



# Towards Sustainable Development in Road Safety: Assessing Public Awareness on Basic Road Traffic Practices in Batu Pahat, Johor

Amirul Naquiddin Tukirin<sup>1</sup>, Nursitihazlin Ahmad Termida<sup>1,2\*</sup>, Basil David Daniel<sup>1,2</sup>, Ahmad Raqib Ab Ghani<sup>1,2</sup>

<sup>1</sup>Faculty of Civil Engineering and Built Environment,  
Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, MALAYSIA

<sup>2</sup>Smart Driving Research Centre, Faculty of Civil Engineering and Built Environment,  
Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, MALAYSIA

\*Corresponding Author

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**Abstract:** Road accident contributes to high fatality rate around the world and being the 8th leading cause of death of all ages worldwide. Thus, road safety is essential for ensuring the safety and security of individuals of all ages, as well as reducing the number of traffic accidents and injuries as a one way to achieve Sustainable Development Goals 2030. This study aims to assess the level of road safety awareness in terms of basic road traffic practices among public who use Jalan Kluang Federal Route 50 (FT050). The level of knowledge on basic road traffic practices, the level of perceived real practice on basic road traffic practices, and the relationship between their level of knowledge and perceived real practice on basic road traffic practices were investigated. A survey method via questionnaire was distributed randomly to 200 respondents who are adults aged 18 and above and who live around Batu Pahat areas using Google Form online platform. Relevant statistical methods via Statistical Package for the Social Science Software version 26.0 (SPSS) such as descriptive, Mean Score Method, Correlation and Regression analyses were used to analyse the data. It is found that the level of knowledge on basic road traffic practices among public is high. Meanwhile, the level of perceived real practice on basic road traffic practices among public is low. Regression analysis results show that the awareness on knowledge of basic road traffic practices variable ( $\beta = 0.624$ ,  $t = 11.229$ ,  $p < 0.05$ ) demonstrate a statistically significant relationship with perceived real practices, indicating that, the better an individual's awareness on knowledge of basic road traffic practices (e.g. importance of safety belt, safety helmet, child restraint system (CRS) and speeding) the better the individual to actually apply the basic road traffic practices (e.g. the use of seat belt, safety helmet, CRS and speeding).

**Keywords:** Road safety, awareness, road traffic practices, Batu Pahat, regression analysis

## 1. Introduction

Road safety has become a major concern all over the world with an increasing number of accidents [1]. Road accidents have increased year after year in developing countries. According to the World Health Organisation (WHO) Global Road Safety Report 2018 [2], road accidents have been the 8<sup>th</sup> leading cause of death for all ages worldwide and the 1<sup>st</sup> leading cause of death for young adults and children aged 5-29 years old, worldwide. In Malaysia, road accidents are one of the most serious social issues nowadays. Thus, road safety has long been considered a social responsibility of the Malaysian government. Many observations and analyses of traffic accident conditions, as well as the effects of

humans, vehicles, and the road environment in the traffic system on traffic safety have been made. According to Omar & Omar [3], Johor is one of the Malaysian states with the highest accident rate, particularly on Federal Route 50 (FT050), which connects the districts of Batu Pahat, Ayer Hitam, and Kluang. Batu Pahat district recorded a very high increase in accident rates from time to time [4]. Hence, this study was conducted to investigate the road safety awareness among public who use Jalan Kluang Federal Route (FT050). In detail, their knowledge and perceived real practice on basic road traffic practices such as speeding, the use of seat belts, the use of helmets and the use of child restraint system (CRS) for children were assessed. These four basic road traffic practices were chosen in this study due to the fact that speeding is one of the major contributory factors to road accidents [5]-[7] and helmets [8], seat belts [9], and CRS [10] use can reduce the risk of road fatalities significantly, thus resulting in low road fatality rates. Moreover, the use of CRS in Malaysia is still new [11] and low [12]. If the level of awareness on these four can be understood, then the actions can be done to lowering the road fatality rates to achieve the Sustainable Development Goals 2030 by the United Nations (UN) in making cities and human settlements inclusive, safe, resilient, and sustainable [13]. In this case, by creating transportation infrastructures that are more safe, accessible, and affordable for all societies [14].

