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UNDERSTANDING THE HUMAN FACTORS CONTRIBUTING TO HIGHWAY ACCIDENTS

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ABSTRACT

Highways play a significant role in supporting economic growth and improving connectivity in Malaysia. However, highway accidents threaten public safety, making comprehending the factors contributing to their occurrence crucial. This article undertakes the human factors that contribute to highway accidents in Malaysia. A questionnaire survey method was employed, utilising quantitative analysis of factors influencing highway accidents. The sampling method utilised a simple random method with a sample size of 384 highway users in Malaysia. Six (6) factors influencing human behaviour were identified and examined to select the three (3) primary contributing factors in which the driver's recklessness ranks first among contributing factors. The findings provided insights into the primary contributors to highway accidents and will serve as a basis for developing suggestions and strategies to improve road safety. This research intends to help the development of proactive solutions to reduce accident rates and create safer transportation systems.

Keywords: *contributing factor, human behaviour, highway, accidents*

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Introduction

Highway accidents are a big problem affecting many countries and societies worldwide. Highway accidents are problems that happen on roads, usually with vehicles. These accidents are caused by human, vehicle, environmental factors, and infrastructure inadequacies. Highway accidents are a serious problem worldwide because they cause a lot of pain and suffering, economic losses, and social problems. Sustainable Development Goal (SDG) 3 (Good Health and Well-Being) is directly affected by unsafe driving behaviours that cause deaths and injuries on the road. In the same way, accidents like these make it harder to reach the goals of SDG 11, which is to create safe, fair, and sustainable urban settings. Therefore, adopting safe driving habits and enforcing regulations are critical for developing peaceful societies, as outlined in SDG 16 (Peace, Justice, and Strong Institutions).

According to the World Health Organization (WHO), approximately 1.35 million people would die in road accidents each year in 2022, with between 20 and 50 million more people suffer injuries, and many end up being disabled. Similarly, according to WHO (2022), road accidents are currently the eighth biggest cause of mortality globally across all age categories and are anticipated to become the seventh greatest cause of death by 2030. Also, according to Royal Malaysia Police (2022), there were 402,626 road accidents in Malaysia from January to September 2022, killing 4,379 individuals. This is an increase from the same time last year when 255,532 road accidents killed 3,324 individuals. Highway accidents, thereby have consequences beyond immediate death and injuries. People, families, and society all bear the financial, social, and psychological impact of these tragedies. Additionally, accidents significantly impact public health because they result in fatalities, permanent disabilities, and years of life lost (Saleh & Quddus, 2013). Accidents can also result in long-term issues that lower the quality of life for the survivors and their families. The emotional trauma that people experience can also have a negative impact on their relationships and mental health, such as psychological distress and post-traumatic stress disorder (PTSD). For instance, the psychological impacts of Malaysian road accidents show that accident survivors frequently experience psychological distress (Asiah et al. 2017). In addition to causing physical damage, accidents on the road result in people losing their employment and their ability to work.

Furthermore, accidents place a heavy financial burden on Malaysia's economy, harming the country's economic development. Like other countries, Malaysia has a significant expense of dealing with road accidents resulting in injuries or fatalities (Musa et al., 2020). The World Health Organization (WHO) (2018) estimates that the economic costs of road accidents cause an average decline in GDP of 3% per nation. The economy is significantly impacted by traffic accidents, including in terms of medical expenses, property damage, litigation, and lost productivity.

These costs pressure people, insurance networks, medical institutions and the economy. According to the Malaysian Road Safety Research Institute (2017), road accidents in Malaysia cost the country RM9.28 billion in 2017. Additionally, the Ministry of Transport (2019) stated that there were over 6,100 fatalities in road accidents in 2019 alone, with the number of incidents remaining relatively constant from 2010 to 2019.

These accidents have far-reaching consequences, affecting economies, society, and progress towards the Sustainable Development Goals. In addition, fostering behavioural change among road users is an important but difficult strategy for reducing highway accidents. This is because changing deeply rooted habits and attitudes takes a long time and much work in education, public awareness campaigns, and changing social norms. The complexities of behavioural change necessitate various strategies (Yannis et al., 2019). Moreover, cultural and attitude barriers may make it more difficult for people to change their behaviour in Malaysia. Public awareness campaigns and educational programmes promoting safe driving practices should be adopted to address these issues. Eventually, this gap leads to the study's research topic. The title of this study was chosen to highlight the need to understand the human variables contributing to highway accidents to develop effective interventions and promote road safety. As a result, by tackling this issue, Malaysia may make substantial progress towards SDG 17 and the creation of safer, more sustainable transport networks for its population.

Literature Review

According to the Malaysian Institute of Road Safety Research (MIROS) (2021), unsafe driving practices such as impaired, distracted, reckless, fatigued, and speeding significantly impact highway accidents. These behaviours make it more challenging to build safe and sustainable cities, especially on frequently used highways like the North to South Expressway (NSE), Federal Highway-Route 2, and New Klang Valley Expressway (NKVE), which hinder Malaysia's achievement of sustainable cities and communities (SDG 11).

