Malaysian Journal of Ergonomics
Volume 1, December 2011 (85-90)

Prevalence of Back Pain among Taxi Drivers in Klang Valley

Baba Md. Deros[1], Noor Sazarina Mad Isa @ Yahya[1], Dian Darina Indah Daruis[1], Ahmad Rasdan Ismail[2] and Regunathan Parasuraman[1]
[1] *Department of Mechanical and Materials Engineering, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia*
E-mail: hjbaba@eng.ukm.my
[2] *Faculty of Mechanical Engineering, Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia*

Abstract

A study on back pain among taxi drivers has been conducted in Klang Valley. It was done to identify the risk factors and the effects of back pain among taxi drivers. This study was conducted using a set of questionnaire developed based on the Nordic Musculoskeletal Questionnaire (NMQ). One hundred taxi drivers were randomly selected as respondents from three different taxi stations; Bandar Kajang taxi station, Kuala Lumpur Central Station, and Bandar Serdang taxi station. The result of this study shows smoking habits, no regular exercise, lifting passenger's luggage, prolonged sitting, twisting and bending during driving, long duration of driving and lack of education and knowledge are the factors that can be associated with the prevalence of back pain among taxi drivers. As a result from back pain, most taxi drivers had reported that they have difficulty when lying in bed, walk slower than before and often absent from work.

Keywords: Musculoskeletal disorders, Back pain, Risk factor, Taxi driver.

1. Introduction

Musculoskeletal disorders are the most common occupational disorders faced by workers. Back pain is one of musculoskeletal disorders which can be associated with many variables such as age, physical fitness, smoking, and abdominal muscle strength. However, a recent study has shown that 37% of all back disorders are directly attributable to occupational risk factors (Punnett et al. 2005).

Taxi drivers are exposed to musculoskeletal disorders especially back pain. Although the nature of driving look easy, but prolonged sitting can cause taxi drivers to feel uncomfortable. According to Harrison et al. (1999), prolonged sitting can exposed an individual to a high risk of getting back pain. Therefore, it is suggested that lordotic posture is maintained during sitting. However, taxi drivers have to bend and twist while driving. It is difficult for them to maintain the lordotic posture. This awkward posture makes them susceptible of getting back pain (Chen

et al. 2005). Besides that, long hours of driving in a restricted area (Harrison et al. 1999), stress associated from driving, other physical factors such as whole-body vibration while driving (Bovenzi & Hulshof 1999) and lifting passenger's luggage also may contribute to the development of back pain among taxi drivers.

Therefore, a cross-sectional study has been conducted to identify the prevalence of back pain disorder among taxi drivers in Klang Valley. The two main objectives of this study were to determine the prevalence and risk factors of back pain and to investigate the effects of back pain among taxi drivers in Klang Valley.

2. Methodology

This study was conducted to determine the relationship between taxi drivers daily task with the occurrence of back pain. A set of questionnaire was developed based on the Nordic Musculoskeletal Questionnaire which has been tested for its reliability and validity (Kuorinka *et al.* 1987). The questionnaire was divided into four sections; Section A Respondent's personal background, Section B Respondent's working background, Section C Musculoskeletal Symptoms and Section D Influence of work on taxi drivers. For Section C and D, answering option was based on the Likert scale method.

Taxi drivers who meet the criteria set by the authors were selected as respondents. All respondents must be a Malaysian citizen and age above 18. Respondents were selected from the three main races in Malaysia; Malay, Chinese and Indian. This study was conducted using survey form which each respondent have to complete the questionnaire set.

Kajang taxi station, Kuala Lumpur Central Station and Serdang taxi station was selected as the study locations. These three taxi station located near the train station where people often took taxi to reached their destination after boarding a train. These three locations were selected because they are among the busiest taxi station in Klang Valley.

In this study, descriptive data was analysed using the Excel software. Meanwhile, the analytical data was analysed using the SPSS (Statistical Packages for Social Sciences) software**.**

3. Results

One hundred respondents had participated in this survey. All respondents were male (Table 1) and majority of them aged between 36 – 45 years old (43%). Malay respondents are the highest ethnic participating in this study with 52%, followed by Indians (37%), Chinese (8%) and others 3%. This study found that majority of respondents are smokers (86%), have low education level (92%) and driving a rented taxi (75%).

