

Explaining risky driving behaviour among the young motor riders in Manipal, Karnataka, India

Citation for published version (APA):

Kumar, S. (2023). *Explaining risky driving behaviour among the young motor riders in Manipal, Karnataka, India: a psychosocial study on objectives for educational interventions*. [Doctoral Thesis, Maastricht University, Hasselt University]. Maastricht University. <https://doi.org/10.26481/dis.20230614sk>

Document status and date:

Published: 01/01/2023

DOI:

[10.26481/dis.20230614sk](https://doi.org/10.26481/dis.20230614sk)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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Summary

Road traffic crashes have emerged as the new public health threat in India and many other developing countries. With a population of nearly 1.37 billion people, India now faces the worst-ever road congestion in most cities and towns, and Indian roads have become more vulnerable to road crashes. Young MTWs riders are more vulnerable to road crashes due to a lack of experience in comprehending, assessing and responding to hazards. Young riders in the age range of 18-25 years contribute to more than half of total fatal crashes. The current research was based in the Indian university town of Manipal with a sizeable young student population in this age range. Manipal is home to the Manipal Academy of Higher Education (MAHE), and it hosts approximately 30,000 young students from all across India and 60 countries all over the world. The overall aim of this dissertation is to understand the risky riding behaviour among young MTWs in Manipal, Karnataka, India. A comprehensive understanding of these factors is necessary, given that little is known about risky riding behaviour and its psychological implications in India. Furthermore, the resulting information can inform interventions to promote less risky or safer riding among young MTWs in Manipal and similar settings.

To better understand the characteristics of fatal road crashes in Manipal from 2008–2018, in chapter 2, we used the data on fatal crashes retrieved from the office of the Superintendent of police. Also, we forecasted crashes by time series analysis prediction from 2019-2025. The analysis indicates an increase in crashes in the last few years. The analysis revealed that most fatal crashes are due to head-on collision followed by rear-end collision. The current chapter highlighted the involvement of motorcyclists in a fatal crashes much more than any other vehicle. Speeding the vehicle beyond the lawful limit is the most common cause of fatal crashes in more than 90% of cases. Crashes are more common on Saturday evenings, primarily due to riding under the influence of alcohol after weekend parties and get together. For the distribution of fatal crashes according to the types of roads, the study reported that the highest proportion of fatal crashes has occurred on National Highways, followed by State Highways and other roads. As for the distribution of fatal crashes depending upon local weather conditions, most fatal crashes were found to occur during heavy rains followed by light rain. For the distribution of fatal crashes per vehicular defect, defective brakes, worn-out tyres, and defective lighting systems contribute to more than half of the total share of fatal crashes.

Chapter 3 was a cross-sectional study which focused on the factor structure of a modified version of MRBQ. Furthermore, it assessed whether the extracted MRBQ factors were associated with self-reported crash involvement and the number of fines

paid to examine the MRBQ's potential in predicting risky riding behaviour. The exploratory factor analysis for the MRBQ questionnaire revealed a 36-item five-factor solution: traffic errors, control errors, stunts, protective equipment, and violations. Riders who reported violations and performing stunts also had more risk of getting involved in recent near-crash experiences. No positive associations were found for the other two factors (traffic and control errors) with near-crash involvement. Riders reporting frequent traffic errors, violations, and control errors had twice the odds of paying fines compared to those who reported low traffic, violations, and control errors.

Further, in Chapter 4, we focused on the perspectives of young riders in practising risky riding behaviours. From the FGD's held, significant factors have been derived which determine the dangerous riding ideas the youngsters are involved. Indicators for these risky riding practices were speeding, drinking and driving, using mobile phones while riding, not wearing a helmet, and improper maintenance of motorbikes. Furthermore, the indicators for the infrastructural factors were non-functional traffic signals, streetlights, barricades, signboards, and speed breakers. The participants enumerated several reasons why a rider speeds up while riding. For example, the participants gave different reasons for speeding, such as rushing for essential purposes, looking for peer consideration, getting late to arrive at the destination, hustling with individual riders and the impact of films. However, the primary reason for indulging in speeding activity was thrill-seeking. Moreover, participants were critical of the local authorities in maintaining the basic road safety infrastructure and the existing loopholes. As for ways to improve the road safety of younger riders, participants suggested conducting awareness programmes through the coordinated effort of public bodies, educational institutions, and the traffic department. Additionally, the authorization of student volunteers to monitor other youths if they abide by traffic laws in and around the city was proposed.

