

A PRELIMINARY ANALYSIS ON ROAD ACCIDENTS AMONG FOOD DELIVERY MOTORCYCLISTS: DETERMINING THE FACTORS INFLUENCING THE ACCIDENTS

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Abstract

Road accidents are the most prevalent phenomena in every part of the planet in our everyday lives. Driver behavior is one of the key elements in this dilemma. In this study three behaviors, human factor, road conditions and road safety policies, are collected from road users situated in Johor Baharu. The purpose of the project is to discover the key elements within those three factors that might affect motorcyclists' road accidents. A regression analysis would be conducted to identify the significant three behavioral factors contributing to the accidents. A total of 112 riders would be selected using a simple random sampling technique to complete the survey. The results showed that the road conditions are an important factor in determining the road accidents for motorcyclists delivering meals in Johor Baharu. Accordingly, the relevant recommendations based on the results may be proposed in that the local government should create an additional motorcycle route to facilitate their travel and further strengthen the motorcycle road regulations as well. These measures can assist and even help to prevent the road accidents among motorcyclists.

Keywords: behavioral factor, motorcycle accident, road accident, impact safety policies

1. Introduction

In certain growing and key regions of the world the majority of motorbikes are now known and become the most prevalent method of transportation in Malaysia. One key reason why motorbikes are so prevalent in those nations was the substantially cheaper prices for motorcycles and the low fuel usage. Because of economic reason and easy movement, especially because of congestion, motorcycles have become Malaysia's second most frequent method of transport. It also has the negative consequence of road accidents, such as deadly accidents, despite the significance of transit in the society

Nevertheless, the trend in Malaysia revealed that mortality rates have grown from the beginning of the 1990s for motorcycle accidents in South-East Asia. Reckless driving is an important driver mistake affecting the motorcycle accident fatality rate. It is observed that motorcyclists had taken off traffic signals about three times. Oral. The main cause of mortality in Malaysia due to motorcycle infractions is head injury for not wearing the helmet, Nur Sabahiah & Satoshi (2011) did in a research in Malaysia. The authors suggest that the danger of

head injuries by motorcycles can be reduced by bis zu 72 percent. In Malaysia, 62.9% of motorcycle deaths reported injuries involve head.

In all parts of Malaysia, the definition of a road accident is contained in the 2012 Malaysia Road Accident Report for statistical purposes when the road accident is an occurrence on public or private roads caused either by disregard or lack of any person or by environmentally friendly causes which lead to at least a moving vehicle accident involving fatal injury, or death (PDRM, 2009). The proportion of deaths involving motorcyclists and passengers from 2008 to September 2017 appears to be the greatest (61.2%) compared to the other categories published by the Road Transportation Department, Malaysia (2017).

The biggest problem in this study was when The Star.com (August 2020) said that deadly engine crashes primarily involve "passenger automobiles," (28%) and that 50 percent of the collisions are carried out either by individual crashes (25%) or by other motorcycle drivers (25%). Whereas male bikers predominant (94% of deaths), female bikers aged 31 to 70, with 'no license' and not casket-wearing, are higher than male bikers.

Over the previous ten years, fatality rates for motorbikes have increased markedly, and thus the Malaysian Government must take a more urgent approach to road transport safety. Sustainable Development Goal 3 (SDG3) of the United Nations (UN) on "Health and Well-being," focuses at "halving the number of global road traffic deaths and injuries" (the SDGs were set in 2015). Statistics have indicated Malaysia's government has to do more to meet the UN's Sustainable Goal to minimize motorcyclists' fatalities.

1.1 Objectives

1.1.1 To identify the factors contributing to the road accidents among food delivery motorcyclists

1.1.2 To determine the significant factors contributing to the road accidents among food delivery motorcyclists.

2. Literature Review

Human Factors

The most important motorcycle accident element is the component of human behavior, according to a research by Zahid Sultan et al. The previous research concentrated on traffic infractions and motorcycle features, whereas motorcyclists' prospects and personal preferences of dangerous riding behavior. All human-linked danger factors are experience, lack of conducting training, high speed and not complying with traffic norms (Mullin et al, 2000; Chen et al, 2009; Peek-Asa et al, 2010; Wong et al, 2010; Rhodes and Pivik, 2011).

Additional study on incidents of motorcycle accidents in Malaysia must be underlined as affecting speed behavior. It has therefore been suggested that the reduction of travel speed might decrease accident injury. Studies showing travel over 60km/h can seriously harm motorcyclists at lesser speeds justify the plan. The proposal (Nur Sabahiah A.S and Satoshi F, 2011). In addition, the interaction of the driver with other road users is most likely to impact the safety of the rider, including assault and the amount to which the driver reacts or offsets the driver's fault (Huth, Füssl, and Risser, 2014). Owing to the unavailability of protection for motorists against vehicles features (Elliott, Baughan & Sexton 2007), motorcyclists are particularly vulnerable to harm. Aggressive driving is logically bad from a safety viewpoint.

