

RISK FACTORS IN ROAD TRAFFIC ACCIDENTS IN THE CITY OF PALU, INDONESIA

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ABSTRACT

Background: Traffic accidents are unpredictable events when they occurred. Thus, understanding the risk factors in road traffic injuries is needed.

Objective: This study aims to analyze the risk factors in road traffic accidents in the city of Palu.

Methods: This was an observational analytic study using case-control approach with sample of 182 respondents consisting of 91 cases and 91 controls. Purposive sampling was used based on a certain considerations made by the researchers themselves. Data were analyzed using Chi-Square test, Relative Risk/Odds Ratios in this study.

Results: The results showed that the scatterbrained factor (OR = 3.180 95% CI 1.669 to 6.059), undisciplined behavior (OR = 11.990 at 95% CI 5.956 to 24.138), exceeding speed limit (OR = 4.230 95% CI 2.204 to 8.118), and no driving license (OR = 10.455 at 95% CI 5.274 to 20.722).

Conclusion: This study concludes that the scatterbrained factor, undisciplined behavior, exceeding the speed limit, and no driving license are the risk factors for road traffic accidents in the city of Palu. It is recommended that all parties to cooperate with the good for the sake of safety and driving safety as well as prevention of road traffic accidents.

Key words: Road Traffic Accidents, Risk factors, Injuries

INTRODUCTION

Road traffic accidents are a major problem, but often ignored by the public health. Therefore prevention efforts for effective and sustainable are needed. Globally deaths and injuries from road traffic accidents are a major public health problem.¹ In a sense, traffic accident is an event in the way that is unexpected and

unintentional involved vehicles with or without other road users, resulting in loss of life or loss of property.² According to the World Health Organization (WHO), it is more than 1.2 million people die in road accidents each year, and between 20 and 50 million suffer from non-fatal injuries. Most regions of the world, injuries from road traffic accidents are still rising. More

than 90% of deaths occurred on roads in low-income countries, and middle income countries only have 48% of vehicles worldwide.³

Number of vehicles is increasing every year and human negligence become a major factor in the increase in traffic accidents in Indonesia. In addition, traffic accident victims are dominated by young and productive age. The majority of cases occurred on poor people as the users of motorcycle and public transport.⁴ The number of traffic accidents that occurred in Indonesia during 2014 obtained from the data throughout the Polda (provincial police) in Indonesia was 84,572 cases. It was around 21,632 people died in the accident, 22,581 people seriously injured, and 95,204 people were suffered from minor injuries.⁵ In 2014, in the province of Central Sulawesi, the number of occurrences of traffic accidents was 1,771 cases. Total incidence of traffic accidents obtained from 10 Polres (police district) in Central Sulawesi found that the highest incidents were in the Palu city with 387 cases, which was increased from the incidents at the previous years, namely 376 cases in 2013, and 289 cases in 2012.⁶

Study showed that the causes of road traffic accidents were human factor, or human error like lack of concentration, scatterbrained, and undisciplined.⁷ However, little is known about the research regarding the risk factors in road traffic accidents in Palu. Thus, this study aimed to analyze the risk factors in road traffic accidents.

METHODS

Design

This was an observational analytic study with case control design to analyze the risk factors (scatterbrained, undisciplined behavior, exceeding speed limit, and driving license ownership) towards the road traffic accidents in the city of Palu.

Setting

This study was conducted on May – August 2015 in the City of Palu

Population and Sample

The target population in this study was all the community in the city of Palu. There were 182 samples recruited using purposive sampling, which consisted of 91 respondents in case group and 91 respondents in control group. The inclusion criteria for the sample included motorcycle rider motorcycle and car driver, getting involved in the traffic accident, more than 17 years old, and based in Palu.

Instrument

The instrument was adopted from Rifal & Chasidy's instrument to measure the risk factors (scatterbrained, undisciplined behavior, exceeding speed limit, and driving license ownership). The Cronbach's alpha for the instrument was 0.947. If the score was higher than 50% then it was categorized as high risk, otherwise if the score was under 50%, it indicates low risks.⁸

Ethical Consideration

Data were collected after obtaining permission from the body of national unity and the protection of the public in Palu. Informed consent was performed to all respondents.

Data Analysis

Chi-Square Test, Relative Risk/Odds Ratios were performed for data analysis in this study.

RESULTS

Table 1 showed that scatterbrained driver had more cases of accidents (78%) compared to those who had low scatterbrained or no scatterbrained, which only 22% of cases of accidents. However,

the OR values was 3.180, indicated that scatterbrained driver were at risk 3.180 times of traffic accidents compared to those who were not scatterbrained. The value 1.660-6.059 (>1) of CI showed that there was a significant association between scatterbrained drivers with the traffic accidents.

