

# A Conceptual Framework on Work-Related Road Safety of the Gig riders in Malaysia

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## Abstract

Road injury is a significant problem for many countries, especially those within low-and-medium income nations. Work-related road accidents have been increasing steadily with road fatalities. In Malaysia, commuting accidents has surpassed industrial accidents in the last ten years. The expansion of the gig economy is in line with the extensive recruitment of gig riders to satisfy the on-demand delivery services, which results in more injuries and fatalities between them. As work-related road safety among the gig riders has not been well studied within low-and-medium income countries, this study aims to present a conceptual framework to identify risk factors that can lead to injuries and fatalities among gig riders. A comprehensive literature review discovered socio-technical work-related risk factors including gig rider context, motorcycle design/safety, interaction with other road users, work/organization context and road/infrastructure/environmental conditions. This study will involve semi-structured interviews, a questionnaire and accident data analysis. This research will determine specific work-related risk factors of the gig riders which have not been thoroughly studied. Moreover, the framework can assist the future development of rules or regulations for reducing the injuries or fatalities of the gig riders, especially in Malaysia.

## Keywords

Work-related road safety, gig workers, on demand delivery service, conceptual framework

## 1. Introduction

Road injury is a significant public health issue and one of the world's top causes of mortality and morbidity. Based on the World Health Organization (2018) report, 1.35 million road fatalities have been recorded annually, where over half of the deaths occur to pedestrians, cyclists, and motorcyclists. These vulnerable groups are still far too often overlooked in the design of road traffic systems across the world. According to International Labor Organization data (2020), the number of work-related accidents has increased year after year since the beginning of the twentieth century. The trends might be worsening within low-and-medium income countries, although the literature is very little in exposing the severity of work-related road accidents within these regions. In Malaysia, the term "work-related road accident" is occasionally lumped in with "commuting accident" reports, particularly when it comes to worker's compensation by the Social Security Organization (SOCSO). SOCSO revealed that over RM 1 billion in settlements for road traffic injuries and fatalities had been paid out annually (Bernama 2021). Over the last ten years, commuting accidents in Malaysia have surpassed industrial accidents, with more than 80% of fatalities occurring while travelling to and from work (Bernama 2020). The Ministry of Transport Malaysia (2021) stated that over 60000 gig riders are currently working on Malaysian roads, with over 200 new riders registered daily. Their

number keeps increasing in line with the rising demand for their services, especially during the current pandemic where people have restricted mobility under Movement Control Order. Although with low traffic during that period, based on a report by the Ministry of Transport Malaysia (2021), about 17 deaths, ten severe injuries, and 64 minor injuries among gig riders were recorded in 2020.

Several approaches have been made on the work-related road safety of heavy vehicles (Newnam and Goode 2015) and the light vehicle fleet (Stuckey et al. 2007), but none have been done on a motorcycle. It is not surprising since existing research comes from high-income countries where motorcycles are not their preferred mode of transportation for work purposes. However, as a country with high motorcycle fatalities, Malaysia still lacks accurate data describing a motorcycle fatality related to work, commuting, or leisure. In addition, Kamaluddin et al. (2019) confirmed that low injury or minor accident has consistently been underreported, especially when it comes to traffic police data.

Since very little literature concentrates on the work-related road safety of the gig riders, we would like to propose a framework that can identify risk factors within the complex system which may influence the rider's injury and fatality. This framework is urgently needed as work-related road accidents cost the gig riders' lives, well-being in addition to the nation's economy. The framework helps in highlighting the critical work-related risk factors and assisting the authorities' future interventions in reducing work-related road accidents, especially among gig riders in Malaysia.

## 1.1 Objectives

This study aims to present a conceptual framework that identifies the work-related road risk factors and their relationship towards injuries and fatalities of the gig riders in Malaysia.

