ORIGINAL RESEARCH

PREVALENCE AND PATTERN OF WORK-RELATED MUSCULOSKELETAL DISORDERS AMONG LOAD CARRIERS IN IBADAN METROPOLIS

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ABSTRACT

Background: Load porterage is a blue-collar job that is more manually driven in low-and-middle income countries where individuals are prone to sustain musculoskeletal complications due to exposure to risks such as carrying heavy loads for shoppers.

Aim: This study aimed to investigate the prevalence and pattern of work-related musculoskeletal disorders (WMSDs) among load porters in Bodija and Akande markets in Ibadan, Oyo State.

Materials and Methods: This cross sectional study was conducted using consecutive sampling technique in selecting 113 load porters with the market conveniently selected. The Nordic Musculoskeletal Questionnaire (NMQ) was used to assess the prevalence and pattern of WMSDs. Descriptive statistics of mean, frequency and percentage were used to summarize the data.

Results: One hundred and two (90.27%) participants reported musculoskeletal pain in one or more body parts in the last 12 months with low back (68.14%) and neck (66.37%) as the most affected body regions. There was significant association between prevalence and tribe and BMI (p=0.04 and p=0.05 respectively). Fifty two (46.02%) participants reported pain in the last 7 days with low back (36.28%) and neck (33.63%) as the most affected regions.

Conclusion: There was high prevalence of WMSDs among respondents.. The most affected body regions were low back and neck.

Recommendation: It was therefore, recommended that healthcare providers should embark on awareness campaign to educate and enlighten load carriers on proper lifting technique which will enhance good work hygiene and ergonomic practice among load carriers .

Keywords: Prevalence, Pattern, Work-related musculoskeletal disorders, load porters, markets

INTRODUCTION

Work-related musculoskeletal disorders (WMSDs) are impairments of the musculoskeletal system, primarily caused by the performance of work tasks and the direct environment in which work is carried out[1]. WMSDs are the most notorious common cause of severe long term pain and physical disability affecting millions of people across the world, with substantial costs and impact on quality of life[2]. It could be the result of regular exposure to work activities that contribute significantly to the development or exacerbation of painful symptoms or conditions that are worsened or that persist due to work conditions[3]. Work-related Musculoskeletal Disorders (WMSDs) are the major cause of pain, disability, absenteeism, reduced productivity, and heavy financial costs among workers worldwide[4]. MSDs exert deleterious effects on the life of the workers in all fields, especially those requiring manual labour [5].

Risk factors often cited for musculoskeletal disorders in the workplace include high hand exertions, repetitive impact on the hand and wrist, awkward postures, prolonged standing and sitting, poor lifting or carrying techniques. Repetitive movements are especially hazardous when they involve the same joints and muscle groups over and over and when the same motion is done too often, too quickly and for too long[6]. Studies have also shown that MSDs make up 39% of all work-related health burdens on the employees, leading to loss of body parts and time, low productivity, change of career, handicap and total or partial dependence on the society[(5,6)]. Several studies have been conducted on prevalence of WMSDs among manual labourers of different occupational group all over the world such as brick carriers in India (90%), water carriers in South Africa, Ghana and Vietnam (98%), butchers (74.5%) , drivers (21.2%)[(7,8,9,10)] but little among load carriers

Numerous conducted studies have shown that carrying heavy loads on a daily basis on the head can cause MSDs, which is detrimental to the spinal health of the carrier. This is because it exerts pressure on the axial skeleton[11]. The findings recorded from a study[11] reveal an exacerbated degenerative change in the cervical spine following axial loading on the head. Poor work posture was one of the major causes of work-related pain and it is important to point out that repeated actions that come with the execution of a task lead to a cumulative workload that could be considered the cause of muscle pain and weakness[11]. These complaints affect the workers' ability, making them less willing to stay in their jobs for a long time, thereby leading to early retirement.