Table 1: Respondent's Background Analysis

		Frequency (N)	**Percentage (%)**
Gender	Male	100	100
	Female	-	-
Age	≤ 25 years old	12	12
	26-35 years old	25	25
	36-45 years old	43	43
	≥ 46 years old	20	20
Ethnic	Malay	52	52
	Chinese	8	8
	Indian	37	37
	Others	3	3
Smoking habits	Yes	86	86
	No	14	14
Type of taxi registration	Taxi owner	25	25
	Rented from individual	36	36
	Rented from company	39	39
Marital status	Single	8	8
	Married	90	90
	Widowed	2	2
	Others	-	-
Education level	PMR	92	92
	SPM	6	6
	STPM	-	-
	DIPLOMA	-	-
	Others	2	2

Analysis of respondent's working background is shown in Table 2. Survey results shows that only 2% of respondents are practising healthy lifestyle while the remaining 98% are not. Seventy two percent (72%) of respondents claimed that they have experienced back pain and 70% of them experienced back pain after they start working as taxi driver. Only 28% of respondents never had any experience of back pain. Seventy percent of respondents claimed that they are having stress while driving and 21% had experienced violence. Besides driving, 98% of respondents said that they had also to lift their passengers' luggage. All taxi drivers have to bend and twist their body while driving, 98% drive in straight position and 2% drive in bending position. All taxi drivers work at least 8 hours per day with the majority (98%) drive more than 10 hours per day. More than half of respondents (59%) have been working as taxi drivers for more than 11 years.

Table 2: Analysis of Respondent's Working Background

Questions		Frequency (N)	Percentage (%)
Frequent exercise	Yes	2	2
	No	98	98
Back pain	Yes	72	72
	No	28	28
Back pain onset	Before taxi	2	3
	driving	70	97
	After taxi driving		
Psychosocial factor:			
i)Stress during driving	Yes	70	70
	No	30	30
ii)Exposed to violence	Yes	21	21
	No	79	79
Lifting passenger's luggage	Yes	98	98
Bending and twisting while driving	No	2	2
	Yes	100	100
	No	-	-
Driving position	Straight	98	98
	Bending	2	2
Duration of driving a day	4 hours	-	-
	6 hours	-	-
	8 hours	2	2
	10 hours	98	98
Duration of employment as taxi driver	≤ 5 years	18	18
	5-10 years	23	23
	11-15 years	47	47
	≥ 16 years	12	12

Musculoskeletal symptom analysis revealed that neck (53%), upper back (52%), lower back (50%), shoulder (48%), buttocks (45%) and knee (43%) recorded the highest percentage of severe pain compared to other body parts. Very few respondents had reported of having very severe pain on lower back (5%), knee (4%), shoulder (3%), upper back and thighs (2%), neck, buttocks and calf (1%). Elbow and palm are not affected by driving task perform by taxi drivers. Percentage of pain or discomfort with respect to musculoskeletal disorders is shown in Figure 1.

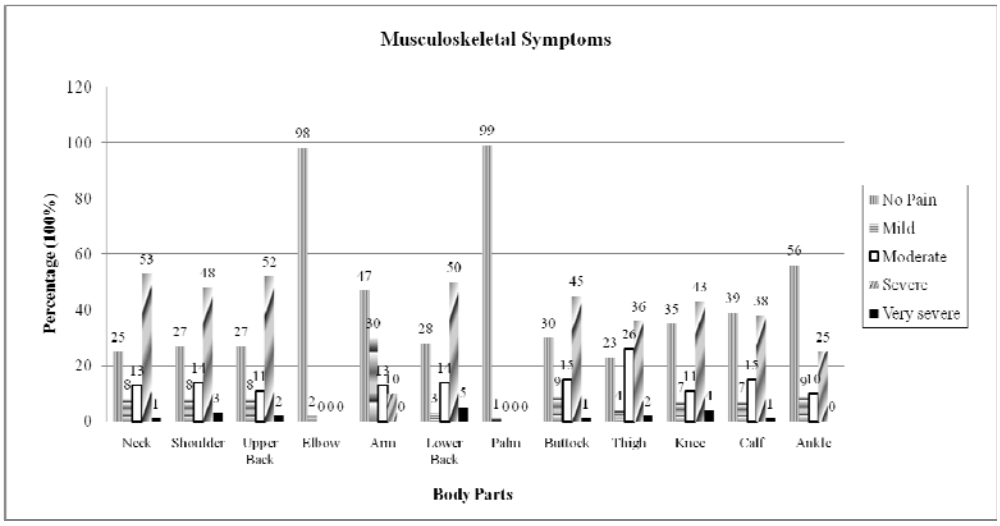

Figure 1: Musculoskeletal Symptoms.