## 2. Literature Review

International Labor Organization (2020) has disregard commuting accidents as occupational accidents since it happens on the route away from the workplace and not within the work area. In the European countries, employees injured during commuting accidents are eligible for compensation except in the USA and Canada, where it is not considered a "work accident" (Charbotel et al. 2010). Commuting safety only stressed the safety measures workers need to take when commuting to and back from work or between those locations. However, it does not cover those who use "work vehicles" as employment tools (Stuckey and Prat 2013), such as taxi drivers, courier riders, e-hailing drivers, bus drivers or conductors, and others. "Work-related road safety" is often used by high-income nations such as the UK, US, and Australia (Stuckey et al. 2013). In Malaysia, work-related road safety has always been misunderstood as commuting safety. Consequently, Malaysian accident data includes all types of collisions linking to commuting workers in the "commuting accident" category without further details either it was work-related or not.

Previous studies in work-related road safety focused more on drivers of heavy (Chen et al. 2021; Newnam and Goode 2015) and light vehicle fleet (Newnam and Watson 2011, Stuckey and Lamontagne 2005, Stuckey et al. 2007). Most work-related road safety studies concentrating on the driver's behaviour (Broughton et al. 2009), working conditions (Fort et al. 2016), and management involvement in mitigating the occupational road risks (Rudyk et al. 2019). Road safety among motorcyclists has often been studied in the general transportation system and rarely within work-related road safety. Since minimal sources are available to review the risk factors of the gig riders, understanding the variables within the transportation system might be helpful as the gig riders are also motorcyclists with similar characteristics. For example, Damani and Vedagiri (2021) have extensively reviewed motorcycle safety in mixed traffic conditions and have developed a diagram showing existing risk factors, as in Figure 1. Similarly, in Malaysia, gig riders spend most of their time in mixed traffic flow. They may be contracting similar risk factors except that the diagram lacks gig works context, contributing to injury or fatality.

