



UNIVERSITI PUTRA MALAYSIA

***EFFECT OF BIOPSYCHOSOCIAL COACHING ON IMPROVING
RETURN TO WORK DURATION AFTER INVOLVEMENT IN
COMMUTING ROAD CRASH***

NURRUL HAFEEZAH BINTI SAHAK

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By

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**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfillment of the Requirements for the Degree of Doctor of Philosophy**

June 2018

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DEDICATION

This work is dedicated to my beloved parents, my husband and my kids.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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NURRUL HAFEEZAH BINTI SAHAK

June 2018

Chairman : Associate Professor Kulanthayan, PhD
Faculty : Medicine and Health Sciences

Introduction: For every death due to commuting road crash, at least 20 others sustain injuries. Due to multiple injuries, workers who are involved in commuting road crashes had longer medical leave compared to other types of occupational accidents. Prolonged medical leave could arise due to persistent pain, untreated psychological effects (depression, anxiety and stress) and reduction in health-related quality of life reduce the chances of return to work. Injured workers might have the risk of losing the job skills or job as employer search another healthy worker who manage to perform his pre-injury job task to prevent any loss to the organization. Therefore, it is highly recommended for injured workers to attend rehabilitation session to foster their return to work duration. The aim of this study was to test the effectiveness of a multidisciplinary rehabilitation (biopsychosocial coaching) to improve injured workers return to work duration after involved in commuting road crash.

Method: *Design:* A randomized control trial (RCT) study design. *Setting:* Selangor and Kuala Lumpur. *Participants:* Eligible 200 workers who were involved in commuting road crash and agreed to participate in SOCSO RTW Program were identified and invited to be part of this study. They were randomly allocated either to the intervention group (received biopsychosocial coaching and vocational rehabilitation) or the control group (received vocational rehabilitation only). *Intervention:* Biopsychosocial coaching intervention with the aim to reduce biopsychosocial barriers for recovery in order to fasten return to work duration through work goal, healthy living, and stress and pain management. The biopsychosocial coaching intervention was delivered concurrent to usual care and the average coaching involved three one-hour long sessions. Injured workers were provided with “Restore Workbook” during the commencement of the biopsychosocial coaching intervention.

The intervention took place at the rehabilitation centre after injured workers had finished their usual care session with the physiotherapist.

Results: A total of 200 injured workers participated in this study, with 86.0% of them were male and 69.0% were blue-collar workers. Intervention group reported seven days earlier (not significantly different) of return to work compared to the control group. Injured workers in the intervention group recorded bigger mean difference in biopsychosocial factors, mental health and health-related quality of life domains between baseline and post-intervention. From the total of seventeen variables in this study, fourteen (pain, function, emotion, coping, confidence, work perception, depression, anxiety, physical functioning, role physical, bodily pain, general health, vitality and social functioning) showed significant difference between the intervention and control group at post-intervention. This study found age, gender, function, confidence, depression, anxiety and stress as factors that could affect injured workers' return to work duration.

Conclusion: Duration of return to work among injured workers could be accelerated through the additional of biopsychosocial coaching in usual care. In addition to that, biopsychosocial coaching also reduced biopsychosocial barriers to recovery, depression, anxiety and stress, as well as increased health-related quality of life.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KESAN BIMBINGAN BIOPSIKOSOSIAL DALAM MEMPERBAIKI
TEMPOH KEMBALI BEKERJA SELEPAS TERLIBAT DALAM
KEMALANGAN SEMASA PERJALANAN BERKAITAN PEKERJAAN**

Oleh

NURRUL HAFEEZAH BINTI SAHAK

Jun 2018

Pengerusi : Profesor Madya Kulanthayan, PhD
Fakulti : Perubatan dan Sains Kesihatan

Pengenalan: Bagi setiap kematian disebabkan oleh kemalangan semasa perjalanan berkaitan pekerjaan, sekurang-kurangnya 20 yang lain mengalami kecederaan. Kecederaan di beberapa anggota badan menyebabkan pekerja yang terlibat dalam kemalangan jenis ini mempunyai cuti sakit yang lebih panjang berbanding jenis kemalangan pekerjaan yang lain. Cuti sakit yang panjang, yang mungkin disebabkan oleh kesakitan berpanjangan, kesan psikologi yang tidak dirawat (kemurungan, kebimbangan dan tekanan) dan pengurangan kualiti hidup berkaitan kesihatan mengurangkan peluang untuk kembali bekerja. Pekerja yang cedera mempunyai risiko kehilangan kemahiran kerja atau pekerjaan disebabkan majikan mencari pekerja baru yang sihat yang mampu melakukan pekerjaannya untuk mengelakkan kerugian kpd organisasi. Oleh itu, sangat disyorkan supaya pekerja yang cedera menghadiri sesi rehabilitasi untuk mempercepatkan tempoh kembali bekerja. Tujuan kajian ini adalah untuk menguji keberkesanan rehabilitasi pelbagai disiplin (bimbingan biopsikososial) untuk membaiki tempoh kembali bekerja selepas kemalangan semasa perjalanan berkaitan pekerjaan.

Kaedah: *Rekabentuk kajian:* Percubaan rawak terkawal. *Lokasi:* Selangor dan Kuala Lumpur. *Peserta:* 200 orang pekerja yang terlibat dalam kemalangan semasa perjalanan berkaitan pekerjaan yang layak untuk menyertai kajian ini dan memberi persetujuan untuk menyertai Program RTW SOCSO dikenalpasti dan dijemput untuk menyertai kajian ini. Mereka ditempatkan secara rawak ke kumpulan intervensi (menerima bimbingan biopsikososial dan rehabilitasi vokasional) atau kumpulan kawalan (menerima rehabilitasi vokasional sahaja). *Intervensi:* Bimbingan biopsikososial dengan tujuan untuk mengurangkan halangan biopsikososial untuk sembuh dalam mempercepatkan tempoh kembali bekerja melalui matlamat kerja,

kehidupan yang sihat serta pengurusan kesakitan dan tekanan. Intervensi ini dilakukan selari dengan penjagaan biasa dan purata bilangan intervensi adalah tiga sesi yang terdiri daripada satu jam bagi setiap sesi. Pekerja yang cedera dibekalkan dengan buku kerja pemulihan semasa intervensi bimbingan biopsikososial dilaksanakan. Intervensi dilakukan di pusat rehabilitasi selepas pekerja yang mengalami kecederaan selesai menjalani penjagaan biasa selepas sesi fisioterapi.

