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Assessment of Musculoskeletal Disorders Between Lorry Drivers in Qom, Iran

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Abstract

Background: Musculoskeletal disorders represent a substantial cause of morbidity worldwide. The contribution of work to these disorders has been well established by various epidemiological and laboratory-based researches. The aim of this study is to investigate the prevalence and associated factors of musculoskeletal disorders in truck drivers. **Materials and Methods:** This cross sectional study included truck drivers referred to Transportation Company in Qom province. We evaluated musculoskeletal disorders by Nordic questionnaire and demographic data. The questionnaire was filled by direct interview. Data analysis was done in SPSS and P value below 0.05 was significant. **Results:** Age of 173 male participated in this study was 38.82 years with body mass index (BMI) of 26.02 (Kg/m^2) and mean work duration of 8.85 years. In the period of past week and past year, prevalences of musculoskeletal disorders at all of the nine body regions of drivers were 56.6% and 78.6%, respectively. The most common musculoskeletal involvement was lumbar, back and neck regions. There were significant relationship among musculoskeletal problems with age, work duration, and BMI ($P<0.05$).
Conclusion: This investigation showed the importance of frequent musculoskeletal disorders among drivers in different body regions particularly in lumbar area and its correlation with work duration, high weight, and age.**[GMJ. 2104;3(3):182-88]**

Keywords: Musculoskeletal disorders; Automobile Driving; Risk factor; Iran

Introduction

Work related musculoskeletal disorders (MSDs) are inflammatory and degenerative disorders of muscle, tendons, ligaments, joints, peripheral nerves and supporting blood vessels caused or aggravated by work [1,2]. The prevalence of work-related musculoskeletal disorders is increasing worldwide. The association between job type and the specific activities within jobs that predispose to the risk of developing such disorders is well documented for many countries. Musculoskeletal diseases are a major cause of diminished work capabilities of industrial workers and public vehicle drivers with substantial financial consequences due to workers' compensation, medical expenses, and productivity losses [3-5].
These types of disorders may impact the dif-

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ferent parts of the body associated with movement including upper limbs, lower limbs, and the back, and that may affect different structures such as tendons, muscles, joints, nerves, and the vascular system. Bureau of Labor Statistics 2006 data on injury and illness showed that the drivers of heavy trucks and tractor-trailers in the US are associated with second highest number of occupational illnesses and injuries for the past three years. It has been estimated that the indirect costs of one workday lost due to sickness amount to over than five hundred dollars [6].

Various epidemiological studies have demonstrated that specific work-related risk factors may cause musculoskeletal complaints. It is obvious that the drivers spend long times behind wheels, so MSDs are progressively formed over time which may have considerable effects on their personal and social life [7]. The evidence illustrated that the people driving at least half of working hours each day endure three times more than other workers [8]. High prevalence of spinal disorders observed among professional drivers, especially back and neck pain, usually lead to constant suffering and disease and probably early retirement [9].

From the study of the occupational health status of the trucking industry, two discrete and major risk factors related to this occupation turn up as root causes. The first one is the impact of prolonged seating and whole body vibration which are characteristics of this profession and are believed to be the main risk factors for MSD, predominantly back pain. The second cause is the mental tiredness, which is caused by long irregular working hours and stress related to driving, is believed to have strong influence on causation of accidents and poor mental and physical health. A review article claimed that these discomforts are due to physical, psychological, and ergonomics stressors [10].

There is a clear correlation between some conditions such as low back pain, back pain, and neck pain and involvement in bus accidents [11]. Another study in Japan that inspected the risk factors of back pain reported that the prevalence of back pain among 285 taxi drivers was 45.8% which is consistent with other similar studies [12]. Some investigations showed risks of musculoskeletal disorders in drivers are very high in Iran [13]. The assessment of musculoskeletal disorders among truck drivers followed two main purposes: Detecting musculoskeletal disorders prevalence and finding causative and other relative factors which had impact on this rate.

Materials and Methods

In this cross-sectional study performed from September 2012 to May 2013, the inclusion criteria were drivers (n=173) with at least 5 years job experience, age over 20 years and people without history of rheumatologic diseases. We considered past medical history of driving and excluded lorry drivers with previous non-work related musculoskeletal disorders in their health folders or any health conditions or disorders which might have effects on musculoskeletal system except their work. There were thirty four transportation companies in Qom province and we selected nine companies by means of cluster method and then randomly picked up 190 truck drivers. After consideration of inclusion and exclusion criteria, finally 173 drivers participated in this study. Musculoskeletal disorders related complaints were defined as pain or discomfort experienced in the different body regions that continued for at least two to three work days during the past week or the past year [14]. All medical examinations and questionnaire filling were supervised by the research team. For this study we used demographic data including age, career duration, weight, height and body mass index (BMI) and for detection of MSDs in drivers, we applied Iranian version of standardized Nordic Questionnaire (SNQ). The SNQ was developed by a team of Nordic researchers organized to create a simple standardized questionnaire that could be used for the screening of musculoskeletal disorders as a part of ergonomic programs and for epidemiological studies of musculoskeletal disorders [15]. This questionnaire contains nine screening questions, covering 12 months prevalence of musculoskeletal problems in different body areas (neck, shoulders, elbows, hands, upper back, lower back, hips, knees,

