ORIGINAL ARTICLE

Work-related Road Traffic Crash: Is Return to Work Rate After Rehabilitation Better With Outcome-focused Intervention?

Nurrul Hafeezah Sahak[1], Kulanthayan K.C Mani[1], Titi Rahmawati Hamedon[1], Krishna Gopal Rampal[2], Kathirkamanathan S. Vythialingam[3]

[1] Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[2] Cyberjaya University College of Medical Sciences, 63000 Cyberjaya, Selangor, Malaysia
[3] Perdana University School of Occupational Therapy, Perdana University, 43400 Serdang, Selangor, Malaysia

ABSTRACT

Introduction: Work-related road traffic crashes (RTC) are a significant global public health challenge due to the seriousness of its consequences. Injured workers who have survived work-related RTC are advised to go for rehabilitation after they have been treated physically by healthcare providers. Reintegrate as soon as possible into the working community able avoid long periods of sick leave. Return to work (RTW) rate have been used extensively in many previous studies as an indicator of rehabilitation outcomes on the working capacity of injured workers. The objective of this study was to compare RTW rate after rehabilitation for injured workers who received physical rehabilitation only (control group) and physical rehabilitation plus outcome-focused intervention (intervention group). **Methods:** Eligible 200 workers who were involved in work-related RTC and agreed to participate in SOCSO RTW Program were identified and invited to be part of this study. Sociodemographic, employment and injury-related questions were distributed. **Results:** This study finding showed majority (79.5%) of the respondents were aged 25 years old or older, male (86.0%), married or divorced (63.5%), and attained secondary and below education level at secondary or below (66.0%). More than half of injured workers consisted of blue-collar workers (69%), had fracture injury (93.0%), and had injury to their lower limbs (48.5%). RTW rate was higher in the intervention group (received physical rehabilitation and outcome-focused intervention) compared to the control group (received physical rehabilitation only). **Conclusion:** RTW rate for work-related RTC was higher with outcome-focused intervention, in addition to physical rehabilitation.

Keywords: Work-related road traffic crash, Return to work, Injured workers, Outcome-focused intervention, RTW rate

Corresponding Author:
Nurrul Hafeezah Sahak, PhD
Email: n_feezah@yahoo.com
Tel: + 6017-3518843

Kulanthayan A/L K.C. Mani, PhD
Email: kulan@upm.edu.my
Tel: + 6013-97692398

INTRODUCTION

The risk of being involved in a road traffic crash (RTC) is increasing with the increasing number of vehicles on the road. The trend of RTC statistics among the general Malaysian population, including workers can be seen in Figure 1 (1).

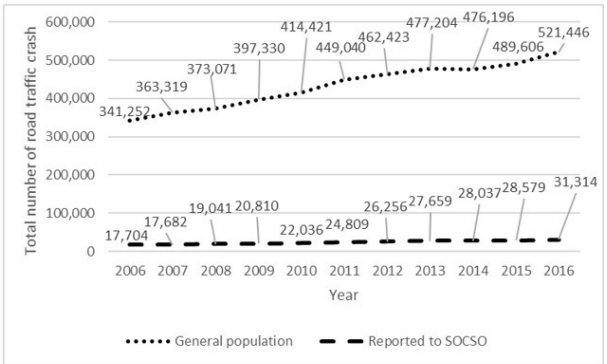

Figure 1: Trend of RTC among general population of Malaysia and reported to SOCSO

Work-related RTC can be summarized as road traffic crash that cause injuries to workers due to the course of work. It could be travelling in either direction from work or a work-related place to workers residence, on a journey made for any reason which is directly connected to employment or on a journey between workplace and place where workers usually take their meals during any authorised recess (2).

For privately employed or self-employed workers, statistics on work-related RTC are collected by the

Social Security Organization (SOCSO). However, the data do not represent the statistics for work-related RTC among all privately employed or self-employed workers, as they only consist of those who claim from the SOCSO 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.

As can be seen in Figure 1 (3), the trend of work-related RTC reported to SOCSO is similar to the trend of RTCs that occurred among the Malaysian general population with an increasing trend year by year.

The breakdown of work-related RTC according to gender can be seen in Figure 2 (3) and according to the means of transport can be seen in Figure 3 (3).

