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# Protecting the Future: How Road Safety Knowledge Can Prevent Risky Behaviours among Adolescents in Malaysia

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**Abstract**

Road traffic injuries pose a significant safety challenge for adolescents, ranking as the leading cause of death and disability in this age group. This study aimed to investigate the association between road safety knowledge, acquired through the Road Safety Education (RSE) program, and risky behavior among Malaysian adolescents. Additionally, it sought to determine whether road safety knowledge could predict risky behavior and whether these relationships were influenced by gender and age. A stratified random sample of 725 secondary school students, aged 13 to 15 years, participated in the study, providing responses through a self-reported questionnaire. The questionnaire encompassed demographic information, self-reported behavior, and road safety knowledge. The analysis of the data revealed a noteworthy inverse correlation between road safety knowledge and risky behavior among the surveyed adolescents. Furthermore, the study conducted T-test analyses, uncovering statistically significant differences in road safety knowledge and risky behavior based on both gender and age. Linear regression analyses reinforced the importance of road safety knowledge, demonstrating it as a significant predictor of risky behavior on the road among adolescents. The study highlights the importance of Road Safety Education for adolescents and the need for broader community access to reduce road risks.

**Keyword:** Road Safety Education, Adolescents, Risky Behavior, Gender, Age, Road Traffic Injuries

## Introduction

Road traffic injuries are the biggest safety challenge for adolescents as they are vulnerable road users. It becomes a huge burden on economic growth of a country and a public health concern worldwide as they are the leading cause of death and disability among adolescents. In 2019, more than 100 000 adolescents (10–19 years) died due to road traffic accidents (Li Liu, et. al., 2022). WHO recorded around 220,000 adolescents aged from 0 - 19 involved in

road traffic accidents in 2019 worldwide. This situation is alarming as road traffic injuries rank as the tenth most prevalent contributor to Years Lived with Disability (YLDs) in the demographic of 15 to 19-year-old children (WHO, 2021). Approximately 25% of young people experience a repeated occurrence of a prior vehicular incident, contributing to 23% of fatal road accidents among adolescents aged 18 to 24 due to road-related injuries (Cebanu, Cazacu-Stratu & Cociu, 2020). In Western countries approximately 35% to 40% of injury-related mortalities among teenagers and young adults (Assailly, 2017).

In Malaysia, 324 cases were reported involved in road traffic injuries in 2021. They were in the age group of 11-15 years old (JPJ, 2022). These adolescents become more vulnerable to road injuries as they were exposed to the road environment when they start attending the school. Most of them are pedestrians, cyclists or users of motorized two-wheelers. The mode of transportation for most of the adolescents in Malaysia is motorcycles. Regrettably, motorcyclists are the top cause of death due to road traffic injury in Malaysia and engaging in hazardous road behaviors stands as a pivotal predictor among this demographic. Adolescents are inherently inclined to pursue novel and thrilling encounters. Part of this inclination is neurologically rooted, as their developing brains exhibit heightened sensitivity to rewarding experiences, compelling them to actively seek excitement more fervently compared to both children and adults. The problem is receiving increasing attention by governments, non-governmental organizations, and academics, indicated by the growing number of published studies in this field in identifying the main niches in their prevention.

The national government has established an objective to notably decrease fatalities and injuries resulting from road accidents by implementing educational interventions. Research indicates that Road Safety Education (RSE) yields greater effectiveness when started at a young age. Furthermore, the knowledge-attitude-behavior model posits that knowledge serves as a fundamental catalyst for instigating behavioral changes. It emphasizes that individuals acquire essential knowledge and skills necessary for behavioral modification through the process of learning. Students with a high level of risky traffic behaviors or with low knowledge of road safety rules are more likely to suffer road traffic injuries (Dong, 2011). Therefore, road safety knowledge has proved to be an independent protective factor for road traffic injuries.