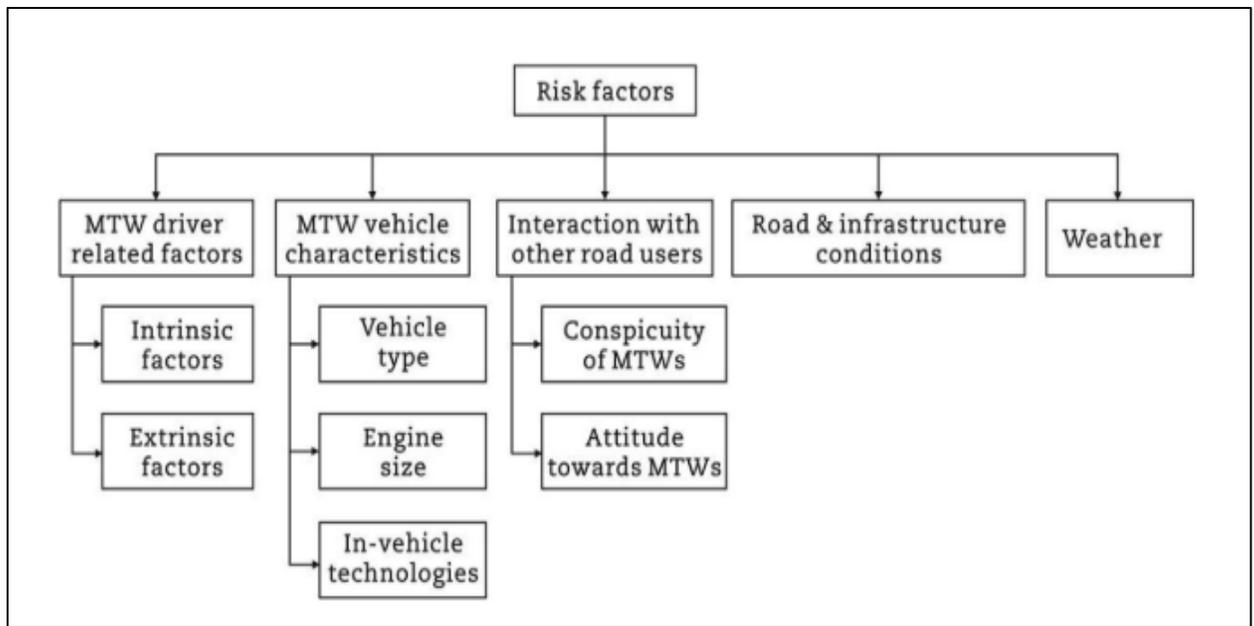


Figure 1: Classification of risk factors considered in the existing studies (Damani and Vedagiri 2021)

Christie and Ward had only mentioned gig workers' safety and health risks (including gig riders) in 2019. Their study found that the work context is the primary influence towards road collisions among gig workers. However, only 27 motorcyclists participated in their research, while most participants were a car or van drivers (138 out of 231 people surveyed). The report may represent work-related road risks among drivers rather than gig riders. According to da Silva (2020), the need for speed and the work environment of "motoboy" increased their risk of fatal motor vehicle accidents in Sao Paulo. This study does not explore any other risk factors concerning the complex work-related road safety of the riders. A recent study by Papakostopoulos and Nathanael (2021) found that young food delivery riders are more likely to participate in dangerous riding behaviour. Critical traffic offences like "red-light running" and "helmet nonuse" appear to relate to various stresses or motives for the riders. Their research was similar to previous work-related road safety studies where the behaviour of riders being the centre of accident occurrence.

Gig riders refer to motorcyclists who work within the gig economy sector. They are involved in the on-demand delivery of food, parcel, and others by taking the job thru apps. Howard (2017) described gig work as a "non-standard" app-based occupation and mentioned those platform providers consider the gig workers as independent contractors rather than "employees". According to Kaine and Josserand (2019) gig workers have little knowledge about their so-called "self-employed" status, making the platform providers escaping from regulatory responsibility as employers. This situation exposed the workers to gig job's operation risk (Bajwa et al. 2018), app disengagement by the platform providers (Stewart and Stanford 2017), unstable incomes (Doucette and Brandford 2019), and uneven tasks obtained with ambiguous working hours (Gandhi et al. 2018). Since gig riders are part of an informal economy like other gig workers, they may lack access to paid or sick leave, social protection, and income protection like other gig economists (ILO 2020). To lessen the gig workers' burden within the informal economy, the ILO (2019) has proposed a Universal Labour Guarantee for the workers to get minimum protection standards, including safe and healthy workplaces.

Similarly, Malaysia has also launched Penjana-Gig Scheme in 2020 to protect all gig workers (SOCSSO 2020). However, since the scheme is optional, it only attracted about 7% out of 400,000 gig workers to become registered members as of June 2020 (Bernama 2020). This situation left the unregistered gig riders unprotected, although their job was precarious.

### **3. Research methodology**

This research will identify the work-related road risk factors and their relationship towards injuries and fatalities of the gig workers. It will involve qualitative and quantitative methodologies. Before questionnaire development, a review of related literature and a semi-structured interview with the gig workers, road safety authorities, and other road users will be conducted. A questionnaire will be distributed among the gig riders within Klang Valley, and the study will analyse the accident data within the area. This study will limit its sample to only those residing within Klang Valley, where it is the hot spot for motorcycle accidents and has the most prominent gig riders apart from its heavy traffic flow. The statistical analysis of this study will be divided into qualitative and quantitative methods. This research will qualitatively examine the gig riders' work-related risk factors using thematic analysis. Additionally, the quantitative process will involve the study of the questionnaire's content validity and reliability. Lastly, the relationship between the risk factors towards injury and fatality will be analysed using Sequential Equation Modelling software.