Keputusan: Seramai 200 pekerja yang cedera terlibat dalam kajian ini, dengan 86.0% dari mereka adalah lelaki dan 69.0% adalah pekerja kolar biru. Kumpulan intervensi merekodkan tujuh hari awal (tidak signifikan) dalam kembali bekerja berbanding kumpulan kawalan. Pekerja yang cedera dalam kumpulan intervensi mempunyai perbezaan lebih banyak dalam faktor-faktor biopsikososial, kemurungan, kebimbangan, tekanan dan domain kualiti hidup berkaitan kesihatan di antara pra-kajian dan pra-intervensi. Umur, jantina, fungsi, keyakinan, kemurungan, kebimbangan dan tekanan mempengaruhi tempoh kembali bekerja dikalangan pekerja yang cedera dalam kajian ini.

Kesimpulan: Tempoh kembali bekerja bagi pekerja yang cedera dapat dipercepatkan dengan bimbingan biopsikososial. Disamping itu, intervensi bimbingan biopsikososial dapat mengurangkan halangan biopsikososial untuk pulih, kemurungan, kebimbangan dan tekanan. Kualiti hidup berkaitan kesihatan juga dapat ditingkatkan dikalangan pekerja yang cedera selepas menerima intervensi bimbingan biopsikososial.

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Thank you!

This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

Kulanthayan KC Mani, Dip (Lund), B.Sc. (UPM), M. Sc. (UTM), PhD (UPM)
Associate Professor
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Chairman)

Titi Rahmawati Hamedon , MD (UKM), M. Community Health (Occupational Health) (UKM)
Medicial Lecturer
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Member)

Krishna Gopal Rampal, MBBS (India), M.Public Health (Urban Health) (Thailand), M. Public Health (USA), PhD (USA)
Professor
Centre for Graduate Studies
Cyberjaya University College of Medical Sciences
(Member)

Kathirkamanathan A/L S.Vytialingam, Dip. COT (Lond), Grad Dip, Hlth Sc (W.Aust), Mapp Sc (Health)(W.Aust)
Associate Professor
Faculty of Medicine and Health Sciences
(Member)

ROBIAH BINTI YUNUS, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

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Date: _____

Name and Matric No: Nurrul Hafeezah binti Sahak, GS28559

Declaration by Members of Supervisory Committee

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Signature: _____
Name of Chairman
of Supervisory
Committee: Associate Professor Dr. Kulanthayan K.C Mani

Signature: _____
Name of Member
of Supervisory
Committee: Dr. Titi Rahmawati Hamedon

Signature: _____
Name of Member
of Supervisory
Committee: Professor Dr. Krishna Gopal Rampal

Signature: _____
Name of Member
of Supervisory
Committee: Associate Professor
Kathirkamanathan A/L S.Vytialingam

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LIST OF ABBREVIATIONS

RTC	Road traffic crash
SOCSSO	Social Security Organization
RTW	Return to work
HRQOL	Health-related quality of life
RCT	Randomized control trial
DASS	Depression, anxiety and stress
SF-36	Medical Outcome 36-item Short Form Health Survey
ÖMPSQ	Örebro Musculoskeletal Pain Screening Questionnaire
SD	Standard deviation
MLR	Multiple linear regression
HR	Hazard ratio

CHAPTER 1

INTRODUCTION

This chapter provides a brief overview of the study and defines the problem of interest. In addition, it explains the research objectives as well as the significance of the study.

1.1 Trend of road traffic crashes (RTCs) in Malaysia

In 2016 the total population of Malaysia was 31.7 million and the population is estimated to be reach 41.5 million in 2040. From this total of the general population in 2016, 14.79 million persons consisted of workers (Department of Statistics Malaysia, 2017).

Through the increasing trend of the population as well as workers, private vehicle ownership is also increasing. According to the Road Transport Department Malaysia (2017), 26.3 million registered vehicles were recorded for the year 2015 compared to 20.2 million in 2010. Hence vehicle registration grew at a pace of 6.0% from 2010 to 2015.

Workers depend on road transportation for easy access to the workplace and vice versa. However, with the increasing number of vehicles on the road, especially during peak hours when workers commute, the risk of being involved in a road traffic crash (RTC) is also increasing. The trend of RTC statistics among the general Malaysian population, including workers can be seen in Figure 1.1.