Road Conditions

In early 2000, the Government started a National Motorcycle Safety Program to minimize motorcycle accidents. The initiative involves promoting motorcycling amenities, such as the delivery of bike lanes or extra lanes along the road to decrease conflicts and the chance of catastrophic injuries in the event of traffic accidents. The number of accidents was first ever dedicated to the motorbike path on a Federal Highway in Selangor (Hussain H. et. al. 2005). Despite traffic accidents, the designated lane or additional lane space continues to occur when implementing the project (Muhammad Marizwan Abdul Manan & András Várhelyi, 2012). Damaged sidewalks are regarded one of the main driver accident reasons (Fares et al., 2010).

The risk of road accidents, such as road surfaces or potholes, is raised for vehicle drivers, since public (functional or structural) road failures put them more at risk (Zakaria, 2011). (Kumar and Gupta, 2010). Malaysia's federal roads are badly maintained and display a great deal of floor damage, causing problems for road users (Mohd Hizam, 2009) and leading to overall road and road performance (Mansor, 2010). Traffic delays, car crashes and paradoxically, therefore increasing maintenance expenses are prone to federal highways (Yap, 2010). Because of poor technological design, low building standards, trucks overloaded, harsh subways and the adverse weather,

damage might occur (Abas, 2011). The disabled thereby receive numerous complaints from road users, roughly half of them relating to the aforementioned damaging form (Mohd Hizam, 2009).

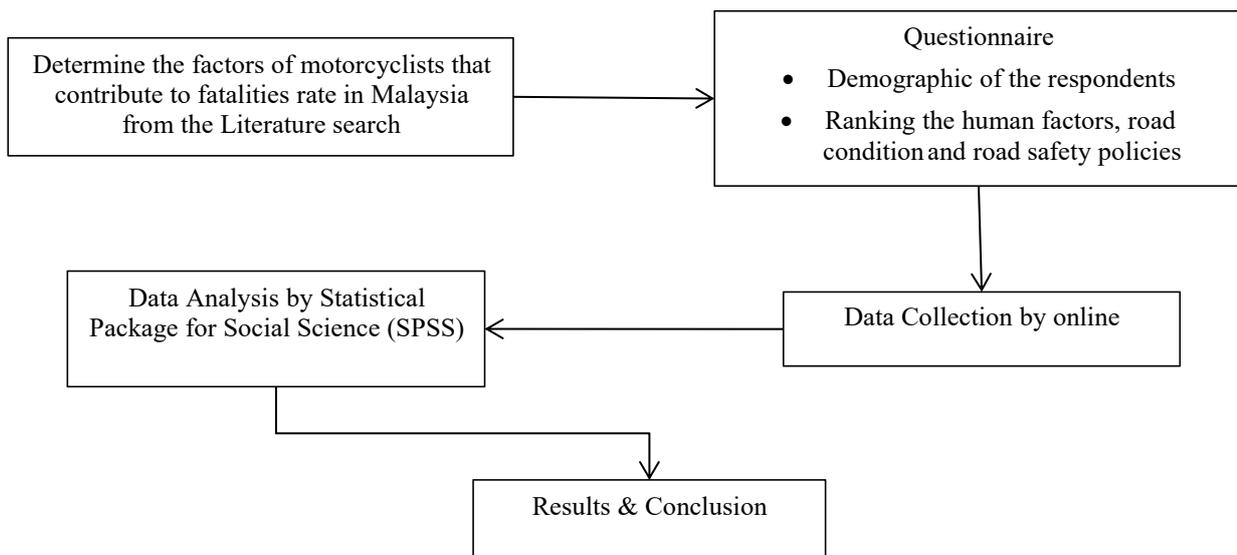
Road Safety Policies

Road safety management (RSM) contributes to developing and implementing national policies on road safety to address road accidents and road fatality. The government uses RSM in a much more specific manual to set its road safety goal, plan the best and appropriate strategy for execution, carry out intervention, assess intervention and then perform results-based research. RSM is utilized to determine its aim and objective. The government has created a road safety plan for 2014-2020 to address the serious problem of a road accident in Malaysia with five major strategic structures, including Road Safety Management, Safer Mobility & Roads and Safer Vehicles and Safer Road Users.

