

## **Factors Affecting Traffic Accidents on Online Transportation Riders in Ambon City**

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### **Abstract**

Based on the Global Status Report on Road Safety (GSRs) released by WHO (2018), it was reported that every 24 seconds there is one life lost and every year 1.35 million victims die due to traffic accidents. Work accidents can happen to anyone, including online motorcycle taxi drivers. This study aims to determine the effect of the variable causing traffic accidents on online motorcycle taxi drivers in Ambon City. This research is a quantitative study with a cross sectional design, with a sample size of 96 people. Data obtained by conducting interviews using a questionnaire. Bivariate analysis using the chi square test, and multivariate analysis using multiple logistic regression tests. The results of this study indicate that the variables that affect the incidence of traffic accidents in online motorcycle taxi drivers in Ambon City are fatigue ( $p = 0.003$ ), behavior ( $p = 0.000$ ), and workload ( $p = 0.001$ ). ) do not have a significant relationship with the incidence of traffic accidents. The most dominant influencing variable is driving behavior with the value of Exp. (B) = 5,340. It is hoped that online motorcycle taxi drivers in Ambon City can prioritize driving safety with good driving behavior and for related agencies to provide socialization about safety riding and periodic vehicle worthiness checks.

**Keywords:** Traffic Accidents, Online Motorcycle Taxi Drivers, Ambon City

### **Introduction**

The high need for transportation can be seen from the increasing number of motorized vehicles. According to data from the Traffic Corps of the State Police of the Republic of Indonesia, in the 2013-2017 period there was a fairly high increase in the number of vehicles, namely 7.40 percent per year. An increase in the number of vehicles occurs in all types of vehicles every year. Motorbikes are the type of vehicle most used by the community. This can be seen from the proportion of motorbikes which is much larger than other types of vehicles, namely 81.58%, followed by passenger cars and freight cars, respectively 11.18 percent and 5.43 percent. Meanwhile, buses have the smallest proportion at 1.81 percent (BPS, 2018).

In addition to increasing traffic jams, the current increase in the number of vehicles is closely related to the increase in the number of traffic accidents. According to the Traffic Law no.22 of 2009, it states that a traffic accident is an incident in road traffic that is unexpected and undesirable, involving one vehicle with or without another road user which causes property loss

to the owner (victim). Accidents are events that are difficult to predict when and where they occur.

Based on the Global Status Report on Road Safety (GSRS), it is reported that every 24 seconds one life is lost and every year 1.35 million people die due to traffic accidents (WHO, 2018). In Indonesia, the Indonesian Police Traffic Corps released data on traffic accidents that occurred from 2016-2018 where the trend of accidents has increased. The number of traffic accidents in 2016 reached 106,591 cases, in 2017 it had increased to 104,327 cases, and in 2018 there were 107,968 cases with an average of 30,000 dying per year or 80 people per day. The dominating type of vehicle is a two-wheeled vehicle with the most accident-prone ages of 15 to 38 years (Korlantas, 2018).

In Maluku, the number of traffic accidents in 2018 has decreased compared to 2017, which was 398 cases, while in 2017 there were 465 cases. The decreasing accident rate is not proportional to the death rate from traffic accidents. The number of victims who died in 2017 was 158 people, in 2018 there was an increase, namely 179 people with serious injuries as many as 250 people (Satlantas, 2019). In Ambon City, there were 91 traffic accidents in 2018 with 56 deaths, 62 seriously injured and 56 minor injuries. Meanwhile, in 2019 there was a decrease in the number of traffic accidents, where there were 30 accidents with 30 deaths, 66 seriously injured and 20 minor injuries.

According to the Director General of Land Transportation, traffic accidents are influenced by human factors, vehicles and the road environment as well as the interaction or combination of two or more of these factors. The amount of the percentage of each of the factors causing traffic accidents in Indonesia, namely the human factor is 93.52%, the vehicle factor is 2.76%, the road factor is 3.23%, and the environmental factor is 0.49% (Warpani, 2002).