Pearson correlation analysis was conducted in order to investigate the association between body parts that experience pain. The analysis shows that shoulder has a significant high positive correlation with upper back ($r=0.966$, $p<0.01$), buttocks ($r= 0.931$, $p<0.01$) and knee ($r=0.925$, $p<0.01$). This means that, if a taxi driver feels pain or discomfort at the shoulder, there is a high probability for him to feel pain on the upper back, buttocks and knee.

Ankle also shows a high positive correlation with thighs and calf with Pearson correlation coefficient values 0.725 and 0.793 respectively. Both correlations values are significant with the p value of 0.000. Neck and lower back show weak correlations with other body parts. However, this does not mean pain or discomfort on lower back is not important and not related at all. High Pearson correlation coefficient value shows a strong association between variables and not the main causal factor for the study.

Figure 2 shows analysis of survey questions regarding the influence of their daily work task on taxi drivers. Effect from back pain faced by taxi drivers, 55% respondents reported that they had experienced difficulty to lie in bed, 54% feels that they walk slower than usual and have to use the handrail when climbing stairs. More than half (51%) of respondents reported that they were absent from work due to back pain. Forty seven percent (47%) of respondents feels that they had trouble to sleep at night, 46% admit they became hot tempered because of back pain, 38% finds it difficult for them to get out of the chair when they are sitting too long during driving. However, only 10% of respondents faced prolonged and continuous back pain. All respondents had reported that back pain did not influence their eating appetite and did not prevent them from bending and kneeling.

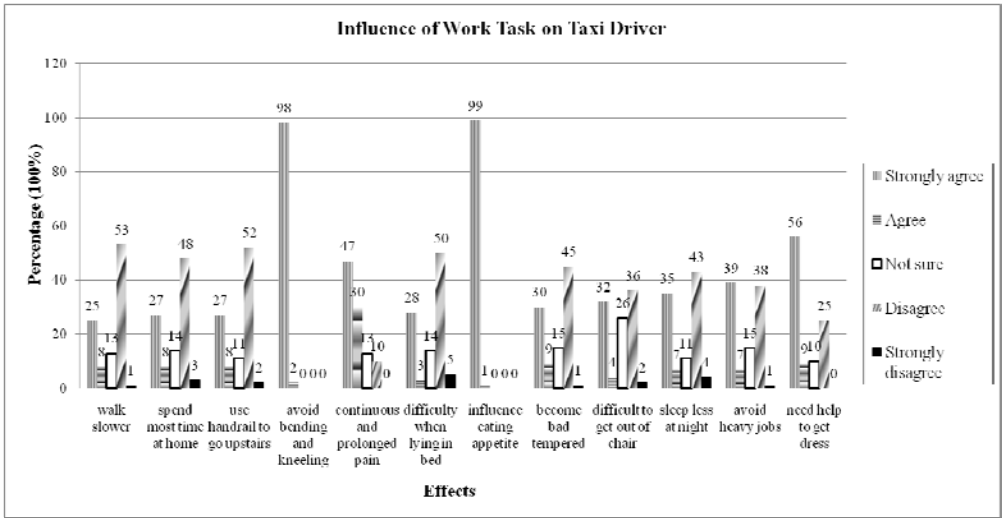

Figure 2: Influence of Work on Taxi Drivers.

4. Discussion

From the analysis, most taxi drivers are smokers and they did not exercise regularly. This exposes them to various health problems such as back pain and other musculoskeletal disorders. A study conducted by Vieira et al. (2006), shows individual that smoke and did not exercise regularly are two times more likely to have low back disorders (1.72 for the welders and 2.56 for the nurses). While, Lei et al. (2005) revealed smoking more than 20 cigarettes per day increased the occurrence of LBP by 2.93 fold (OR= 2.93 1.63–5.27 p=<0.01). Low level of education may also contribute to the reason why taxi drivers are less cautious about the back pain problem which may arise from the nature of their work. So, it is part of the employer's social responsibility to educate their workers to apply good work practise during driving to prevent back pain problem.

Most respondents stated that they had experienced back pain after driving taxi. This result is inline with a study conducted by Sakakibara et al. (2006), where 78% of respondents claimed that driving activity makes their back pain even worse. In addition, limited space in the drivers' seat exposed taxi driver to a high risk of getting back pain. Biomechanical study also shows driving activity can cause postural strain to lumbar spine (Harrison et al. 1999).

This study shows that bending, twisting and lifting passenger's luggage are the daily tasks most performed by taxi drivers. These actions may be the factors why most respondents developed back pain after working as taxi driver. The result is supported by a study conducted by Chen et al. (2005) which shows a significant association between low back pain with bending and twisting while driving. These are studies shows that lifting, carrying, pushing and pulling activity are associated

with the prevalence of musculoskeletal (Anannontsak dan Puapan 1996; Hoozemans et al. 1998; Macfarlane et al. 1997; Magnusson et al. 1996).