Over the years, there has been an emergence of the physically demanding occupation of commercial load carrying popularly called "alaaru" or "alabaru" among the Yorubas in the South-West of Nigeria who are commonly seen in the markets where they assist shoppers to carry their groceries of varying weights over varying distances for paltry economic reward[12]. This professional load carriers in many developing countries use their heads to carry loads that could be as heavy as 100 kg on a regular basis for many years and this is a very common practice in many African countries carried out by both male and female of varying age groups as a way of surviving downturns in the

economy[12]. The load carriers are thus needed to transport market goods and wares particularly since the African urban market spaces are mostly unmotorable and heavily congested and also, against the backdrop of huge unemployment in Nigeria, load porterage has become and remained an important leeway for people to earn a living[13]. Protecting this category of workers from undue WMSDs can only be achieved where there are proper and adequate empirical studies on WMSDs among them. Thus, there is need for an empirical update of WMSDs among this occupational group in which the burden of WMSDs among this high-risk group seems to have received less attention in research, despite its implications in policy and practice. This study aimed to assess the prevalence of self-reported musculoskeletal disorders among load potters, the pattern of distribution of WMSDs among the body parts and to investigate the relations between work-related musculoskeletal disorders (WMSDs) and work profile of load carriers in Bodija and Akande markets, Ibadan.

MATERIALS AND METHODS

Research design and participants selection

This was a cross sectional study in which the studied sample of 113 respondents (99 females, 14 males) was selected using consecutive sampling technique and it was carried out in Bodija and Akande markets, Ibadan, the capital and the most populous city of Oyo state, in Nigeria. It is the third largest city by population in Nigeria with a total population of 2,649,000 as of 2021, and over 3 million people within its metropolitan area. It is one of the country's largest city by geographical area[18].

Research instrument

The Nordic Musculoskeletal Questionnaire was used to gather information on WMSDs from participants and it comprises an anatomical diagram featuring nine major areas of the body (neck, shoulders, upper-back, elbows, wrists/hands, low back, hips/thighs, knees and ankles/feet). Participants were instructed to note body parts where they have felt any ache, discomfort or pain in the last 12 months and 7days. Thereafter, using the knowledge of the body areas, respondents were asked to answer 11 questions that followed. Two of the questions inquired whether respondents ever had any ache, discomfort or pain on any of the highlighted body regions in the last 12 months and 7 days. Nine questions specifically inquired whether respondents had troubles on each of the body parts in the last 12 months. Respondents were also asked whether or not such ache, discomfort or pain in the last 12 months prevented them from doing their normal work. Further, socio-demographic information including (age, sex, marital status, educational level and years of practice) and work profile (working hours per day, working hours per week, months of experience) were obtained from respondents using a proforma.

Inclusion criterion

The participants included in this study were consenting male and female load carriers who have been involved in this job for at least one year. Eligible respondents were those who were 18 years and more, and who were mainly involved in load carriers as a full-time occupation.

Exclusion criteria

Those excluded from this study were load carriers with musculoskeletal disorders other than work-related and pregnant load carriers in their second and third trimesters.

Ethical approval and consent to participate

All guidelines as per declaration of Helsinki and good clinical practice guidelines were followed. Ethical approval was sought and obtained from Bowen University Teaching Hospital Health and Research Committee (BUTH-HREC) with the number BUTH/REC-827 and the Oyo State Research Council. Administrative approval to conduct this study was obtained from the chairperson of the Association of load potters in both Bodija and Akande markets. A written informed consents were obtained from the load potters after the purpose of the study was explained to them prior to their participation in the study. The Yoruba translated version of the informed consent was made available for those who had preference for or were literate in Yoruba language only, since Yoruba is the local language spoken in the setting where this study was conducted.

Sample size calculation

Sample size for this study was determined using the Cochran's sample formula (Cochran, 1965) as shown below: Where n_0 signifies the sample size; z-value is found in a Z table (1.96 for a confidence level of 95%); p is the (estimated) proportion of the population which has the attribute in question (0.92); q is 1-p (1–0.92 = 0.08) and d is the desired level of precision (i.e., the margin of error = 0.05)

$$n = \frac{(1.96)^2 \times 0.92 \times (1-0.92)}{(0.05)^2}$$

=113 Load potters

Data analysis

Descriptive statistics of means, standard deviation, frequency and percentage was used to summarize the obtained data (demographic variables and work profile of the occupational load carriers).

