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Occupational Health and Safety in Land Transportation For Driver Employees at PT. X

Yolla Radhicha[1], Rika Mianna[2], Syaiful Bachri[3], Jufenti Ade Fitri[4]
[1,2,3,4] Al Insyirah Institute of Health And Technology, Faculty of Health, Indonesia

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ABSTRACT

Human Factors are a major cause of occupational morbidity and mortality, with traffic accidents being one of the main contributors. Due to their high exposure on the road, professional drivers, including employees of PT. X, are highly vulnerable to accidents. It is crucial to impelement preventive measure by understanding the aspects that affect their safety. This study aims to evaluate how human factors such as tenure, knowledge, behavior, and training correlate with traffic accidents among the driving division employees at PT. X. This research is a quantitative study with a cross-sectional design. The sample consisted of a total sampling of 114 respondens. Data were collected through questionnaires and analyzed using univariate and bivariate methods with the chi-square test. The results of the study found that 59,6% of drivers had a long tenure, 43% had a high level of knowledge, 61,4% exhibited moderate behavior, and 72,8% had previously attended training. There is a significant relationship between tenure (p-value = 0,031), knowledge (p-value = 0,023), behavior (p-value = 0,000) with the occurrence of traffic accidents among the driving divission employees at PT. X. It is recommended that drivers regularly evaluate their knowledge through mini-quizzes, increase training frequency, install OHS (Occupational Health and Safety) banners in the work area, and provide rewards for drivers with the best safety records.

Corresponding Author:

Rika Mianna
Faculty of Health,
Al Insyirah Institute of Health And Technology,
Email: rikamianna@gmail.com

1. INTRODUCTION

A work accident is an undesired and unpredictable event that can result in loss of life or property. A work accident is a work-related event that can result in injury or death. Global data shows that more than 2.78 million work-related deaths occur annually, with two-thirds (2/3) of these deaths occurring in Asian countries. In 2018, Indonesia was recorded as the country with the highest number of work-related accidents in the world.

According to the International Labour Organization (ILO), a worker dies every 15 seconds due to a work-related accident. In fact, each year, there are more than 250 million workplace accidents and 1.2 million worker deaths due to work-related accidents. In other percentages, there are nearly 1,000 non-fatal work-related accidents and 374 million worker injuries each year. The ILO report also shows that compared to other countries in Southeast Asia, Indonesia's occupational safety standards rank among the lowest. (Edenia Devina, 2023)

Workplace accidents refer to accidents that occur anywhere, whether on land, in water, underground, or in the air. This also includes road accidents, such as car accidents, which are

influenced by driver factors. One of the most important means of public communication to accelerate our development is traffic. Traffic facilitates economic activities. We can imagine how difficult it would be to get to work or perform tasks that require road use if there were no traffic. All activities depend on traffic. Regardless of the name of the means of transportation, in the complexity of everyday human life, it facilitates the economy, strengthens national unity, and influences various aspects of national and state life. (Wahidah Ramadloni Mayandari, 2023)

Traffic accidents are a transportation problem. This problem usually arises when existing transportation methods, whether roads, cars, or other supporting methods, cannot keep pace with societal progress. With economic growth and population growth, there is an increase in activity to meet needs, which means an increased need for private and public transportation. Recently, traffic accidents have become increasingly frequent and cause significant losses. Traffic accidents cause damage to public facilities and fatalities. The increasing number of traffic accidents is directly and indirectly influenced by increasingly complex traffic conditions due to the increasing number of two-wheeled and four-wheeled vehicles. (Siti Riptifah Tri Handari, 2021)

The purpose of Law Number 22 of 2009 concerning Road Traffic and Transportation is to improve traffic safety in Indonesia by regulating various aspects of traffic and road transportation, from traffic regulations and traffic procedures to law enforcement against violations. One of the main focuses of this law is to prevent traffic accidents using a competent approach (Siregar & Dewi, 2020).