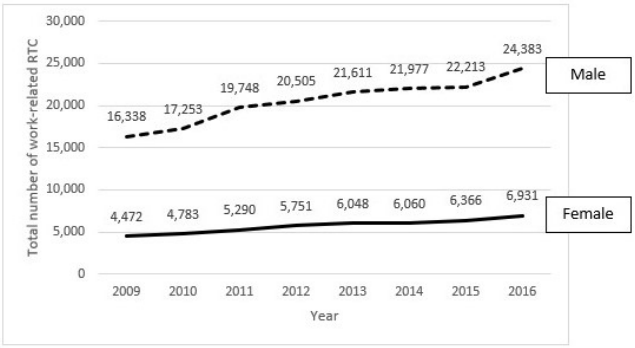

Figure 2: Trend of work-related RTC reported to SOCSO according to gender

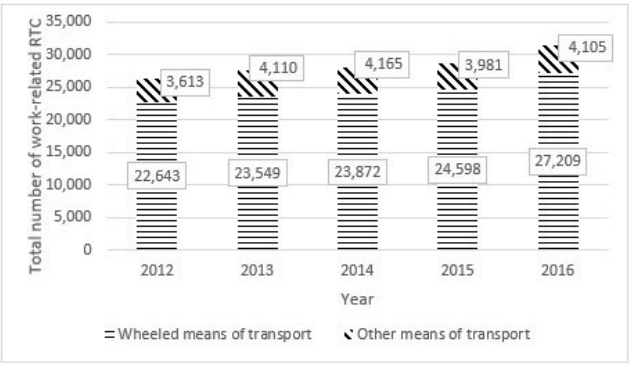

Figure 3: Trend of work-related RTC reported to SOCSO in Malaysia from 2012 to 2016 according to means of transport

RTC are a significant global public health challenge due to the seriousness of the consequences (4). It not only gives impact for injured workers, but also for 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" (5).

Injured workers who have survived work-related RTC are advised to go for rehabilitation after they have been treated physically by healthcare providers, such as orthopaedic or general surgeons, at the hospital. For speedy recovery they are advised to reintegrate as soon as possible into the working community by avoiding long periods of sick leave. The return to work (RTW) rate has been used extensively in many previous studies as an indicator of rehabilitation outcomes on the working capacity of injured workers (6,7,8).

In the Malaysian setting, SOCSO provides protection for workers who suffer from accidents arising from work including work-related RTC. 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.

Return to Work (RTW) programme was introduced by SOCSO 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 RTC. The cost of participation of work-related RTC workers in this programme is incurred by SOCSO (9).

MATERIALS AND METHODS

This was a randomized controlled trial study with allocation concealment. This study was part from a bigger study on the effectiveness of outcome-focused intervention among work-related RTC survivors. To be eligible for this study, potential participants were selected based on the inclusion criteria, i.e., vehicle driver, passenger, motorcyclist, cyclist or pedestrian, involved in a work-related RTC, newly reported case (within the year 2014/2015), and there was no plan for RTW within the next month. An injured worker will not be chosen if had sick leave for longer than 52 weeks.

Participants who consented to be in the study were originated from SOCSO RTW Program. The principal investigator assessed the eligibility of respondents who had agreed to participate in the SOCSO RTW programme. Participants were identified by the researcher with the referral from the SOCSO case managers. Case managers are the persons-in-charge for identifying potential eligible insured injured workers to participate in SOCSO RTW Programme. They collaborate with other team members, such as orthopaedic surgeons and physiotherapists, to make an individually tailored rehabilitation plan. Case managers also act as an intermediary to ensure the link between all the parties involved in RTW programme (employee, employer, family member, and health professionals) know their roles so that the programme can succeed.

For the purpose of group allocation, consenting injured workers were required to select an opaque and sealed envelope that had been prepared by the principal researcher beforehand. There was a questionnaire booklet in each envelope. On each booklet, principal researcher had written an identification number for the treatment assignment, as well as for confidentiality. If the

identification number on the questionnaire started with "I", that particular injured worker was assigned to the intervention group, and if it was "C" the injured worker was allocated to the control group. Injured workers were recruited until the required sample size was met.