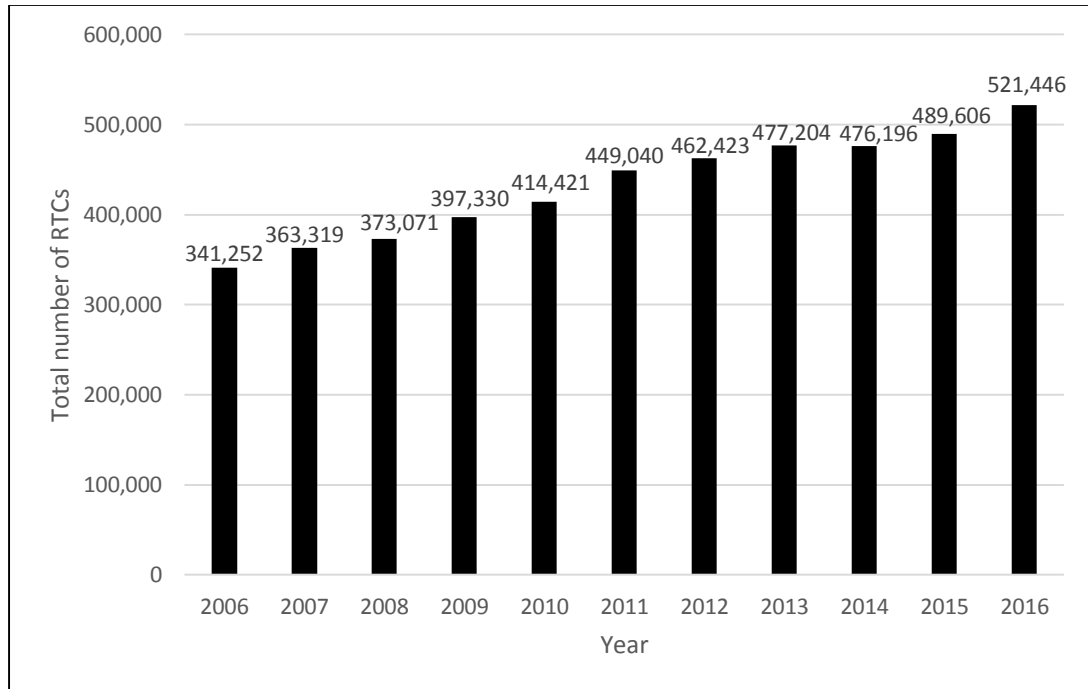


Figure 1.1 : Trend of road traffic crashes (RTCs) for the general population (including workers) in Malaysia
(Source: Royal Malaysia Police Report, 2017)

1.2 Commuting road crashes

Commuting road crashes are part of RTCs that involve workers. According to past literature on commuting road crashes from different countries of the world like Finland (Nenonen, 2013), Austria (Halla & Zweimüller, 2013), Saudi Arabia (Elshinnawey, Fiala, Abbas, & Othman, 2008) and Malaysia (SOCISO, 2015 ; SIRIM, 2014), it can be summarized that commuting road crashes are RTCs that cause injuries to workers due to the course of work while travelling in either direction between work or a work-related training place and the:

- i) workers residence
- ii) place where workers usually take their meals
- iii) place where workers usually receive their remuneration

In Malaysia, to date, there are no centralized data related to the trend of commuting road crashes for the general working population. For privately employed or self-employed workers, statistics on commuting road crashes are collected by the Social Security Organization (SOCISO). However, the data do not represent the statistics for commuting road crashes among privately employed or self-employed workers, as they only consist of those who claim from the SOCISO Employment Injury Scheme.

SOCSO is a government body that administers the Social Security Scheme for workers who are not employed by the government or foreign workers.

Data from SOCSO indicated that 89.3% of Malaysian commute to work using own vehicles. Only 8.7% commute using transportation provided by employer and 1.9% take public transport. The probability of younger workers (less than 25 years old) to be involved in commuting road crash is higher compared to older workers. Majority (68.8%) of workers who involved in commuting road crash were on morning shift and 16.7% worked for night shift. More than half (52.1%) of injured workers involved in crash during commuting to work and 36.4% returning from work. Commuting road crash during official duties and meal breaks only reported 6.3% and 5.2% respectively.

As can be seen in Figure 1.2, the trend of commuting road crashes reported to SOCSO is similar to the trend of RTCs that occurred among the Malaysian general population with an increasing trend year by year.

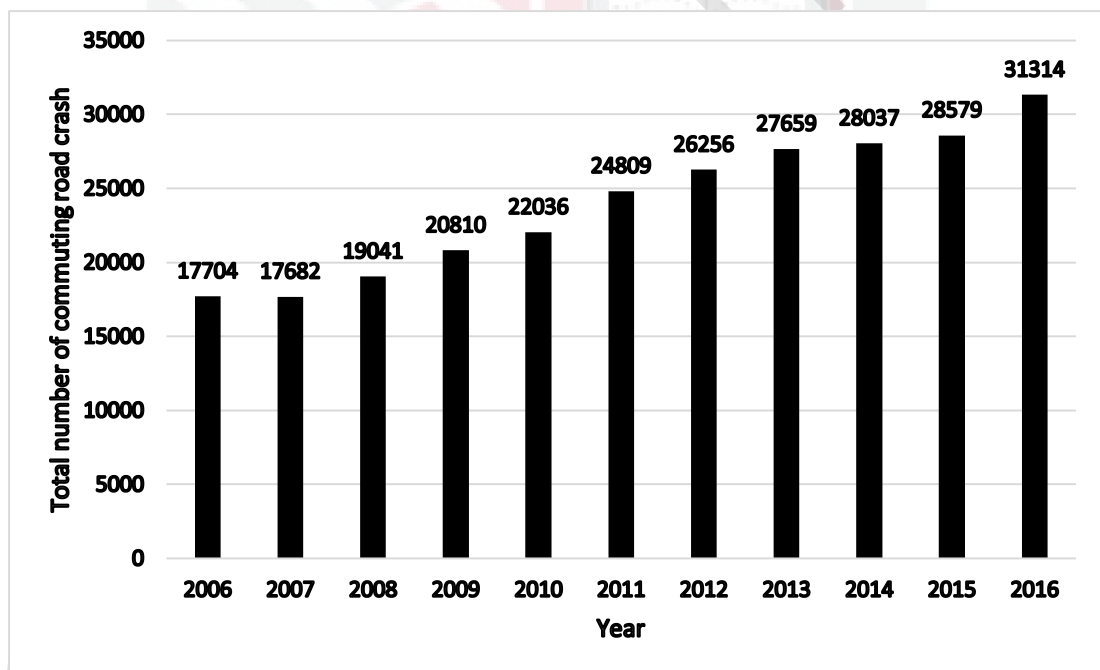


Figure 1.2 : Trend of commuting road crashes reported to SOCSO in Malaysia from 2010 to 2016

(Source : SOCSO Annual Report, 2016)

As reflected in Figure 1.2, commuting road crashes showed an increase of 9.57% in 2016 compared to 2015. On the other hand, for the same period, industrial accidents showed lower increment of 3.05%. According to SOCSO (2011), two of the three work-related deaths were caused by commuting road crashes. In 2016, the death rate due to RTC was 2.59 person for every 10,000 registered vehicles.