Traffic accidents are now a serious problem. Without preventive and mitigating measures, an estimated 2.5 million deaths and 10 million injuries will occur annually over the next ten years. This is a serious problem. More than one-third of deaths are caused by traffic accidents, and human error is the primary cause. The number of accidents in Indonesia increases every year. There are an average of 11,000 deaths annually. The number of traffic accidents in 2021 reached 103,645, with 25,226 victims, of which 23,529 were fatalities. In 2022, this figure increased again to 94,617, with 19,054 fatalities. In other words, the number of traffic accidents increased by 34.6% from January 2021 to September 13, 2022. (Utami Sylvia, 2020)

Data from the Republic of Indonesia Policy Agency (2018) shows that three people die from traffic accidents every hour. Furthermore, the data indicates that several factors influence the overall number of accidents. Specifically, human factors, such as company employees related to driver ability and personality, are responsible for 61% of accidents, 9% are related to vehicle qualifications, and 30% are related to infrastructure and the environment. And it can be concluded that human error is the primary cause of the high rate of traffic accidents. (Yuniar Fitriah, 2024).

Based on data from the Riau Police Traffic Directorate, throughout 2024 there were 1,673 traffic accidents recorded in Riau Province, with 623 fatalities and material losses reaching Rp. 9,445,750,000. while in the Minas District area, Siak Regency, the number of traffic accidents throughout 2024 increased by 5.7 percent compared to the previous year. Based on data presented at the year-end press conference at the Siak Police Headquarters, 223 traffic accidents were recorded in 2024, an increase from 211 cases in 2023. The Siak Police Chief, AKBP, accompanied by the Head of Traffic Police, AKP, said that this increase also had an impact on the number of accident victims, both fatalities, serious injuries and minor injuries. The number of traffic accident victims also increased by 12 percent, from 367 in 2023 to 411 in 2024. The peak number of traffic accidents occurred in April 2024, with 25 traffic accidents resulting in 14 fatalities and 27 minor injuries. Total material losses incurred that month reached IDR 170,050,000.

One of the main factors causing traffic accidents is the human factor. Furthermore, according to the Three Main Factor Theory, the main factors causing accidents are human factors, which include age, gender, length of service, education level, knowledge, behavior, training, and human error. Factors such as fatigue, drowsiness, alcohol or drug use, and violating traffic laws such as exceeding the speed limit can all lead to driver negligence (Asfiati & Zurkiyah, 2021).

Companies require various resources to operate, such as capital, materials, machinery, and human resources. Human resources are crucial to business processes because without them, a business cannot operate properly. Here, the employment relationship can mean that accidents occur as a direct result of work or occur during work. In an industrial context, the zero accident principle is a must for companies that prioritize Occupational Safety and Health (OHS). This

principle emphasizes that a good OHS management system and a strong safety culture can prevent workplace accidents.

Minas District is a strategic location with numerous industrial activities and is known as the operational center of several large companies, particularly those working in the oil and gas sector. Due to the intense activity in Minas District, there are many operational vehicles, such as those of PT. X. PT. X is a company that patrols the area to check all assets belonging to large companies in Minas. This condition increases the risk of traffic accidents for both company employees and others using the road. The purpose of this study was to determine the OHS of Land Transportation among Driver Employees at PT. X in Minas District.

2. RESEARCH METHOD

This research uses a quantitative method with a cross-sectional approach. This study aims to identify and analyze the relationship between employee characteristics and traffic accidents at PT. X in Minas District. This study is planned to last approximately four months, from April 2025 to August 2025, at PT. X, located in Minas District, Siak Regency, Riau Province.

The population in this study is all operational vehicle drivers at PT. X, totaling 114 employees. Given the relatively small population size, the sampling technique used is total sampling, where all members of the population are used as the research sample. The data types in this study are primary data, collected directly from primary sources through research instruments such as questionnaires, and secondary data, obtained from existing sources, such as company accident reports. Univariate analysis aims to describe the data in depth without considering the relationship with other variables, with the data presented in the form of a frequency distribution. Bivariate analysis aims to determine whether there is a relationship between the independent and dependent variables. The technique used in this bivariate analysis is the Chi-Square test. The results of the bivariate analysis will indicate whether there is a significant relationship between the tested variables. The p-value (probability) obtained from the statistical test will be compared with the significance level (e.g., α = 0.05) to determine the significance of the relationship..