The aim of this case study was to address the issue of road safety awareness among public on Jalan Kluang Federal Route (FT050) in terms of basic road traffic practices. The following are the study's primary objectives which are to identify the level of knowledge on basic road traffic practices among public, to assess the level of perceived real practice on basic road traffic practices among public, and to examine the relationship between the level of knowledge and perceived real practice on basic road traffic practices among public. The road safety awareness that has been studied is the level of knowledge and perceived real practice on basic road traffic practices among public on FT050 such as speeding, the use of seat belts, the use of helmets and the use of CRS for children. In order to accomplish the objectives of this study, the study was conducted on public who use FT050 and the samples are among adults aged 18 years old and above. The survey method via questionnaire was applied to collect the data. Data was then analyzed using descriptive and inferential statistics techniques via Statistical Package for Social Science (SPSS) software version 26.0.

## 2. Basic Road Safety Practices

In this study, basic practice of road safety focuses on four issues: (i) speeding, (ii) seat belt use, (iii) helmet use, and (iv) CRS use. Speeding has shown to be the most elevated on record for the cause of road traffic accidents among the behavioural components studied [6], [7]. Speed limits are put in place by the road authority to advise and regulate motorists about safe driving speeds and these limits are enforced by police or road transport authorities [15]. This is done in order to improve road safety and reduce the number of traffic collisions that cause road traffic accidents. With proper enforcement, a speed limit can be a useful traffic safety technique for improving an area's safety level.

Numerous studies on the benefits of seat belts for drivers and front-seat passengers have found that seatbelts can reduce the risk of all injuries by 40–50 percent, serious injuries by 43–65 percent and fatal accidents by 40–60 percent [16]. Therefore, it is very important for all road users to wear seat belts properly while riding in a vehicle to avoid serious injuries in the event of an accident.

A helmet used must be in accordance with the Motorcycle Safety Helmets (MSHs) standards which have been tested in accordance with the procedures set out in Standard MSHMS1: 1996 (Standards and Industrial Research Institute of Malaysia, SIRIM, 1996) [17]. The standard of the used of MSHs was determined by the results obtained using the SIRIM testing procedures according to MS1:1996 MSH standard requirements [17]. The SIRIM testing procedures include the impact test, the penetration test, and the retention test, which were conducted at the impact testing station, the penetration testing station, and the retention testing station, respectively. There were "pass" and "fail" alternatives for these test outcomes. The tested MSHs that passed all tests were considered "standard" MSHs and the failed MSHs (failed at least one test) were considered "nonstandard" MSHs. In addition, helmets in Malaysia must follow the certified motorcycle helmet standard as each helmet has the SIRIM certification label.

The Malaysian government has decided to make installing a child safety seat or CRS in all types of vehicles mandatory beginning January 1st, 2020 [11]. This CRS is required for all vehicle owners with children under the age of 11. Therefore, a proper mitigation measure must be considered to increase the safety of children. CRS can be one of the medium that can be used. CRS has been shown to significantly protect children in car accidents [12]. To ensure that CRS is used effectively, it must adhere to the correct guidelines in terms of CRS type and installation [18]. Malaysia Institute of Road Safety Research (MIROS) currently provides comprehensive guidelines to private vehicle users in terms of acceptable types of CRS that meet safety requirements. MIROS has also implemented QR codes for all CRS sold in Malaysia. The QR code will provide additional information on how to select the correct CRS product. Aside from that, this code links to a website with instructions on how to properly install the CRS and provide the required age and height of the children or infant [11].

