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Multifactorial Analysis of Work Accidents among Transportation Sector Workers in Parepare City

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ABSTRACT
Reports have shown that there has been a continuous annual increase in the number of traffic accidents in Indonesia. Parepare City, in particular, faces significant congestion in its public transportation system, leading to 167 cases and 144 cases of accidents in 2019 and 2020, respectively. Therefore, this study aims to analyze the influence of knowledge, attitude, personality, and safety riding practice on traffic accidents among transportation workers in Parepare City. This cross-sectional study comprised 100 respondents selected using the simple random sampling method. The study instrument was a questionnaire, which had previously been tested for its validity and reliability. The data obtained were analyzed using univariate analysis to describe the characteristics of each variable. In contrast, bivariate analysis was conducted using the chi-square test with a confidence level of 95%. Data were collected through interviews with a questionnaire and analyzed using multiple logistic regression with the forward LR method. The results showed that attitude and safety riding practice had a significant influence. Multivariate analysis showed that factors influencing accidents included attitude (AOR = 0.031; 95%CI = 0.45-0.26), practice (AOR = 0.108; 95%CI = 0.03-0.38), and knowledge (AOR = 0.337; 95%CI = 0.13-0.88), while personality had no effect. Based on the results, future studies were advised to conduct long-term investigations (longitudinal studies) to monitor changes in the variables observed and the relationship with the rate of traffic accidents.

INTRODUCTION

Implementing Occupational Safety and Health (OSH) is a crucial strategy to prevent work-related accidents and diseases.[1] One of the proactive steps in this aspect is the identification of hazards and risks. Furthermore, establishing a safe, comfortable, and healthy workplace can reduce the risk of accidents and mitigate the danger experienced by workers.[1]

According to Law Number 1 of 1970, work accidents are unexpected and undesirable events that disrupt the regulated workflow of an activity, potentially leading to both human casualties and property loss. Meanwhile, occupational diseases are physical and spiritual, health issues caused by work or the workplace.[2] Safety management and work safety protocols must be applied across all sectors, including transportation. Despite Indonesian extensive regulations governing security in the transportation sector, accidents persist. To address this challenge, the National Transportation Safety Committee (NTSC) plays an essential role in ensuring safety and enhancing services to the public. In 2021, NTSC reported 19 accidents in the shipping sector, leading to a tragic toll of 342 casualties, including fatalities and missing individuals. The aviation sector also experienced a similar challenge, with 18 reported cases, and 9 of them were classified as severe accidents. For example, the Boeing 737-500 plane crash on January 9, 2021, claimed the lives of 56 people. The NTSC also reported an equivalent figure for road traffic and transportation modes. The NTSC maintains a list of accident-prone areas where these incidents frequently occur.[3]

On January 21, 2022, a tragic accident occurred in Balikpapan, East Kalimantan, in the transportation sector. A Tronton truck collided with several motorists at the intersection of Simpang Rapak, Jalan Soekarno Hatta, leading to a devastating loss of five lives and causing slight injuries to 30 individuals. This indicates a need to monitor and evaluate accidents by carrying out assistance programs to create occupational safety and health management systems for drivers, toll road education, and OSH education for drivers.[3] Traffic accidents in Indonesia during the 2015-2019 period experienced a surge, with an average annual percentage increase of 4.87%. This increment was simultaneously followed by an increase in the number of deaths and minor injuries by 1.41% and 6.26%, respectively.[4] Parepare is the second largest city in South Sulawesi and is also known as the Commercial City due to its port, which serves as a hub for transporting agricultural and livestock production to other regions.

Reports through page one data managed by Parepare City Regional Government show the large flow of foreign and domestic goods based on shipping type at the port. This level of importation also increases the use of land transportation, such as goods trucks between regions, leading to congestion of public vehicles in the regions. This indicates that transportation drivers must consider safety and security while riding. Secondary data obtained indicates that Parepare City witnessed 167 traffic accidents in 2019, followed by 144 cases in 2020. These accidents led to substantial material losses, totaling Rp. 125,400,000 in 2020, with 13 fatalities, three severely injured individuals, and 150 sustaining minor injuries. Safety riding, characterized by adherence to riding regulations and safety riding behavior, is essential in reducing the risk of traffic accidents. This concept is designed to enhance driver awareness of potential hazards during their journeys, promoting safe riding practice.[6] Therefore, this study aims to analyze the influence of knowledge, attitude, personality, and safety riding practice on traffic accidents among transportation workers in Parepare City.

MATERIAL AND METHOD

This was an analytical observational study with a cross-sectional approach. Furthermore, the samples were taken using a simple random sampling method, totaling 100 transportation sector workers, particularly public transport drivers in Parepare City. The study instrument was a questionnaire, which had previously been tested for its validity and reliability.