The number of commuting road crashes reported to SOCSO according to gender can be seen in Figure 1.3. Male is four times likely to involve in commuting road crash compared to female. The breakdown of commuting road crashes according to the means of transport can be seen in Figure 1.4.

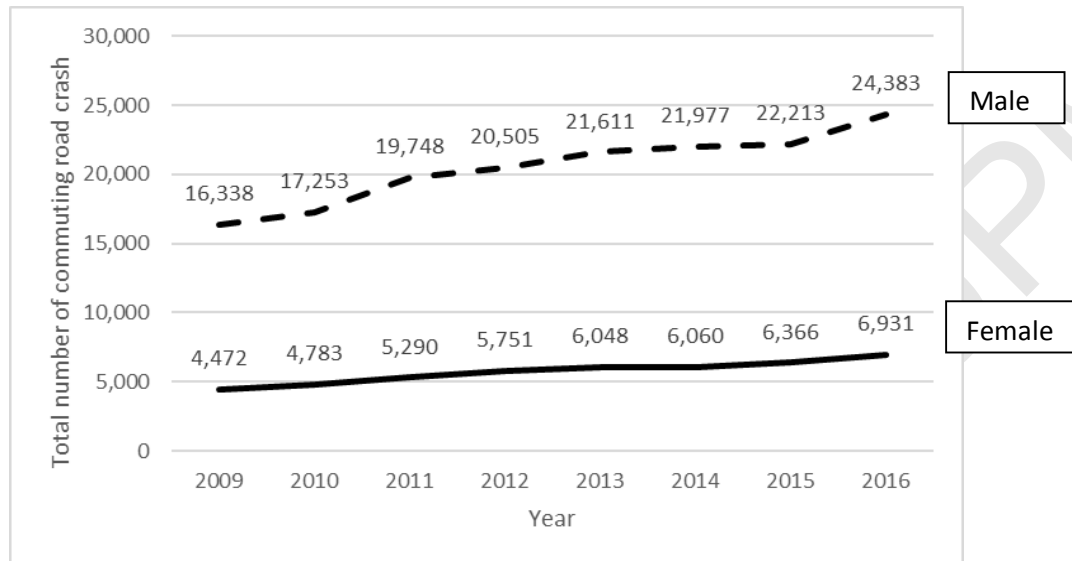


Figure 1.3 : Trend of commuting road crashes reported to SOCSO in Malaysia from 2010 to 2016 according to gender
(Source : SOCSO Annual Report, 2016)

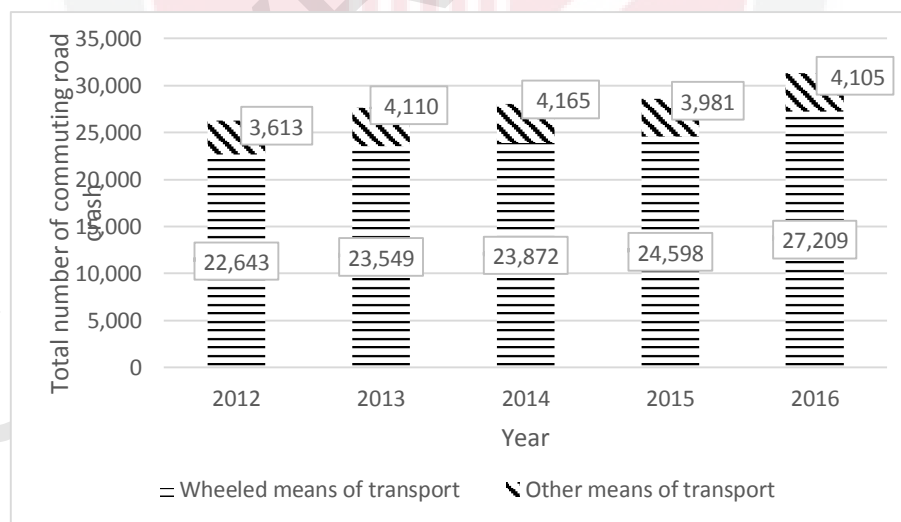


Figure 1.4 : Trend of commuting road crashes reported to SOCSO in Malaysia from 2012 to 2016 according to means of transport
(Source : SOCSO Annual Report, 2016)

1.3 Impact of commuting road crashes

Some workers who are severely injured due to commuting road crashes need more time for treatment compared to acute injury workers and are reported to have longer medical leave. Commuting road crashes cause economic losses to injured workers, their families as well as to the country.

During long absenteeism from employment due to commuting road crashes, those injured workers do not receive full monthly income salary from their respective employers. Although the injured workers receive approximately 80% of their average daily income from the SOCSO temporary disablement benefit during their medical leave, the amount is not enough for their expenses in order to maintain their pre-injury lifestyle, especially for those who are the breadwinner of the family. According to Hyder (2004), and Geziary, El Sayed, Hussain, & Sakr (2004), the work-related disablement of household heads is proven to cause major economic hardship for families due to the loss of earnings.

Economic losses may also arise from the cost of treatment and labour lost. In more serious cases, family members need to take time off work to care for the injured workers during the treatment or recovery period as injured workers struggle to take care of themselves at home (Franze, Bjonstig, & Jansson, 2006) due to pain and the functional limitations for self-management. Disability due to commuting road crashes affect all ages but the most affected are those in the young and productive years of their life.

According to the World Health Organization (WHO), RTCs cost most countries 3% of their gross domestic product (GDP). In 2016, RTCs cost Malaysia an estimated RM 9.21 billion. Malaysian Institute of Road Safety Research (MIROS) estimates that death due to RTC cause the country an average of RM 1.2 million, RM120,000 for severe injury and RM 12,000 for light injury in medical cost, productivity loss and other pay-outs.