On the other hand, for undisciplined behavior, the result showed that undisciplined driver had more cases of

accidents (74.7%) compared to those who had high discipline behavior, which 73% of no cases of accidents. The OR values was 11.180, indicated that undisciplined driver were at risk 11.990 times of traffic accidents compared to those who were discipline. The value 5.956 – 24.138 (>1) of CI showed that there was a significant relationship between undisciplined drivers with the traffic accidents.

Table 1. Analysis of risk factors on Road traffic accidents

Risk factors	Traffic accidents				Total	OR (CI 95%)
	Cases		Control			
	n	%	n	%		
Scatterbrained						
High risk	71	78.0	48	52.7	119	3.180 (1.669 – 6.059)
Low risk	20	22.0	43	47.3	63	
Undisciplined behavior						
High risk	68	74.7	18	19.8	86	11.990 (5.956 – 24.138)
Low risk	23	25.3	73	80.2	96	
Exceeding speed limit						
High risk	72	79.1	43	47.3	115	4.230 (2.204 – 8.118)
Low risk	19	20.9	48	52.7	67	
No driving license						
High risk	70	76.9	22	24.2	92	10.455 (5.274 – 20.722)
Low risk	21	23.1	69	75.8	90	
Total	91	100	91	100	182	

For exceeding the speed limit, the result showed that the drivers who exceeded the speed limit had more cases of accidents (79.1%) compared to those who did not exceed the speed limit, which only 20.9% of cases of accidents. The OR values was 4.230, indicated that drivers who exceeded the speed limit were at risk 4.230 times of traffic accidents compared to those who were driving under limit. The value 2.204 – 8.118 (>1) of CI showed that there was a significant relationship between drivers who exceeded the speed limit with the traffic accidents.

Last, for no driving license, the result showed that the drivers who had no driving license had more cases of

accidents (70%) compared to the drivers who had license, which only 21% of cases of accidents. The OR values was 10.455, indicated that drivers who had no driving license were at risk 10.455 times of traffic accidents compared to those who had driving license. The value 5.274 – 20.722 (>1) of CI showed that there was a significant relationship between drivers who had no driving license with the traffic accidents.

DISCUSSION

Road traffic accidents are still a problem today, which are caused by many factors, and one of them is the human factor that has a lack of concentration. The finding of this study showed that the number of

traffic accidents were higher for those who were scatterbrained. The OR value also indicated that people who were scatterbrained when driving had 3.180 greater time to get accidents than those who were not scatterbrained. This findings however were in line with the previous study, which indicated that scatterbrained is a human factor that causes a traffic accident. It is because the driver has a lack of focus, which might be caused by the environment or the behavior of the driver him/herself, like chatting on the road, playing hand phone, listening to the music, and etc. These make the driver could not anticipate with the situation on the road and pay attention with changed sudden situation.⁹ In addition, another study also revealed that there was a significant relationship between the scatterbrained driver with the traffic accident.¹⁰

This study also revealed that undisciplined behavior influenced the number of traffic accidents. There were 74.7% of cases for those who had undisciplined behavior. This behavior, according to the literature, is caused by many factors, including the lack of information regarding the regulation on the road, knowing the rules but ignored, and even does not care with the regulation and the safety. Some drivers like preempting another vehicle, do not keep their distance, stop carelessly, or stop at the zebra crossing lines that should be stopped before the line, especially when the red light; adding speed when the traffic light is yellow to avoid the red light for various reasons, the habit of driving such as overtaking or zigzag, violate the traffic signs, do not wear a helmet while driving, do not complete the completeness of the vehicle such as the rearview mirror is removed or replaced with a smaller size for reasons of style, running red lights, and against the flow of traffic.⁹

The findings of this study also indicated that, based on OR value, undisciplined driver had 11.990 greater times risk getting accidents compared to those who were discipline. This is consistent with the theory that said the main obstacle in improving road safety is a discipline in the society in in the road. The lack of discipline is one of the factors that led to the accident. The number of accidents that begins with traffic violations, especially violations of signs and traffic lights.⁹ This is also supported by previously study, stated that undisciplined behavior of motorists obtained value OR = 1.503, which means undisciplined motorists were at risk 1,503 times in an accident compared to the riders who were well behaved. However, the behavior of each person is very complex that is related to the accidents, mostly from incautious of the drivers.¹¹

Exceeding speed limits, another factor that was revealed in this study that influenced the traffic accident. Findings indicated that the drivers who exceeded the speed limits had 79.1% cases of accidents. Literature said that high rates of driving over the speed limit are caused by various factors, namely, physical condition or the smooth asphalt roads that lead riders to add to the vehicle speed, deserted traffic conditions, and the habit of driving at high speed is >50km/h.¹⁰ In addition, age is also related to the maturity level of the driver, particularly in the decision to advance, and the ignorance factor related to the standard of speed limit that lead to the traffic accidents. The finding of this study also showed that, based on OR value, those who were driving exceed the limit had 4.230 times greater risks to get accidents.