RESULTS

Demographics and work profile of the respondents

A greater proportion of the participants 99 (87.61%) were females. The mean age of the participants was 39.85±12.30 years. Out of 113 participants, 49 (43.36%) were married. Participants from the Yoruba tribe had a higher representation of 111 (98.23%) participants and then the Hausa tribe with a representation of 2 (1.77%). The educational level was largely distributed across primary and secondary levels with 54 (47.79%) and 51 (45.13%) participants respectively and followed by participants with no education, 7 (6.19%) and participants with tertiary education, 1 (0.88%). The mean Body Mass Index (BMI) of participants is 21.81±3.76 with the minimum as 16.02kg/m^2 and the maximum as 45.20kg/m^2. The mean months of working experience of the participants was 43.86±49.88 with the minimum and maximum as 12 and 240 months respectively. The number of days per week worked by the load porters had a mean of 5.21±1.39 with minimum number of days per week as 2 and the maximum as 7 with most of these load porters working 5 to 6 days a week. The mean daily work hours was 8.39±2.24 with minimum and maximum working hours of 3 and 13 respectively (Table 1).

Table 1: Demographic variables and work profile of the respondents

Variables	Mean ±S. D	Minimum	Maximum
Age (Years)	39.85±12.30	14	70
BMI (Kg/m^2)	21.81±3.76	16.02	45.2
Duration of work(hours)	8.39±2.24	3	13
Duration of work(days)	5.21±1.39	2	7
Working experience (Months)	43.86±49.88	12	240
		Frequency	**Percentage**
Gender	Female	99	87.61
	Male	12	12.39
Highest education	No formal education	7	6.19
	Primary	54	47.79
	Secondary	51	45.13
	Tertiary	1	0.88
Age (Years)	<20	12	10.62
	21 – 30	11	9.73
	31 – 40	42	37.17
	> 40	48	42.4
BMI (kg/m^2)	Normal weight	90	80.36
	Obesity	2	1.79
	Overweight	8	7.14
	Underweight	12	10.71
Marital Status	Divorced	10	8.85
	Married	49	43.36
	Single	41	36.28

12-months and 7-days Prevalence and Pattern of distribution of musculoskeletal disorders across body parts of respondents

In the last 12 months, the overall prevalence of WMSDs among this participants is 90.27%. Out of 113 participants, 75(66.37%) participants reported pain in the neck, 52(46.02%) participants reported pain at the shoulders, 39(34.51%) reported pain at the elbows, 49(43.36%) reported pain at the wrist, 57(50.44%) reported pain at the upper back, 77(68.14%) reported pain at the low back, 60(53.09%) reported pain at the hip, 65(57.52%) reported pain at the knees and 72(63.72%) reported pain at the ankle (Table 2). In the last 7 days, the overall prevalence of WMSDs is 46.02%. 38(33.63%) participants complained of pain in the neck, 21(18.58%) participants complained of pain at the shoulders, 18(15.93%) participants complained of pain at the elbow, 23(20.35%) participants complained of pain at the wrist, 28(24.78%) complained of pain at the upper back, 41(36.28%) participants complained of pain at the low back, 28(24.78%) participants complained of pain at the hip, 37(32.74%) participants complained of pain at the knees, 30(26.55%) participants complained of pain at the ankles (Table 2)

Table 2: 12-months and 7-days prevalence and pattern of MSD across body parts of respondents

Associated body region	Category	12-months prevalence	Associated body region	Category	7-days prevalence
Neck	**No**	**38(33.63%)**	**Neck**	**No**	75(66.37%)
	Yes	75(66.37%)		Yes	38(33.63%)
Shoulder	No	61(66.98%)	Shoulder	No	10(94.41%)
	Yes	52(46.02%)		Yes	21(18.58%)
Elbow	No	74(78.49%)	Elbow	**No**	95 (84.07%)
	Yes	39(34.51%)		Yes	18(15.93%)
Wrist/hand	No	64(56.64%)	Wrist/hand	No	90(79.65%)
	Yes	49(48.36%)		Yes	23(20.35%)
Upper back	No	56(49.56%)	Upper back	No	85(75.22%)
	Yes	57(50.44%)		Yes	28(24.78%)
Lower back	No	36(31.86%)	Lower back	No	72(76.71%)
	Yes	77(60.00%)		Yes	41(36.28%)
Hip /thighs	No	53(46.90%)	Hip	No	85(75.22%)
	Yes	60(53.09%)		Yes	28(24.78%)
Knee	No	48(42.48%)	Knee	No	76(67.26%)
	Yes	65(57.52%)		Yes	37(32.74%)
Ankle	No	41(36.28%)	Ankle	No	83(73.45%)
	Yes	72(63.72%)		Yes	30(26.55%)