Commuting road crashes may also have implications such as a limitation in the social activities of the injured workers due to physical pain or low self-esteem. As a result, psychological consequences like depression, anxiety or stress may arise among these commuting road crash victims and their family members. This may lead to a reduction in the quality of life of the injured workers (Baranyi et al., 2010).

Commuting road crashes are considered to be a significant global public health challenge due to the seriousness of the consequences not only for the commuting road crash victims, but also for the many parties around them, such as spouse, parents or employer, especially for those who are seriously injured and are subject to a slow recuperation process. This impact becomes a barrier to living a “good life” (Derrett et

al., 2009). Therefore, it is important for these injured workers to undergo a rehabilitation process that enables them to get back to work (RTW) faster.

1.4 Importance of getting back to work after commuting road crash

Work plays a major role in terms of the health and social well-being of workers (Vogel, Barker, Young, Ruseckaite, & Collie, 2011; Hoefsmit, Houkes, & Nijhuis, 2012) because work promotes the general health status and social inclusion (van der Feltz-Cornelis et al., 2010). Many believe that one's self-identity is dependent on work, because through working one is able to earn money and become a productive member of society. Furthermore, work increases a person's sense of self-worth and personal fulfilment. Thus, when somebody's injuries prevent them from working, they will be emotionally unstable as well as physically, mentally, and socially impaired (Hansson, Lytsy, & Anderzen, 2010). This is why post-crash management including rehabilitation after a commuting road crash plays an important role in assisting injured workers to return to their pre-injury job and be part of a working society again.

In different countries, the RTW duration and rates among injured workers differ, which might be due to the different definitions of RTW, different types of work-related injuries or the time of RTW rate being calculated (example 6 or 12 months post-injury). In China, a retrospective cohort study on work-related injury by He et al. (2010) reported that 92.9% of injured workers in the study on RTW had resumed work at the seven months follow-up. Lower RTW rates, ranging between 65 and 72%, were found in French RTW-related studies as concluded by Poulain et al. (2010). Generally, according to a review article by Athanasou (2005), RTW rates for 71 worldwide studies ranged between 29% and 100% with a median rate of 67%.

On top of this, the differences in the RTW duration and rates are also due to the different types of rehabilitation received by injured workers. Al-Dawood (2000) as well as Khorasani-Zavareh et al. (2009), and Hyder (2004) were among the researchers that reported and believed that effective rehabilitation is able to minimize the physical consequences of commuting road crashes so that injured workers are able to get RTW as soon as possible after being involved in a commuting road crash.

1.5 Rehabilitation after commuting road crashes

Rehabilitation is a process of recovery after being involved in a serious injury, illness or surgery to regain strength, relearn skills or find alternative methods of doing the same activities as before (<https://medlineplus.gov/rehabilitation.html>). Rehabilitation is important to minimize future functional disabilities, become independent again, and restore participation in normal daily activities, such as walking.

However, the definition of rehabilitation for workers might be slightly different from other groups of people as the goal of rehabilitation for injured workers should comprise the RTW goal (Soberg, Finset, Bautz-Holter, Sandvik, & Roise, 2007). Rehabilitation for the injured working population with restrictions and limitations related to work functioning (Rinaldo & Selander, 2016) aims to optimize the work ability (Vindholmen, Hoigaard, Espnes, & Seiler, 2014) so that they could safely endure a return to their pre-injury job in a timely manner.

Workers who have survived commuting road crashes are advised to go for rehabilitation after they have been treated physically by healthcare providers, such as orthopaedic or general surgeons, at the hospital. They are advised to reintegrate as soon as possible into the working community by avoiding long periods of sick-leave for a speedy recovery.

In addition, Schmitt, van Meeteren, de Wijer, Helders, & Graaf (2008) highlighted the improvement in health status and the quality of life through rehabilitation. According to Christie et al. (2016), discharge from hospital after being treated due to injury can be difficult for many injured workers as they are inadequately prepared for the transitioning from hospital care to self-care at home. Rehabilitation is able to improve injured workers' post-discharge dilemma through providing useful information, such as pain management and a timescale for recovery and getting back to work.

The RTW duration and rate have been used extensively in many previous studies as an indicator of rehabilitation outcomes on the working capacity of injured workers (Norlund, Ropponen, & Alexanderson, 2009). Injured workers are recommended to go for rehabilitation to shorten the time to get back to work after being involved in commuting road crashes. They can go for a single-mode or multidisciplinary-mode of rehabilitation.

1.5.1 Single-mode rehabilitation approach to facilitate RTW outcomes

The single-mode rehabilitation approach is one of the rehabilitation approaches that can be used by those involved in commuting road crashes to facilitate their RTW outcomes. Examples of single-mode rehabilitation are physical exercise, patient education, and functional restoration, which are provided to injured workers separately at different times. Based on the study results of Yu et al. (2016), single-mode rehabilitation produces equally or less effective RTW outcomes, but may have a positive effect on the outcome if it is part of a multidisciplinary rehabilitation intervention.

1.5.2 Multidisciplinary rehabilitation to facilitate RTW outcomes

A multidisciplinary rehabilitation intervention for post-crash care involves two or more healthcare disciplines (Norlund, Ropponen, & Alexanderson, 2009) with multidisciplinary team members from various disciplines. Team members in a multidisciplinary rehabilitation collaborate with each other because injured workers with long medical leave normally experience multiple problems that need treatment from various specialist disciplines. Although there are many parties involved, they have one mission in assisting them to get better and be able to perform daily and work-related activities as soon as possible (Norrefalk, 2003).