The Government of Malaysia has taken a number of efforts to execute the 2014-2020 Road Safety Plan including soft and harsh enforcement techniques. Soft implementing techniques are utilized to provide the community with information and awareness about road safety. The government uses convincing communication and education medium to instruct the public to comply with road safety laws and regulations, through the execution of the road safety strategy, the road safety education program and the road safety training program (Olumide & Owoaje, 2016). However, the Malaysian government has used harsh enforcement tactics to enhance the Community's stricter compliance with traffic laws. These techniques discipline the public using the traffic ticket, penalties, penalty demerit system and camera system (Mphela, 2011).

3. Methods

Figure 1: Process of methodology



A descriptive research design coupled with a quantitative method have been employed via the current cross-sectional study to identify the key variables between the human factor, road conditions and road safety policies for road accident fatality amongst food supply motorcyclists. The instrument was designed by Endut, Holt, Shehu and Elma (2014); Harith and Mahmud (2018) and Harith, Mahmud and Doulatbadi. The instrument was adapted from earlier research (2019) Before collecting the data and obtaining the reliability values for all the variables evaluated, a pilot study was done. The surveys were disseminated via social media sites, a technique of unlikely sampling was used. The respondents in Malaysia were food delivery riders. Before agreeing to participate in the survey, the respondents were requested permission. A total of 112 were acquired successfully and all replies were valid for analysis following the data cleaning process. Analysis of correlation was carried out to evaluate the amount of association among food supply motorcyclists between the human, road and safety factors (independent variables) and the death rate (dependent variable).

For this study, the hypotheses proposed were as stated below:

- H₁: Human factor has a significant impact on the fatalities rate among food delivery motorcyclists.
 H₂: Road conditions have a significant impact on the fatalities rate among food delivery motorcyclists.
 H₃: Road safety policies have a significant impact on the fatalities rate among food delivery motorcyclists.

4. Data Collection

This study was based on a primary data gathering method using a set of questionnaires and applying a quantitative technique to analyze the data. Firstly, the primary data been used in this study to collect data. The questionnaires were distributed using social media platforms to those who are motorcyclists and provide food delivery service in Johor Baharu, Johor, Malaysia. Respondents were asked permission prior to their agreement to participate in the survey. The eligible of respondent had been placed along with the questionnaire to check the validity to be fit in this study. The respondents were requested to read the opening instruction and understand the description stated and fill out the questionnaire in careful manner. A total of 112 data were successfully obtained and after going through data cleaning process, all responses were valid for analysis. The secondary data were gathered for any valuable information from past researcher that related to the study. The common sources of secondary data were from journal, newspaper, bibliographies and others. This helps in enhancing the understanding of the problem from the researcher point of view for additional information required.

5. Results & Discussion

Table 1: Demographic Analysis

Demographic Variables		Frequencies	Percentage (%)
Gender	Male	86	76.8
	Female	26	23.2
Age	18-19 years old	20	17.9
	20-24 years old	38	33.9
	25-29 years old	33	29.5
	30-34 years old	21	18.8
Education	SPM/Certificate	65	58
Level	Diploma	30	26.8
	Degree	16	14.3
	Postgraduate	1	0.9
Job	1-3 Months	8	7.1
Experience	4-6 Months	17	15.2
	7-9 Months	5	4.5
	10-12 Months	4	3.6
	More than a year	78	69.6

The total respondents analyzed from the survey was 112, which included 76.8% (n=86) males and 23.2% (n=26) females. Based on age group, 17.9% of the total fell within 18-19, 33.9% within 20-24, 29.5% within 25-29, while the rest at the age of 30-35, 18.8 %. Most respondents who held a high school qualification were 58%,

26.8% with diploma, 14.3% with degree, and 0.9 % were postgraduates. All respondents were having at least a month experience as a food panda rider with 7.1% within 1-3 months, 15.2% having experience for 4-6 months, 4.5% within 7-9 months and 3.6 % within 10-12 months. Meanwhile 69.6% of respondent have explore this career for more than a year. The respondents were asked whether had they ever experience an accident during delivering which 91.9% involved meanwhile 8.9% never encounter yet.

Table 2: Reliability Coefficient of Variables

Variables	Items	Cronbach's Alpha value
Human Factor	7	0.714
Road Condition	7	0.670
Road Safety Policies	6	0.788

*Sample size=112

From table 2, the reliability test based on the Cronbach's Alpha values for all variables portray a moderate and good score which is therefore acceptable. This can be seen from the score value of human factor showing a good score with 0.714. While for road condition, it is rather moderate and acceptable value as the score is 0.670. Road safety policies which ais the last factor indicates a good value with a score of 0.788.

