

Prevalence of Musculoskeletal Pains among Three Wheel Drivers in Galle Municipality area of Galle District in Sri Lanka

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Abstract- *The number of three wheelers on the roads in every part of the country has increased during past two decades in Sri Lanka. Three wheel driving is one of the common options for thousands of youth who dropped out from schools. Three wheel drivers are exposed to several risk factors that make them vulnerable for musculoskeletal disorders (MSDs). Especially long static sitting postures throughout the day, frequent body vibration; lifting heavy goods of the passengers and psychosocial stresses are some of them. There is no reported evidence that estimated the prevalence of MSDs in this population. Aim of this study was to describe the prevalence of musculoskeletal pains and associated factors among three wheeler drivers.*

The study was performed on a 250 three wheeler drivers selected from 30 clusters in Galle Municipality area. A pretested questionnaire was administered in a personal interview during the working hours to ascertain personal and work related characteristics. Data were analysed with descriptive statistics and chi-square test using SPSS statistical software (version-16).

Only 201(80.4%) drivers participated for the interview. Most commonly reported MSD symptom was back pain 30.3% followed by 17.4% shoulder pain, 11.4% Neck Pain, 10% Knee joint pain, 9%, Wrist joint pain and 5% Elbow joint pain respectively. Having a history of accidents significantly associated with low back pain (OR=2.13, 95% CI=1.13-3.99), shoulder pain (OR=2.32, 95% CI=1.10-4.88), neck pain (OR=3.150, 95% CI=1.29-7.63), and wrist pain (OR=4.90, 95% CI=1.75-13.75). Lifting heavy goods of passengers has significantly associated with wrist pain (OR=4.18, 95% CI=1.53-11.38).

Back pain was the most common MSD symptom among three wheeler drivers. Previous accidents have great impact on musculoskeletal health of the study population. Measures need to be taken

to prevent accidents and promote occupational health of this population. Health problems of this population should be further investigated.

Keywords: Musculoskeletal disorder, Back Pain, Shoulder Pain

I. INTRODUCTION AND JUSTIFICATION

Three wheel as a transport mode has largely spread all over the country and the number of three wheelers on the roads has increased during past two decades in Sri Lanka. It has been a main mode of transportation of low and middle income population. About 285,000 three wheel drivers are self employed in this industry and it has become a good solution to the unemployment (Fernando and Gamini, 2012). Three wheel driving has been a common option for unemployment among youth dropped out of school in Sri Lanka during the past two decades. According to the nature of the job, three wheeler drivers are exposed to large number of occupational health hazards during the working hours such as static sitting postures during working hours, body vibration, lifting heavy goods of the passengers and job stresses due to various reasons and also other psychosocial stresses. Apart from that nature of the job creates an environment to these workers for smoking, alcohol use, taking junk foods and physical inactivity. Most of the above risk factors that three wheeler drivers are exposed have been identified as known risk factors for musculoskeletal disorders and other non communicable diseases. Therefore three wheeler drivers are at risk of developing any occupational health problem due to above risk factors. In this study we only focused on musculoskeletal disorders.

There are large number of three wheeler drivers self employed in Galle municipality area in Galle district. Especially the school leavers who are unsuccessful in their primary and secondary education easily choose the job as the three

wheeler drivers. Though this occupational group is at risk of developing various health problems, there is no reported evidence that estimated the prevalence of any health problems in this population. One study has assessed the stress level of this population (Fernando and Gamini, 2012). Therefore; our objective was to investigate prevalence of musculoskeletal disorders and associated factors in this population. Findings of this study will shed lights on musculoskeletal problems of the three wheeler drivers.

II. METHODOLOGY

For this descriptive cross sectional study, we selected a sample of 250 three wheeler drivers from 30 three wheel parks using clusters sampling in Galle municipality area. We included only participants who can understand Sinhala with at least one year experience in three wheeler driving, who volunteered to participate in the study. The Galle municipality area has 30 three wheeler parks with 469 three wheeler drivers but only 201 three wheeler drivers adhered to the interview schedule during the data collection period. A self developed, pretested questionnaire designed by the chief investigator with expert advice and incorporating published literature (Fernando and Gamini, 2012, Chen *et al.*, 2005, Gilbert, 2011) was administered. Data collection was carried out during the working hours for each participant. The questionnaire explored variables such as demographic and personal characteristics, work related risk factors, physical health and psychosocial factors. Convenient time of the participant was used for interviews without disturbing their routine work while they were waiting to get their turn for the next hire. Data were analysed using SPSS statistical software (version-16). Descriptive statistics and chi-square test were performed by maintaining significant level of $\alpha=0.05$

Ethical clearance for the study was obtained from the Ethical committee of Faculty of Medical Sciences of University of Sri Jayewardenepura.