Multidisciplinary rehabilitation has been highlighted as being of more benefit than single-mode rehabilitation in terms of both the physical and psychological problems that arise due to commuting road crashes to improve the RTW rate and duration among injured workers (van der Feltz-Cornelis et al., 2010; Hoefsmit, Houkes, & Nijhuis, 2012; Kamper et al., 2015 and Rinaldo & Selander, 2016). However, the effectiveness of rehabilitation (either single-mode or multidisciplinary-mode) may also be affected by other factors, such as injured workers' comorbidity, age, post-injury motivation to get RTW or self-efficacy. Nevertheless, multidisciplinary rehabilitation has been proven to be more effective in assisting injured workers to resume their pre-injury employment. The determinants of the RTW outcomes will be discussed in-depth in Chapter Two.

There are two types of multidisciplinary rehabilitation; the differences and similarities of which can be seen in Table 1.1.

Table 1.1 : Differences and similarities between two types of multidisciplinary rehabilitation

Multidisciplinary rehabilitation characteristics	
Meeting and discussion between team members and injured workers about RTW goal	Yes/No
Individually tailored rehabilitation plan	Depends on study objective
One-stop centre	Yes/No
Convenience	Yes/No
Presence of case manager	Depends on study objective
Presence of physician	Yes
Presence of physiotherapist	Yes

(Source: Stapelfeldt et al., 2011; Dekkers-Sanchez et al., 2011; Brendbekken et al., 2016; Momsen et al., 2016)

Examples of multidisciplinary rehabilitation intervention aiming to assist injured workers get RTW faster are shown in Table 1.2.

Table 1.2 : Various components in multidisciplinary rehabilitation used by different authors

Authors	Multidisciplinary rehabilitation intervention components
Law et al. (2016)	Physical and psychosocial interventions
Streibel & Bethge (2014)	Exercise, physical therapy, education, relaxation, and massage therapy
Netterstrøm, Friebel, & Ladegaard (2013)	Physical exercise, gradual increase in working hours and identifying obstacles for RTW
Palmer et al. (2012)	Exercise therapy, behavioural intervention, physical therapy and workplace intervention
Wåhlin, Ekberg, Persson, Bernfort, & Öberg (2012)	Clinical intervention and work-related intervention
Oyeflaten, Lie, Ihlebæk, & Eriksen (2012)	Physical activity, education, and cognitive behavioural modification

1.5.3 Multidisciplinary rehabilitation to facilitate RTW outcomes in Malaysia (SOC SO RTW Programme)

In the Malaysian setting, the Social Security Organization (SOC SO) was appointed as the government statutory body to provide protection for workers who suffer from accidents arising from work including commuting road crashes. The coverage of protection for this kind of injury is provided under the Employment Injury Insurance Scheme, one of the benefits under this scheme is rehabilitation. In line with Malaysian law, under Section 57 (1) of the Employee's Social Security Act 1969, SOC SO has taken the initiative to provide multidisciplinary rehabilitation (physical and vocational rehabilitation) to the injured insured workers in order to enhance their productivity and efficiency after being involved in work-related accidents.

The Return to Work (RTW) programme was introduced by SOC SO in 2007 as part of its rehabilitation benefits to enable injured workers to regain their ability to perform day-to-day activities and get RTW as soon as possible. The main reason for the execution of this programme was the increasing number of permanently disabled workers due to work-related injury, including road crashes. The cost of participation of commuting road crash workers in this programme is incurred by SOC SO.

This multidisciplinary rehabilitation is managed by case managers who have been working with SOC SO. Case managers are the persons-in-charge for every insured injured worker. They are responsible for identifying potential eligible injured workers to participate in this RTW Programme. They collaborate with other team members,

such as orthopaedic surgeons and physiotherapists, to make an individually tailored rehabilitation plan. Along the way of the rehabilitation process, Lu & Xu, (2007), and Jensen, Jensen, & Nielsen (2012) suggested that case managers should give full social support to the insured injured workers through counselling to reduce their psychological effects and assist the injured workers to be clear about the stage of work injury. In addition, case managers also act as an intermediary to ensure the link between all the parties involved in this RTW programme (employee, employer, family member, and health professionals) and that they know their roles so that the programme can succeed and injured workers can return to work in a timely manner.

1.5.4 Introduction of self-management method in Malaysia RTW Programme

Self-management is the involvement of injured workers in the management of their care after commuting road crashes. However, poor self-management may lead to a weakness in adherence to treatment, reduced quality of life and affect their psychological well-being (Goldberg, Hinchey, Feder, & Schulman-green, 2016; Newman, Steed, & Mulligan, 2004). Although there are many names for self-management, like self-care (Lee, Kennedy, & Rogers, 2006), self-help (Johnston, Jull, Sheppard, & Ellis, 2013) and patient care counselling (Sperry, 2006), they have the same purpose in improving injured workers understanding of their health condition, compliance with health prescriptions, and assisting in managing care to foster better adherence (Tung, Lin, Chen, & Chang, 2013) to the injury recovery process after being involved in a commuting road crash.

One of the approaches to the implementation of self-management after a commuting road crash is coaching. Coaching is different from teaching and mentoring as coaching involves self-directed problem solving for issues that arise during the recovery period after being involved in a commuting road crash by a trained coach. This technique is supported by Dufour et al. (2014) who contended that coaching is able to motivate commuting road crash survivors in changing negative thinking patterns and promote behaviour change. In his review in the Handbook of Return to Work on the barriers to recovery and return to work, Aylward (2016) supported the importance of behaviour change among injured workers in managing rehabilitation and RTW, but explained that it is a gradual process. In order to change specific behaviour through active learning strategies, injured workers have to be motivated and be able to perform the suitable action as required in the intervention module (Kooijmans et al., 2012).

Therefore, based on the evidence concerning the effectiveness of self-management intervention among injured workers, this research explores additional self-management in SOCSO RTW multidisciplinary rehabilitation by introducing the term biopsychosocial coaching instead of self-management because the injured workers in this study were coached in terms of the biological, psychological, and social aspects that could assist their recovery and return them to their pre-injury job in a timely fashion without a relapse due to re-injury.