and feet), point prevalence (seven days) and pain severity of the same body areas, and 27 detailed data on daily working hours were obtained by the time spent in the workplace. The validity and reliability of the questionnaire were investigated and approved in different studies and several languages, including the Persian language [16,17]. The Nordic musculoskeletal disorders questionnaire (NMQ) was used in several studies for evaluating musculoskeletal problems, including computer and call centre workers [18], car drivers [19] and forestry workers [20]. Informed consent was implied when questionnaires were voluntarily completed and returned.

Chi Square test and fisher's exact test were used to compare demographic variables between lorry drivers with musculoskeletal disorders. Demographic variables were including age, dominant hand, past job history, and BMI. Calculations were done using the SPSS software (SPSS Inc., version 14, Chicago IL, USA) and p-value less than 0.05 was considered significant.

Results

The mean age of 173 male participated in this study was 38.82±6.85 years with BMI of 26.02±2.87 (Kg/m2), career duration of 8.85±5.4 years. According to results of NMQ, last week and 12-month period prevalence of musculoskeletal disorders at any of the nine body regions of cases were 56.6% and 78.6%, respectively. Musculoskeletal disorders within last week were most commonly reported in drivers at the lumbar (20.2%) and upper back (13.3%), and in a 12-month period, these rates were at the neck (27.2%) and lumbar (24.3%). In the last year, musculoskeletal disorders caused limitation in their functions in lumbar (11.0%) followed by upper back (8.7%), respectively. Details of occurrence of musculoskeletal disorders are described in table-1.

This study showed that MSD had significant association with the age of drivers within the past week and the past year, respectively ($P<0.001$), and significant association with musculoskeletal disorders with BMI in the past year ($P=0.039$) but non-significant relationship in the past week ($P=0.96$).

According to career duration, our participants were divided into three groups: Less than 10 years, 10-15 years, and more than 15 years. Prevalence of musculoskeletal disorders within last week in drivers with more than 15 years career duration were significantly higher than participants with less than 10 and 10-15 years career duration ($P=0.007$). During the preceding year, a similar significant difference in drivers was seen in prevalence of musculoskeletal disorders ($P<0.001$). Table-2 presents the association of musculoskeletal disorders to job duration, age, and BMI.

Table 1. Frequency of Musculoskeletal Disorders in the Past Week, 12 Months, and the Limitation of Function.

Body region	Frequency (Percentage) in recent week	Frequency (Percentage) in12 month	Frequency (Percentage) limitation of function
Neck	14 (8.1)	47 (27.2)	2 (1.2)
Shoulder	20 (11.6)	25 (14.5)	8 (4.6)
Elbow	2 (1.2)	9 (5.2)	0 (0)
Wrist/hand	14 (8.1)	14 (8.1)	1 (0.6)
Upper back	23 (13.3)	27 (15.6)	15 (8.7)
Lumbar	35 (20.2)	42 (24.3)	19 (11)
One or both hips/thighs	4 (2.3)	10 (5.8)	1 (0.6)
One or both knees	14 (8.1)	33 (19.1)	6 (3.5)
One or both ankle/feet	6 (3.5)	7 (4)	1 (0.6)

This investigation reported some of the body areas are more involved especially with increasing career duration. Among these, lumbar region and wrist have significant relationship with duration of work. Detail of all musculoskeletal body regions is showed in table-3.

Discussion

The aim of the current study was to determine the frequency of musculoskeletal disorders in truck drivers and its association to some risk factors in this profession. The results of this study indicated that prevalence of musculoskeletal disorders in drivers is very high and more than half of the cases within the last week and about eighty percent within the past year had these problems. The most common involved body regions within the last year were neck pain (27.2%), low back pain (24.3%), upper back (15.6%), shoulder (14.5%) and knee (19.1%), respectively.