Past implementations of Road Safety Education (RSE) interventions have demonstrated that well-structured and systematic programs have been proven to have an impact on some protective results of socio-cognitive and behavioral factors. However, the efficacy of these interventions has been notably contingent upon the specific characteristics and profiles of the recipients or beneficiaries (Cuenen, 2016). This underscores the significance of comprehensive intervention programs encompassing road safety education, knowledge dissemination, behavioral change strategies, and environmental risk management. Therefore, meticulous and precise planning becomes imperative for the successful execution of these programs. Ultimately, scientific evidence highlights the potential positive impact of Road Safety Education (RSE) when implemented with adherence to best practices. These include the programming of pedagogical objectives, the verification of the trainers' competences, the adaptation of methods in order to achieve the purposes, and the testing of the effects produced by the impact (Assailly, 2017).

In Malaysia, the Road Safety Education (RSE) programme was implemented in the national curriculum system. It is one of the road safety programmes in the 4th pillar of the Road Safety Plan of Malaysia 2014-2020 which deals with improving road user behaviour. The RSE programme in schools will create road safety awareness among school children as children and young people have a high involvement in road crashes, so they must learn to use the road safely. RSE programmes can develop knowledge, skills, attitudes and even more prominently - values that enable children and their family to use the road safely. The implementation of this programme was extended to cover secondary schools from form 1 to form 3. The focus of the RSE programme is for the youths as they are one of the vulnerable people to be involved in road crashes. There are several risk factors that contribute to road traffic injuries among youth such as not wearing helmets while cycling or riding a motorcycle, speeding, not wearing seatbelts, drunk driving and distracted driving.

Therefore, the purpose of this study was to evaluate the relationship between road safety knowledge gained from the RSE programme and risky behaviour among lower secondary schools in Malaysia. Additionally, the aims of this study were to assess whether the knowledge is predicting the risky behaviour of the sample. Furthermore, our aim was to examine whether these two variables were modified by gender and age. We hypothesised that adolescents who obtained more knowledge through the RSE programme are not likely to demonstrate risky behaviour and they are more prudent road users compared to those who are not receiving the road safety knowledge. It was assumed that there will be a significant difference of involvement in risky behaviour regarding gender and age of the adolescent.

## Methodology

### Research Design & Sampling

A cross-sectional study was utilized as a framework to conduct the whole study using quantitative research method. In this study, two-stage sampling comprising purposeful random sampling and simple random sampling was applied to gather the data. Six (6) states were identified based on the road crash statistics from the Royal Malaysia Police. The highest numbers of crash cases involving those aged 13 to 15 years old in six (6) districts were shortlisted, with one district representing one (1) state. Six locations were selected for a study in Malaysia, including Peninsular Malaysia, East Coast, and East Malaysia. These locations were chosen based on road crashes rates. During the second stage, four (4) secondary schools in each district were randomly selected as participating schools. Therefore, in total, twenty-four (24) secondary schools were selected. Data collection took place before the end of school terms, which begins in November 2022 until February 2023 after the module has been used for more than 10 months.

### Participant

The research encompassed an adolescent cohort comprising 725 individuals, with 50.8% (n=368) representing male participants and 49.2% (n=357) comprising female participants. The sample was drawn from twenty-four (24) specifically chosen secondary schools in Malaysia. Regarding age distribution, 34.3% (n=249) of respondents were 13 years old, 34.6% (n=251) were 14 years old, and a cumulative 31.0% (n=225) were 15 years old.