Biopsychosocial coaching exposed injured workers to knowledge and skills in order to self-manage themselves in terms of daily and work activities after being involved in a commuting road crash. The components of biopsychosocial coaching are more focused on providing knowledge and skills, such as the definition of pain and the importance of exercising to help reduce the pain and faster recovery, as well as managing the emotional impact (Barlow, Bancroft, & Turner, 2005; Du et al., 2011; Turner, Anderson, Wallace, & Bourne, 2015).

1.6 Biopsychosocial approach

Biopsychosocial approach was used in this study. Biopsychosocial consists of three aspects, which are 'bio', 'psycho' and 'social'. The term 'bio' means biological or physical factors such as tissue damage and deconditioning. 'Psycho' means psychological factors, which included thoughts and feelings. 'Social' consists of surrounding people such as family, friends, work and recreation.

Six biopsychosocial factors were included in this study, which consisted of pain, function, emotion, coping, confidence and work perception. Pain indicates how much an injured worker could interfering pain in his life and function is the expression of the impact of commuting road crashes injury on functional activities, such as work and recreational activities. Emotion involved the level of emotional distress, while coping reflects the approach to manage commuting road crash injury. Confidence is the level of optimism and sense of being control of life, and work perception reflects the attitude related to work such as expectations about returning to work.

1.7 Problem statement

As reported by SOCSO, past statistics have recorded the increment for commuting road crashes from year to year. With the increment of Malaysian workers 2.1% annually, commuting road crashes reported to increase 7.7% annually. It has been estimated that for every death, at least another 20 persons sustain road traffic injuries (Global Status Report on Road Safety, 2013) and that these survivors have to live with the consequences arising from the RTC. The works by Ameratunga, Norton, Bennett, & Jackson (2004), and Polinder et al. (2010) agreed that despite the improving rates of RTC survivors, which were due to the substantial improvements in trauma care, injured workers might not be able to work as they did before.

It is strongly believed that implementation of biopsychosocial approach with higher adherence to a personal health-related goal is able to improve health outcomes, which leads to early RTW (Jerant, Von Friederichs-Fitzwater, & Moore, 2005; Ahola & Groop, 2012; Vanichkachorn, Roy, Lopez, & Sturdevant, 2014; Panagiotti et al., 2014). Thus, although commuting road crash survivors are able to seek medical treatment from health care providers (biological/ physical aspect), they also need to empower themselves in emotional consequences (psychological aspect) and role changes (social

aspect) (Musekamp, Bengel, Schuler, & Faller, 2016). Therefore, better manage of biopsychosocial factors that delay recovery can facilitate RTW among commuting road crashes survivors.

Those involved in commuting road crashes had longer medical leave compared to other types of occupational accidents (Seland & Cherry, 2006; Townsend & Simcic, 2010). The reason for this is that commuting road crashes normally involve multiple injuries to different body parts (Hincapié, Cassidy, Côté, Carroll, & Guzmán, 2010; Leijdesdorff, Siegerink, Sier, Reurings, & Schipper, 2012; Bayan, Bhawalkar, Jadhav, & Banerjee, 2013). According to a study by Clay, Newstead, Watson, & McClure (2010), injured workers with injuries to more than one body part do not resume work within six months' post-injury.

Injured workers who have prolonged medical leave due to commuting road crashes might experience the risk of the loss of their job skills or lose their job. Due to the long recovery process that prevents injured workers from working, they might forget how to perform their job. From the point of view of an employer, they might search for another healthy and competent worker to perform that particular job to prevent any loss to the company.

In order to gain their full working capacity as before the commuting road crash, these injured workers need rehabilitation, with getting back to work as their main goal. However, rehabilitation needs time. Sometimes the progress of recovery is slow due to many factors, such as injured workers become demotivated or the cost to attend a rehabilitation session is expensive. Therefore, these factors may affect the adherence of the injured workers to the rehabilitation session and have an impact on their injury recovery.

In addition, rehabilitation should not simply focus on the physical limitations of the injured workers, as the RTW process is not solely determined by physical readiness (Shi, Sinden, Macdermid, Walton, & Grewal, 2014). To maximize the proportion of workers with sustainable back to work, it has been suggested that commuting road crash victims need orienting to think positive and adopt a healthy lifestyle to foster better adherence to their injury recovery process. This adherence is important to prevent prolonged absenteeism as it can lead to other problems including physical deconditioning and low self-esteem (Tschernetzki-Neilson, Brintnell, Haws, & Graham, 2007). Delay or failure to fix this problem may prevent successful rehabilitation, as timely work re-entry is crucial for the improvement of health as well as to reverse the adverse health effects that arise from worklessness.

Discharge from the hospital after a commuting road crash is a challenging time to perform day-to-day and work activities for some of the injured workers as they need to face the reality of life with their physical limitations. Despite the pain, they have to carry out daily life activities with limited capability compared to the time before the

commuting road crash. This can cause psychological distress and reduced their quality of life as their ability does not meet their expectations to perform better. In order to go through this difficult moment in their life, timely rehabilitation intervention with active behavioural coping strategies has been identified as being helpful to facilitate recovery and reduce the time of suffering and time lost from life responsibilities (Visser et al., 2015; Al-Dawood, 2000).

There is a large volume of published studies on multidisciplinary rehabilitation among workers in other countries concerning various diseases or illnesses, such as cancer, stroke, diabetes, musculoskeletal problems and low back pain. Interestingly, this kind of rehabilitation has shown its effectiveness when implemented among those workers to improve their working status. Although SOCSO has adapted multidisciplinary rehabilitation for its RTW Programme, and even though a large and growing body of literature on biopsychosocial has been written in other countries, to date, the programme does not include coaching intervention focusing on the biopsychosocial determinants of RTW as part of its multidisciplinary rehabilitation intervention.