In the epidemiologic triad concept, the risk of traffic accidents is influenced by 3 factors, namely the host, agent and environment. Characteristics of humans as hosts include: age, driving experience, driving behavior and drinking alcoholic behavior. Characteristics in the agent include: engine failure, engine design, vehicle frame and motor vehicle speed regulation. Meanwhile, the characteristics in the environment that affect traffic accidents are road conditions, traffic conditions and natural / weather conditions. The relationship between the characteristics in the epidemiologic triad is thought to form a relationship with high dimensions because of the strong interaction between variables.

Although all road users are at risk from accidents to death at the time of traffic accidents there are high differences in the fatality rates between these groups of road users. Motorbikes are a group of road users who are more at risk of having a serious accident than car drivers (Dahda, 2008).

Fatigue can occur as a result of various factors that may be related to work, lifestyle, or a combination of the two. Such as age, travel time, medical history, sleep time, and work status. People who experience work fatigue usually experience symptoms that indicate decreased activity, decreased motivation, and show physical exhaustion due to psychological effects that have short or long-term effects. In addition, travel time is also a factor of fatigue if the travel time is longer than the general working time, which is 6-10 hours (Kuswana, 2016).

Behavioral factors also have an important role in determining the occurrence of traffic accidents for motorcyclists. Where the rider who behaves badly when driving also affects the safety of the

rider, such as not wearing a helmet or wearing a helmet that does not comply with the recommended standards, being disorderly when driving by violating traffic signs and road markings

In general, different levels of work demands will cause differences in performance levels and workloads. In conditions of high performance demands, the workload also increases. A high workload condition if carried for too long will have a negative impact. A person's performance will be at its best when work demands are medium. In this condition the workload is at a low level. Drivers are not passive in tolerating the consequences of various levels of work demands, but on the other hand, they are quite active in managing themselves so that they get a work load that is deemed appropriate. This is mainly done by reducing speed on the highway.

The length of time a person works well in a day is generally 6-10 hours. The rest (14-18 hours) is used for family and community life, rest, sleep, and so on. Extending working time beyond the capacity of the length of work is usually not accompanied by optimal work efficiency, effectiveness and productivity, in fact, there is usually a decrease in the quality and results of work and working for a long time, there is a tendency for fatigue, health problems, illness and accidents and dissatisfaction. (Suma'mur, 2009). This study aims to determine the effect of the variable causing traffic accidents on online motorcycle taxi drivers in Ambon City.

## Methods

This research is a quantitative study with a cross sectional design, which aims to see the influence of the variables causing traffic accidents on online motorcycle taxi drivers in Ambon City. The study population was all online motorcycle taxi drivers in Ambon City. While the number of population in this study is not known with certainty, so the sampling used the Lemeshow formula (for an unknown population) and obtained 96 samples through accidental sampling technique.

Data was collected through interviews using a questionnaire, including the Industrial Fatigue Research Committee (IFRC) to measure respondents 'fatigue levels, Driver Behavior Quality (DBQ) to measure driving behavior and NASA-TLX to measure respondents' workload.

The independent variables in this study are work fatigue, driving behavior, workload and length of work. While the dependent variable is the incidence of traffic accidents. The data obtained were then processed using the SPSS application. Univariate analysis is presented in the form of a frequency distribution table and for bivariate analysis using the chi-square test by testing the dependent variable on each independent variable then presented in the form of a frequency table and cross tabulation (Crosstab) in accordance with the research objectives and accompanied by a narrative as a table explanation . Multivariate analysis is carried out using multiple logistic regression tests, where the table analysis is carried out in stages using the backward method to find which variable has the most influence on the dependent variable.

## Results and Discussion

### Univariate Analysis

Table 1. Distribution of Fatigue Frequency, Driving Behavior, Workload and Length of Work for Online Transportation Riders in Ambon City

Variable	Categori	Frequency (n)	Percentage (%)
Fatigue	High	52	54,2

	Low	44	45,8
	<b>Total</b>	<b>96</b>	<b>100,0</b>
Driving behavior	Bad	54	56,3
	Good	42	43,8
	<b>Total</b>	<b>96</b>	<b>100,0</b>
Workload	Heavy	55	57,3
	Light	41	42,7
	<b>Total</b>	<b>96</b>	<b>100,0</b>
Length of working	Not Eligible	58	60,4
	Eligible	38	39,8
	<b>Total</b>	<b>96</b>	<b>100,0</b>

### ***Online Transportation Rider Fatigue***

There are two categories of respondents' fatigue level, namely high and low. There were 52 more online motorcycle taxi riders (54.2%) than online motorcycle taxi riders with a low level of fatigue, which was 44 people (45.8%). , Online motorcycle taxi riders with poor sleep quality were 56 people (58.3%) compared to online Transportation riders with good sleep quality, namely 40 people (41.7%).

