



Consistent versus inconsistent behaviour of helmet use among urban motorcyclists in Malaysia

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ABSTRACT

Helmet use is extremely important in protecting a motorcyclist from serious neck and head injuries when a crash occurs. In Malaysia, there has been a great challenge related to road accidents involving motorcycles, especially in urban areas where traffic networks are busy and complex. To some extent, the level of fatalities caused by road accidents has worsened due to the inconsistent use of a helmet. This study examines the differences between those who consistently wear a helmet and those do not, considering socio-demographics, experiences, road infrastructure, psychological factors, and other possible determinants of helmet use among motorcyclists. The study was carried out based on a total sample of 728 respondents, of whom 62% were reported consistently wearing a helmet while riding a motorcycle. This study found that self-reported attitude was the factor most strongly associated with consistent helmet use. The study demonstrated other factors (e.g. risk perception, personal experiences, and perceived behaviour of others) associated with consistently wearing a helmet. The study offers recommendations and policy implication for helmet use policies in Malaysia as well as globally.

1. Introduction

Malaysia is one of the countries in Global South Asia where its residents really depend on motorcycles for their everyday mobility (Ahmed et al., 2013; Manan and Várhelyi, 2012; Manan, 2014; Sukor et al., 2017). According to Sanlam (2012) and Road Safety Department (2014), about 8.4 million motorcycles were registered in 2010, while more than 500 thousand motorcycles were registered in 2011 alone. The trend of motorcycle ownership and use has increased over many years in the country, partly because of several advantages, like its flexibility in travelling on narrow, broken, and congested roads, its low maintenance cost, and its affordable price (Umar et al., 1995; Road Safety Department, 2014). In Malaysia, several mechanisms of payment allow people to purchase a motorcycle without any significant barriers. For example, government officers and certain private companies can partly subsidise their employees to purchase a new motorcycle through various attractive packages and incentives. At the same time, motorcycles provide a means of transportation for disadvantaged segments of the population, such as low-income workers, women, and students. In fact, rather than as a leisure mode of transport like the case of industrial countries, the majority of people in Malaysia has used a motorcycle as the main mode of transport on daily basis for business, work, and school-related travels. The function of the mode is to deliver

goods and people (Hsu et al., 2003). Sanlam (2012) has revealed that an increased production of motorcycles in the domestic market and the influx of new imported motorcycles into the local automotive market in Malaysia have spiked the number of vehicle registrations in the country. Nonetheless, the great popularity of motorcycle use to some extent has contributed to the occurrence of road accidents. Table 1 describes the statistics of vehicles registered on Malaysia road and the numbers of road accidents over from 2012 to 2014 (Ministry of Transport Malaysia, 2017).

As described by Ranney et al. (2010), motorcyclists are very vulnerable when accidents occur, partly because they have utilised a limited amount of safety protection, especially compared to those of car users. The NHTSA (2007) has further revealed that the injury rate for motorcyclists is about eight times more likely to exist than the injury rate that involves car users. Thus, to improve safety level among motorcyclists, helmet use is mandatory. A study from Iowa (USA) has shown that accidents among motorcyclists are twice as likely to lead to deadly head and neck injuries if they are not wearing a helmet than the accidents among other modes of transport (Iowa Comprehensive Highway Safety Plan, 2006). WHO (2013) has even warned that almost 60% of the deaths caused by road accidents, and most of the deaths associated with head and neck injuries have involved motorcyclists. The urgency of using a helmet is further discussed by Liu et al. (2004),

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Table 1

Total number of vehicles registered on road and involved in road accident from 2012 to 2014.

Source: Ministry of Transport Malaysia (2017).

Year	Motorcycle		Car		Others		Total vehicles on road	Total vehicles involved in accident
	On road	Involved in accident	On road	Involved in accident	On road	Involved in accident		
2012	10,599,370	130,080	9,951,515	655,813	2,065,221	135,339	22,616,106	921,232
2013	11,087,878	121,700	10,535,757	632,602	2,195,621	147,521	23,819,256	901,823
2014	11,629,265	125,712	11,199,190	617,578	2,272,737	143,053	25,101,192	886,343

indicating that helmet use reduces the risk of head and neck injury by 72% and the risk of death by 37%.

Interestingly, most of the countries in Southeast Asia, including Malaysia, belong to the 20 countries in the world that have the greatest rate of motorcycle accident deaths (Peltzer and Pengpid, 2014). To reduce the fatalities and injuries involving head injuries, the authority has implemented helmet legislation in Malaysia since 1973, and it was updated in 1996 (Road Safety Department, 2014). Violation of the helmet law is a finable offence with a maximum fine of only RM300 (about 95 US Dollars), which is arguably very soft, compared to penalties in many other countries, especially developed countries. In Malaysia, all motorcyclists and pillion passengers are required to use the latest standard helmet (MS1:1996), which is designed and equipped with safety characteristics (Manan and Várhelyi, 2012). Despite this regulation, however about 38% of the total road accidents involved unhelmeted motorcyclists (Peltzer and Pengpid, 2014). Other studies further noted that 55% of motorcyclists failed to use their helmets properly on Malaysian roads in 1995 and 41% in 1998 (Krisnan, 1995; Umar et al., 1995).