The number of injured workers in both the intervention and the control groups was calculated based on the sample size for time-to-event studies;

$$n = \frac{2\,(Z\alpha/2 + Z\beta)^2}{(\ln(Mt/Mc))^2}$$

where
$(Z\alpha/2 + Z\beta)^2 = 7.84$
Mt = mean survival time in intervention group
Mc = mean survival time in control group

Therefore, the total size for each study group was:

$$n = \frac{2\,(7.84)}{(\ln(122/190))^2} \quad (10)$$

$$= 80$$

The minimum recruitment was 160 participants. However, in anticipating a dropout rate of 20% (11), the recruitment goal for this study was increased to 200 participants for both the intervention and the control group.

Injured workers in both intervention and control groups received physical rehabilitation which was carried out in selected rehabilitation centres in Selangor and Kuala Lumpur. It was provided by physiotherapists appointed by SOCSO. Injured workers may select the place for their rehabilitation centre according to their preference based on the distance between SOCSO rehabilitation panel and their home or to their office.

Meanwhile, injured workers in the intervention group received outcome-focused intervention concurrent with physical rehabilitation. Principal researcher was responsible to deliver outcome-focused intervention to all injured workers in the intervention group. Outcome-focused intervention in this study means injured workers were oriented to achive rehabilition outcome- return to work. This intervention helped injured workers attained their RTW goal by identifying domains that strongly influenced injured worker's recovery process. These domains were identified when injured workers answered questionnaires at the beginning of the study, prior receiving the intervention. The intervention topics are shown in Table I. It was compulsory for Topic 1 to Topic 5 to be shared and explained to all injured workers in the intervention group, whereas the other topics (Topic 6 to 16) were chosen by the principle researcher based on the guidelines in Table II.

Injured workers in the intervention group preferred to receive the intervention at the rehabilitation centre after they had finished their rehabilitation session with physiotherapist. On average, each injured worker received three one-hour long sessions of outcome-focused intervention.

Table I: Contents of intervention given to injured workers in the intervention group

Topic	Title	Purpose
1	Introduction	To explain the aim of the coaching to the injured workers
2	Science of pain	To provide information on the physiology of pain and ways to manage one's own pain
3	Biopsychosocial model	To address potential factors that can delay the injury recovery process
4	Thoughts and feelings	To explain how thought patterns impact on emotions and behaviour and to provide choices to respond to these scenarios
5	Breathing techniques	To teach correct breathing technique for the reduction of tension, as well as anxiety and pain
6	Physical conditioning	To share the effects of inactivity and actions to effectively recondition
7	Managing activity	To assist in managing activity during the injury recovery process
8	Response to stress	To provide knowledge on the impact of stress
9	Relaxation and mindfulness	To share the relaxation and mindfulness techniques to reduce the impact of pain and negative emotion
10	Improving sleep	To identify current behaviour that might impact on getting good quality sleep and to share strategies to improve sleep patterns
11	Fuel to go	To provide relevant nutritional tips for healthy eating habits to aid recovery
12	Motivation and choice	To explain the process of behaviour change
13	Goal setting	To identify personal values and goals to assist the recovery process
14	The role of work	To address the importance of work that influences the back to work outcomes
15	Communication	To share options for improving communication at work and home
16	Maintaining change	To obtain affirmation to manage one's own injury effectively

Table II: Guidelines for topics to be delivered to injured workers in the intervention group

Domain	Topics delivered to injured workers
Pain	Topic 2 – Science of pain Topic 3 – Biopsychosocial model
Function	Topic 6 – Physical conditioning Topic 7 – Managing activity
Emotions	Topic 4 – Thoughts and feelings Topic 8 – Response to stress Topic 9 – Relaxation and mindfulness
Coping	Topic 5 – Breathing Topic 10 – Improving sleep Topic 11 – Fuel to go Topic 12 – Motivation and choice Topic 16 – Maintaining change
Confidence	Topic 13 – Goal setting
Work perception	Topic 14 – Role of work Topic 15 - Communication

During the commencement of intervention, injured workers were provided with a workbook to make sure they actively participated and applied the concepts that they had received from the researcher through the activities provided in the workbook.