3. RESULTS AND DISCUSSIONS

A. Univariat Analysis

a. Traffic Accidents

Table 1. Distribution of Traffic Accident Frequency Among Driver Employees of PT. X, Minas District

No	Category	Frequency (F)	Percentage (%)
1.	Ever	90	79
2.	Never	24	21
	Total	114	100

The distribution of the frequency of traffic accidents among employees in the driver division at PT. X, Minas District, shows that 90 respondents (79%) have experienced traffic accidents.

a. Work Period

Table 2. Frequency Distribution of Working Periods of Driver Employees at PT. X, Minas District

No.	Category	Frequency (F)	Percentage (%)
1.	≤ 1 year (new)	9	8
2.	2-5 year (medium)	37	32
3.	Moret than 5 years (long)	68	60
	Total	114	100

The frequency distribution of work period for driver employees at PT. X, Minas District, shows that there are 68 respondents (60%) with a work period of more than 5 years.

b. Knowledge

Table 3. Frequency Distribution of Knowledge of Driver Employees at PT. X, Minas District

No.	Category	Frequency (F)	Percentage (%)
1.	Low	22	19
2.	Medium	43	38
3.	High	49	43
	Total	114	100

The frequency distribution of knowledge among employees in the driver department at PT. X, Minas District, shows that there are 49 respondents (43%) with a high knowledge category.

c. Behavior

Table 4. Frequency Distribution of Behavior of Driver Employees at PT. X Minas

No.	Category	Frequency (F)	Percentage (%)
1.	Poor	6	5
2.	Moderate	70	62
3.	Good	38	33
	Total	114	100

The frequency distribution of behavior among driver employees at PT. X, Minas District, shows that there are 70 respondents (61%) with moderate behavior category.

d. Training

Table 5. Distribution of Training Frequency for Driver Employees at PT. X, Minas District

No.	Category	Frequency (F)	Percentage (%)
1.	Never	31	27
2.	Ever	83	73
	Total	114	100

The distribution of training frequency for driver employees at PT. X, Minas District, shows that there are 83 respondents (73%) in the category of having attended training.

Relationship between Length of Service and Traffic Accidents

Table 6. The Relationship Between Length of Service and Traffic Accidents Among Driver Employees at PT. X, Minas District

Work Periode	Kecelakaan Lalu Lintas		Total	*P*value*
	Never	Ever		
≤ 1 Year (New)	2 1,9%	7 7,1%	9 9,0 %	0,031
2-5 Year (Intermediate)	13 7,8%	24 29,2%	37 37,0%	
More Than 5 Year (Long)	9 14,3%	59 53,7%	68 68,0%	
Total	24 24,0%	90 90,0%	114 114,0%	114

The results of the analysis of the relationship between work period and traffic accidents among employees in the driver section at PT. X showed that there were 7 (7.1%) respondents who worked with a new work period (≤ 1 year) had experienced traffic accidents, then 24 (29.2%) respondents with a medium work period (2-5 years) had experienced traffic accidents, and 59 (53.7%) respondents who worked with a long work period (more than 5 years) had experienced traffic accidents. The results of the statistical test obtained p = 0.031, so it can be concluded that there is a significant relationship between work period and traffic accidents among employees in the driver section at PT. X, Minas District.

The Relationship Between Knowledge and Traffic Accidents

Table 7. The Relationship Between Length of Service and Traffic Accidents Among Driver Employees at PT. X, Minas District

Knowledge	Traffic Accident		Total		*P*value*
	Never	Ever			
Low	9 4,6%	13 17,4%	22 22,0%		0,023
Medium	5 9,1%	38 33,9%	43 43,0%		
High	10 10,3%	39 38,7%	49 49,0%		
Total	24 24,0%	90 90,0%	114 114,0%	114	

The results of the analysis of the relationship between knowledge of traffic accidents among employees in the driver division at PT. X showed that there were 13 (17.4%) respondents who had low knowledge had experienced traffic accidents, then 38 (33.9%) respondents who had moderate knowledge had experienced traffic accidents, and 39 (38.7%) respondents who had high knowledge had experienced traffic accidents. The results of the statistical test obtained p = 0.023, so it can be concluded that there is a significant relationship between knowledge of traffic accidents among employees in the driver division at PT. X, Minas District.