Our findings were mostly similar to those reported from other articles from oversees. In the study of Backman, about 70% of the drivers had suffered from pain in the shoulders and the back of the neck during the last month. The symptoms were more common in the left shoulder rather than in the right one. In all, 40% of the drivers often had back trouble [21]. Netterson in a study in Denmark reported the prevalence of frequent low back pain was 57% among bus drivers [22]. This

Table 2. Frequency of Musculoskeletal Disorders in Drivers According to Their Age, BMI, and Work Duration

			MSD (%)		P value
			Positive	Negative	
Age groups	Last week (years)	<35	45.5	54.5	0.001
		35-44	59.4	40.6	
		>45	71.1	28.9	
	Last year (years)	<35	66.7	33.3	0.001
		35-44	84.1	15.9	
		>45	89.5	10.5	
Work duration	Last week (years)	< 10	51.8	48.2	0.007
		10-15	59.5	40.5	
		>15	75	25	
	Last year (years)	< 10	73.2	26.8	0.001
		10-15	83.8	16.2	
		>15	95.8	4.2	
BMI groups	Last week (kg/m^2)	<20	-	-	0.96
		20-24.9	57.4	42.6	
		25-29.9	58.2	41.8	
		>30	57.7	42.3	
	Last year (kg/m^2)	<20	-	-	0.039
		20-24.9	55.9	44.1	
		25-29.9	70	30	
		>30	77.8	22.2	

result is in agreement with other observations [23,24]. High prevalence of musculoskeletal diseases particularly low back pain is possible due to prolonged sitting position and absence of enough exercise among truck drivers [25].
Another point is the form of the seats. Patterson et al. found that musculoskeletal disorders were the most prevalent health problem in bus drivers. This study showed that back pain is more prevalent among the bus drivers who complain about their seats [26]. Our study demonstrated that working duration is so important in the prevalence of MSDs in some body regions particularly lumbar, wrist, hand, and elbow. Also this investigation illustrated that age and weight is significant in expression of musculoskeletal diseases. In the study of Sadeghi et al. about relation between musculoskeletal disorders and anthropometric indices in the bus drivers in Isfahan, prevalence of musculoskeletal disorders were 25.3% and 23.2% in back and neck, respectively, and there were significant correlations between MSD with height, age and BMI [27]. Furthermore, frequent distribution of pain in porter tractor drivers in Zahedan city reported 56.8% and 29.5% in waist and wrist, respectively, and showed that vibration of whole body is one of the reasons of the pain in the organs [28].
It seems that work-related musculoskeletal injuries in drivers are due to repetitive movements, forceful exertions, heavy physical and prolonged static load, whole-body vibration, and psychological work stress. In addition, upper limb disorders are the result of posture of arms and neck, repetitive upper-limb activity, force, and hand–arm vibration [29,30].

Table 3. Comparison of the Frequency of Body Regions' Musculoskeletal Disorders with the Work Duration

Body region	Status	< 10years	10-15 years	>15 years	P value
		Frequency (%)	Frequency (%)	Frequency (%)	
Neck	No	79 (70.5)	32 (86.5)	15 (62.5)	0.079
	Yes	33 (29.5)	12 (33.5)	9 (37.5)	
Shoulder	No	101 (90.2)	31 (83.8)	16 (66.7)	0.084
	One or both Shoulder	11 (9.8)	6(16.2)	8(33.3)	
Elbow	No	107 (95.5)	34 (91.9)	23 (95.8)	0.09
	One or both Elbow	5(4.5)	3(8.1)	3 (12.5)	
Wrist/hand	No	108 (96.4)	29 (78.4)	22 (91.7)	0.001
	One or both Wrist/hand	4 (3.6)	8(21.6)	6(24)	
Upper back	No	96 (85.7)	31 (83.8)	19 (79.2)	0.72
	Yes	16 (14.3)	6 (16.2)	5 (20.8)	
Lumbar	No	93 (83)	24 (64.9)	14 (58.3)	0.008
	Yes	19 (17)	13 (35.1)	10 (41.7)	
hips/thighs	No	107 (95.5)	35 (94.6)	21 (87.5)	0.31
	Yes	5 (4.5)	2 (5.4)	3 (12.5)	
knees	No	89 (79.5)	30 (81.1)	21 (87.5)	0.66
	Yes	23 (20.5)	7 (18.9)	3 (12.5)	
ankle/feet	No	107 (95.5)	36 (97.3)	23 (95.8)	0.89
	Yes	5 (4.5)	1 (2.7)	1 (4.2)	

In terms of the study limitation, it should be noted that self-report data collected in this study may not be an accurate description of the variables reported. Another limitation is the fact that the study was cross-sectional, which makes it difficult to determine causality.

Conclusion

the results of this study highlighted the importance of frequent musculoskeletal disorders between drivers in different body regions. Among these, lumbar area was more frequent and strongly associated with work duration and BMI. Any interventional plan for prevention or decreasing musculoskeletal problems should focus on recommendation of daily exercise, decreasing weight, and early detection and management of these problems.

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