## 3. Methodology

This research has applied quantitative method in order to identify the level of knowledge on basic road traffic practices among public, to assess the level of perceived real practice on basic road traffic practices among public, and to examine the relationship between the level of knowledge and perceived real practice on basic road traffic practices among

public. The probability sampling method using simple random sampling technique are applied in this study. Adults aged 18 and above, and who live in Johor's Batu Pahat District were chosen as respondents since this study was focused on adults knowledge and perceived real practice on basic road traffic practices such as speeding, the use of seat belts, the use of helmets and the use of CRS for children, in which it is not suitable to be asked among children who mainly has no driving license yet. The data required for this study was gathered using a survey method via online Google Form as a questionnaire instrument due to pandemic Covid-19 state when this study took place. The questionnaire contains 3 sections: Section A (Demographics of Respondents), Section B (Level of Respondents' Awareness Regarding Knowledge on Basic Road Traffic Practices) and Section C (Respondents' Level of Perceived Real Practice Regarding Basic Road Traffic Practices). The data were then analysed using relevant statistical methods using SPSS version 26.0 such as for Section A, descriptive analysis in a form of frequency and percentage was used, the Mean Score Method, Correlation and Regression Analysis were used for Section B and C.

### 3.1 Respondent Profile's Analysis

According to Trochim & Land [19], descriptive statistics are employed to determine the distinctive properties of the data during analysis. In addition, they argued that this method might provide a straightforward overview of the study sample. This technique is also the basis for nearly all quantitative data analyses and simple graphical analyses. Thus, in this study, descriptive statistical analysis using frequency method implemented on gender, age, races, education status, employment status, monthly income, vehicle license, years of driving/riding experience, type of private vehicle and perceived travel speed. The analysis's findings were presented as a percentage shown in Sub-Section 4.1.

### 3.2 Mean Score Method

The mean is one of the central tendency distribution methods for measuring the average or centre of distribution of variables [19]. In this procedure, the total mean is added together and divided by the number of total quantities. The 5 Likert scale were indicated with the different level from 1 to 5 (1 = not very important, 2 = not important, 3 = neutral, 4 = important and 5 = very important) for Section B (Level of Respondents' Awareness Regarding Knowledge on Basic Road Traffic Practices) and (1 = very rare, 2 = rare, 3 = seldom, 4 = often and 5 = very often) for Section C (Respondents' Level of Perceived Real Practices Regarding Basic Road Traffic Practices). The mean score range was divided into two categories which are high (3.67 – 5.00) and low (1.00 – 3.66) based on Wiersma [20].

### 3.3 Correlation and Regression Analyses

In correlation analysis, the strength of the relationship between two variables is determined which denoted as  $r$ . Positive  $r$  values indicate that there is a positive relationship between the variables, whereas negative  $r$  values indicate that there is a negative relationship. In this study, awareness on knowledge of basic road traffic practices acts as an independent variable ( $X$ ) and perceived real practice acts as a dependent variable ( $Y$ ).

Regression analysis is an approach to examine the relationship between the level of knowledge ( $X$ ) and perceived real practice ( $Y$ ) on basic road traffic practices among public in route FT050. Thus, simple linear regression analysis using least square method was used in this study and equation (1) shows the regression equation.

$$Y = B_0 + B_1X_1 \quad (1)$$

where  $Y$  = Dependent variables (Perceived real practice on basic road traffic practices),  $X_1$  = Independent variable (Knowledge of basic road traffic practices) and  $B_0$  and  $B_1$  = Coefficients or regression.

## 4. Results and Discussion

A pilot study has been conducted before the questionnaire was distributed to the respondents in order to determine the level of reliability of the questions that have been developed. The total sample size used in the pilot study must be 10% of the projected sample size [21]. As a result, 20 respondents were chosen as a sample for the pilot study. Two sections of questionnaire which include Section B (Level of Respondents' Awareness Regarding Knowledge on Basic Road Traffic Practices consists of eight questions) and Section C (Level of Perceived Real Practice Regarding Basic Road Traffic Practices consists of seven questions) were analysed for reliability test. The results of Cronbach Alpha on eight questions in Section B is 0.914 which is considered as excellent value. Meanwhile, the Cronbach Alpha value for seven questions in Section C is 0.892 which is considered a good value. Since all of the Cronbach's alpha values are 0.700 or higher, this is considered as an acceptable value [22]. As a result, it can be stated that all of the questions for all sections can be used for data collection.