Relationship of Behavior to Traffic Accidents

Table 8. The Relationship of Behavior to Traffic Accidents Among Driver Employees at PT. X, Minas District

Behavior	Kecelakaan Lalu Lintas		Total		*P*value*
	Never	Ever			
Less	0 1,3%	6 4,7%	6 6,0%		0,034
Moderate	11 14,7%	59 55,3%	70 70,0%		
Good	13 8,0%	25 30,0%	38 38,0%		
Total	24 24,0%	90 90,0%	114 114,0%	114	

The results of the analysis of the relationship between behavior towards traffic accidents among employees in the driver section at PT. X, Minas District, showed that there were 6 (4.7%) respondents with poor behavior who had experienced traffic accidents, then 5 (55.3%) respondents with moderate behavior who had experienced traffic accidents, and 25 (30.0%) respondents with good behavior who had experienced traffic accidents. The results of the statistical test obtained p = 0.034, so it can be concluded that there is a significant relationship between behavior towards traffic accidents among employees in the driver section at PT. X, Minas District.

The Relationship Between Training and Traffic Accidents

Table 9. The Relationship Between Training and Traffic Accidents Among Driver Employees at PT. X, Minas District

Training	Traffic Accident		Total		*P*value*
	Never	Ever			
Never	14 6,5%	17 24,5%	31 31,0%		0,000
Ever	10 17,5%	73 65,5%	83 83,0%		
Total	24 24,0%	90 90,0%	114 114,0%	114	

The results of the analysis of the relationship between training and traffic accidents among employees in the driver section at PT. X, Minas District, showed that there were 17 (24.5%) respondents in the category of never having attended training but having experienced traffic accidents, and 73 (65.5%) respondents in the category of having attended training and also having experienced traffic accidents. The results of the statistical test obtained p = 0.000, so it can be concluded that there is a significant relationship between training and traffic accidents among employees in the driver section at PT. X, Minas District.

Discussion

Relationship between Length of Service and Traffic Accidents

Based on the results of statistical tests using the chi-square test, it can be concluded that there is a significant relationship between length of service and traffic accidents among drivers at PT. X, Minas District. This is consistent with the Three Main Factor Theory, which states that the primary factor causing workplace accidents is the human factor, namely length of service. This research aligns with research conducted by (Desti Purnama Sari, Yulia Hariani, Noer Muhammad, 2024), which stated a relationship between length of service and traffic accidents. Similarly, a 2018 study cited by (Machfudz Eko Arianto, Susan Feriana, 2021) found a relationship between length of service and unsafe driving that could lead to traffic accidents.

Length of service is the amount of time a person spends working at a particular location. A person's experience and work environment are influenced by length of service; therefore, the longer a person works, the greater their experience and skills should be (Machfudz Eko Arianto et al., 2021).

According to the International Labour Organization (ILO), the two main factors causing workplace accidents are age and length of service. A US study showed that lack of work experience is a major factor causing workplace accidents (Wibisono, 2023, cited in Desti Purnama Sari et al., 2024). A previous study by Tiara Vani and Supriono A (2020) also found that employees with more work experience experienced workplace accidents more often than those with less experience (Tiara et al., 2020, cited in Desti Purnama Sari et al., 2024). Researchers assume that length of service is a factor influencing traffic accidents because long work periods are often associated with physical and mental fatigue. Continuous work demands over many years, irregular working hours, and pressure to meet targets can therefore increase the risk of traffic accidents.

The Relationship Between Knowledge and Workplace Accidents

Based on the results of statistical tests using the chi-square test, it can be concluded that there is a significant relationship between knowledge and traffic accidents among employees in the driver department at PT. X, Minas District. This is in accordance with the Three Main Factor Theory which states that the main factor causing workplace accidents is the human factor, namely knowledge. This study is in line with previous research (Handari et al., 2019 quoted from Desti Purnama Sari et al., 2024) which also found that there is a strong correlation between the level of knowledge and the incidence of workplace accidents. Similarly, research (Machfudz Eko Arianto et al., 2021) stated that there is a significant relationship between driving safety knowledge in drivers and traffic accidents. This study is also in line with the results of research (Sari Narulita et al., 2019) which found that the majority of employees have a low level of knowledge, resulting in a lack of training and information regarding occupational safety. This could be one of the reasons why employees lack an understanding of occupational safety. This research aligns with research by Mochammad Fanny Afriansyah et al., 2022, which states that there is a relationship between knowledge and driving safety, as a person with good knowledge will influence quick and correct decision-making

