PREVALENCE OF WORK-RELATED MUSCULOSKELETAL DISORDERS AMONG COMMERCIAL TRICYCLE RIDERS IN MAIDUGURI METROPOLIS OF NORTH-EASTERN NIGERIA

A. Umar; Abdulsalam Abdullah; Jacinta A. Opara;

A. M. Abdulkadir;

S. G. Yahaya;

Ibrahim A. Njodi
University of Maiduguri
Maiduguri-Nigeria

and

Olushola F. Ajibola
Federal College of Education, Okene-Nigeria

ABSTRACT

This study was to determine the prevalence of WMSDs among commercial tricycle in Borno State. Across-sectional study of the commercial tricycle riders was carried out using the standardized Nordic Questionnaire. Descriptive Statistics of mean, standard deviation, frequency and percentage were used to summarize the data, while chi-square was used to test difference in prevalence of WMSDs of selected socio-demographic and work-related characteristics of the participants at 0.05alpha level. Work related musculoskeletal disorders (WMSDs) have become a major problem in many industrialized countries and a comparable trend has also been observed in developing countries. The results showed the overall 12 months prevalence of self –reported WMSDs to be 99.7%., with the two shoulders most commonly affected with a prevalence of 89.1%. There was statistically significant difference in 12 months prevalence of WMSDs among commercial tricycle riders of different educational level (x^2 =11.449; P-value=0.010) with those in the age group of 18-35 years recorded the highest prevalence rate of 78.2%. There was a high 12 months prevalence of WMSDs among the commercial tricycle riders with the highest prevalence observed in the shoulder region. This study supports the need for vigilant ergonomic intervention at job sites and early ergonomic education as an integral part of apprenticeship and training of commercial tricycle riders in order to prevent the incidence and prevalence of WMSDs among this group of individuals.

Keywords: Work, Musculoskeletal disorders, Commercial tricycle riders, Maiduguri, Nigeria

INTRODUCTION

Commercial tricycles riders are generally subjected to tremendous amount of physical stress, strain and extreme atmospheric weather conditions, carrying people and goods from one place to another. In Maiduguri, Borno State Nigeria commercial tricycling is currently the most abundant mode of transportation available due to the difficulties in its utilization for insurgent attacks. Musculoskeletal

disorders (MSDs) are injuries or disorders of the musculoskeletal system resulting from repeated exposure to various hazards or risk factors in the workplace (OHSCO, 2007).Musculoskeletal disorders can arise from sudden exertion such as during lifting heavy objects, making the same motions repeatedly, repetitive strain or from repeated exposure to force vibrations and awkward postures (NIOSH 2015). The musculoskeletal system basically includes muscle s, bones, tendons, tendon sheaths, ligaments, bursa, joints and intervertebral discs (Rostykus & Mallon, 2013). MSDs are therefore conditions affecting the musculoskeletal system usually present in the tendons, muscles, joints, blood vessels and nerves of the limbs and back. Other terms used to describe MSDs include repetitive strain Injury, musculoskeletal Injury, cumulative trauma disorder, occupational overuse syndrome and strain or sprain (Lipscomb et. al., 2004).

It was stated by the World Health Organization (1985) that a disorder is work related when working procedures, equipment, or environment contributes significantly to the cause of the disorder. Studies by Szero and Lam (2000), Walker –Bone and Almer (2002), Chyuan et al (2004) and Hussain (2004) have shown that work related musculoskeletal disorders (WMSDs) affect workers in many occupations. Chyuan et al.(2004) documented that WMSDs can affect almost all parts of the body especially the back, neck and upper limbs. This affectation depends on the physical movement characteristics, ergonomic and mechanical design of work tasks.

Epidemiologically, WMSDs among tricycle riders are increasing being an healthcare issue in Maiduguri,, a leading cause of disability among manye individuals (Barbe et al., 2013). In the United States for instance, there were more than 16 million strains and sprains treated among the WMSDs in 2004, and the total cost for treating MSDs is estimated to be more than $125 billion per year (Gallagher et al., 2013). In 2006, approximately 14.3% of the Canadian population was living with a disability, with nearly half of them due to MSDs (Goodridge et al., 2011). Neck pain is one of the most common complaints, with about one fifth of adults' worldwide reporting pain annually (McLean et al., 2010).

Most workplace MSDs episodes involve multiple parts of the body MSDs are the most frequent health complaint by European, United States and Asian Pacific workers (Haukkal et al., 2011). MSDs constituted the third leading reason for disability and early retirement in the United States.. MSDs are widespread in people engaged in different kinds of occupations such as construction workers, factory workers and those engaged in occupations such as office work (Sprigg et al., 2007). The frequency of injury and body parts affected vary by occupation. In United State for instance nurses were reported to have up to 38% MSDs mainly due to lower back injury (ANA, 2001).

