



**ASSOCIATION BETWEEN SOCIO DEMOGRAPHIC, WORK FACTORS,
FATIGUE AND EMOTION REGULATION WITH COMMUTING RIDING
BEHAVIORS AMONG WORKERS IN SELANGOR, MALAYSIA**

By

NOOR HIDAYAH BINTI JAAFA

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of
Master of Science**

March 2023

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirement for the degree of Master of Science

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The rising trend of commuting accidents has caused worrisome conditions whereas more than 30 000 cases were reported and 76.9% were motorcyclists and pillion riders. Despite numerous research have been conducted to explore the causes of these issues yet there was still a lack of information regarding the relationship between work factors, fatigue, emotion regulation, and commuting behaviour. Thus, this study aims to determine the relationship between work factors, fatigue, and emotion regulation with commuting riding behaviour in Selangor. This cross-sectional study involved 430 workers (male: 5.5%; females: 13.6%) with average age was 34 were randomly selected in Selangor. Convenient sampling was done, followed by purposive sampling of respondents based on the inclusive and exclusive criteria. Self-administered questionnaire consisting standardized questionnaire were used to collect information on sociodemographic and work factors, occupational fatigue exhaustion / recovery scale (OFER), cognitive emotion regulation questionnaire (CERQ) and commuting riding behaviour (SMRBQ) among respondents. The most prevalent unsafe riding behaviour reported was related toward time and money opportunistic (1.85 ± 0.59). In multiple linear regressions, being male ($\beta = 0.23$, $p < .01$) and young ($\beta = 0.2$, $p < .01$) who had experienced in a road crash ($\beta = 0.1$, $p < .05$) which also possessed self-blame ($\beta = 0.09$, $p < .01$), putting into perspective ($\beta = 0.08$, $p < .01$) and chronic fatigue ($\beta = 0.04$, $p < .05$) would predict 20% variance in riding behaviour among workers in Selangor. Therefore, it can be concluded gender and age factor, emotion regulation condition and level of fatigue should be considered in improving the CRB of workers in Selangor.

Keywords: occupational fatigue exhaustion / recovery scale (OFER), cognitive emotion regulation questionnaire (CERQ), commuting riding behaviour

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

**HUBUNGKAIT ANTARA SOSIO DEMOGRAFI, FAKTOR PEKERJAAN,
KELETIHAN DAN PENGATURAN EMOSI DENGAN TINGKAHLAKU
PENUNGGANG SEMASA BERULANG-ALIK DALAM KALANGAN
PEKERJA DI SELANGOR, MALAYSIA**

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Peningkatan trend kemalangan semasa berulang-alik telah menimbulkan satu keadaan yang membimbangkan, dimana lebih daripada 30 000 kes telah dilaporkan dan 76.9% adalah penunggang dan pembonceng motosikal. Walaupun banyak penyelidikan telah dijalankan untuk mencari punca-punca kepada isu ini namun masih terdapat kekurangan dalam maklumat mengenai faktor kerja, keletihan, pengaturan emosi dan tingkah laku semasa berulang alik. Oleh itu, kajian ini bertujuan untuk mencari hubungan antara faktor kerja, keletihan, pengaturan emosi dengan tingkah laku semasa berulang alik di Selangor. Kajian keratan rentas ini melibatkan 430 pekerja (lelaki: 5.5%; perempuan: 13.6%) dengan purata umur adalah 34 yang dipilih secara rawak di Selangor. Pensampelan mudah dilakukan, diikuti dengan pensampelan responden berdasarkan kriteria inklusif dan eksklusif. Soal selidik sendiri yang terdiri daripada soal selidik standard digunakan untuk mengumpul maklumat mengenai sosio-demografi dan faktor kerja, keletihan pekerjaan / skala pemulihan (OFER), soal selidik peraturan emosi kognitif (CERQ) dan tingkah laku menunggang berulang-alik (SMRBQ) di kalangan responden. Tingkah laku menunggang tidak selamat yang paling lazim dilaporkan berkaitan dengan masa dan wang oportunis (1.85 ± 0.59). Dengan menggunakan Regresi Linear, lelaki ($\beta = 0.23, p < .01$) orang muda ($\beta = 0.2, p < .01$) yang telah mengalami kemalangan jalan raya ($\beta = 0.1, p < .05$) yang juga mempunyai kesalahan diri ($\beta = 0.09, p < .01$), meletakkan perspektif ($\beta = 0.08, p < .01$) dan keletihan kronik ($\beta = 0.04, p < .05$) akan meramalkan 20% varians dalam tingkah laku menunggang di kalangan pekerja di Selangor. Secara kesimpulannya, faktor jantina, umur, peraturan emosi dan keletihan pekerjaan harus dipertimbangkan dalam meningkatkan menunggang semasa berulang-alik dari tempat kerja.

