emphasizes the importance of providing regular occupational safety and health training, increasing knowledge, and forming a positive attitude towards occupational safety as the main key in increasing the implementation of occupational safety and health in the petrol station environment. A good implementation of occupational safety and health is not only beneficial for worker safety, but also for the protection of company assets and customer satisfaction.

CONCLUSION

This study shows that factors such as knowledge, attitudes, working periods, and occupational safety and health training have a significant relationship with the practice of implementing occupational safety and health in gas station operators in Medan City. Among these variables, occupational safety and health training was the dominant factor that had the most influence in increasing the effective implementation of occupational safety and health, with an Odds Ratio (OR) value of 3.609. Meanwhile, the duration of work and shift division system did not show a significant relationship with occupational safety and health practice. These results affirm the importance of strengthening the occupational safety and health training program on a regular basis as well as fostering attitudes and increasing knowledge as a strategic effort to improve work safety in the petrol station environment.

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