### 4.1 Data Analysis

A total of 200 respondents have participated in the survey and their profiles are shown in Table 1.

**Table 1 - Respondents' profiles (N = 200)**

<b>Item</b>	<b>Frequency</b>	<b>Percentage, %</b>
<b>Gender</b>		
Male	108	54.0
Female	92	46.0
<b>Age (Years Old)</b>		
18-25	60	30.0
26-40	112	56.0
41-60	26	13.0
>60	2	1.0
<b>Race</b>		
Malay	155	77.5
Chinese	25	12.5
Indian	18	9.0
Others	2	1.0
<b>Education Level</b>		
PMR and below	3	1.5
SPM/STPM	85	42.5
Diploma	43	21.5
Degree	61	30.5
Master/PHD	8	4.0
<b>Employment Status</b>		
Government sector	31	15.5
Private sector	103	51.5
Self-employed	37	18.5
Student	18	9.0
Unemployed	11	5.5
<b>Monthly Income</b>		
< RM2000 (B40)	88	44.0
RM2000-RM4000 (B40)	95	47.5
RM4000-RM6000 (M40)	12	6.0
>RM6000 (T20)	5	2.5
<b>Vehicle License Ownership</b>		
Yes	200	100.0
No	0	0
<b>Years of Driving/Riding Experience Respondents</b>		
< 1 Year	9	4.5
1 – 5 Years	51	25.5
>5 Years	140	70.0
<b>Private Vehicle Ownership</b>		
Motorcycle	18	9.0
Car	125	62.5
Van	0	0
MPV	57	28.5
<b>Perceived Average Travel Speed (km/hr)</b>		
< 60		
60 – 90	6	3.0
90 – 110	39	19.5
>110	150	75.0
	5	2.5

Referring to Table 1, most of the respondents are male (54%), adults ranging from the age group of 26-40 years old (56%), Malay (77.5%) and have education level of SPM/STPM (42.5%). Meanwhile, most of the respondents' employment status are working in the private sector (51.5%) and earns from RM 2000 to RM4000 per month (47.5%). In addition, all of the respondents have vehicle license and have driving/riding experiences of 5 years and above (70%). Majority of them own a car (62.5%) and their perceived average travel speed while driving/riding is between 90-110 km/hr (75%).

#### 4.2 Determine Level of Respondents' Awareness Regarding Knowledge on Basic Road Traffic Practices

To determine the level of public awareness regarding their knowledge on basic road traffic practices, Mean Score Method was used. Table 2 shows the results obtained.

**Table 2 - Mean score for Section B (level of respondents' awareness regarding knowledge on basic road traffic practices) (N = 200)**

Questions of Section B		Mean
Scale: 1=Not Very Important, 2=Not Important, 3=Neutral, 4=Important, 5=Very Important		
1)	Is it important for you to know about road safety in Malaysia?	4.480
2)	Is it important for you to know about the speed limit while driving/riding?	4.145
3)	Is it important to know the function of seat belts?	4.155
4)	How important for you to use safety belt for short distance travel? (e.g: Below 5 kilometers)	3.255
5)	Is it important for you to know about the function of helmets?	4.125
6)	Is it important for you to know about the standard certified for motorcycle helmet in Malaysia?	3.760
7)	Is it important for you to know about the function of child restraint system (CRS) for children?	4.265
8)	Is it important for you to know about the standard guidelines for CRS in Malaysia?	3.860
<b>Mean Score</b>		<b>4.006</b>