Kata kunci: keletihan pekerjaan / skala pemulihan (OFER), soal selidik peraturan emosi kognitif (CERQ), tingkah laku menunggang berulang-alik

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LIST OF ABBREVIATIONS

CERS	Cognitive Emotion Regulation
CRB	Commuting Riding Behaviour
OFER	Occupational Fatigue Recovery
DBQ	Driving Behaviour Questionnaire
RTA	Road Traffic Accident
NIOSH	National Institute of Occupational Safety and Health
MIROS	Malaysia Institute Road Safety Research
MRBQ	Motorcycle Riding Behaviour Questionnaire
S mrbq	Short Motorcycle Riding Behaviour Questionnaire
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background

The use of motorcycles in Malaysia has grown rapidly. According to the Road Transport Department of Malaysia, the accumulated number of motorcycles in Malaysia has risen from 14,891,585 in 2020 to 15,506,689 in 2021. Along with the growth in the number of motorcycles, the road crashed involving a motorcycle also increased (S.Abdulwahid et al.,2022). Malaysia as a developing nation with rapid economic progress has been affected by the number of road crash occurred until now. Based on Malaysia Road Fatalities, motorcyclist was known as the highest road fatalities 59% for a period of ten years until 2019.

Based on previous study, human behavioural, vehicles and environmental factors are the three major factors that can cause an accident (Mohanty et al., 2015). Most of commuting accident occurred due to human factors, such as bad attitudes or driving habits, level of age and health as well as behavioural problem of workers (Selamat et al., 2015). In a previous study, the risk of road crashes were found to be increased by dangerous driving behaviour such as aggressive violation, errors and lapses ((Machado-león et al., 2016)). Besides, most of motorcycles crashes is widely believed been contributed by risk taking behaviour (Ibrahim et al., 2012).

Studies related to the possible factors which may influence driving and riding behaviour have been abroad. There is a study in Colombia among Bus Rapid Transit operators found that stress related working conditions (Job Strain, Social Support and Effort/Reward Imbalance) are relevant predictors of risky driving (Useche et al., 2017). Meanwhile, the socio-demographic factors such as age and gender are frequently being studied as a factor that may affect motorcyclist riding behaviour. Findings of a previous study stated that there are three primary personality traits of young motorcyclists, namely sensation seeking, amiability and impatience (Wong et al., 2010). A significant, small effect of gender was found on self-reported speed violations and stunts, with male riders engaging in these behaviours more frequently than female riders (Stephens et al., 2017).

1.2 Problem Statement

In Malaysia, commuting accidents have become one of the main issues confronting occupational safety and health (NIOSH, 2019). This uprising issue has caused a high number of road traffic fatalities, where 35,195 cases of commuting accidents have occurred in 2018 (Social Society Organizational, 2018). Moreover, it has been recorded that transport crashes were the fourth most common death with 3.7% in 2018 (Department of Statistic, 2018). As an

urban area in Malaysia, Selangor showed over 3.7 million accumulated vehicles on the road in the year 2021. The rising number of vehicles will create more heavy traffic at the same time. Motorcycle is the dominant vehicles in urban area, thus rate of road crash involving motorcyclist is high in states such as Selangor (W.Bukhari et al., 2022). Therefore, this issue cannot be neglected as it indicates a serious situation to the country.

There are many factors that significant toward road crash involving motorcyclist. In year 1980, Haddon Jr had studied that classified the three major factors were human, vehicles and environmental factors which also known as Haddon Matrix. Most of road crashes occurred due to human factors, such as driving habits, speeding as well as behavioural issues (N.Che-Him et al., 2018; W.Bukhari et al., 2022). Road and Transport Act 1987 has been used in Malaysia as the main legislation related road safety. On the other study, there is still in general lack of awareness of road safety such as helmet use (J. Oxley et al., 2018). There are many road safety campaigns have helped to slow down the rate of road crashes (MIROS, 2021). However, there is still knowledge gap of accurate targeted and focused population in road safety planning which can improve its effectiveness. Thus, this study focus on workers in Klang Valley that commute to work using motorcycle.