#### 4. Development of conceptual framework

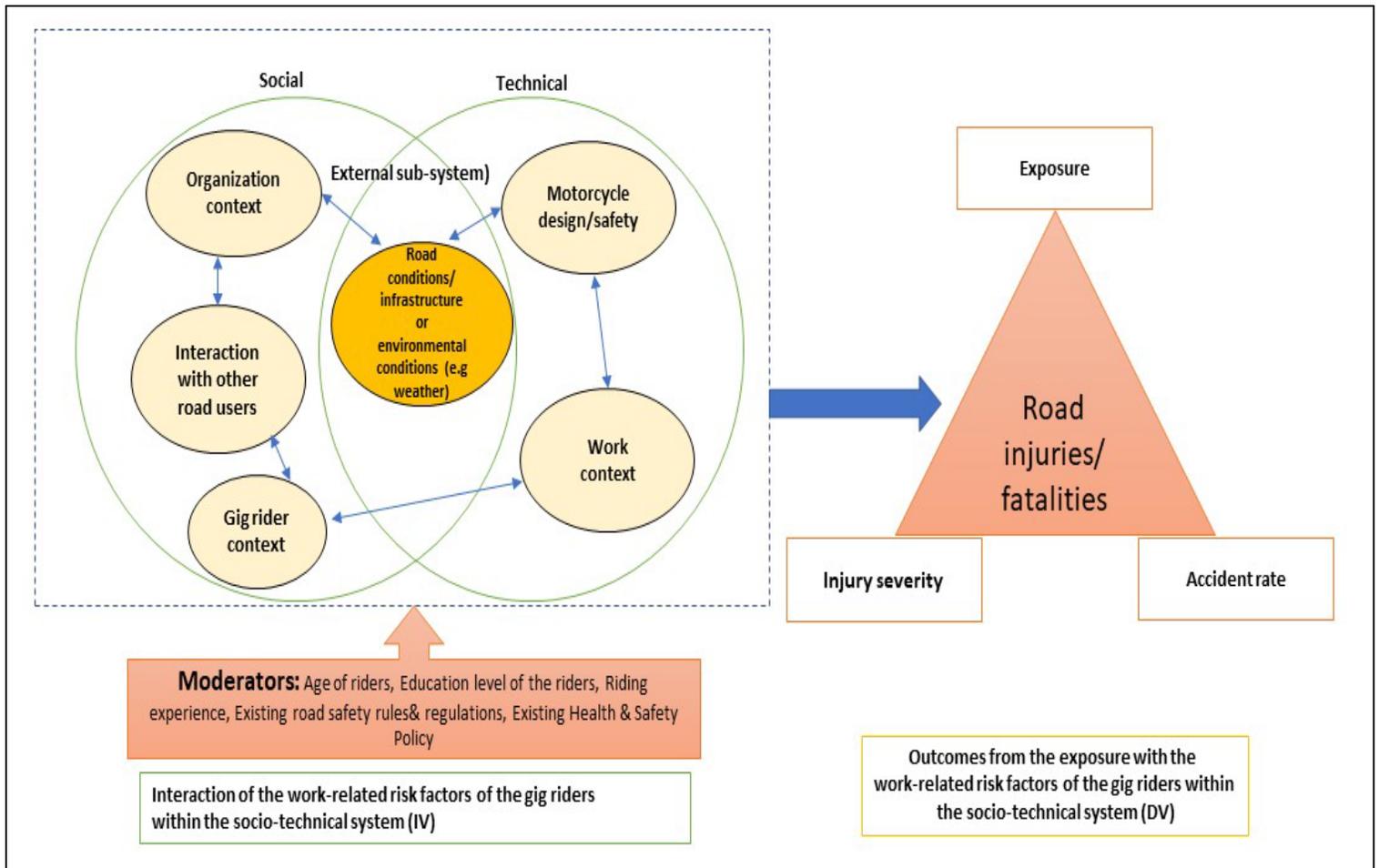


Figure 2: Conceptual framework for work-related road safety risk factors of the gig workers.