**Research Instrument**

To achieve the objective of this study, a survey form has been designed to evaluate road safety knowledge and risky road behaviour among secondary school students. The self-report questionnaires consist of three sections which are demographic data, road safety knowledge and risky road behaviours. In the demographic section: Data of age, gender, school, district, and state was gathered. As for Section A (Road Safety Knowledge), a total of 20 multiple-choice items were constructed to assess the level of road safety knowledge among the participants. All the items were developed based on the theme of Road Safety Education (RSE) modules that have been used in Malaysian curriculum. However, different questions were created for each age group since they use different RSE modules in school. The score gained from this section was 1 for the right answer and 0 for the wrong answer. Therefore, the total score ranged from 0 to 20 points, and higher scores indicated good road safety knowledge. In Section B, nine items of risky road behaviour were built to measure the level of risky behaviour among the participants. A five-point Likert scale of "Never", "Rarely", "Sometimes", "Always", "Often" was utilized to measure the frequency of each behaviour. The items were related to risky behaviour on crossing, cycling, riding, and driving behaviour. The total scores for this questionnaire ranged from 9 to 45 points, and higher scores revealed higher risky behaviours.

**Research Procedure**

This research project starts from November 2022 until February 2023. Approval to conduct the research has been granted by the Educational Planning and Research Division (EPRD), Ministry of Education. The officers from the selected State Education Departments and the District Education Offices regarding the involvement of the school in this study was informed by the research team. Arrangements for data collection were made once the school administrators conceded with the proposed study. Prior to the data collection phase, the researchers contacted the principals and the teachers-in-charged from each school to brief the school personnel about the research project. Upon the agreement of the school to involve in the study, a letter about details of the school visit together with an approval letter from the Ministry of Education was delivered to the respective school. A total 24 schools were involved in data collection from November 2022 till February 2023. For each school, all the participants were gathered in a room for the briefing session by the researcher before answering the survey.

**Data Analysis**

Data were processed and analyzed using SPSS software, and the descriptive and inferential statistics were applied. Simple frequency and percentage were used to examine the level of road safety knowledge and risky road behaviour among the adolescents. It was categorized into three levels, namely low, moderate, and high, based on the score and data distribution. Percentage was also utilized to present the distribution of data for each item. As for inferential statistics, correlation analysis using Pearson Correlation was carried out, with the aim of establishing relationships between the study variables. Additionally, an independent sample t-test was utilized to determine the mean difference of safety knowledge and risky behaviour according to gender and age. Further analysis using linear regression was also utilized to predict the effect of road safety knowledge on risky behaviour on the road. The significance levels adopted were 0.01.

**Results**

Table 1

*Level of road safety knowledge and risky behaviour among adolescents*

| Variables | Level | | | | | |
|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | |
| | N | (%) | N | (%) | N | (%) |
| **Road Safety Knowledge** | 6 | 0.8 | 187 | 25.8 | 532 | 73.4 |
| **Risky Behaviour** | 669 | 92.3 | 56 | 7.7 | - | - |

Table 1 shows the level of road safety knowledge and risky behaviour among respondents. It was divided into low, moderate, and high. In terms of road safety knowledge, the finding revealed that 73.4% (n=532) of the respondents recorded a high level of road safety knowledge, 25.8% (n=187) of them were in moderate level and only 0.8% (n=6) respondents reported having low knowledge on road safety knowledge. Parallel to the finding, most of the respondents, 92.3% (n=669) rarely involved in risky behaviour on the road while only 7.7% (n=56) of them reported having risky behaviour at moderate level.

Table 2

*Correlation between road safety knowledge and risky behaviour*

| Variables | Road Safety Knowledge | |
|---|---|---|
| | R value | Sig. |
| **Risky Behaviour** | -0.228** | 0.000 |

**. Correlation is significant at the 0.01 level (2-tailed)

A Pearson correlation coefficient was computed to determine the relationship between road safety knowledge and risky behaviour (Table 2). The result revealed a significant negative correlation between road safety knowledge and risky behaviour ($r=-0.228$, $p<0.000$). Therefore, the finding indicated that as the level of road safety knowledge increases, the level of risky behaviour decreases. The finding has approved our hypothesis.