DISCUSSION

The purpose of this study was to investigate the prevalence and pattern of WMSDs among occupational load porters in Ibadan, Oyo state. As at the time this research was carried out, there seemed to be paucity of studies that have been carried out on WMSDS among load porters in Nigeria. The findings of this study revealed that females were predominant with a percentage frequency of 87.61% and mean age of 39.85±12.30 years. This is similar to the finding by[13]. The unintentional gender bias during recruitment seen in this study was because most of the male load porters did not give consent to participate in this study. Also, in terms of geographical location and religion, women in the south west are permitted to engage in outdoor activities in order to support the family financially. Netting[13] linked increasing women's involvement to an increasingly high rate of migration of young women to leading urban market centres, with load porterage being the most accessible job for the poorly trained women. However, when load porterage began in Nigeria, it was introduced by male migrants from the northern part and this was because this area was a male domain[13]. However, with an increasing level of male unemployment, changes in the structure of the economy and excruciating poverty in the developing world, women were introduced into employment and many have been forced into the informal sector as they lack the requisite capacities and skills to compete in the formal sector of the competitive economy[13]. The mean body mass index (BMI) of the respondents was 21.81±3.76 kg/m2. The distribution of BMI categories shows that the majority of respondents 80.36% have a normal weight. These metrics suggest that while most respondents maintain a healthy weight

which is necessary to ensure their effective discharge of their load carriage job. A previous study among prevalence and risk factors of work-related musculoskeletal disorders among shopkeepers in Ethiopia by[16] shows similar reports where 70.9% of shopkeepers though that of this present study is higher. Based on the current study, it is suggested that most load carriers have a healthy weight that will enhance their better performance on the job. The high percentage of individuals with normal weight indicates effective management of lifestyle factors, such as diet and physical activity, which may contribute to their overall health and well-being.

The ages of the participants ranged from 14 to 70 years with the mean age as 39.85±12.30 years and with over 70% in middle aged category working as load porters and this was because a vast majority of the people involved in this occupation in that market were older individuals who had to financially fend for their home which to an extent was expected due to poverty and economic downturn. However, it was expected that younger individuals would be seen in this occupation due to the physically tasking nature of the occupation. However, not many young people want low paying jobs and may want to further their education. The marital status of the participants revealed a larger percentage of them to be married. It was reported that the reason for doing this work was due to the unemployment rate in Nigeria and they had to earn a living by doing this work in order to fend for their dependents. Some of them are widowed (11.50%) and so they become the sole breadwinner of the family. Most of the participants in this study were of the Yoruba tribe (98.23%). This being that the area is vastly populated by the Yoruba tribe. Also, most consenting participants were from the Yoruba tribe. However, when the load porterage business began, it was primarily common amongst the Hausas but with time, the Yorubas began gaining more grounds[13]. Most of the participants in this study had only undergone primary education and this may be because of lack of financial means to further their education to higher levels. The reason most of them do this work is due to poverty and this may be the restricting factor to furthering their education beyond the primary level. The participants had working experiences that varied between a year and 15 years. The mean of the years of experience was 43.86±49.88 months (3.66±4.16 years). This present finding differs from that from a previous similar study[17] which reported their average experience was 4.55±1.66 years, ranging from 1 to 6 years. The wide range of experience in this present study could be due to quick personal daily money they earn and easy entrance into occupational load carriers without educational or skills and flexible work arrangements. The participants had working hours ranging from 3-13 hours daily which there is no rigid time frame of working unlike the white collar jobs that require standard 8 hours workdays. This differs from a study on prevalence of musculoskeletal pain among computer users working from home during the COVID-19 pandemic which reported the daily working hour from 6-8 hours[18]. The longer working hours may be linked to their willingness to work as long as the markets are still open and there are shoppers that need their service and the financial incentive they get as a reward as their labour.