Commuting accidents are increasingly recognized to pose a severe and significant burden to the economic and social well-being of Malaysia (Nordin, 2014). The employer had to pay large amount of the compensation to the workers involved with commuting accident due to increasing numbers of road fatalities. It is one of the employer's responsibility to offer protection for their employees under the Employee's Social Security Act 1969. According to an article from Bernama, SOCSO paid RM93.57 million to workers involved in commuting accidents in 2018. Although commuting accidents are an important issue, there is little existing information related to commuting accident. Most of the studies conduct in a general road crash. There is study investigated road crash and traffic offences by motorcyclist in Vietnam (H. Trung Bui et al, 2020) and estimating factors of motorcyclist involved in crashes (J. Lee, 2018). In this study we are focusing on commuting which can provide better view of road crash involving motorcyclist.

Evidences have shown that individual and family factors, work burden, workplace support, bad weather and road conditions were causes in road crashes (Selamat et al, 2015; C. Wankie et al, 2021; Y. Yang et al, 2019). Despite various studies reported that riding behaviour was a factor in road crashes, but there is little information of study on factors of riding behaviour. Studies have proved that careless and dangerous driving, traffic error, control error, and speed violation were related to road crashes (Sarani et al., 2011; Sakashita et al., 2014; Stephens et al., 2017). Moreover, driver behaviour was also found as a predictor of self-reported crashes through an investigation related to determine factors related to crashes (Hezaveh et al., 2018). Considering the effect of riding and driving behaviour, there is a need to study factors that lead to their behaviour.

As studies for factors of driving behaviour went wide, factors of riding behaviour are yet to be fully understood. Evidence has shown that factors such as age and gender were related to driving behaviour (Hassan et al., 2017; Mohamed et al., 2017). Furthermore, a person who has involved in a road crashes also found affects an individual driving behaviour (Al Reesi et al., 2013). Even though there were studies conducted on riding behaviour in a certain population such as students in Thailand (Chumpawadee et al., 2015) and employed motorcycle riders in Iran (Ali et al., 2011), there are limited studies that have accessed the riding behaviour among Malaysian workers. Furthermore, shift workers are also founded as a factor of driving behaviour (Valent et al., 2010). Therefore, further study on other factors related to riding behaviour among Malaysian workers is required.

During commuting from the workplace to home, workers probably facing fatigue due to their work. Fatigue may affect the performance of each individual, such as their driving or riding behaviour. According to (Yazdi et al., 2015) fatigue is a problem that cause by high workplace demand, long duty periods, disrupted circadian rhythms, social and societal demands and insufficient sleep. Example for fatigue affect the driving skills is during cases of lane drift, fatigue increase the number of drifts from the centre of the lane, the distance drifted from the centre and variability in the driver's ability to drive in the centre of the lane (Jackson et al., 2011). Mostly in research study, it mentioned about relationship within fatigue and driving behaviour but there is limited data that explain specifically on riding behaviour. Therefore, this study is conducted to determine the relationship between fatigue and riding behaviour of a worker.

Evidence has shown that emotion has related to driving behaviour (Eyal et al., 2020). Certain road conditions such as traffic jams may cause a stressful event. Here, it is essential for the road user to be able to control and regulate their emotion successfully. Cognitive Emotion Regulation Strategies (CERS) were found to play an important role in this coping process (Garnefski et al., 2001). Various research related driving behaviour has been explored yet there is still limited study to explore riding behaviour. It has been reported that CERS can be used in order to control driving behaviour (Feng et al., 2018) but lack of studies relate between CERS and riding behaviour. Anyhow, there was a report that showed riding exposure relates to emotional dynamism (Samuel et al., 2019). Therefore, a study to find the relationship between CERS and riding behaviour is necessary.

Overall, riding behaviour could be influenced by various factors. Due to growth of motorcycle usage, clearly the number of road crashes may increase as well. Thus, this study aims to identify the work factors, commuting experience, fatigue and emotion regulation as factors of riding behaviours.

1.3 Study Justification

High numbers from commuting accidents lead to this study to determine more effective intervention program for rider. Many studies have been done but there are still lack of information about the factor on riding behaviour which also causes the increasing number of commuting accident. So, this study is important in order to explore the related factors on riding behaviour and unsafe act while riding. It is also important in proposing the actions and precautions that should be taken for controlling people riding behaviour.