**Table 3**

*Mean difference of road safety knowledge and risky behaviour between gender*

| Variables | Gender | Mean | Std. Deviation | F Value | Sig. |
|---|---|---|---|---|---|
| **Road Safety Knowledge** | Male | 14.20 | 2.958 | 10.444** | .001 |
| | Female | 15.12 | 2.464 | | |
| **Risky Behaviour** | Male | 10.1413 | 4.65562 | 10.401** | .001 |
| | Female | 7.8908 | 3.91150 | | |

**. The mean difference is significant at the 0.01 level (2-tailed)

Table 3 displayed the mean differences of road safety knowledge and risky behaviour according to the gender of the respondent. Further analysis using an independent-sample t-test showed a statistically significant difference in road safety knowledge between different gender ($F(723) = 10.444$, $p = .001$). The 95% confidence interval of the difference between means ranged from (-1.322 to -.527) and it indicated a difference between the means of the

sample. Therefore, we accepted the hypothesis that there is a significant difference of road safety knowledge between the gender. In addition, the finding also discovered a statistically significant difference in risky behaviour based on the gender (F (723) = 10.401, p = .001). The 95% confidence interval of the difference between means ranged from (1.62265 to 2.87845) and it indicated a difference between the means of the sample. Therefore, we accepted the hypothesis that there is a significant difference of risky behaviour between the gender. Furthermore, female respondents (M=15.12, SD=2.464) reported higher mean scores on road safety knowledge compared to male respondents (M=14.20, SD=2.958). Nevertheless, male respondents (M=10.1413, SD=4.65562) recorded higher mean value on risky behaviour compared to female respondents (M=7.8908, SD=3.91150).

Table 4
*Correlation between Knowledge and Behaviour with Gender and RSE Input*

| **Variables** | **B** | **b** | **t** | **p** |
|---|---|---|---|---|
| Road Safety Knowledge | -0.368 | -0.228 | -6.309 | .000 |

Note: R2 = 0.052, Dependent variable: Risky Behaviour

Table 4 presented the result of a linear regression. Regression analysis was used to test whether road safety knowledge significantly predicted the risky behaviour. The overall regression was statistically significant (R2 =0.052, F (1, 723) = 39.81, p < .000). It was found that road safety knowledge significantly predicted risky behaviour (β = -.368, p < .000). Therefore, the research hypothesis is accepted.

**Discussion**

The study's findings underscore the pivotal role played by road safety knowledge in equipping individuals with the information necessary to make informed decisions, ultimately shaping their choices towards safer behaviors. It is noteworthy that this relationship between road safety knowledge and the tendency for risky behavior transcends demographic and age boundaries, extending its influence across diverse populations. This aligns with Alonso et al (2018) assertion that teenagers exposed to comprehensive road safety education exhibit a noticeable reduction in engaging in risky behaviors such as speeding, neglecting seatbelt usage, and distracted driving. This observation resonates with the concept that knowledge serves as an empowering tool, enabling individuals to opt for safer alternatives and adhere to established road safety norms. The connections that demonstrate adolescents who have undergone road safety courses not only exhibit a heightened awareness of road safety regulations but also manifest a decreased inclination towards hazardous driving behaviors (Romer et al., 2014). This relationship is underpinned by the theoretical framework of planned behavior by Ajzen which suggests that individuals are more inclined to engage in safe behaviors when they possess a robust comprehension of the inherent risks and consequences associated with reckless actions (Dinh et al., 2020).

Studies also show that gender differences in road safety knowledge and behavior have been observed, with men generally exhibiting more risk-taking tendencies while driving compared to women (Granié et al., 2020). Previous studies have shown that male drivers are more likely to engage in reckless driving practices, while female drivers tend to prioritize safety over

speed (Chen, 2009). While these gender-based disparities exist, it is essential to emphasize that all drivers should adhere to traffic laws and prioritize road safety. Promoting safe driving practices among both males and females, especially young drivers, is key to reducing accidents and fatalities caused by risky behaviors (Arnett et al., 2002). Recognizing these gender differences and implementing gender-specific education and training programs can contribute to creating a safer driving environment for everyone on the road.