Highway accidents are categorized as major or minor, depending on their severity. Even though every accident is different, the severity can be determined by the type of collision, risk factors, and vehicle impact pattern (GHSA, 2022). Despite having a sophisticated transportation system and a well-maintained road network, Malaysia has a high rate of accidents, which poses a significant concern for policymakers and experts in road safety. Notwithstanding the efforts to reduce the frequency of collisions, Malaysia continues to report a high number of fatalities and serious injuries due to road accidents, with human factors being the main contributor.

Human Behaviour Factor

Human behaviour is one of Malaysia's leading causes of highway accidents. It includes people's actions, choices, and traits of personality that contribute to road accidents. These traits include various issues, including the drivers' mental health, attitudes, talents, knowledge, and driving behaviours. These behaviours increase the likelihood of accidents and endanger the lives of drivers and other road users (Zheng et al., 2019).

Table 1: Summary of human factors that contribute to highway accidents

Challenges / Author	MIROS (2021)	Nasir et al. (2018)	Rahman et al. (2019)	Uddin et al. (2020)	MOT (2019)	Brown et al. (2018)	Smith et al. (2020)	Johnson et al. (2017)	Hussain et al. (2018)	Mohd Rus et al. (2021)	RMP (2021)	Nelson et al. (2015)	Hou et al. (2020)	Frequency
Distracted driving	/					/	/	/						4
Reckless driving	/	/	/		/			/						5
Speed driving	/		/	/			/							4
Fatigue driving					/				/	/				3
Impaired driving	/					/		/		/				4
Blindspot	/										/	/		3

Distracted Driving

Distracted driving is defined as any activity that diverts the driver's attention away from the road, and it is becoming increasingly common in Malaysia (Brown et al., 2018). It includes using a cell phone, eating, drinking, conversing with other passengers, or using in-car technologies. Road safety is at risk from distracted driving because it reduces a driver's ability to concentrate, respond quickly, and make wise driving decisions. Additionally, distractions of many kinds, including cognitive, physical, and visual, can impair driving performance (Smith et al., 2020). Moreover, distracted driving contributed to over 3% of fatal events in Malaysia, according to Johnson et al. (2017). Additionally, using a phone while driving greatly increased the risk of an accident by 7.5%, and nearly 25% of drivers admitted to doing so (MIROS, 2021).

Reckless Driving

Driving recklessly is another significant factor contributing to road accidents in Malaysia. The leading causes of accidents in Malaysia, according to Rahman et al. (2019), were reckless driving practices. Reckless driving contributed to more than 25% of fatal events in Malaysia (Mohd Nasir et al., 2018). According to MIROS (2021), human behaviour significantly impacts the likelihood of accidents. Additionally, research from Malaysia's Ministry of Transport shows that reckless driving was a factor in 17.6% of all road accidents in 2019 (MOT, 2019). For instance, overtaking from the left and right lanes and tailgating were the most frequent reckless driving behaviours resulting in accidents (Johnson et al., 2017).

Speed Driving

According to MIROS (2021), speeding is the number one factor contributing to fatal road accidents in Malaysia, which caused 23.4% of all fatalities on Malaysian roads in 2020. Additionally, MIROS found that drivers of large vehicles, such as trucks and buses, were more inclined to exceed the permitted speed limit, making them more susceptible to road accidents. After all, driving at high speeds increases the chance of an accident and the severity of injuries in the event of an accident (Rahman, 2019). In addition, Smith et al. (2020) found that human behaviour accounted for 62.7% of occurrences in Malaysia, with speeding being the most common driving behaviour contributing to accidents. Similarly, according to Uddin et al., (2020), speeding was a prominent cause of road accidents in Malaysia, accounting for 40.6% of all incidents because the likelihood of a fatal accident increased as the vehicle's speed increased.

Fatigued Driving

Another human behaviour that contributes to road accidents in Malaysia is fatigue. The Malaysian Ministry of Transport (MOT) (2019) reports that weariness contributed to 1.6% of all road accidents 2019. This is because drowsy or exhausted drivers have slower reaction times and less focus, which increases the likelihood of an accident. More than 5% of fatal incidents in Malaysia involve weariness (Hussain et al., 2018). Similarly, fatigue significantly contributed to 9.5% of Malaysian road accidents (Mohd Rus et al., 2021). Therefore, facilities for rest stops should be built beside highways to let drivers take pauses and rest when they grow tired, reducing the likelihood of accidents caused by weariness.