Based on Table 2, question 4 has the lowest mean score with 3.255. The question is "How important for you to use safety belt for short distance travel? (e.g: Below 5 kilometers)". Therefore, it shows that the respondents have a low awareness level for this question which may contribute to the low practice of using safety belt for short distance travel. This is in-line with Kulanthayan et al. [23] in which that the compliance to the seat belt use is much higher for car users driving in city centre areas than with those driving outside city center areas. Note that this study has been conducted in sub-urban areas of Batu Pahat, thus contributes to low compliance of seat belt use. Meanwhile, question 1 has the highest mean score with 4.480. The question is "Is it important for you to know about road safety in Malaysia?". Therefore, it shows that the respondents have a high awareness level for this question. Or in other words, the respondents aware that knowledge on road safety is crucial. The overall mean score for section B is 4.006. It can be concluded that the level of respondents' awareness regarding knowledge on basic road traffic practices is high level. These results are synchronised with Anjang Ahmad et al. [24] on the level of road safety awareness among secondary school students in Batu Pahat, in which they found that the respondents have a high level of awareness (in terms of knowledge and attitude regarding the importance of safety on roads), however, the knowledge may not be translated into their daily practices on road.

#### 4.3 Determine Level of Respondents' Awareness Regarding Perceived Real Practice on Basic Road Traffic Practices

To determine the level of public awareness regarding their perceived real practice on basic road traffic practices, Mean Score Method was used. Table 3 shows the results obtained.

**Table 3 - Mean score for Section C (perceived real practice regarding basic road traffic practices) (N = 200)**

Questions of Section C		Mean
Scale: 1=Very Rare, 2=Rare, 3=Seldom, 4=Often, 5=Very Often		
1)	How often do you follow the vehicle speed limit while driving/riding?	3.890
2)	How often do you wear seat belts while driving on the road?	3.470
3)	How often do you use safety belt for a short distance travel? (e.g: Below 5 kilometers)	2.765
4)	How often do you wear a motorcycle helmet while riding a motorcycle on the road?	3.095
5)	How often do you use child restraint system (CRS) for your children while travel?	3.540
<b>Mean Score</b>		<b>3.352</b>

Based on Table 3, question 3 has the lowest mean score with 2.765. The question is "How often do you use safety belt for a short distance travel? (e.g: Below 5 kilometers)". This shows that majority of the respondents have a low level of perceived real practice regarding basic road traffic practices, which is synchronised with the level of knowledge on the importance of using seat belt for short distance travel (items in Section B). It is known that short distance travel mainly occurred in residential areas in which low enforcement had at this area type due to low speed environment, thus may contributing to the low use of seat belt. As stated by Mohamed et al. [25], seatbelt enforcement activities are

significantly affecting seat belt wearing rate. Meanwhile, question 1 has the highest mean score with 3.890. The question is “How often do you follow the vehicle speed limit while driving/riding?”. As a result, the majority of respondents have a positive perception about their vehicle speed while driving/riding, in which that they perceived they are obeying the speed limits. The overall mean score for Section C is 3.352. It can be concluded that the level of perceived real practice regarding basic road traffic practices is low level, as hypothesised by Anjang Ahmad et al. [24].

#### 4.4 Correlation and Regression Analysis

The Pearson correlation, *r* value between perceived real practice (PRP, as dependent variable) and awareness on knowledge of basic road traffic practices (AKBRTP, as independent variable) is 0.624, indicating moderate positive correlation relationship obtained and significant at 0.01 level (2-tailed), as expected.

The model summary for this survey can be seen in Table 4. The adjusted R<sup>2</sup> is 0.386 indicates that the model accounts for 38.6% of variance in the score. Hence, it was considered a moderate model.

**Table 4 - Model summary**

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change
1	0.624 <sup>a</sup>	0.389	0.386	0.66865	0.389

Table 5 shows the coefficients of regression results. It is found that the AKBRTP variable ( $\beta_1 = 0.624$ ,  $t = 11.229$ ,  $p < 0.05$ ) demonstrate a statistically significant relationship with PRP, indicating that AKBRTP has significantly affects the PRP. It can be concluded that in this study, the respondents’ awareness on knowledge of basic road traffic practices thus significantly contributing to their perceived real practice. This is similar to Anjang Ahmad et al. [24] in which that the relationship between road safety awareness and safe driving attitudes among teenagers in Batu pahat are significantly correlated.