Road safety education plays a pivotal role in mitigating hazardous road behaviors. Research by Alonso et al (2018) underscores the interconnectedness of age, observed misconduct, attitudes toward road safety, and risk perception with the road risky conduct exhibited by children and adolescents. Studies, as delineated by Scott-Parker (2017), have consistently indicated that individuals possessing higher levels of road safety knowledge are notably less inclined to engage in perilous behaviors, such as excessive speeding or distracted driving, underscoring the significance of comprehensive road safety education, especially when initiated at a young age.

In accordance with Üzümcüoğlu et al (2020), heightened awareness and comprehension of traffic regulations yield a propensity for more responsible driving conduct, thereby contributing to enhanced road safety for the entire populace. For school students and beyond, an imperative extends beyond mere compliance with traffic laws, encompassing a profound understanding of the rationale behind these regulations. This knowledge empowers informed decision-making while driving, facilitating the avoidance of perilous behaviors detrimental to personal and collective safety. Moreover, a nuanced comprehension of traffic laws cultivates empathy towards fellow motorists, while fostering a sense of communal responsibility for the well-being of the broader community. Consequently, this perspective underscores the necessity of actively pursuing road safety education to foster responsible driving practices, thereby enriching the overall safety landscape on our roads.

**Limitation**

One significant drawback of self-report questionnaires is the potential for respondents to provide inaccurate or socially desirable answers. This limitation arises from various factors, including respondents' willingness to be truthful, their memory limitations, and the desire to present themselves in a favorable light. Consequently, this can lead to the collection of unreliable or invalid data, undermining the quality of the research findings.

Another limitation worth noting is the racial imbalance in the respondent sample. The study's data collection revealed a disproportionate distribution of respondents across different racial groups, with a predominant representation of the Malay race. This imbalance could be attributed to various factors, including the demographics of the schools involved in the study. It is essential to recognize that this imbalance may impact the generalizability of the study's findings, as the experiences and perspectives of students from underrepresented racial backgrounds may not be adequately captured. Additionally, external factors, such as the COVID-19 pandemic and the shift to online learning, may have further influenced the students' exposure to road safety education. These contextual factors should be considered when interpreting the study's results, as they could impact the effectiveness of the road safety education module in the specific educational context.

**Implication and Recommendation**

The study's findings hold significant implications for both practitioners and road safety education theory. It underscores the critical importance of continuous and comprehensive road safety education, particularly among young individuals. This emphasis extends beyond merely raising awareness of traffic regulations; it also highlights the program's role in fostering responsible driving behaviors, ultimately contributing to enhanced road safety for all. Practitioners in the field can leverage these insights to emphasize the need for ongoing knowledge dissemination and effective implementation, especially at the school level. Moreover, from a theoretical perspective, the study aligns with well-established theories like the Theory of Planned Behavior by Ajzen, shedding light on the pivotal role of knowledge in shaping human behavior. This contribution extends the understanding of how knowledge can influence and promote safer behaviors across various domains, enriching our comprehension of decision-making and behavior on a broader scale.

The study's emphasis on the Road Safety Education (RSE) program, a joint initiative between the Ministry of Transport and Ministry of Education since 2004, further underscores its importance. This program's primary goal is to equip students and teachers with road safety knowledge to ensure the safety of future generations on the road. The study's confirmation of the positive impact of RSE in fostering safer behaviors among students highlights the need for its continual improvement and sustainability. Key recommendations include ongoing knowledge acquisition, regular utilization of RSE modules, and robust monitoring mechanisms. Additionally, supporting teachers and educational institutions in delivering RSE effectively is crucial. These measures collectively aim to promote responsible road behaviors among students and contribute significantly to creating a safer road environment for everyone.

