PATTERN AND PREVALENCE OF WORK-RELATED MUSCULOSKELETAL DISORDERS AND ITS ASSOCIATION WITH QUALITY OF SLEEP AMONG FOOD VENDORS IN OGBOMOSHO, NIGERIA

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Abstract

Background: Food vendors are at risk of musculoskeletal disorders due to the awkward postures they attain while cooking and serving the food. The pain that results from musculoskeletal disorders could impact their sleep.

Objective: This study investigated the prevalence of work-related musculoskeletal disorders (WMSDs) on food vendors' sleep quality.

Method: This cross-sectional study was conducted on food vendors in selected food outlets in Ogbomosho, Nigeria. Data was collected on participants' socio-demographics, prevalence of work-related musculoskeletal disorders using the Nordic Musculoskeletal Questionnaire and quality of sleep using the Pittsburgh

Sleep Quality Index. Descriptive statistics and Chi-square were used to analyze the data. The alpha level was set at p≤0.05.

Result: There were 82 participants [19 males (23.2%) and 63 females (76.8%)]. The mean age was 31.5±9.592 years. The average number of weekly working hours for participants was 69.95±17.318 hours. The majority of the participants (83%) reported having pain in one or more parts of the body in the last 12 months, with the low back (53.7%) and knees (51.2%) reported as the most affected regions. There was a significant association between WMSDs and participants' sleep quality (p = 0.003). Also, there was a significant association between sleep quality and the number of participants' work hours (p = 0.025).

Conclusion: The study revealed a high prevalence of WMSDs among food vendors in Ogbomosho which was significantly associated with quality of sleep. Hence, proper education and awareness programmes on WMSDs and their prevention should be done for food vendors.

Keywords: work-related, musculoskeletal disorders, food vendors, sleep quality

Introduction

Work-related musculoskeletal disorders (WMSDs) refer to a gamut of inflammatory and degenerative disorders initiated or aggravated largely by the performance of work or associated work settings.[1] According to the National Institute for Occupational Safety and Health, previous injuries, physical condition, genetics, lifestyle, and poor diet are factors that contribute to musculoskeletal symptoms. Work-related musculoskeletal disorders are observed at workplaces where there is a discrepancy between the physical capacity of the human body and the physical requirements of the job.[2]

Food vendors are individuals or businesses that sell food or food-related products to the public[3]. They may be exposed to work-related musculoskeletal disorders due to repetitive movements, awkward postures, and duration spent in these postures. Anecdotal reports reveal that some of the awkward postures that food vendors assume include bending over the payment counters, food display shelves and even in the kitchen while cooking. They have been said to remain on their feet for long periods with little to no breaks, which may be a risk factor for musculoskeletal discomfort and in the long run result in musculoskeletal disorders that may affect their sleep quality.

Quality of sleep is a multidimensional construct that encompasses aspects such as sleep duration, sleep continuity, sleep architecture and

subjective satisfaction with sleep.[4] It encompasses the degree to which a person's sleep is restful, rejuvenating, and interruption-free.[5] The rejuvenation provided by sleep is vital for the body systems as well as our ability to think clearly, learn new information, and manage our emotions.[6] People who are sleep deprived are also more likely to make errors and omissions.[7] Saghir et al.[8] submitted that working while sleep-deprived can leave people feeling more irritable, angry, and vulnerable to stress. Different researchers have described the mechanism through which WMSDs affect sleep quality. The prevailing scientific view on the association of pain (a major symptom of WMSDs) and sleep is that they are reciprocally related [9] implying that the presence of pain can precipitate acute sleep disturbances and the presence of sleep disturbances can predispose to more pain and dysfunction even in the cause of instrumental activity of daily living which is summarily describe as work-related musculoskeletal disorders. Also, Inflammatory-mediators released during WMSDs may cause depression and anxiety which then impairs sleep[10].

Food vending practice has different models in the typical Nigerian metropolis of which Ogbomosho City is a unique example. Two models are commonly practised, and this involves formal and informal ready-to-eat models. [3] The uniqueness of the food vending model practised may alter the pattern of WMSD preponderance and sleep disturbance that is prevalent in this Nigerian city. Although the literature on work-related musculoskeletal disorders among food factory workers is available, none exists with a focus on food vendors' musculoskeletal health and sleep quality. Hence, this study investigated the association between WMSDs and the quality of sleep of food vendors in Ogbomosho, Nigeria.

Materials and Methods

Design

A cross-sectional survey design was utilized in this study.