III. RESULTS

201 participants completed the interview according to prescheduled time guide and response rate was 80.4%. Personal characteristics of the participants are presented in table I and II.

All the participants were males and 82.6% were married. The mean age was 40.64 (SD=11.3) followed by mean height 161.42 (SD=5.3) cm, mean weight 60.29 (SD=9) kg and mean BMI 23.12 (SD=3.2) kg/m² respectively.

Table I: Personal Characteristics of participants

Characteristics	Mean	SD
Age (years)	40.64	11.3
Height (cm)	161.42	5.8
Weight (kg)	60.29	9
BMI	23.12	3.2
Number of working hours	12.28	2.537

Table II: Personal characteristics-categorical

	Number of	
	Participants	%
Age (years)		
20-30	39	19.8
31-40	72	35.8
41-50	45	22.4
51-60	10	5
Marital status		
Married	166	82.6
Unmarried	30	14.9
Separated	2	1
Widowed	3	1.5
Education		
Primary schooling	48	23.9
Up to Ordinary Level exam	111	55.2
Up to Advanced Level exam	42	20.9
Monthly income		
10000-20000 rupees	24	11.9
20001-30000 rupees	100	49.8
30001-40000 rupees	40	19.9
40001-50000 rupees	32	15.9
>50000 rupees	5	2.5
Years of Work experience		
<=5 years	61	30.3
6-10 years	63	31.3
11-15 years	37	18.4
16-20 years	23	11.4

21-25 years	13	6.5
>=26 years	4	2
Have own home to live		
Yes	138	68.7
No	63	31.3
Main occupation (Three wheeler driving)		
Yes	156	77.6
No	45	22.4

Among the participants 23.9% of them had completed their primary education and 55.2% had learnt up to the Ordinary Level Examination. About one fifth of them (20.9%) had learnt up to Advanced Level Examination. The majority (68.7%) of them had their own house. Among the participants, 38.4% had the experience of working for more than 10 years. They have average 7 hours of sleep at night. Nearly three quarter (77.6%) cited three wheeler driving as their main occupation.

Personal risk factors of the participants are presented in table III. A considerable number of participants (32.3%) had met with accidents while working during the past. When looking at their unhealthy habits, 50.2% were smokers and 74.6% consumed alcohol and also 26% chewed betel. The majority (78.6%) did not do exercises and 69.7% did not lift heavy goods of passengers during their working hours as a principle. Among the participants 28.9% had violated road rules and at some time received punishments. In addition, participants had experienced unpleasant stressful situations such as 15.4% (n=31) disrespect, 22.9% (n=46) verbal abuse, 9.5% (n=19) physical violence and 8% (n=16) theft.

Table III: Personal Risk Factors

	Number of Participants	%
Experience of accidents during past 12 months		
No accidents	136	67.7
1-5 accidents	60	29.9
>5 accidents	5	2.4
Current Cigarette smoking		
No	100	49.8
Yes	101	50.2
Alcohol Consumption		
No	51	25.4
Yes	144	74.6
Beetle Chewing		
No	149	74.1

Yes	52	25.9
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Do regular Exercise

Yes	43	21.4
No	158	78.6

Lifting heavy goods of passengers

Yes	61	30.3
No	140	69.7

Mental Stress

No stress	159	79.2
Stressful	42	20.9

Job Satisfaction

Satisfied	165	82.1
Not satisfied	36	17.9

Road rules violation with punishment

Yes	58	28.9
No	143	71.1

Experience of violence and abuse

Disrespect	31	15.4
Verbal abuse	46	22.9
Physical violence	19	9.5
Theft	16	8

Prevalence of musculoskeletal symptoms is presented in table IV. Most commonly reported work related musculoskeletal pain were low back pain 30.3% followed by 17.4% shoulder pain, 11.4% Neck Pain, 10% Knee pain, 9%, Wrist pain and 5% Elbow pain respectively.

Table IV: Prevalence of musculoskeletal Pains

	Number of Subjects	%
Back pain	61	30.3
Shoulder pain	35	17.4
Wrist joint pain	18	9
Elbow joint pain	10	5
Knee joint pain	20	10
Neck pain	23	11.4

The relationship between musculoskeletal pains and associated risk factor is presented in table v. Having history of accident significantly associated with back pain (OR=2.13, 95% CI=1.13-3.99), shoulder pain (OR=2.32, 95% CI=1.10-4.88), neck pain (OR=3.150, 95% CI=1.29-7.63), and wrist pain (OR=4.90, 95% CI=1.75-13.75). Lifting heavy goods of passengers has significantly associated with

wrist pain (OR=4.18, 95% CI=1.53-11.38). Alcohol consumption had a significant association with history of accidents (n=55, OR = 2.374, 95% CI = 1.102-5.111).