There is possibility for factors related to work give effect to the riding behaviour that can cause commuting accident but the number of studies relate between work factors and riding behaviour is still small. Based on the annual report of SOCSO state more than 25,000 cases were reported regarding commuting accident since 2012 (SOCSO, 2017). Therefore, this study will find the effects of work factors on riding behaviour to get better understanding on factors of commuting road crash. Findings of this study may help in prioritizing preventive strategies of road crash while indirectly will contribute to reduce the number of commuting accidents. Results of this study can be used to enhance the effectiveness of any safety road intervention program in order to promote a safer behaviour of riding among workers.

Fatigue due to work is the factor that will influence the riding behaviour of workers (Luqman et al., 2018). Hence, it is important to tackle this problem in order to control the commuting accident in Malaysia. This problem need to be analyse in depth with assessing the pattern of those riding behaviour. Then, we can reduce the exposure risk of worker toward commuting accident. Same goes to the other factors such as the work factors and emotion regulation. Results from this study can be used as intervention strategies to be by organizational and national level.

After all, the socio-demographic factor and the personal worker background also may contribute to problem where worker may involve with commuting accident. Thus, it is important in this study to determine the socio-demographic factor of the Malaysian workers. From the analysis of this study, the target group for the intervention program for safety road user can be more specific, so that the program will become more efficient and successful.

1.4 Conceptual Framework

Generally commuting accident can be categorized into three main factor environmental, individual and mechanical. In this research study, we only focus on individual factors which conduct among Malaysia Workers as the sample population to be studied. There were 34,467,000 employed workers in Selangor been recorded in 2018 (Department of Statistic Malaysia, 2018). The study will assess the potential factor related to socio-demographical data, work

characteristics fatigue and emotion regulation (independent variables) that may influence the riding behaviour. The factor of socio-demographic also will be assessed in this study to get to know the characteristics of an individual and their way of riding a motorcycle. The findings of the study are expected to find the relationship between work factors, emotion regulation with commuting riding behaviour of the Malaysian workers. The motorcyclist riding behaviour is defined in terms of 3 main factors. Factor 1 are traffic unfit erroneous riding, intrusive and exhibitivive behaviours, Factor 2 involve time and money opportunistic behaviour and Factor 3 include helmet use behaviours. The conceptual framework of the study is illustrated in Figure 1.1.