Population

The participants in the study were food vendors in Ogbomosho, Nigeria. Those who have been involved in the occupation for at least 12 months were included. While food vendors who have pre-existing, musculoskeletal disorders were excluded from the survey.

Sample size determination and selection

Nine food outlets were initially purposively selected to be involved in this study out of the identified 52 food outlets in the Ogbomosho metropolis. Food vendors in these 9 food outlets were then approached to participate in this study based on consecutive sampling techniques. The sample size was determined using Slovin's[11] formula given as $n = N / (1 + ne^2)$, where n= sample size to be recruited, N= Total population size, and e=

margin of error which is approximately 5%. A minimum sample size of 80 was estimated.

Measurements

A self-reported questionnaire was used to obtain socio-demographic data on age, gender, job position, years of experience, working hours per week, weight and height of the participants. The weight and height of each participant were measured by the first author using a standardized weighing scale and stadiometer respectively. The body mass index (BMI) was thereafter calculated. The Nordic Musculoskeletal Questionnaire (NMQ) was used to investigate the presence of musculoskeletal disorders in the body and their effects on activities of daily living, and the Pittsburgh Sleep Quality Index (PSQI) was used to evaluate sleep quality.

Procedure/survey Administration

An informed consent stating the rationale for the study as well as an assurance of confidentiality and anonymity was sought and obtained from participants before involving them in the research. The questionnaire was interviewer-administered to each participant by the data collector. Ethical approval was sought and obtained from the Bowen University Teaching Hospital Health Research and Ethics Committee (BUTH-HREC) with approval number BUTH/REC-861.

Data Analysis

Descriptive statistics of mean, frequency, standard deviation, bar charts, pie chart, tables, and figures were used to summarize the sociodemographic data and data on Work-related Musculoskeletal Disorders and Sleep Quality of Participants. The chi-square test was used to determine the association between Work-related Musculoskeletal Disorders and Sleep Quality, selected sociodemographic variables and each of Work-related Musculoskeletal Disorders and Sleep Quality. All statistical analyses were carried out using Statistical Package for Social Sciences (SPSS) version 21.0. The alpha level was set at 0.05 ($p \leq 0.05$).

Results

Eighty-two food vendors participated in the study and there was a hundred percent response rate. Figure 1 shows the sociodemographic data of the participants. Most of the participants were female (76.8%) and within the age group of 19–35 years (68.3%). A large proportion of the participants had less than three years of experience (97.6%). Of the total participants, more than half (73.2%) worked overtime. The mean height of the participants was 1.64±0.07m (1.51 – 1.80 m) and the mean weight was 63.46±14.25 kg (45.00 – 140.00kg). The mean BMI was 23.78±5.30 kg/m^2 (17.00 – 54.00 kg/m^2). The study showed that pain at the low back was the most prevalent work-related musculoskeletal disorder in the last 12 months among the participants (53.7%), followed closely by pain in the knees (51.2%) (Fig. 2).

Overall, 82.9% of the participants had a musculoskeletal disorder during the last 12 months (Fig. 2). Furthermore, 47.6% of the participants reported to have very good subjective sleep quality, 13.4% used sleep medication once or twice a week and 51.2% of the participants had acute sleep disturbance (Table 1). The Chi-square test showed that there was a significant association between the WMSDs and the quality of sleep of participants (p=0.003) (Table 2). Also, WMSDs were significantly associated with the age of the participants (p=0.031) but gender (p=0.080), years of experience (p=0.450) and work hours (0.098) were not. Moreover, a significant association was found between the quality of sleep and the number of work hours (p=0.025) of the participants (Table 2).
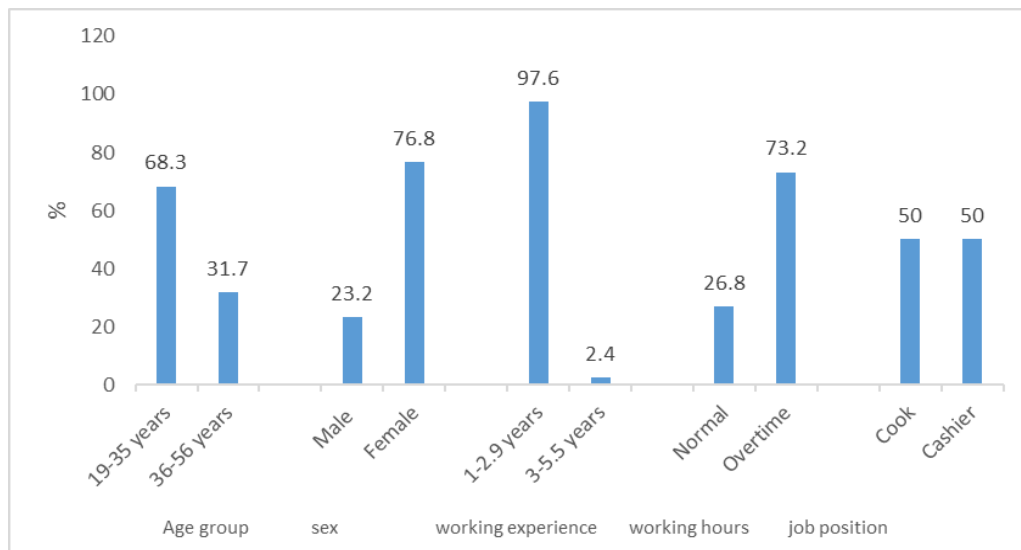