As in Figure 2, the conceptual framework consists of two main components: the interaction of work-related road risk factors within the socio-technical system (independent variables). The road fatalities or injuries are the outcomes from interaction with the risk factors (dependent variables) where several other variables can moderate it.

Based on the study by Allen et al. (2017), Christie and Ward (2019), Ibrahim et al. (2018), and Damani and Vedagiri (2021), we selected the socio-technical elements and moderators for this study. The social components of the system, such as the organization context, the rider context, and their interaction with other road users, while the technical parts, for instance, the motorcycle design/safety and work context. The external factor to the system refers to the road conditions/infrastructure or environmental conditions which might influence other components within the socio-technical system. The outcomes of interactions with risk factors within the socio-technical system will result in road injuries or fatalities if there is enough exposure, adequate injury severity, and the accident rate.

#### 4.1 Underpinning theories

Many components in the road transport system, including road users, cars, and roads, interact millions of times a day in which vehicles and road users engage in subsystems where people and technology interact (Larsson et al. 2010). Salmon et al. (2012) further explained that a transportation system is a complex socio-technical structure that includes social, technical, and psychological elements combined to transport people, goods, and others from one

point to another. Work-related road safety itself is a complex socio-technical system that needs convoluted understanding between occupational and road safety apart from the transportation system. Robertson et al. (2015) asserted that safety is a dynamic, evolving, and continually changing open system exposed to a wide range of technical and other forms of environmental impacts. Since the work-related road of the gig riders involves complex, dynamic, and new technologies, the socio-technical theory is suitable for the purpose of exploring the injury or fatality risk factors within the system. Based on Mumford (2006), the socio-technical theory was started in the 1950s by members of the Tavistock Institute in London, with the primary objective to improve the overall quality of working life.

Mumford (2006) further explained there are two interrelated subsystems in a socio-technical system:

- The technological subsystems include equipment, equipment, machinery, and technology and work for the organization.
- The social subsystem includes people and teams and needs for coordination, management, and control.

In terms of identifying the relationship between risk factors of the socio-technical system and road fatalities and injuries, we have chosen the taxonomy that may influence road safety as proposed by Elvik et al. (2009). Increasing the exposure with the risk factor interactions will also enhance the severity of injury and accident rate, which influence the occurrence of road injury or fatality.

## 5. Discussion

This study will investigate the relationship between work-related road risk factors and the occurrence of fatality or injury among gig riders. Apart from that, it also will examine the relationship of the risk factors within the socio-technical system of work-related road safety. Based on existing literature, work-related road accidents are often mixed with commuting accidents when it comes to compensation data for injured workers. Although gig economy workers were known as "non-standard" workers within employment law, many countries have opted to give some protection in terms of their safety and health after International Labor Organization introduced Universal Labour Guarantee in 2019. Since work-related road safety is a socio-technical system, the socio-technical theory has been chosen to build the conceptual framework. Based on the literature, the work and organization context, gig rider context, interaction with other road users, and external sub-systems such as road conditions/infrastructure or environmental conditions are the risk variables within the system which might result in fatality or injury of the gig riders contracting them. However, the injury and fatality of the riders will depend on the degree of exposure, injury severity, and accident rate when contracting the risk factors.

## 6. Conclusion

Work-related road safety has been previously discussed but only limited to heavy or light vehicle fleets. Existing studies on motorcycle injuries or fatalities have been done among commuters and rarely focusing on work-related employees, specifically those within the gig economy sector. Workers within the gig economy are facing a lack of social security and income protection, which will be at a "loss," especially when they are involved in an accident. Since the risk of contracting serious injuries or fatalities are higher among motorcyclists as compared to the driver of other vehicles, our framework will give a better understanding of work-related road safety risk factors of gig riders that have not been rigorously studied. Moreover, the framework will assist the future development of rules or regulations for reducing the injuries or fatalities of the gig riders, especially in Malaysia.

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