### ***Driving Behavior of Online Transportation Riders***

The driving behavior of the respondents was categorized into two, namely bad and good. Online motorcycle taxi drivers with bad driving behavior were 54 people (56.3%) compared to online motorcycle taxi drivers with good driving categories, namely 42 people (43.8%).

### ***Online Transportation Rider Workload***

The respondent's workload is categorized into two, namely heavy and light. Online motorcycle taxi riders with a heavy workload were more than 55 people (57.3%) compared to online Transportation riders with light workloads, namely 41 people (42.7%).

### ***Length of Work for Online Transportation Riders***

The length of work is categorized into two, namely not meeting the requirements (> 8 hours / day) and meeting the requirements ( $\leq$  8 hours / day). More online motorcycle taxi riders in the ineligible category were 58 people (60.4%) compared to online motorcycle taxi riders with the eligible category, namely 38 people (39.8%).

## **Bivariate Analysis**

### ***Relationship between Fatigue and Accidents in Online Transportation Riders in Ambon City***

Based on the research conducted, it shows that the proportion of online transportation riders who experience traffic accidents is more in the high fatigue category, namely 30 people (57.7%), compared to low fatigue, namely 11 people (25%), Chi Square test results are obtained. p value = 0.003 ( $p < 0.05$ ), it means that  $H_0$  is rejected and  $H_a$  is accepted.

This means that there is a significant relationship between fatigue and the incidence of traffic accidents among online transportation drivers in Ambon City.

***The Relationship between Driving Behavior and Accidents in Online Transportation Riders in Ambon City***

In this study, it shows that online transportation drivers who have experienced traffic accidents are more in the bad driving behavior category, namely 33 people (61.1%), compared to good driving behavior, namely 8 people (19%), from the Chi Square test results. obtained p value = 0.000 ( $p < 0.05$ ), it means that  $H_0$  is rejected,  $H_a$  is accepted. So it can be concluded, there is a significant relationship between driving behavior and the incidence of traffic accidents on online transportation drivers in Ambon City.

***Relationship between Workload and Accidents in Online Transportation Riders in Ambon City***

In the study, it was found that online transportation drivers who had traffic accidents occurred more to motorists with the heavy workload category, namely 32 people (28.2%), compared to light workloads, namely 9 people (22%). From the results of the Chi Square test, the value was obtained.  $p = 0.001$  ( $p < 0.05$ ), it means that  $H_0$  is rejected,  $H_a$  is accepted.

So it can be concluded, there is a significant relationship between workload and the incidence of traffic accidents on online transportation drivers in Ambon City.

***Relationship of Length of Work with Accidents in Online Transportation Riders in Ambon City***

In this study, it was found that online transportation drivers who had traffic accidents occurred more to motorists with a length of work that did not meet the requirements, namely 23 people (39.7%), compared to 18 people (47.4%) who met the requirements. ). From the Chi Square test results obtained p value = 0.592 ( $p > 0.05$ ), which means that  $H_0$  is accepted  $H_a$  is rejected. So it can be concluded that the length of work does not have a significant relationship with traffic accidents on online transportation drivers in Ambon City.

Table 2. Bivariate Analysis of Independent Variables on Traffic Accidents in Online Transportation Riders in Ambon City

Variable	Traffic accident				Total		P Value
	Ever		Never		n	%	
	N	%	N	%			
<b>Fatigue</b>							
High	30	57,7	22	42,3	52	100	0,003
Low	11	25	33	75	44	100	
<b>Driving Behaviour</b>							
Bad	33	61,1	21	38,9	54	100	0,000
Good	8	19,0	34	81,1	42	100	
<b>Workload</b>							
Weight	32	58,2	23	41,8	55	100	0,001
Light	9	22	32	78	41	100	
<b>Length of working</b>							
Not eligible	23	39,7	35	60,3	58	100	0,592
Eligible	18	47,4	20	52,6	38	100	

## Multivariate Analysis

In multivariate analysis used logistic regression test, to determine the effect of 4 (four) independent variables on 1 (one) dichotomous dependent variable. The method used is the backward conditional where all the independent variables are entered simultaneously, then at each stage it will be eliminated by the system until only significant variables are left.