The 12-month prevalence of WMSDs among the load porters was 90.27% The high prevalence of reported pain indicates a significant burden of musculoskeletal disorders among load carriers and this was similar to a study[5] on prevalence of WMSDs among Nigerian quarry workers with 12-month prevalence value of 89.8%. The physically demanding nature of load carriers must have contributed to the high prevalence of pain and also the

monotonous nature of load carriers work has been shown to increase repetitive strain and predispose them to a higher risk of WMSDs. The 12-month self-reported distribution of WMSDs across various anatomical body parts was the lower back pain (68.14%) was highest among occupational load porters in Bodija and Akande markets and this was similar with a study carried on prevalence of WMSDs among brick field workers in India[8] and this may be as a result of frequent stooping, heavy lifting and poor lifting techniques. This claim was also similar in a study conducted on prevalence and exposure to ergonomic risk factors among crop farmers in Nigeria[19]. Also, a study conducted on prevalence of WMSDs among butchers by, reported highest prevalence in low back (66.7%)[9]. However, a study carried out in Kano on prevalence of WMSDs among load carriers reported highest prevalence in the upper back (71%)[20]. The self-reported WMSDs symptom being highest at the lower back is in line with what obtained among manual labourers involved in manual handling and carrying activities[11], and were more likely to suffer from lower back pain. The neck was the second most affected body region with a prevalence of 66.37% and this is similar to the findings of a similar study on WMSDs among peasant farmers with prevalence of (66.7%)[21] and this could have occurred due to the fact that when heavy loads are persistently carried on the head, it produces a resultant deformation of the intervertebral discs and drying up of the intervertebral disc fluid thereby causing pain. Also, a study on spinal deformities among load porters conducted showed cervical spondylosis to be common among load carriers and this was believed to be because load porters stiffen their necks while carrying loads in order to bear the weight of the loads[12]. The results of this study showed that the prevalence of WMSDs varied significantly among the body parts of workers. Reports from the developed world showed that WMSDs may account for as high as 60% of occupational health conditions[11]. It can therefore be deduced that the statistics from developing countries may be higher due to poor working conditions, lack of up to date ergonomically suitable equipment, and health and safety-related policies[22]

The overall 7-day prevalence of WMSDs was 46.02% and this similar to what was reported (41.1%) in a previous study among heavy load carriers in Yaounde, Cameroon[16] and this also similar to a study conducted on prevalence and risk factors of WMSDs among low resourced urban dwellers (37.4%)[23] although prevalence from this study is higher than that of the urban dwellers but they are both below average. However, this finding is contradicted by a study on prevalence of WMSDs carried out on sugarcane farmers in northern Thailand which had a prevalence of 88%.

In the past 7-days, lower back pain had the highest prevalence (36.28%) and this could be as a result of repetitive straining of the lower back due to heavy lifting and prolonged standing or walking with the load on their heads. and this is similar to a study conducted on prevalence and risk factors of WMSDs among low resourced urban dwellers (45.6%)[23]. However, this is below what was reported among heavy load carriers[16]; the difference in the reports might be due to peculiarities of the location where the study were carried, the nature of the size of loads the carriers had to carry and the specific body part they used most for such endeavors. This pattern of distribution of WMSDs is a reflection that the most vulnerable part of our body to be affected due to heavy and poor lifting technique is the spine.

Limitations

There are some limitations that should be considered when interpreting the outcomes of this study. Firstly, because the

convenience sampling technique was used to exclusively select the two markets from which the respondents were recruited, this might have resulted in selection bias, hence the participants may not be true representatives of the occupational load carriers in Ibadan. Also, our study only inquired whether the respondents had WMSDs or not did not use measures such as visual analogue pain score to assess the severity of symptoms. Furthermore, some of the respondents might not have given precise answers or might have amplified their WMSDs owing to recall bias and regardless of whether they were caused by work or not.

CONCLUSION

The outcome of this study revealed that there was high prevalence of musculoskeletal disorders among load carriers in Ibadan metropolis with the low back and neck as the most affected body parts during the last 12 months and last 7 days which may be due to not being aware and not implementing proper manual handling of unorganized loads and poor ergonomically working positions adopted. It was therefore, recommended that healthcare providers should embark on awareness campaign to educate and enlighten load carriers on proper lifting technique which will enhance good work hygiene and ergonomic practice among load carriers and also in order to minimize the overload of the load carriers body an assistive equipment can be used to carry out their load carrying job. Policy makers should ensure that protective measures are put in place and ergonomically fitting working equipment are utilized.

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