Impaired Driving

Driving when impaired by drugs, alcohol, or medication is a serious problem linked to human behaviour factors. The Royal Malaysian Police (RMP) (2021) estimates that 12.6% of all road accidents in 2020 were caused by drunk driving. Similarly, MIROS et al. (2021) reported that drunk drivers were to blame for 2.4% of road accidents in Malaysia. Drunk driving was more common among male drivers, those between the ages of 21 and 40, and those involved in accidents on weekends and public holidays.

Additionally, Brown et al. (2018) note that drunk driving is a common problem leading to highway accidents in Malaysia. According to Johnson et al. (2019), driving under the influence led to more than 10% of fatal incidents in Malaysia because it impairs judgment, response time, and eyesight, increasing the likelihood of an accident.

Ignoring Blind Spots

Ignoring a vehicle's blind spots when driving constitutes a serious threat to public safety because it raises the likelihood of creating numerous accidents and the consequences that come with them (MIROS, 2021). Furthermore, the risk of missing objects or cars in blind spots increases when using mirrors without shoulder checks (Hou et al., 2020). Many drivers need to correctly adjust their mirrors, which causes gaps in their field of vision, according to Nelson et al. (2015). Distracting activities while driving also divert the driver's attention from the road and make it more difficult to monitor the vehicle's blind spots.

METHODOLOGY

This research focuses on the quantitative method and is obtained using primary and secondary data sources. The primary information has been obtained by providing a series of questionnaire surveys to Malaysian highway users. Meanwhile, the secondary sources were obtained from literature reviews, journals, books, articles, dissertations, and other publications. The population size of highway users was referred from Malaysia Highway Authority (MHA) (2021), in which the average daily traffic (ADT) on all Malaysian highways was around 131,000 vehicles per day. Hence the sample size given from the population size is 384. The sample size was determined using Krejcie and Morgan's (1970) table. All of the 384 questionnaire survey forms were distributed among them by online platforms.

FINDINGS AND DISCUSSION

Based on Table 2, six variables have been determined to identify the human factors contributing to highway accidents. The average mean for this section, which is 4.39, indicated that most respondents considered all the human factors contributing to highway accidents entirely true.

Table 2: Mean ranking of human factors that contribute to highway accidents

	Statement	Mean	Agreement Level	Rank
1	Speed Driving	4.30	Strongly agree	4
2	Reckless Driving	4.49	Strongly agree	1
3	Distracted Driving	4.46	Strongly agree	2
4	Ignoring Blind Spots	4.34	Strongly agree	3
5	Impaired Driving	4.40	Strongly agree	5
6	Fatigued Driving	4.32	Strongly agree	6

The highest ranking implies that respondents agree that reckless driving is the leading cause of highway accidents. Most respondents strongly agreed that reckless driving is a serious problem, displaying a high degree of perception, and are concerned about this behaviour, as supported by the mean value of 4.49. In this regard, reckless driving has long been recognized as a major factor in highway accidents. Tailgating, for example, significantly increases the likelihood of an accident (Fergusson et al., 2013). Similarly, reckless driving behaviours, such as aggressive manoeuvres, are a major cause of highway accidents (McCartt et al., 2018). These behaviours are aligned with earlier research suggesting that these behaviours increase the chance of collisions and harm drivers and other road users.

The second-ranking variables indicate that respondents concur that distracted driving is a high-risk factor in highway accidents, to which the respondents overwhelmingly agreed with a mean value of 4.46. This is because distractions divert the driver's attention away from the road, resulting in delayed reactions and poor decision-making, increasing the chance of an accident (Klauer et al., 2014). Distractions, particularly mobile phone use, have been demonstrated in numerous studies to have a negative impact on driving performance and safety (Tornros et al., 2018). The increased usage of smartphones and other electronic devices has heightened concerns about this issue; thus, it shows a strong belief that distracted driving is a major highway issue.

Impaired driving, which includes driving under the influence of alcohol, drugs, or prescription, ranks third but remains a serious concern. The mean value of 4.40 represents the belief that this behaviour is a serious highway concern that causes accidents. Alcohol and drugs considerably impact driving abilities, reaction times, and decision-making processes (Li et al., 2017).

These rankings highlight the three main causes that highway users believe contribute to Malaysian highway accidents: reckless, distracted, and impaired driving. These findings can be used to teach and educate the public about the dangers of reckless driving, distracted driving, and impaired driving through educational campaigns, media initiatives, and community outreach programs. By addressing these behaviours, stakeholders may strive to reduce highway accidents, save lives, and make roads safer for everyone.

CONCLUSION

In conclusion, the study's findings indicate that reckless driving, distracted driving, and impaired driving are key factors contributing to highway accidents in Malaysia. Understanding and addressing human behaviour factors can help minimise highway accidents and improve road safety outcomes. Achieving these objectives aligns with SDG 3, which aims to ensure healthy lives and promote well-being. As a result, prioritising road safety and implementing measures to address human behaviour factors can help to create safer roads and healthier communities.

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Sekian, terima kasih.

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