In fact, several studies have reported that Malaysian motorcyclists seem to accept helmet compliance and the majority of them are quite aware of this legislation. For example, Kulanthayan et al. (2001), as well as Manan and Várhelyi (2012) demonstrated compliance with the proper use of safety helmet among motorcyclists, especially among those who were 21 years old or above, female riders, and pillion passengers. The studies have further noted that those who live in urban areas and travel for long trips (2 km or above) are more likely to obey helmet use regulations. Nevertheless, one of the main challenges is that the consistency in using a helmet seems to be lacking, and this behaviour may contribute to serious injury and death when road collisions involving motorcyclists occur (Ahmed et al., 2013; Supramaniam et al., 1984).

2. Aims

One of the main concerns related to road safety behaviour in Malaysia is that some motorcyclists were inconsistent in wearing a helmet while riding, thereby this could contribute to a fatal accident. By using a dataset from respondents in two urban areas of Malaysia, the goal of the study is twofold. **First**, it examines the characteristic differences between the group of motorcyclists who consistently wear a helmet and the group of motorcyclists who inconsistently wear a helmet. **Second**, the study explores the determinants of motorcyclists' inconsistent helmet use. This study argued that psychological and behavioural determinants such as attitudes, perceived behavioural control, subjective norms, fear, the perception of danger, and moral obligation might associate to the behaviour of helmet use. Since the issues of motorcycles' road safety are quite complex, involving socio-demographic characteristics, riding behaviours, riding culture, attitudes toward riding, motorcycle type, and regulations, it is necessary to explain the determinants of helmet use among motorcyclists.

The results of this study will provide important information for the design of more effective policies and enforcement regarding helmet use in large cities in developing countries such as Malaysia. The next sections describe the review of the literature, methods of analysis, results,

study limitations and directions to future research, as well as discussions and conclusion.

3. Literature review

Several factors have linked to the likelihood of helmet use among motorcyclists. For example, people's own experiences and knowing others' riding behaviours and attitudes can be factors that influence motorcyclists' helmet-wearing behaviour. The experience with road accidents as well as self-accident experiences or accident experiences with close friends and family members may lead to increase helmet use among motorcyclists (Susilo et al., 2015; Sukor et al., 2017). Other studies have found that being fined for not wearing a helmet or other safety violations could influence motorcyclists' safety behaviour (Hung et al., 2008; Li et al., 2008; Manan and Várhelyi, 2012). These studies report that punishment can be effective in getting people to ride more safely, particularly when the degree of punishment is not too soft. Furthermore, Beck et al. (2009) indicated that the perception of being caught may influence the risky behaviour among riders. This is in line with a report by Road Safety Department (2014), arguing that the perception of being caught could be the key role to decrease risky behaviour, especially when a campaign about safety awareness is conducted among the riders.

Many studies have used Theory of Planned Behaviour (TPB) to explain the relationships among human behaviour on riding a motorcycle and person's salient belief. The theory argues that attitudes, perceived behavioural control and subjective norms may predict intentions and behaviour (Ajzen, 1991; Elliot et al., 2007; Palat and Delhomme, 2012), and these principles should apply to the case of helmet use. Recently, Haqverdi et al. (2015) have found that the constructs of norms, attitudes toward helmet use, risky traffic behaviour and awareness of traffic rules are the key determinants of helmet use behaviour. According to TPB, three kinds of beliefs may guide human behaviour: behavioural beliefs (global positive or negative evaluations about performing the target behaviour), normative beliefs (individual beliefs about normative expectation of others and motivation to comply with these expectations) and control beliefs (individual beliefs about the presence of factors that may further or hinder performance of the behaviour). Furthermore, according to TPB, the elements of beliefs underpin person's attitude, subjective norms and perceived behaviour control, which in turn are determinants of intention and leads to action. Eagly and Chaiken (1993) have argued that the attitude measures reflect tendencies to evaluate an entity with some degree of favour or disfavour, often recognised as cognitive, affective and behavioural responses. The concept of attitude indicates the degree to which performance of a behaviour related to the attitude is positively or negatively valued. Attitudes can reflect the total set of accessible behavioural beliefs, linking the behaviours to various outcomes and other attributes. Iversen and Rundmo (2004) have shown that individuals with attitudes that were less focused on safety issues were more likely to engage in risky behaviours while driving, including not using a helmet.

Schwartz's Norm Activation Theory (Schwartz, 1977) is another behavioural theory that reveals moral obligation is an important predictor of behaviour, particularly for those with a high tendency to assume responsibility for things. This theory mainly argues that people

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