The prevalence of WMSDs among commercial motorcyclists in Gombe has been documented (Aliyu, 2013), and the prevalence of WMSDs among commercial drivers and motorcyclists has been determined in south western Nigeria (Akinbo et al., 2008). However, there seems to be no available information on the prevalence of WMSDs amongcommercial tricycle riders in Maiduguri,Borno state of Nigeria where the utilization of tricycles for commercial activities have currently superseded all other forms of vehicles. This study is therefore undertaken to determine the prevalence for work related musculoskeletal disorders among commercial tricycle ridersin Maidugurimetropolitan council Borno State.

Methods

A total of 385 commercial tricycle riders working in Maiduguri metropolitan council area of Borno state were captured for the study. Commercial tricycle riders recruited for this study were tricycle riders .working in Maiduguri Metropolitan Council, who had at least one year working experience on

the job. Tricycle riders below the age of 18 years and whose injuries were recorded to be other activities besides riding were excluded from this study

A Modified version of the Nordic musculoskeletal questionnaire (NMQ) was used to collect the data.The standardized Nordic musculoskeletal questionnaire (NMQ) is a questionnaire often used to investigate work-related musculoskeletal disorders symptoms in working populations (Kuorinka et al., 1987). Yes or No was used as a response foreach body area to three questions concerning annual prevalence, any disability during the last year (annual disability) and weekly prevalence. A sketch of human body was attached to the questionnaire to help the participants locate the body region accurately. The reliability of the NMQ, using a test-retest methodology, found the number of different answers ranged from 0 to 23%. Validity tested against clinical history and the NMQ found a range of 0 to 20% disagreement (Kuorinka et al., 1987). Comparing the pain in the last 7days and clinical examination, the sensitivity of the NMQ was found for between 66 and 92.5% and specificity between 71 and 88% (Ohlsson et al., 1994). For this study, the questionnaire was self administered or interviewer assisted as appropriate.

Section A – consists of questions to collect data on socio-demographic variables (age, marital status, educational level, years of working experience, number of working hours per day).

Section B–consists of questions on prevalence and coping strategies of WMSDs. Questions referred to ten body areas namely 4 upper limb segment (shoulder, elbow forearm, wrists hand thumbs), 3 lower limb segment (hip/thigh, knees, ankles/feet) and 3 trunk segment (neck, upper back, lower back).

Section C -Focuses on items of perception on the job risk factors that may contribute to the development of WMSDs.

Section D- consists of data on coping strategies towards reducing risk of developing WMSDs among commercial tricycle riders.

Data analyses

The data was using descriptive statistics of mean, standard deviation, frequency and percentage to describe the socio-demographic characteristics and prevalence of WMSDs among tricycle riders. Chi square statistics was used to determine the difference in the prevalence of WMSDs among commercial tricycle riders of different, age, years of working experience and educational level. Level of statistical significancewas set at 0.05 alpha.

.**Result**
.All the total of 385questionnaires were completed correctly as a result of interview assistance and close monitoring indicating a 100% response. Therefore all the data for the 385 participants weres analyzed.

Socio Demographic Characteristics All the participants of this study were males with an age range of 18 – 65 years, and a mean age of 30.31±7.683 years. The majority of the participants (78.1%) were in the 18 – 35 years age group, followed by 36 – 55 years (21.3%) and 56-65 years were the least (0.5%). Most of the participants (50.1%) were married while (48.8%) were single and very few of them (1.0%) were divorced category, with primary education being the highest qualification of the participants (40.5%) and tertiary education being the lowest qualification with (8.1%). Also, most of the participants (66.2%) had 2 – 5 years of working experience, and major of the participants worked

for 8 hours and above (46.8%). The details of the participants' socio-demographic characteristics are presented in table 1.

Pattern of WMSDs among Commercial Tricycle Riders The pattern of distributions of WMSDs among the participants for the last7 day and last12 months prior to the study is summarized in table 2 below. The both shoulders was the most commonly affected body part for the past 12 months (89.1%). It was followed by both wrist/hand (85.7%), both elbows (81.0%), lower back (80.3%). The least affected body part was the left elbow (0.5%). The both wrist/hand was the most affected body part for the past 7 days (82.6%), followed by the both shoulder (76.1) with the left elbow also being the least affected (0.8%).