In Chapter 5, we did a qualitative study to understand the traffic police personnel's perceptions of the risky riding behaviour of young riders in the city. Five themes were derived from the data collected (1) Current traffic scenario in the city, (2) Common practices observed among the young riders, (3) Determinants of crashes observed among the young riders, (4) Strategies to improve road safety in the city, and (5) Proposals suggested by the traffic police personnel. The traffic scenario has changed drastically for Manipal. The reason is that the number of occupants in the city has expanded on the grounds of job security and educational purposes, which has added to an increment in the number of vehicles in the city. Nevertheless, the city has seen a hefty traffic load during the morning and evening hours and at the end of the week. It was reported that young female riders adhered better to traffic rules and well-being

when contrasted with young male riders. This chapter highlights the young riders' lack of adherence to traffic rules and vague reasons for not abiding by the traffic rules or approaching the traffic police to convince them. Talking and texting on mobile phones while riding is a common behaviour among young riders reported by the majority of traffic police personnel. The chapter also points out the city's most crash-prone areas, i.e., the railway bridges used for road transportation connecting the cities. It was recommended to improvise the city's road safety measures by considering the target population group. Establishing a coordination committee that can locally organize awareness programmes for road safety and proper traffic police personnel training could improve road safety and reduce crash fatalities.

Finally, in Chapter 6, we did a cross-sectional study to identify the psychosocial determinants of risky riding behaviour in young, motorized two-wheeler riders guided by the empirical literature and the TPB. The result of the study indicated that speeding behaviour had a significant positive correlation with all its psychosocial determinants. Furthermore, the results stated that the riders believe that mobile phone usage while riding is normal and less risky than performing stunts on the road. It was observed that mobile phone usage behaviour had a significant positive correlation with all its psychosocial determinants except for habits and past behaviour. Moreover, there is a strong significance between the participants' behavioural intention, PBC, normative beliefs, barriers, and attitudes toward using mobile phones behaviour. The participants in the study clearly understand the benefits associated with helmet usage and have a positive attitude toward following the rule of helmet usage. Riders' perceived benefits and attitudes are considered to be the strong predicting factors for helmet usage. Furthermore, subjective norm was found to be positively associated with helmet usage. Policymakers and strategy planners should be encouraged to consider these valuable leads to design future interventions aiming toward controlling risky riding behaviours among young riders in India. Behavioural change programmes like behaviour change communication and persuasive communication programmes targeting speeding and mobile phone usage behaviour can be initiated with the involvement of young riders and support from government authorities, university officials, and the regional transport office.

In the general discussion in Chapter 7, the main findings are summarized and discussed. Finally, the following recommendations of the findings are proposed:

1. **Academic recommendations-** (a) Future research on collecting detailed information on crash configuration to support in-depth research, (b) MRBQ research with the incorporation of helmet and mobile phone usage behaviour in

other settings in India using a larger population and broader age group involvement, (c) research on what extent the young riders themselves performed the risky riding behaviours.

2. **Practical recommendations-** (a) the practitioners should engage young riders for behavioural change programmes like behaviour change communication and persuasive communication programmes targeting speeding and mobile phone usage behaviour, (b) software manufacturers should research and develop applications for mobile phones to minimize the direct usage of mobile phone while riding, (c) it is recommended to have an active experimental approach, such as a simulator, where riders personally experience the impact of speeding to better assess the relationship between speeding and crash risk.
3. **Policy approaches for licensing procedure-** (a) policymakers should implement strict regulations for those riding underage or without a proper valid licence, (b) graduated driving licence programmes for better driving skills.
4. **Policy approaches for MTWs safe systems-** It is recommended for the policymakers to implement and sustain the concept of “safe system approach” like advanced rider assistance systems (ARAS) such as anti-lock braking systems (ABS), assist and slipper clutches (A&S clutch), adaptive cruise controls (ACC).
5. **Policy approaches for a Road Safety Information Database-** It is mandatory to have Road Safety Information Database in a country like India. Although, due to the ongoing COVID-19 pandemic, the entire focus of the government has shifted towards it, the government and policymakers should still take cognizance of it and implement National Road Safety Information System sooner.
6. **Policy approaches for strict law enforcement-** Policymakers must take appropriate measures to assist the enforcement authorities to strengthen and improve the quality of enforcement in order to ensure effective and uniform implementation of traffic laws. For instance, establishing and strengthening highway patrolling on National and State Highways in cooperation with State Governments.
7. **Policy approaches for road infrastructure improvements-** It is necessary to improve the existing road safety infrastructure in India to achieve “vision zero” for the MTW riders in India. The policymakers should focus on immediate fixation to neutralize any possible threats for the riders. Fixing the infrastructural issues with advanced road engineering under a coordinated multi-sectoral effort will result in a more significant commitment to reducing road crashes.