All respondents are driving at least 8 hours per day. This is similar to a finding in Chen et al. (2005) study where the percentage of low back pain prevalence is increasing with the increased hours of driving. Chen et al. (2005) also revealed that driving more than 4 hours per day exposed drivers 1.78 times risk of getting low back pain. While Porter and Gyi (2001) shows in their study that driving more than 20 hours a week can cause high frequency of back pain which will lead to absenteeism in the workplace. This explained why taxi drivers are at high risk of getting back pain.

Most of the respondents that participated in this study are driving a rented taxi. According to Raanaas & Anderson 2008, rented taxi driver are at high risk of getting low back pain compared to taxi driver who owns the taxi (OR= 1.60, Cl = 1.17-2.19, $p<0.01$). Owner of the taxi has advantage in controlling their working time compared to rented taxi driver who has to work according to scheduled time. This may give extra pressure to rented taxi drivers and makes them prone to get back pain problem (Krause et al. 1998).

This study also found that more than half of respondents (54%) reported that back pain makes them walk slower than usual. This result is very much different from a study conducted by Miyamoto et al. (2008) among taxi drivers, which shows only 12.7% experienced this problem. However, both study found that back pain did not influence respondent's eating appetite.

5. Conclusion

From this study it is clear that back pain is a problem faced by most of taxi drivers in Klang Valley. Non-occupational risk factors that are associated with back pain among taxi drivers in this study are smoking and no regular exercise. While, the occupational risk factors that contributed to back pain are lifting activity, prolonged sitting, bending and twisting and long driving hours. Impact from back pain, taxi drivers faced difficulty to lie in bed, walk slower than usual and often unable to work. Low education level among taxi drivers makes them unaware of occupational diseases they are exposed to. Therefore, taxi drivers need to be exposed and educate to good work practise or supplied with back or lumbar support when driving to reduce the risk of musculoskeletal disorders.

References

[1] A. Anannontsak and P. Puapan, Journal of Human Ergology, Vol. **25** (1996) 65

[2] D. D. Harrison, S. O. Harrison, A. C. Croft, D. E. Harrison, and S. J. Troyanovich, Journal of Manipulative Physiology Therapy, Vol. **22** (1999) 594

[3] E. R. Vieira, S. Kumar, and Y. Narayan, International Journal of Industrial

Ergonomics, Vol. **38** (2006) 143

[4] G. J. Macfarlane, E. Thomas, A. C. Papageorgiou, P. R. Croft, M. I. Jayson and A. J. Silman, Spine, Vol. **22** (1997) 1143

[5] I. Kuorinka, B. Jonsson, A. Kilbom, H. Vinterberg, F. Biering-Sørensen, G. Andersson, and K. Jørgensen, Applied Ergonomics, Vol. **18** (1987) 233

[6] J. C. Chen, W. R. Chang, W. Chang, and D. Christiani, Occupational Medicine, Vol. **55** (2005) 535

[7] J. M. Porter and D. E. Gyi, The prevalence of musculoskeletal troubles among car drivers, Department of Design and Technology and Department of Human Science, Loughborough University. Leicestershire UK (2001)

[8] L. Lei, P. G. Dempsey, J. G. Xu, L. N. Gea, and Y. X. Liang, International Journal of Industrial Ergonomics, Vol. **35** (2005) 197

[9] L. Punnet and D. H. Wegman, Journal of Electromyography and Kinesiology, Vol. **14** (2005) 13

[10] M. J. M. Hoozemans, A. J. Van Der Beek, M. H. W. Frings-Dresen, F. J. H Van Dijk, and L. H. V. Van Der Wonde, Ergonomics, Vol. **41** (1998) 757

[11] M. L. Magnusson, M. H. Pope, D. G. Wilder, and B. Areskoug, Spine, Vol. **21** (1996) 710

[12] M. Bovenzi and C. T. Hulshof, International Archieves Occupational and Environmental Health, Vol. **72** (1999) 351

[13] M. Miyamoto, S. Konno, and Y. Gembun, Industrial Health, Vol. **46** (2008) 112

[14] N. Krause, D. R. Ragland, J. M. Fisher, and L. Syme, Spine, Vol. **23** (1998) 2507

[15] R. K. Raanaas and D. Anderson, International Journal of Industrial Ergonomics, Vol. **38** (2008) 280

[16] T. Sakakibara, Y. Kasai, and A. Uchida, Occupational Medicine, Vol. **56** (2006) 494