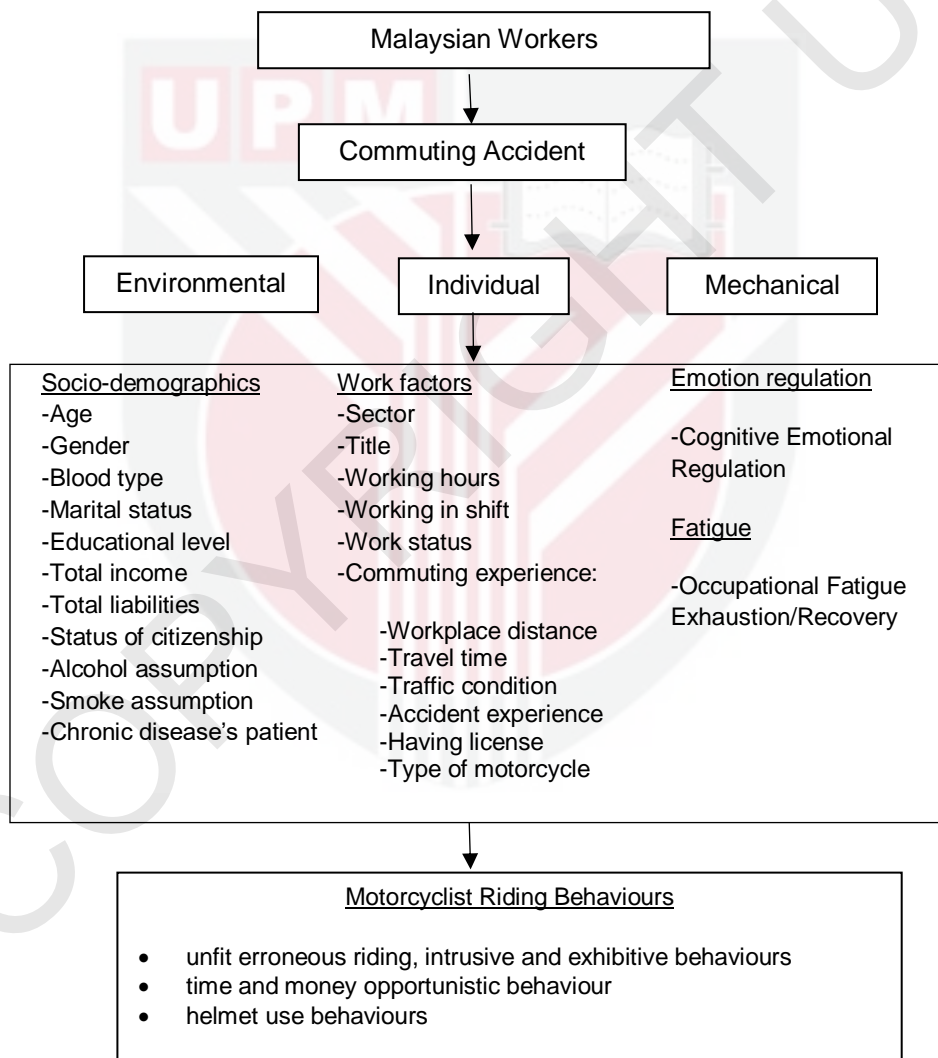


Figure 1.1 : Conceptual Framework

1.5 Research Questions

This study will answer 2 main research questions:

- a) **Research question 1:** What are the demographic, work, fatigue and emotion regulation factors of commuting riding behaviour of Malaysia workers?
- b) **Research question 2:** What is the most significant factor effecting commuting riding behaviour?

1.6 Research Objectives

1.6.1 General Objective

The general objective of this study is to determine the relationship between work factors, fatigue and emotion regulation with commuting riding behaviour among Malaysian workers in Selangor.

1.6.2 Specific objectives

- i. To determine the socio demographic backgrounds regarding Malaysian workers.
- ii. To determine the commuting riding behaviour among Malaysian workers.
- iii. To determine the work factors, fatigue and emotion regulation of the Malaysian workers.
- iv. To determine the relationship between work factors, fatigue, emotion regulation and factors of socio demographic with commuting riding behaviour among Malaysian workers

1.7 Research Hypothesis

- i. There is a significant relationship between work factors, fatigue emotion regulation, factors of socio demographic with commuting riding behaviour among Malaysian workers.
- ii. The work factors, fatigue and emotion regulation do give effect on commuting riding behaviour among Malaysian workers.

1.8 Definition of Terms

1.8.1 Conceptual Definitions

Fatigue and Occupational Fatigue Recovery (OFER)

Fatigue is the state of feeling very tired, weary or sleepy resulting from insufficient sleep, prolonged mental or physical work or extended periods of stress or anxiety (Canadian Centre for Occupational Health and Safety, 2017). Work contribute high impact to a person fatigue level. Hence, this study focus on the impact of fatigue especially after a day of work.

Cognitive Emotion Regulation (CER)

Cognitive emotion regulation and behavioural problem are influenced by the ability of a person to cope with stress (Lohman et al., 2000). It has been suggested, coping responses lead to psychological wellbeing. Thus, this study interest on the response of a person on handling stressful situation in order to have better psychological wellbeing.

Commuting Riding Behaviour (CRB)

Commuting is a process to travel from one place to another. In this study, workers need to commute from their residences to their workplace or otherwise (MIROS, 2021). Riding behaviour is the way rider behave during ride a motorcycle on the road (Elliot et al, 2007).

1.8.2 Operational Definitions

Fatigue and Occupational Fatigue Recovery (OFER)

Occupational Fatigue Exhaustion / Recovery (OFER) measure work related fatigue which consists 15 items with 7-Likert scales ranged from (Totally disagree) to (totally agree). OFER measure three factors such as chronic work-related fatigue, acute after-work fatigue and recovery between work shifts (P. C. Winwood et al., 2005).

Cognitive Emotion Regulation (CER)

Cognitive Emotion Regulation measured nine cognitive strategies people tend to use after having experienced negative life events. It consists of 18 questions with 5-point Likert scale type ranging from 1 (almost never) to 5 (almost always). There are nine conceptually distinct subscales in CERQ (Self-blame, Other-blame, Rumination, Catastrophizing, Positive refocusing, Planning, Positive reappraisal, Putting into perspective and Acceptance) was developed to assess

cognitive emotional regulation strategies against unpleasant events (Nadia et al., 2001).

Commuting Riding Behaviour (CRB)

Riding behaviour have been categorized into three main factors involve unfit erroneous riding, intrusive and exhibit behaviour, time and money opportunistic and helmet use behaviour (Hosseinpourfeizi et al., 2018). While commuting is related to travelling for work purpose. Thus, current study specific on the motorcyclist behaviour during travelling for work.



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