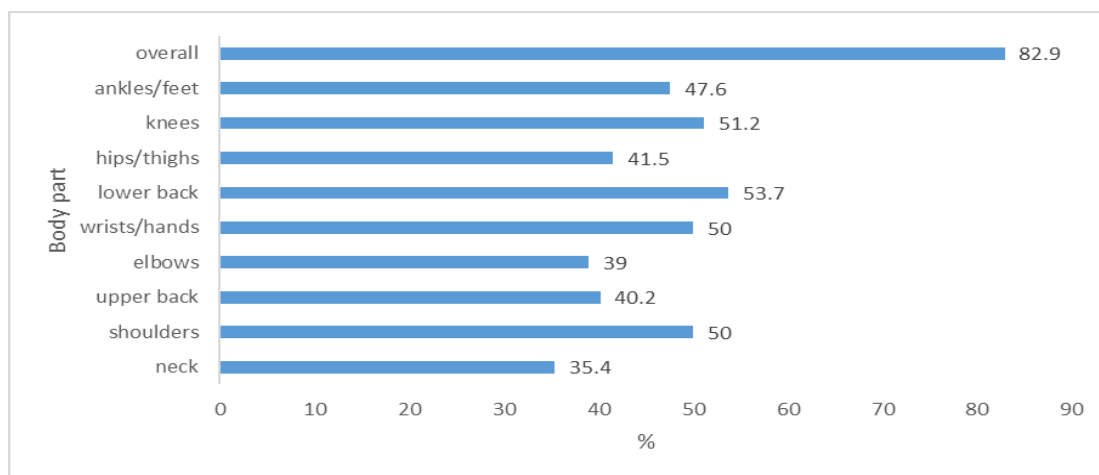**Figure 1: Sociodemographic variables of the Respondents**

Figure 2: 12-month prevalence of work-related musculoskeletal disorders

Table 1: Components of sleep quality

Components of sleep quality	Characteristics	Frequency (N)	(%)
Subjective sleep quality	Very good	39	47.6
	Fairly good	38	46.3
	Fairly bad	5	6.1
Sleep latency	0	18	22.0
	1	32	39.0
	2	26	37.1
	3	6	7.3
Sleep duration	0	19	23.2
	1	22	26.8
	2	28	34.1
	3	13	15.9
Habitual sleep efficiency	0	49	59.8
	1	19	23.2
	2	12	14.6
	3	2	2.4
Sleep disturbance	Not during the past month	5	6.1
	Less than once a week	66	80.5
	Once or twice a week	11	13.4
	Not during the past month	64	78.0
Use of sleep medication	Less than once a week	6	7.3
	Once or twice a week	11	13.4
	Three or more times a week	1	1.2
Daytime dysfunction	Not during the past month	39	47.6
	Less than once a week	36	43.9
	Once or twice a week	5	6.1
	Three or more times a week	2	2.4
Sleep disturbance of participants	Reduced sleep disturbance	40	48.8
	Acute sleep disturbance	42	51.2

Table 2: Association among Work-related musculoskeletal disorders, sociodemographic variables, and quality of sleep of participants.