Table 3. Multivariate Analysis of Variables Influencing Traffic Accidents on Online Transportation Riders in Ambon City

Variables in the Equation						
	B	S.E.	Wald	df	Sig.	Exp(B)
Fatigue	1.389	.521	7.124	1	.008	4.013
Behavior	1.675	.550	9.272	1	.002	5.340
Workload	1.664	.562	8.753	1	.003	5.281
Constant	-4.932	1.356	13.229	1	.000	.007

Based on Table 2 above, of the 4 independent variables included, 1 variable will be eliminated at each stage so that there will be 3 significant variables remaining, namely fatigue, driving behavior and workload. The results of the analysis show that the driving behavior variable is the variable that most influences the incidence of traffic accidents on online motorcycle taxi drivers in Ambon City with an Exp (B) value of 5,340.

In this research, it was found that there was a significant relationship between fatigue and the incidence of traffic accidents among online motorcycle taxi drivers in Ambon City. This is in line with research conducted by (Tanriono et al., 2019) which was carried out on motorcycle taxi drivers in Bitung City where the significance level was obtained of 0.001 ( $p < 0.05$ ), which means that there is a relationship between work fatigue in motorcycle taxi drivers. This research is also in line with the research conducted by (Zhang et al., 2016) which shows a significant relationship between fatigue and accidents in bus drivers. He explained that fatigue is a condition known as the silent killer. In theory, work fatigue can lead to accidents because work fatigue has an effect on decreasing one's concentration and readiness to do work

Driving behavior in this study is also known to have a significant relationship with the incidence of traffic accidents. The same results were found in the study (Mekonnen et al., 2019) using the DBQ (Driver Behaviors Questionnaire) questionnaire which shows that drivers with unsafe behavior are at risk of having an accident. Different research results were stated by Sari & Mahyuni (2015) which shows that the driving behavior factor has no effect on the incidence of work accidents in truck drivers at PT Berkat Nugraha Sinar Lestari. The same results were found in the study (Alavi et al., 2017) about personal and mental health factors that affect the incidence of traffic accidents. The results showed that there are several personalities or behaviors that are not related to accidents.

Workload has a significant relationship with the incidence of traffic accidents among online motorcycle taxi drivers in Ambon City. This is in line with Dewi & Prihatsanti's (2013) research that excessive workload can cause work-related disorders or illnesses, where heavy workloads can cause physical and mental fatigue and emotional reactions such as headaches, indigestion and irritability. Meanwhile, the workload that is too light where the work is done repeatedly can cause boredom.

The length of work does not have a significant relationship with traffic accidents for online motorcycle taxi drivers in Ambon City. The unrestricted working time of online motorcycle taxi riders causes the driver's ability to determine work time and rest time between work when the body starts to feel tired and sleepy. This is not in line with research conducted by Ting et al (2008) which states that long driving durations are a significant cause of road fatigue-related accidents. Fatigue caused by driving for long periods of time seriously disrupts driver alertness and performance and can jeopardize transportation safety. The length of work for a person determines his efficiency and productivity. The length of time a person works a day is generally 6-8 hours. In a week people can only work well for 40-50 hours, more than that the tendency to arise negative things will be even greater (Hikmawan, 2013).

## Conclusion

Based on the research results, it can be concluded that work fatigue, driving behavior and workload have a significant relationship to the incidence of traffic accidents among online motorcycle taxi drivers in Ambon City. Online motorcycle taxi management should pay attention to the welfare of its partners and carry out periodic health checks. The police collaborate with related agencies to routinely conduct socialization related to safe driving behavior to the online motorcycle taxi driver community, including periodic vehicle cruising checks. Drivers are expected to prioritize their occupational safety and health, including safe driving behavior, proper use of PPE, obeying traffic rules and paying attention to their physical condition, including adequate rest, stretching between work times, and consuming nutritious food.

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