The data obtained were analyzed using univariate analysis to describe the characteristics of each variable. In contrast, bivariate analysis was conducted using the chi-square test with a confidence level of 95%. Multivariate analysis with the logistic regression method was then used to identify the variables with the highest significant influence on the dependent variable. In this study, all the data analyses were carried out using SPSS 24.

RESULTS

The characteristics of respondents observed included age, educational background, gender, type of work, years of service, duration of work, and shift work, as shown in Table 1. Based on the results, the majority of respondents were males (99%) aged ≤ 40 years (80%), senior high school graduates (67%), online drivers (75%), ≤ 5-year experience (80%), > 8 hours (77%), and work shift on Afternoon – Night. Table 2 showed that 51% of drivers experienced work accidents in the last 6 months, specifically during the night (23%). The dominant types of accidents included falling (28.0%), crashing (14%), and being hit (4%), while the remaining respondents did not experience accidents (54%). The severity of injuries experienced by respondents was mild (39%), moderate (6%), and severe (1%).

Table 1. Characteristics of Respondents

Characteristics	n = 100	%
Age (Years)		
≤ 40	80	80
> 40	20	20
Educational Background		
Elementary School	1	1
Junior High School	15	15
Senior High School	67	67
University	17	17
Gender		
Male	99	99
Female	1	1
Type of Work		
Taxi Bike	7	7
Online Driver	75	75
Courier	17	17
Public Transport Driver	1	1
Years of Service		
≤ 5 years	80	80
> 5 years	20	20
Duration of Work (Hours)		
≤ 8	23	23
> 8	77	77
Shift Work		
Morning – Afternoon	25	25
Afternoon – Night	37	37
Night – Morning	3	3
Fullday	35	35

Source: Primary Data, 2023

Table 2. Work Accidents History

Work Accidents History	n = 100	%
Accidents History in the Last 6 Months		
Yes	51	51
No	49	49
Occurrence Time		
Morning	7	7
Afternoon	16	16
Night	23	23
Did not have an accident	54	54
Severity of Injury		
Mild	39	40
Medium	6	6
Severe	1	1
Did not have an accident	54	54
Type of Accident		
Fall	28	28
Crashing	14	14
Hit	4	4
Did not have an accident	54	54

Source: Primary Data, 2023

Bivariate analysis between the variables of knowledge, attitude, personality, and safety riding practice on work accidents was presented in Table 3. Based on the analysis results, the variables of knowledge, attitude, and practice had a statistically significant relationship with work accidents (p<0.05), while the personality variable did not have a significant relationship with the dependent variable (p>0.05). Furthermore, an analysis of the pure influence of work accidents risk factors was carried out using multivariate analysis.

Table 4 showed the results of the analysis carried out to determine the most influential variables. The multiple logistic regression test using the forward LR method was carried out by entering all independent variables with a p-value of ≤ 0.25 into the model, including knowledge, attitude, and practice. The independent variables with a *p-value* ≤ 0.25 and those with *p-value* < 0.05 were gradually entered from the smallest to the largest value. The results of the multivariable analysis of this study are presented in Table 5.

The multivariate analysis results showed that the variables related to work accidents in transportation sector workers included attitudes (AOR = 0.031; 95%CI = 0.45-0.26), practice (AOR = 0.108; 95%CI = 0.03-0.38), and knowledge (AOR = 0.337; 95%CI = 0.13-0.88). This indicated that practice and attitude had the highest level of influence on work accidents.

Table 3. Bivariate Analysis

Variable	Accidents				Total	*p-value*	(95%CI)
	Once		Never				
	n	%	n	%			
Knowledge							
Good	21	40.4	31	59.6	52	0.044	0.182-0.909
Bad	30	62.5	18	37.5	48		
Attitude							
Positive	37	43.5	48	56.5	85	0.001	0.007-0.438
Negative	14	93.3	1	6.7	15		
Personality							
Positive	44	55.5	36	45.0	80	0.177	0.819-6.288
Negative	7	35.0	13	65.0	20		
Practice							
Safe	35	43.8	45	56.3	80	0.008	0.060-0.634
Not safe	16	80.0	4	20.0	20		

Source: Primary Data, 2023

Table 4. Multivariate Analysis

	Variable	Wald	*p-value*	AOR	95% CI	
					Lower	Upper
Step 1[a]	Attitude Category	7.510	0.006	0.055	0.007	0.438
	Constant	7.905	0.005	23.562		
Step 2[b]	Practice Category	11.806	0.001	0.119	0.035	0.401
	Attitude Category	9.998	0.002	0.034	0.004	0.277
	Constant	19.331	0.000	515.096		
Step 3[c]	Knowledge Category	4.937	0.026	0.337	0.129	0.880
	Practice Category	11.980	0.001	0.108	0.031	0.381
	Attitude Category	10.256	0.001	0.031	0.004	0.259
	Constant	21.256	0.000	3240.410		

a. Variable (s) entered on step 1: Attitude Category
b. Variable (s) entered in step 2: Practice Category
c. Variable (s) entered in step 3: Knowledge Category