Prevalence of WMSDs by Socio-demographic Characteristics The prevalence of work-related musculoskeletal disorders by socio-demographic characteristics of the participants was illustrated in table 3. The highest prevalence was found in the 18 – 35 years age group (78.2%) while the age group 56-65 years had the least prevalence (0.5%) with regards to educational level, participants who attended primary school had the highest prevalence (40.5%) and those with tertiary education was the lowest (8.1%).
Participants with 2 – 4 years of working experience had the highest prevalence (66.2%) followed by 1 -2 years of working experience (22.3%) and the least was 8 years and above (0.8%). Those working for 8 hours and above per day had the highest prevalence (46.8%) and the least are those working for only 2 – 4 hours per day (2.6%).

Prevalence of WMSDsamong Commercial TricycleRiders The 12-monthPrevalence of Work-related musculoskeletal disorders among Commercial tricycle rides in this study was found to be 99.7%. Fig. 1 illustrates the percentage of the participants with WMSDs and non WMSDs.

Table 1: Socio-demographic characteristics of participants

Variable	n	Percentage (%)
Age Group (Years)		
Mean ±SD 30.31± 7.683		
Range 18 – 65		
Marital Status		
Single	188	48.8
Married	193	50.1
Divorce	4	1.0
Educational Level		
None	55	14.3
Primary	156	40.5
Secondary	143	37.1
Tertiary	31	8.1
Years of working experience		
1 – 2 years	86	22.3
2 – 4 years	255	66.2
4 – 6 years	32	8.3
6 – 8 years	9	2.3
8 years and above	3	0.8
Number of hours per day		
2 – 4	10	2.6
4 – 6	41	10.6

6 – 8	154	40.0	
8 hours & above	180	46.8	

Key: n = Frequency

Table 2: 7-days and 12 months pattern of WMSDs among commercial tricycle riders

Body Region	12 months		7 days	
	Frequency	%	Frequency	%
Neck	183	47.5	132	34.3
Shoulder				
Right	15	3.9	14	3.6
Left	11	2.9	13	3.4
Both	343	89.1	293	76.1
Elbow				
Right	12	3.1	15	3.9
Left	2	0.5	3	0.8
Both	312	81.0	290	75.3
Wrist/Hand				
Right	24	6.2	13	3.4
Left	2	0.5	4	1.0
Both	330	85.7	318	82.6
Upper back	144	37.4	106	27.5
Lower back	309	80.3	269	69.9
Hips/thighs/buttocks	292	75.8	276	71.7
Knees	249	64.7	227	59.0
Ankles/feet	268	69.6	234	60.8

Table 3: Chi-square statistics for the difference in the prevalence of WMSDs

Characteristics	WMSDs		X^2	P-Value
	n	%		
Age group				
18 – 35	301	78.2		
36 – 55	82	21.3	0.280	0.869
56-65	2	0.5		
Educational Level				
None	55	14.3		
Primary	156	40.5	11.449	0.010*
Secondary	143	37.1		
Tertiary	31	8.1		
Year of working Experience				
1 – 2 years	86	22.3		
2 -4 years	255	66.2	3.486	0.480
4 – 6 years	32	8.3		

6 – 8 years	9	2.3		
8 years and above	3	0.8		
Working hours per day				
2 – 5	10	2.6		
4 – 6	41	10.6	1.142	0.767
6 – 8	154	40.0		
8 hours and above	180	46.8		

* Statistically significant at P<0.05 %=Percentage

WMSDs=Work related musculoskeletal disorders

Have you ever experienced work related ache, pain, discomfort, or injury in any part(s) of your body that lasted for more than three days in the last 12 months
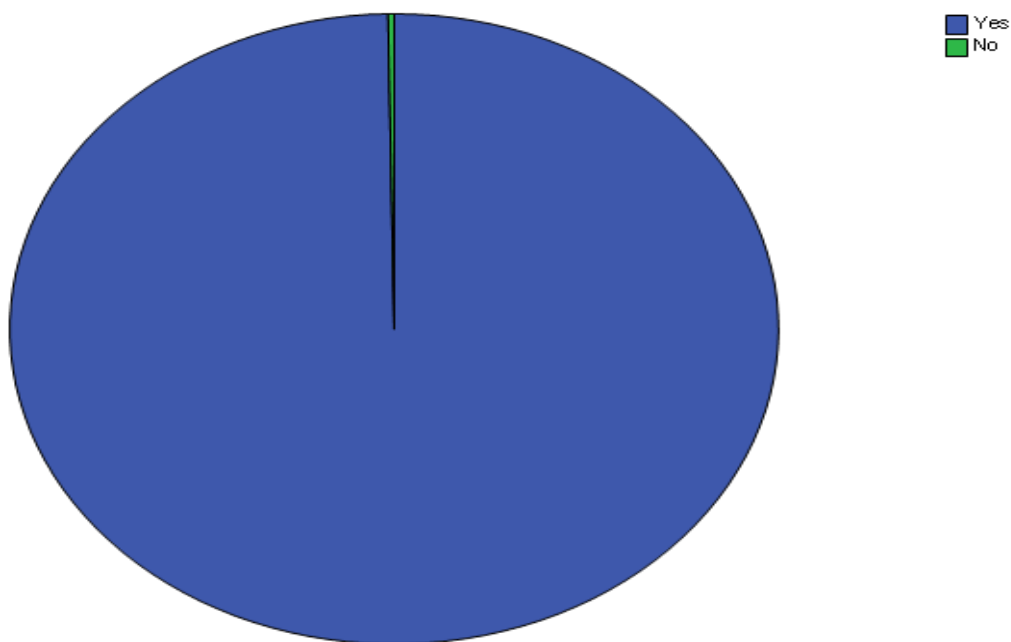
Fig. 1: Pie chart showing 12-month Prevalence of Work-related musculoskeletal disorders among Commercial tricycle rides