SPSS version 20.0 was used to analyzed collected data. Categorical data were asserted as frequency and percentage. Continuous data were reported as mean (standard deviation). The distribution of data was checked to ensure that the parametric assumptions were met. The results were considered as significant if p was less than 0.05; two-tailed.

RESULTS

A total of 200 injured workers were enrolled in this study. The overall mean age of 200 participants was 32.3 years (SD= ± 8.2). The age category used in this study was divided into early working age (≤24 years old) and prime working age (≥25 years old) (12). Majority (79.5%) of the respondents were aged 25 years old or older, male (86.0%), married or divorced (63.5%), and attained secondary and below education level at secondary or below (66.0%). Table III is showing injured workers' sociodemographic data.

Majority (69.0%) of the respondents consisted of blue-collar workers, had fracture injury (93.0%), and had injury to their lower limbs (48.5%) (Table IV). The overall mean monthly income received by the respondents in this study was RM 2232.8 (SD= ±RM 1079.2). Monthly income for this study was categorized based on the mean income among Malaysian workers in 2015, which was RM 2312 (13).

Injured workers were asked verbally about their current work status at four months follow-up (either return to work (RTW) or not return to work (not RTW)). Higher percentage (69.7%) of injured workers from the intervention group reported that they had return to work compared to those in the control group (57.1%). However, there was no significant difference (p-value = 0.17) in RTW rate between the intervention and control group.

Table III: Injured workers' sociodemographic characteristics

Respondents characteristics	Intervention group N(%)	Control group N (%)	Total N (%)	Mean ± SD
Age (year)				
≤ 24	24 (24.0)	17 (17.0)	41 (20.5)	32.3 ±
≥ 25	76 (76.0)	83 (83.0)	159 (79.5)	8.2
Gender				
Male	84 (84.0)	88 (88.0)	172 (86.0)	
Female	16 (16.0)	12 (12.0)	28 (14.0)	
Marital status				
Single	39 (39.0)	34 (34.0)	73 (36.5)	
Married/ divorced	61 (61.0)	66 (66.0)	127 (63.5)	
Highest education level				
Secondary education and below	70 (70.0)	62 (62.0)	132 (66.0)	
Tertiary education	30 (30.0)	38 (38.0)	68 (34.0)	

Table IV : Injured workers' employment and injury characteristics

Respondents characteristics	Intervention group N(%)	Control group N (%)	Total N (%)	Mean ± SD
Occupation category				
Blue-collar workers	73 (73.0)	65 (65.0)	138 (69.0)	
White-collar workers	27 (27.0)	35 (35.0)	62 (31.0)	
Monthly income (RM)				
≤ 2312	70 (70.0)	68 (68.0)	138 (69.0)	2232.8 ±
≥ 2313	30 (30.0)	32 (32.0)	62 (31.0)	1079.2
Nature of injury				
Fracture	95 (95.0)	91 (91.0)	186 (93.0)	
Tear	3 (3.0)	8 (8.0)	11 (5.5)	
Dislocation	2 (2.0)	1 (1.0)	3 (1.5)	
Location of injury				
Neck	1 (1.0)	0 (0.0)	1 (0.5)	
Trunk	1 (1.0)	3 (3.0)	4 (2.0)	
Upper limb	38 (38.0)	29 (29.0)	67 (33.5)	
Lower limb	46 (46.0)	51 (51.0)	97 (48.5)	
Multiple injuries	14 (14.0)	17 (17.0)	31 (15.5)	

DISCUSSION

In this study, injured workers in the intervention group received the content of intervention in the form of oral and reading material (workbook). This approach helps to remind injured workers who tend to forget what they have been taught during the face-to-face individual session. In addition to that, injured workers found that some of the content in the intervention module refreshed their knowledge concerning the information they already knew. For example, they were taught on the strategies to improve sleep patterns as well as healthy eating habits in aiding recovery. This approach encouraged them to transform the theory they had known into practice by applying it during their rehabilitation stage and therefore able to aid for faster RTW.