IV. DISCUSSION

The results showed prevalence of some MSD among three wheel drivers was considerably high. The common MSD among this population was back pain followed by shoulder pain and neck pain. Since this population spent more hours in prolong static posture during the working hours, frequent vibration of the body might have predisposed to musculoskeletal symptoms. According to Akinpelu (2011), majority of occupational drivers (89.3%) had reported

experience of musculoskeletal pain in the prior 12 months and low back was the most commonly reported pain site. Chen et al, 2005 has also suggested that prolonged sitting behind the wheels can cause significant postural strains on back muscles and the lumbar spine (Chen *et al.*, 2005). Further, one biomechanical experiments revealed that the association between bending and twisting movements while behind the wheel and prevalence of low back pain (Toren, 2001). Another study among Malaysian commercial vehicle drivers also supported this finding showing a high prevalence of low back pain (60.4%) (Tamrin *et al.*, 2007).

Table v : Association of musculoskeletal symptoms and personal or work related characteristics

Risk factor	Shoulder Pain		Wrist Pain		Knee Pain		Neck Pain		Elbow Pain		Back pain	
	OR		OR		OR		OR		OR		OR	
	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)	Yes (95% CI)
History of Accidents												
Yes (n=65)	17	2.3	12	4.9	8	1.4	13	3.1	5	2.1	27	2.1
No (n=136)	18	(1.1-4.8)*	6	(1.7-13.7)*	12	(0.5-3.7)	10	(1.2-7.6)*	5	(0.6-7.8)	34	(1.1-3.9)*
Lifting goods of the passengers												
Yes (n=61)	15	1.9	11	4.1	4	0.5	9	1.5	2	0.5	18	0.9
No (n=140)	20	(0.9-4.1)	7	(1.5-11.3)*	16	(0.1-1.7)	14	(0.6-3.8)	8	(0.1-2.7)	43	(0.4-1.8)

According to Marianne et al. (1996), vibration (resulting from driving) and lifting cause back, neck, and shoulder pain in occupational drivers. Grace and Lam (2007), reveals that neck, back, shoulder and knee/thigh areas had the highest 12-month prevalence rates ranging from 35% to 60%, and about 90% of the discomfort in bus-driving. The prevalence of our results is relatively low compared to bus drivers. Raanaas and Anderson (2008), revealed that taxi drivers have an elevated risk of musculoskeletal problems. When workload and lifestyle factors were analysed simultaneously, independent risk factors for musculoskeletal pain were identified as driving hours per shift and per week, experience of violence, body mass index (BMI), unhealthy eating habits and little physical exercise.

Significant associations found in our study between prevalence of back pain, neck pain, shoulder pain and wrist pain with the previous history of accidents indicates that previous accidents have great impacts on drivers' musculoskeletal health. Dharmaratne and Stevenson (2006) highlighted an increased risk of crashes associated with travel on privately owned buses and three wheelers compared to travel on government buses. Ediriweera *et al.*(2012), examined the socio demographic factors associated with aggressive driving behaviors of three Wheeler Taxi Drivers in Sri Lanka and revealed that drivers with less than high school education were 3.5 times more likely to drive aggressively. Single or unmarried drivers were 9

times more likely to run red lights and being single was a major risk factor for drunken driving.

A study showed that there were 49 (14.5%) road traffic accidents (RTAs) involving three wheel drivers during the period of 6 months prior to the research. In this study 32.3% (n=65) had faced road traffic accidents, a considerably high proportion. The occurrence of RTAs was significantly higher among the drivers who drive rented three wheelers, who have the habit of driving after having alcohol and smoke while driving (Sampath and Fonseka, 2010).

The prevalence of wrist pain has shown significant association with lifting heavy goods of passengers. The awkward, forceful motions of wrist joint while lifting goods might have lead to wrist pain. Greater support of well conceived research is needed to fill many of the existing gaps in our knowledge about occupational health problems among this group. Findings of this study will shed light on future exploration of occupational health problems among this study population.

V. CONCLUSION

Low back pain was the most common musculoskeletal disorder among three wheeler drivers. Previous accidents have great impact on musculoskeletal health of the study population. Measures need to be taken to prevent accidents among three-wheeler drivers and musculoskeletal health of the three wheel drivers need to be further investigated and paid due attention.

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