This is consistent with the literature indicated that the driving behavior over the speed limit is the human factor that is at risk for road traffic

accidents.¹² Speed is at the core of motor vehicle traffic injury problems on the road. Speed affects the risks and consequences of accidents. The physical condition of the road and the surroundings encourage drivers to increase the speed of the vehicle. The increase of the risk of accidents is in line with the increase of the speed of the vehicle, especially at a crossroads, and the habit of overtaking. Riders as road users often underestimate the speed limit and underestimate the distance of an approaching vehicle.¹² Another study also revealed that the rider speed more than 50 km/h is at risk 1.796 times to traffic accidents. Vehicle speed is closely associated with the driver. A half of all traffic accidents occur on roads with speed <50km/h. It is because the vehicles at high speed can not be controlled perfectly, especially at the slippery roads or bend.¹¹

In regards to the ownership of driving license, Driving License or SIM is a proof of a person who has met the requirements for driving. Drivers who have a license can be said to have mastered the skills of driving on the highway and more aware of traffic rules on the road than those who do not have a license. Driver who have a license can be a benchmark in the drive, but it does not guarantee no possibility of traffic accidents.¹³ Findings of this study indicated that those who had no driving license had 76.9% cases of accidents. The finding of this study also showed that those who had no license were 10.455 greater times risks than those who had license.

This is consistent with the study indicating that Driving License (SIM) is a proof of registration and identification provided by Polri (Indonesian National Police) to someone who has met the requirements of the administrative, physical and spiritual health, understand

the traffic rules and skillful driving a motor vehicle.¹⁴ Any person driving a motor or car on the road is required to have (SIM) a driving license in accordance with the type of vehicle being driven.¹⁴ To get a license, the candidate must have a driving competence that can be acquired through education and training or learn on their own, and must meet the age requirements, administration, health, and pass the exam.¹⁴ This is also supported by the previous study who revealed that there was a significant relationship between the driving license ownership and the risk of accidents.¹⁵

However, this study also showed that there were traffic accidents for those who had license. Literature revealed that those who had driving license but getting accidents are influenced by various factors, including people do not follow the test for licensing at the local police for reasons of time, the complicated process, and the cost.¹⁵ People mostly do not obtain a driving license, or get driving license through brokers without testing, or get a "SIM shoot" with age under 17 that do not meet the standard, which are vulnerable for accidents.¹⁴ On the other hand, SIM ownership for drivers should be considered an important thing, because it shows drivers expertise in running their vehicles. If the mental the drivers assume that the SIM ownership is intended to avoid police operations traffic, then it is likely the numbers of traffic accidents will still happen.

CONCLUSION

It can be concluded that the scatterbrained factor, undisciplined behavior, exceeding the speed limit, and no driving license are the risk factors for road traffic accidents in the city of Palu. From this finding, the recommendation were proposed in the following statements:

- Community in Palu should be vigilant and careful, especially when you are riding, which is required good concentration in driving and pay attention to signs and traffic signs around the streets for safety.
- Community should be encouraged to always follow the order of traffic in order to avoid traffic accidents, due to traffic accidents occurred originated from minor infractions.
- Community should not be affected with the smooth and quite condition of the road, because when the vehicle is in a state rate will be difficult to control and could endanger themselves and others.
- Community should take the test of driving license, because in the tests there is information on rules and procedures for traffic safety, as well as the feasibility of bringing a vehicle symbol corresponding legislation.
- Cross-sectoral cooperation in addressing the problem of traffic accidents should be held, especially in the city of Palu, both from the police in the SIM expenditure, monitoring traffic conditions, policing and law enforcement as appropriate; and also the transportation department in issuing signs, curb lanes or traffic or traffic management; and health personnel in the provision of education-related traffic accidents hazards and implement Safety Riding for the creation of a culture of healthy traffic.
- Further research should be conducted related to the traffic accidents in the city of Palu and related factors, including the human factor, vehicle factor, the road factor, and weather factors / environment, as well as other factors that affect or relate related traffic accidents in the city of Palu.

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