Stable emotion able to help injured workers more relax and this could influence their RTW speed. When injured workers recover faster, they were able to return to the employment faster (14), as positive thought leads to positive emotion and positive action. Outcome-focused on RTW and the inclusion on the topic "Thought and feelings" in this study able to assist injured workers to identify which positive thoughts that important during the process of getting back to work after involved in work-related RTC.

Another reason for higher percentage of RTW among intervention group could be injured workers in this group had better coping skills compared to those in the control group. Those who had better coping skills able to cope their difficulties for positive change (15). On the other hand, if injured workers do not able to cope with their situation, it is difficult for them to change themselves to get better physically. In this study, injured workers in the intervention group able to cope with their physical limitations or pain for speedy recovery. As the result, percentage of RTW higher in the intervention group.

In addition to that, journey to RTW should incorporate individual confidence in order to achieve RTW (16). Confidence is identified as an important aspect in rehabilitation in order to face any challenges in pursuing targeted RTW goal (17,18). Injured workers felt more confident about their individual RTW goal when they saw improvement in recovery through the achievement in their daily goal setting (19). In this study, each injured worker in the intervention group was assigned to outline daily goal based on their present physical capability.

Besides, injured workers in the intervention group of this study was advised about their work goal. It was important to highlight the importance of work and the expectation of returning to employment during rehabilitation process as it able to facilitate RTW journey among injured workers (20). This study aimed to motivate injured workers to value their work as being very important in their life from the aspect of well-being, economy and social life. Work motivation towards work resumption goals and willingness to expend effort for faster RTW were the examples of promoting factors for RTW (21). This could be the reason of higher RTW percentage among intervention group at four-months follow-up.

On top of that, this study reported non-significant difference in terms of RTW rate between the intervention and control group. This could be due to the insufficient dose of intervention whereby an average of three 1-hour individual intervention was given to the participants. Greater intervention input received by injured workers in the intervention group might lead to the statistical difference between the study groups (22). Therefore, injured workers should receive appropriate dose of intervention focusing on their RTW goal in order to ensure they had the highest chance of RTW.

There were few limitations for this study. Firstly, it did not categorise injured workers according to the injury phases (acute, sub-acute and chronic). Different injury phase might affect the RTW outcomes. However, due to the random allocation between the two groups in this study, this factor would be reduced. Another limitation of this study was majority of injured workers consisted of male and blue-collar workers. However, as this study applied a randomized control trial study design, the randomisation done among the participants smoothed away the variation. This study was a low-cost intervention study that did not involve multidisciplinary specialists in the delivery of the intervention content. Other studies have demonstrated better study findings with the participation of related multidisciplinary specialists, such as social workers and psychologists (23, 24). Nevertheless, the principle researcher had undergone training with the intervention provider to ensure the accuracy of the content delivery.

CONCLUSION

This study showed that outcome-focused intervention in addition with physical rehabilitation reported higher rate in RTW. Identification of recovery goal is crucial whereby injured workers should be driven towards achieving RTW. In order to ensure injured workers who were in the recovery process had the highest chance of RTW, they need to be disciplined to achieve their RTW goal. Negative outcome expectancies, such as long recovery should be avoided as they could interfere with the confidence level of injured workers, which may prolonged the time taken to RTW.

In future, follow-up studies should be conducted between those who had RTW and not RTW. This assessment could be conducted at 1 year post-intervention. This assessment is important to determine the long-effect of outcome-focused intervention received by injured workers. Besides, future studies should implement this intervention at early stage to have positive impact on RTW rate. Collaboration with healthcare workers should be made to identify injured workers who have potential delay to RTW due to their injury. Early intervention might help them recover faster and return to the employment without further disability.

ACKNOWLEDGEMENTS

This study obtained approval from the University Research Ethics Committee of Universiti Putra Malaysia (JKEUPM) (Reference: UPM/tncpi/rmc/1.4.18.1 (JKEUPM)/F1)