**Conclusion**

In conclusion, this study underscores the critical role of Road Safety Education (RSE) in equipping Malaysian adolescents with the knowledge necessary to reduce risky behavior on the road. The findings reveal a significant inverse correlation between road safety knowledge acquired through RSE and risky behaviors among adolescents, highlighting the program's effectiveness in promoting safer road behaviors. Moreover, gender and age differences in road safety knowledge and behavior emphasize the importance of tailoring education and interventions to address specific demographic groups. The study's linear regression analysis further solidifies the significance of road safety knowledge as a predictor of safer behavior among adolescents. These insights underscore the need for continued investment in RSE programs, both in schools and across the broader community, to mitigate the risks of road traffic injuries among young individuals. Additionally, the study highlights the importance of ongoing monitoring and formative assessment to ensure the sustained effectiveness of RSE implementation, calling for collaborative efforts between teachers, the Ministry of Education, and relevant stakeholders to enhance road safety education in Malaysia.

**Statements and Declarations**

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**References**

Alonso, F., Esteban, C., Montoro, L., Serge, A. (2019) Conceptualization of aggressive driving behaviors through a perception of aggressive driving scale (PAD). Transp Res F: Traffic Psychol Behav 60:415–426. https://doi.org/10.1016/j.trf.2018.10.032

Arnett, J., Irwin, C., & Halpern-Felsher, B. (2002). Developmental sources of crash risk in young drivers. Injury Prevention, 8(Suppl 2), ii17–ii23. https://doi.org/10.1136/ip.8.suppl_2.ii17

Chen, C.-F. (2009). Personality, safety attitudes and risky driving behaviors—Evidence from young Taiwanese motorcyclists. Accident Analysis & Prevention, 41(5), 963–968. https://doi.org/10.1016/j.aap.2009.05.013

Dinh, D. D., Vũ, N. H., McIlroy, R. C., Plant, K. A., & Stanton, N. A. (2020). Effect of attitudes towards traffic safety and risk perceptions on pedestrian behaviours in Vietnam. IATSS Research, 44(3). https://doi.org/10.1016/j.iatssr.2020.01.002

Granié, M.-A., Thévenet, C., Varet, F., Evennou, M., Oulid-Azouz, N., Lyon, C., Meesmann, U., Robertson, R., Torfs, K., Vanlaar, W., Woods-Fry, H., & Van den Berghe, W. (2020). Effect of Culture on Gender Differences in Risky Driver Behavior through Comparative Analysis of 32 Countries. Transportation Research Record: Journal of the Transportation Research Board, 2675(3), 274– 287. https://doi.org/10.1177/0361198120970525

Jabatan Pengangkutan Jalan Malaysia (JPJ). 2022. Buku Statistik Kemalangan Jalan Raya. Bahagian Keselamatan Jalan Raya, JPJ.

Liu, L., Villavicencio, F., Yeung, D., Perin, J., Lopez, G., Strong, K., & Black, R. E. (2022). National, regional, and global causes of mortality in 5–19-year-olds from 2000 to 2019: a systematic analysis. *The Lancet Global Health*, *10*(3), e337–e347. https://doi.org/10.1016/s2214- 109x(21)00566-0

Romer, D., Lee, Y.-C., McDonald, C. C., & Winston, F. K. (2014). Adolescence, Attention Allocation, and Driving Safety. Journal of Adolescent Health, 54(5), S6–S15. https://doi.org/10.1016/j.jadohealth.2013.10.202

Scott-Parker, B. (2017). Emotions, behaviour, and the adolescent driver: A literature review. Transportation Research Part F: Traffic Psychology and Behaviour, 50, 1–37. https://doi.org/10.1016/j.trf.2017.06.019

Üzümcüoğlu, Y., Özkan, T., Wu, C., & Zhang, H. (2020). Traffic climate and driver behaviors: The moderating role of driving skills in Turkey and China. Journal of Safety Research, 75, 87–98. https://doi.org/10.1016/j.jsr.2020.08.004

World Health Organization (WHO). (2019). Global Health Estimates. https://www.who.int/data/global-health-estimates

World Health Organization (WHO). (2022). Global Health Estimates. https://www.who.int/data/global-health-estimates