Discussion

Prevalence of WMSDsamong Commercial Tricycle Riders The 12 month prevalence of WMSDs (99.7%) recorded in this study is consistent with the following studies; Amod et al. (2012) found the prevalence of WMSDs among bus drivers in central India to be 70.7%, Abdu (2012) recorded a 70.0% prevalence among hospital porters in three selected government hospitals in Maiduguri, and Ezeukwu et al, 2011, reported a 90.1% prevalence of WMSDs among timber workers in Enugu metropolis. This study showed a statistically significant difference in the prevalence of WMSDs among participants of different educational status.

Pattern of WMSDs among Commercial Tricycle Riders In this study, the low back was reported as the affected site by WMSDs among commercial tricycles in Maiduguri, with a 12 month prevalence of 80.3% and a 7 day prevalence of 69.9%. The finding of this study is consistent with previous studies that have overwhelmingly implicated low back as the affected body part by WMSDs. Amod et al (2012) reported a low back pain (LBP) prevalence of 58.5% among bus drivers in central India, while Abdu (2012) reported a LBP prevalence of 57% among hospital porters in Maiduguri. In Lagos Nigeria, the prevalence of work-related low back pain among commercial motorcyclists is found to be 43.0%, followed by the neck (13.7%) (Akinbo et al., 2008).

Age Prevalence of WMSDsamong Commercial Tricycle Riders The age group 18-35years had the highest prevalence (78.2%), followed by those at the 36-55 years age group, with the 56-65 years age group having the least recorded prevalence (0.5%). This may indicates that participants at the higher age group had a relatively higher prevalence. Habibi et al. (2008) reported that steel workers at the age group of 24-35 manifested the most frequent number of WMSDs and WMSDs associated lost work days.

Years of Working Experience and Prevalence of WMSDs The finding of this study has shown that; participants who have been in the job for 2-4 years have the higher prevalence of WMSDs (66.2%) this finding is consistent with the result of Abdu (2012) who reported that as the years of working increase, the prevalence also increases. This may be due to the fact that; repeated exposure to risk factors over long period of time can predispose a worker to WMSDs.

Daily Working hours and Prevalence of WMSDs The result of this study has shown that; musculoskeletal disorders is related to the daily working hours participants working for over 8 hour had the highest prevalence (4.6.8%) while those working for only 2-4 hours daily had the lowest (2.6%). This is consistent with the finding of a study on the prevalence of WMSDs among Irish farmers by Blake et al. (2010), who reported that full-time farmers have a higher prevalence of WMSDs than their part-time counterparts.

Conclusion

The conclusions based on the findings of this study are as follows;
1.   There was a high prevalence of WMSDs among commercial tricycle riders with shoulder,wrist/hand and elbow in decreasing order of body part affected.

2. Educational level was the only variable that resulted in statistically significant difference in the prevalence of WMSDs at (P- value=0.010).
3. There was no observable difference in the prevalence of WMSDs among commercial tricycle riders by their socio demographic characteristics.

Recommendations

The recommendations based on the findings of the study are:
1. Awareness programs to commercial tricycle riders on how to reduce the prevalence of WMSDs should be routinely encouraged.
2. Formulating strategies in providing proper ergonomics and coping strategies that will help in the prevention and management of WMSDs, thereby reducing the rate of occupational hazards and also improve quality of life are required.
3. Formulation of appropriate policy to reduce WMSDs by policy makers.
4. Appropriate and effective physiotherapy management should be in place to address cases of WMSDs among commercial tricycle riders and other occupation groups of high risk.

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