REFERENCES

1. Royal Malaysia Police Report, 2017
2. Sirim 4: 2014 (Good Practices in Implementing Commuting Safety Management Guidelines
3. SOCSO Annual Report, 2016
4. Global Status Report on Road Safety 2013, World Health Organization
5. Derret S, Langley J, Hokowhitu B, Ameratunga S, Hansen P, Davie G, et al. Prospective outcomes of injury study. Injury Prevention. 2009; 15(5):e3
6. Norlund A, Ropponen A, Alexanderson K, Multidisciplinary interventions: Review of studies of return to work after rehabilitation for low back pain. Jornal of Rehabilitation Medicine. 2009; 41(3): 115-121
7. Poulain C, Kerneis S, Rozenberg S, Fautrel B, Bourgeois P, Foltz V. Long-term return to work after a functional restoration program for a chronic low-back pain patients: A prospective study. European Spine Journal. 2010; 19 (7): 1153-1161
8. He Y, Hu J, Yu ITS, Gu W, Liang Y. Determinants

of return to work after occupational injury. Journal of Occupational Rehabilitation. 2010; 20(3): 378-386
9. SOCSO RTW Program in Malaysia – A journey through a decade, A handbook, 2016
10. Van derFeltz-cornelis CM, Hoedeman R, de Jong FJ, Meeuwissen JA, Drewes HW, van der Laan NC, Ader HJ. Faster return to work after psychiatric consultation for sicklisted employees with common mental disorders compared to care as usual. A randomized clinical trial. Neuropsychiatric Disease and Treatment. 2010; 6: 375-385
11. Cornelius LR, Van Der Klink JJL, Groothoff JW, Brouwer S. Prognostic factors of long term disability due to mental disorders: A systematic review. Journal of Occupational Rehabilitation. 2011; 21(2):259-274
12. https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html (Date of retrieved: 18 June 2019)
13. Department of statistics Malaysia (Date of retrieved: 20 June 2019)
14. Mehlsen M, Hegaard L, Ørnbøl E, Søndergaard J, Fink P, Frostholm L. The effect of a lay-led, group based self-management program for patients with chronic pain: A randomized controlled trial of the Danish version of the Chronic Pain Self-Management Programme. Pain. 2017; 158 (8)
15. Bromberg J, Wood ME, Black RA, Surette DA, Zacharoff KL, Chiauzzi EJ. A randomized trail of a web-based intervention to improve migraine self-management and coping. Headache. 2010; 52 (2): 244-261
16. McLean R. Employment status six months after discharge from inpatient rehabilitation for a mild-to-moderate physical disability. Annals of the Academy of Medicine Singapore. 2007; 36(1): 18-21
17. Hou WH, Liang HW, Sheu CF, Hsieh CL, Chuang HY. Return to work and quality of life in workers with traumatic limb injuries. Archives of Physical Medicine and Rehabilitation. 2013; 94(4): 703-710
18. Carriere JS, Thibault P, Sullivan MJL. The mediating role of recovery expectancies on the relation between depression and return-to-work. Journal of Occupational Rehabilitation. 2015; 25(2): 348-356
19. Damush T, Weinberger M, Perkins S, Rao J, Tierney W, Qi R, Clark D. The long-term effects of a self-management program for inner-city primary care patients with acute low back pain. Archives of Internal Medicine. 2003; 163: 2632-2638
20. Hoefsmit N, Houkes I, Nijhuis FJN. Intervention characteristics that facilitate return to work after sickness absence: A sytematic literature review. Journal of Occupational Rehabilitation. 2012; 22(4): 462-477
21. Brouwer S, Krol B, Reneman MF, Bűltmann U, Franche RL, Van Der Klink JJL, Groothoff JW. Behavioral determinants as predictors of return to work after long-term sickness absence: An application of the theory of planned behavior. Journal of Occupational Rehabilitation. 2009; 19(2): 166-172
22. Netterstrøm B, Friebel L, Ladegaard Y. Effects of a multidisciplinary stress treatment programme on patient return to work rate and symptom reduction: Results from a randomized, wait-list controlled trial. Psychotherapy and Psychosomatics. 2013; 82(3): 177-186
23. Netterstrøm B, Bech P. Effect of a multidisciplinary stress treatment programme on a return to work rate for persons with work-related stress. BMC Public Health. 2010; 10(1): 658
24. Tkachuk GA, Marshall JK, Mercado AC, McMurty B, Stockdale-Winder F. Readiness for change predicts outcomes of functional rehabilitation following motor vehicle accident. Journal of Occupational Rehabilitation. 2010; 22(1): 97-104