**Table 5 - Regression Coefficients between PRP and AKBRTP**

Model		Coefficients <sup>a</sup>				t	Sig.
		Unstandardized Coefficients, B	Std. Error	Standardized Coefficients, Beta			
1	(Constant)	0.094	0.294	-	0.318	0.751	
	AKBRTP	0.813	0.072	0.624	11.229	0.000	

<sup>a</sup>Dependent Variable: PRP

#### 5. Discussion and Conclusions

The aim of this study is to examine the public awareness on basic road traffic practices in terms of speeding, seat belt use, helmet use and CRS use. According to the author’s knowledge, the study on the awareness of these four elements altogether is still outstanding, and mostly the literature on seat belt and helmet use are considered old that may be due to the difficulties in obtaining the data. Thus, this may be a contribution of this paper by looking at these four basic road traffic practices altogether that may contribute to the possible sustainable approach to increase road safety. Mean Score Method, correlation and regression analyses were done to achieve the aim.

Based on the analyses done, it is found that the level of respondents’ awareness regarding knowledge on basic road traffic practices is high level, while their perceived on real practice on basic road traffic practices, on the other hand, is in low level. These findings are similar with previous study’s findings by Anjang Ahmad et al. [24] on the road safety awareness among secondary school children (teenagers) in Batu Pahat, Johor. However, there is a question in both sections that may need some attention. For example, although on average, the level of the respondents’ awareness regarding their knowledge on basic road traffic practices is high, but the question on seat belt use for short distance has the lowest mean score (3.255). In addition, the perceived real practice questions on seat belt use for short distance among the respondents has also obtained the lowest mean score (2.765) result. This is alarming and actions need to be done in increasing the public awareness of the importance of seat belt use in any long or short distance travels. This issue is also raised in Lamin et al. [9] research paper that the seat belt wearing behaviour among Malaysian road users are alarming.

Another concern that is found in this study is that the speeding issue. Among the survey questions in Section C which shows a high average level is "How often do you follow the vehicle speed limit while driving/riding?". This question received the highest average level of 3.890 out of the five questions in Section C. However, based on the question asked in Section A on the perceived average travel speed that mostly the respondents behave, majority of the respondents (75%) answered that they drive/ride between 90-110 km/hr, which is considered high speed. Note that the posted speed limit for FT050 is between 60-90 km/hr, meaning that most of the respondents are speeding. This contradicts with the results found on the similar question asked in Section C as discussed above.



For the Regression analysis, it can be concluded that increase 1 unit in respondents' awareness on knowledge of basic road traffic practices will increase their perceived real practices of basic road traffic practices by 0.624 unit. In other words, the better an individual's awareness on knowledge of basic road traffic practices (e.g. importance of safety belt, safety helmet, child restraint system (CRS) and speeding) the better the individual to actually apply the basic road traffic practices (e.g. the use of seat belt, safety helmet, CRS and speeding). This finding is also similar to the similar study done among secondary school students in Batu Pahat [24]. Thus, actions through sustainable approaches need to be done by the related authorities on the seat belt and speeding issues in order to increase the awareness of road users about negative consequences of speeding and not using seat belts. Moreover, the relevant authorities need to intensify road safety campaigns among public as an effort to reduce fatal accidents in Malaysia as required by the Sustainable Development Goals 2030 [13]. Changing attitudes is a more direct way of increasing road safety awareness and using passive tools such as posters and flyers through sustainable way via online platform to promote the importance of road safety awareness in terms of basic road traffic practices can be done. The posters or flyers needs to have a clear and direct information. This is for public to understand the purpose of the posters or flyers. As for the speeding issue, the roadway design plays a vital role in which that the wide roadway segment needs to be avoided in order to reduce the speed of vehicles [26], such as installing appropriate traffic calming device or install dummy speed camera. For the future study, it is recommended to collect data from various places to further enhance the generalisation of the findings.

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