Source: Primary Data, 2023

DISCUSSION

The analysis showed that the knowledge variable significantly influenced (p = 0.026 < 0.05) the incidence of work accidents among drivers in the Parepare transportation sector. Based on the findings, most respondents lacked knowledge about basic traffic rules, such as "at roundabout intersections, drivers must give priority to other vehicles coming from the right." Furthermore, a lack of knowledge about the basic traffic rules could be a risk factor contributing to the occurrence of work accidents. The results supported the theory that actions or behavior based on knowledge were more likely to be remembered and applied compared to those without a solid knowledge base.[7] Several studies showed that there was a significant relationship between knowledge about safety riding and accidents associated with online two-wheeled transportation drivers in Pekanbaru with a correlation coefficient of 0.000 (p < 0.05).[8] Another study used a sample population of 60 respondents who had experienced work accidents in a certain period. In the last one year, 53 respondents were affected, and 48 (90.6%) had less knowledge.[9]

The results of the analysis of respondents' attitudes showed that there was a significant

influence (p = 0.001 < 0.05) on the incidence of work accidents. This was in line with previous studies that individuals' attitudes could influence behavior. Based on the results, if someone had a positive attitude towards an object or idea, they tended to take actions supporting the object, and vice versa.10 In line with other studies, most of the respondents had a negative attitude towards safety riding (p = 0.011).[11] This study showed that some drivers only followed traffic rules when the police were around, and some who had not experienced accidents felt there was no reason to change their riding style. However, maintaining this attitude could increase the risk of getting into an accident.

Based on the results, there was a significant relationship between safety riding practice and the incidence of work accidents in the Parepare transportation sector (p = 0.008 < 0.05). In line with other studies, there was a significant relationship between safety riding behavior and work accidents among online drivers in the X Tembalang Community with a significance value (p = 0.017 < 0.05). Furthermore, the results showed that the odd ratio value was 13.00, where drivers with unsafe riding behavior had a 13 times higher risk than others.

Unsafe riding practices, such as non-compliance with traffic rules, use of inadequate personal protective equipment, or non-compliance with company safety policies, could increase the risk of work accidents. For example, drivers or workers who did not wear helmets or appropriate personal protective equipment could increase the risk of serious injury. Furthermore, violations of traffic rules, such as excessive speed or ignoring traffic signals, often led to collisions and accidents that threatened the safety of workers. According to the Theory of Planned Behavior (TPB), individual behavior could be explained through 4 components: attitude, subjective norm, perception of self-control over behavior (Perceived behavior control), and intention to carry out the attitude.[12]

This study confirmed that implementing safety riding behavior was essential in reducing the risk of traffic accidents.[13] Based on previous studies, there was a relationship between unsafe workplace actions and accidents among online drivers and base drivers in Manado, with a significance level of (0.002).[14] Furthermore, a study in 2019 also showed a relationship between driver behavior and accidents among drivers in Bitung, with a significance level of (0.04).[15]

Multivariate analysis in this study showed that the most influential variables affecting the occurrence of work accidents among drivers in the Parepare transportation sector included safety riding practice (p = 0.001< 0.05), attitude (p = 0.001< 0.05) and knowledge (p = 0.026 < 0.05). At the same time, personality had no association (p = 0.177 > 0.05). To reduce the incidence of work accidents in this sector, it was important to promote safety riding practice through training, awareness, and enforcement of policies. Apart from protecting workers' lives and well-being, this could also produce long-term benefits for companies, such as reducing medical care costs, workers' absenteeism, and negative impacts on the company's reputation. Therefore, managing good safety riding practices was key to achieving a safer and more productive work environment in the Parepare transportation sector.

CONCLUSION AND RECOMMENDATION

In conclusion, this study showed that the most influential variables influencing the occurrence of work accidents among drivers in the Parepare transportation sector were safety riding practice, attitude, and knowledge. Based on the results, future studies were recommended to conduct long-term investigations (longitudinal studies) to monitor changes in knowledge, attitude, and safety riding practice in relation to the rate of work accidents. Several interventions were also advised, such as implementing specific safety training programs for drivers. Furthermore, there was a need for collaboration among related parties, such as local governments, transportation companies, or road safety organizations, to collect data and obtain support in implementing intervention programs.

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AUTHOR CONTRIBUTIONS

Organize and design research; SSR and LMS, conducting research; SSR, LMS NMS, and NHI, analyzed the data; AN and AFMN, wrote the manuscript; All authors. The author read and approved the final manuscript. SSR = Syamsiar S. Russeng; LMS = Lalu Muhammad Saleh; NMS = Nurul Mawaddah Syafitri; NHI = Naufal Hilmy Imran; AN = Auliyah Nurazizah; AFMN = Andi Fatimah Mustovia Nurhidayah.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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