There is increasing concern that low health-related quality of life (HRQOL) is a major part of the RTC burden (Kenardy, Heron-delaney, Warren, & Brown, 2014), (Hours et al., 2014), (Martin-Herz, Susanne P., Zatzick, Douglas F., McMahon, 2012) & (Murgatroyd, Casey, Cameron, & Harris, 2015). Therefore, improving the HRQOL level of post-crash care is important. The evidence from Murad, Brien, Farnworth, & Chien (2013) in their research on health status among Malaysian RTW programme participants revealed that the overall mean scores of health-related quality of life (HRQOL) for all domains were significantly lower than the international norms. An improvement in the HRQOL level among commuting road crash survivors is crucial as, according to the review by Zibung, Riddez, & Nordenvall (2015), HRQOL even occurs several years after a traumatic event.

1.8 Significance of the study

The result of this study can be used as a base to develop an effective rehabilitation programme as this was the first trial of biopsychosocial coaching among participants who participated in the SOCSO RTW Programme. This research will provide knowledge concerning the effectiveness of the SOCSO RTW Programme with the addition of biopsychosocial coaching among commuting crash survivors and could be generalized to other types of occupational injury if proven effective. In addition, each of the injured workers participating in the SOCSO RTW Programme will be assessed systematically through their biopsychosocial determinants to RTW. They will be given an appropriate coaching module based on their individual barrier to RTW, which will assist their recovery journey as well as their RTW duration.

A shorter period of recovery not only benefits the injured worker, but is advantageous to other stakeholders, such as employers, family members, and SOCSO. The cost of medical leave may also be reduced as there will be no long absenteeism to recuperate from injury. Besides, employers are able to retain a skilled workforce even after their workers have been involved in a work-related accident. Injured workers who are spouses or parents will no longer worry about having low self-esteem as this intervention provides support to its participants to regain self-confidence that has been lost due to the injury. As for SOCSO, it may shorten the length of disability benefit claims. Through these savings, SOCSO may be able to use the money for other social security-related purposes, such as safety and health awareness programmes among employers and employees.

In referring to the Decade of Action for Road Safety 2011-2020, an initiative by the United Nations Road Safety Collaboration to stabilize global road accident fatalities until 2020 at the national, regional, and global levels, this research fulfils the fifth pillar (trauma care and rehabilitation) of activities in this global plan by implementing one of the aspects in the rehabilitation process to minimize the risk of injured workers experiencing prolonged disability.

1.9 Research objectives

1.9.1 General objective

To evaluate the effect of a combination of biopsychosocial coaching and vocational rehabilitation to improve the back to work (RTW) duration among injured workers who have been involved in commuting road crashes.

1.9.2 Specific objectives

- i. To compare the RTW duration of injured workers in the intervention group and the control group.
- ii. To compare the RTW rate of injured workers in the intervention group and the control group.
- iii. To compare the biopsychosocial factors, mental health, and HRQOL of injured workers at the baseline and the post-intervention (4-months after) assessment.
- iv. To compare the biopsychosocial factors, mental health, and HRQOL of injured workers in the intervention and the control group at post-intervention.
- v. To determine the association of the identified potential factors that may affect RTW (sociodemographic characteristics, employment characteristics, injury characteristics, biopsychosocial factors, mental health, and HRQOL) and the RTW duration.

1.10 Research hypotheses

- i. There is a significant difference in the RTW duration among injured workers between the intervention group and the control group.
- ii. There is a significant difference in the RTW rate among injured workers between the intervention group and the control group.
- iii. There is a significant difference in the mean score for the biopsychosocial factors, mental health, and HRQOL of injured workers between the baseline and the post-intervention assessment.
- iv. There is a significant difference in the mean score of the biopsychosocial factors, mental health, and HRQOL of injured workers between the intervention and the control group at post-intervention.
- v. There is an association between the identified potential factors that may affect the RTW (sociodemographic characteristics, employment characteristics, injury characteristics, biopsychosocial factor, psychological effects, and HRQOL) and the RTW duration.

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BIODATA OF STUDENT

The student's name is Nurrul Hafeezah binti Sahak who was born on 3 March 1986 in Subang Jaya, Selangor. She completed her secondary education (Sijil Pelajaran Malaysia) in 2003 with 8A's from Sekolah Menengah Kebangsaan (P) Sri Aman, Petaling Jaya, Selangor. She pursued a three-year degree in Environmental and Occupational Health in 2008 from Universiti Putra Malaysia. After graduating, she pursued Master in Industrial Safety Management from Universiti Kebangsaan Malaysia. In December 2010, she enrolled as a doctorate candidate in the field of Occupational Safety and Health in Universiti Putra Malaysia under the Ministry of Higher Education Scholarship (MyPhD). During her candidature, she has attended several workshops/ courses organized by local or oversea organization to enhance her knowledge in research and study field. In 2012, she attended a workshop on Managing the Research Journey conducted by a researcher from the University of Otago, New Zealand. Without failed, she joined the biennial Return to Work Conference organized by SOCSO from 2012 to 2017. In 2013, she attended a course on Survival Analysis in 2013 held by Universiti Kebangsaan Malaysia. She participated in the Commuting Accidents Prevention Seminar by Monash University in 2013. In 2015, she had an oral presentation during the 12th Australian Injury Prevention and Safety Promotion Conference in University of Sydney, Australia. She had a poster presentation at the Safety 2016 World Conference in Tampere, Finland. She attended an international course on Transportation Planning and Safety conducted by the Indian Institute of Technology (IIT) Delhi, India in December 2016. During the course, she presented an oral presentation in Young Researcher Symposium conducted by IIT. She participated three other international courses conducted by the Global Alliance of NGOs for Road Safety - Risk Area Crash Course (2016) and Monitoring and Evaluation Course (2017) and also by the John Hopkins International Injury Research Unit (2017).

LIST OF PUBLICATIONS

Conferences

Nurrul Hafeezah Sahak, Kulanthayan K.C Mani, Titi Rahmawati, Krishna Gopal Rampal, Kathirkamanathan A/L S. Vytialingam. How important is self-care skills in recovery process? A preliminary study. 12th Australasian Injury Prevention and Safety Promotion Conference, 25-27 November 2015, University of Sydney, Australia.

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