Knowledge also influences a person's behavior. Even with sufficient knowledge, workplace accidents still frequently occur because people don't understand potential workplace hazards and don't use appropriate prevention strategies (Afdahlika et al., 2020, cited in Desti Purnama Sari et

al., 2024). Drivers with high levels of knowledge are better able to avoid accidents because they understand that minor accidents can lead to serious accidents. Knowledgeable drivers will act positively and try to avoid accidents, while drivers with low knowledge tend to ignore surrounding hazards and fail to follow procedures because they are unaware of the risks involved. Researchers assume that knowledge is a factor in traffic accidents; a person's level of understanding directly influences risk perception and decision-making on the road.

Relationship of Behavior to Traffic Accidents

Based on the results of statistical tests using the chi-square test, it can be concluded that there is a significant relationship between behavior and traffic accidents among driver employees at PT. X, Minas District. This is in accordance with the Three Main Factor Theory, which states that the main factor causing workplace accidents is human factors, namely behavior. This study aligns with previous research (Yelvina Tanriono et al., 2019) that found a significant correlation between driver behavior and workplace accidents caused by drivers. The results of this study are comparable to research conducted by (Mahdiel et al., 2016) cited by Yelvina Tanriono et al., 2019) in the journal entitled "The Pattern of Road Traffic Crashes in Southeast Iran," where human factors such as traffic violations, unsafe driving, fatigue, and sleep disturbances are risk factors for accidents, reaching 90%. Due to the fact that some drivers only obey traffic signs when supervised by their superiors, they rarely check tire pressure, ensure proper tire tread, or check for tire damage such as cracks on the road surface, drivers who behave unsafely are at greater risk of experiencing traffic accidents compared to drivers who apply safe behavior when driving (Ulfiatul Azizah et al., 2025). Researchers assume that behavior is a factor related to traffic accidents because drivers often commit negligence, sometimes intentionally, such as speeding and violating traffic laws.

The Relationship Between Training and Traffic Accidents

Based on the results of statistical tests using the chi-square test, it can be concluded that there is a significant relationship between training and traffic accidents among driver employees at PT. X, Minas District. This is in accordance with the Three Main Factor Theory, which states that the main factor causing workplace accidents is the human factor, namely training. This study aligns with research (Ervina Dyah Azrinindita et al., 2022), which states a significant relationship between training and workplace accidents. A previous study by Jihan Mawafasyah and Kresna Febriyanto showed a significant relationship between OHS training and the work environment on Occupational Safety and Health ($p = 0.000$) (Ervina Dyah Azrinindita et al., 2022). One of the goals of training, according to Malayu SP Hasibuan, is to reduce the rate of worker accidents, which will reduce medical costs incurred by the company (Ervina Dyah Azrinindita et al., 2022).

Similarly, research (Soeprihanto, 2009, cited by Ervina Dyah Azrinindita et al., 2022) states that one of the things that must be considered to improve employee skills is having a training program. Knowledge and skills can be acquired through education and training. The training provided to employees must be appropriate to their roles and responsibilities. Knowledge and skills about OHS can help employees better view OHS. A better perception will impact attitudes and actions in handling OHS, which also depends on the employee's ability to absorb and understand OHS information (Hamalik, 2011, cited by Ervina Dyah Azrinindita et al., 2022). Therefore, researchers assume that training is a factor related to traffic accidents because this training can systematically improve driver competence and shape safe behavior.

4. CONCLUSION

Based on the research results, the following conclusions can be drawn:

1. There is a significant relationship between length of service and traffic accidents among employees in the driver division.
2. There is a significant relationship between knowledge of traffic accidents among employees in the driver division.

3. There is a significant relationship between attitudes toward traffic accidents among employees in the driver division.
4. There is a significant relationship between training and traffic accidents among employees in the driver division.

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