Table 3: Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	2.257	.303		7.438	.000
	Human Factor	-.007	.008	-.117	-.809	.421
	Road Safety Policy	-.004	.011	-.079	-.378	.706
	Road Condition	-.038	.014	-.407	-2.689	.008

a. Dependent Variable: Fatalities Rate

In determining the significant factors, sig value for each of the variables must be observed. Sig value should not exceed $p=0.05$. The values shall be less than alpha 0.05 for the hypothesis to be accepted. Table 3 depicted that the significant sig-value of human factor was 0.421, road safety policy was 0.706 and road condition stated 0.008. Two out 3 variables score a p-value of more than 0.05 except for road condition. Hence, road condition is the only significant factor showing a 1% level of significance meaning it is the factor that contributed to the fatalities rate among motorcyclist in Johor Baharu.

5.3 Proposed Improvement

In general, all variables such as human factor, road condition and road safety policies are related to fatalities rate in road by motorcyclist. However, result finding shows all factors at a weak relationship which it may not only one factor that contributes to fatalities rate. Among all variables, human behavior and road condition are the highest due to perception and behavioral of human non-controllable. Despites with the pandemic season, people tend to ride a motor with high speed although the road is less traffic and the road policies is upgraded. Some are due to ignorant of rider, some came from the outer pressure to gain more income due to the commission are based on deliver took place in a day. Therefore, management of the company should emphasize of rider safety first rather than the amount of product delivered in a day by replace the policy of commission income with monthly salary income. Not only that, infrastructure such as loopholes, damage surface road should be monitor by authority frequently in order to reduce the number of incident cases. As the result are based on perception of respondent by quantitative method, it is a fixed answer and the data will be bias. Hence, it is suggested to place the mix method survey with interview (qualitative) method to determine which factor is highly related to fatalities rate and what are their suggestion in order to reduce

the cases. By doing so, the research result may determine which part is highly correlated and give an idea on each individual perspective of factor of accident among the motorcyclist.

5.4 Validation

Hypothesis Testing

In determining the hypotheses, significant value for each of the variables must be observed. Significant value should not exceed $p=0.05$. The values shall be less than alpha 0.05 for the hypothesis to be accepted. From the analyses conducted, the values obtained were: human factor, $p=0.00$, road safety policy $p=0.01$ and road condition, $p=0.00$. As all the values were less than $p=0.05$ thus the hypothesis is accepted. All variables are having relationship to fatalities rate.

6. Conclusion

The results of this study are highly relevant in the global setting, in particular for countries pursuing methods that are comparable to those discovered in Malaysia. Studies demonstrate that the only way to reduce risks among motorcyclists is to establish separate lanes, in particular exclusive lanes for them. However, road maintenance may be improved and suggestions from this research indicate a more optimum and consistent execution of the maintenance plan should be conducted frequently. Based on the results it proves that road condition causes accidents, and thus road safety partly relies on the proper maintenance of road surfaces. Additionally, climate and road degradation could also contribute to accidents, therefore repairs need to be carried out often and again a good maintenance schedule needs to be planned efficiently so that the consequent of wasteful costs such as repairs, delays and social cost could be lessened. Malaysia's road infrastructure should pay greater attention and develop passive and lasting solutions to prevent damage to all the key stakeholders.

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Biography

Dr Siti Ayu Jalil is currently attached with Malaysia Institute of Transport (MITRANS), Universiti Teknologi MARA, Shah Alam as the Head of Legal Services and Quality. She completed her Doctoral of Philosophy in the area of *Environmental Economics* from Universiti Putra Malaysia, Master of Business Administration (Finance) from Universiti Malaya, Malaysia and Bachelor of Arts in Economics (Hons) (Financial Studies) from Newcastle-Upon-Tyne Polytechnic, UK. Her research interest is on Carbon Dioxide emissions and Macroeconomics Studies. She has involved in various research with industries such as Prasarana Malaysia Bhd., Maritime Institute of Malaysia (MIMA) and Department of Road Transport, Ministry of Transport and currently holds two university research grants. In MITRANS as Head of Quality, she is responsible for preparing and attaining the MQA/IQA-01 partial accreditation and MQA/IQA-02 full accreditation for Diploma Executive Program collaborating with the Department of Road Transport. Whereas as Head of Legal Administrative, she is responsible for reviewing MITRANS' Memorandum of Understanding (MoU), Memorandum of Agreement (MoA) and other legal documents with the industries as well as the ministries. She has published about thirty papers in journals and conferences attended. She is also the executive editor of Journal of Emerging Economies of Islamic Research (JEEIR) UiTM.

Siti Nurul Suhada Rosle is a first year master student at the Faculty of Business & Management, Universiti Teknologi MARA. She earned Bachelor of Accountancy from Universiti Teknologi MARA, Malaysia on 2016. Her research interest is on the fatalities rate among motorcyclists which specifically focuses on the human behavior, road condition, environment factors and road safety policies.