Variable	Quality of sleep		χ^2	Df	p-value
	Reduced sleep disturbance	**Acute sleep disturbance**			
WMSDs					
Present	28	40	9.217	1	0.003*
Absent	12	2			
Age (years)					
19-35	28	28	0.105	1	0.815
36-56	12	14			
Gender					
Male	9	10	0.020	1	1.000
Female	31	32			
Year of experience					
0-2.9	38	42	2.006	1	0.228
3-5.5	2	0			
Work hours					
0-56	6	16	5.567	1	0.025*
57-105	34	26			
Job position					
Cook	18	23	0.781	1	0.508
Cashier	22	19			

*Significant at $p \leq 0.05$

Discussion

Food vendors are predisposed to work-related musculoskeletal disorders due to the strenuous activities carried out in awkward positions during the cooking and sales of food. These disorders may disrupt the quality of sleep achieved by the vendors. This study investigated the impact of work-related musculoskeletal disorders (WMSDs) on the quality of sleep of eighty-two (82) food vendors in Ogbomosho, Nigeria.

The results of the study revealed that the food vendors are within the age range of 19 and 56 years, with an average age of 31.5±9.6. This is similar to the results of a study conducted by Afolaranmi et al.[12] in north-central Nigeria. It is not surprising because this is the age group that makes up the workforce of a country. Furthermore, it was observed that a large proportion of the participants were female. This is consistent with studies conducted in different parts of Nigeria,[12–15] which show that females dominate the food vending workforce. This is due to sociocultural factors, which expose females to cooking and food matters and encourage the training of females

to perform household activities such as cooking and cleaning at an early age.

The 12-month prevalence of musculoskeletal disorders in at least one body region among food vendors in Ogbomosho was 82.9%, indicating that 8 out of every 10 food vendors presented with pain within the last year. This is similar to the findings of a study conducted in Ethiopia, where the prevalence of musculoskeletal disorders among participants within the 12 months prior to the study was 81.5%.[16] This shows the high propensity of food vendors to acquire musculoskeletal disorders. The high prevalence of musculoskeletal disorders among food vendors can be attributed to their activities and the demands of their work.

Furthermore, this study indicates that the lower back (53.7%) and the knees (51.2%) were the most affected anatomical regions. This is slightly less than the value reported by Jayaraman et al.[17] (56% for the lower back). This pattern is expected of food vendors because they are exposed to heavy lifting, repetitive movements and awkward postures. Muscle fatigue and pain develop due to the exposure they receive from repetitive tasks, uncomfortable posture, and long hours

of work. Working in an abnormal posture can cause injury and damage to body tissue from the overstretching of ligaments, muscles, and tendons.[18]

Also, it was observed that the majority of the participants had acute sleep disturbances, but a higher percentage recorded their subjective sleep quality to be very good, implying that despite the sleep disturbances, their quality of sleep was very good. This contradicts the findings of the study done by Saah and Amu,[19] where the majority of restaurant workers reported poor sleep quality using the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The perception of a good quality of sleep that contradicts an overall estimate of acute sleep disturbance as reported in this present study could mean that participants were unable to give an accurate, objective report on their quality of sleep. Moreover, it could be that, over time, they have employed various coping mechanisms, so they slept well regardless of the disturbance(s).

The prevalence of musculoskeletal (MSK) disorders was significantly associated with participants' quality of sleep. The association between specific MSK disorders, such as low back pain, and sleep quality has been established in various studies among different populations.[20–23] However, studies on the relationship between MSK disorders and sleep quality among food vendors are sparse. A plausible explanation for the significant association is that the pain, discomfort, and unrest from musculoskeletal disorders can cause sleep disturbances, further affecting the quality of sleep.[22–24]

This present study shows a significant association between WMSDs and the age of the participants. This is in line with Ahmed et al.[25] who revealed that age is significantly associated with WMSDs, and this could be due to disc degeneration as people grow older. This study reported that there was no significant association between WMSDs and the job positions of participants, which is in contrast with Jayaraman et al,[17] who reported that there was a higher prevalence of musculoskeletal disorders among the cooks and chefs than the waiters and cashiers. A possible reason for the contrast is the difference in the location of the study. This research involved food vendors who majorly use informal food vending practice models whereby there is no strict job description differences between cooks

and cashiers. The cooks and the cashier do the same jobs specifications even though their job titles are different.

There was a significant association between the quality of sleep and the working hours of food vendors. This is supported by the submission and trend in previous studies by Saah and Amu,[19] Lajoie et al.,[26] Dhande and Sharma,[27] that long hours and shift work predispose waiters working in upscale restaurants to poor sleep quality.

proper education, awareness, and interventions such as regularly inviting health care professionals, especially Physiotherapists, to transfer appropriate knowledge and teach musculoskeletal disorder prevention techniques.

Conclusion

There was a high prevalence of WMSDs among food vendors in Ogbomosho, Oyo State. The prevalence of WMSDs was significantly associated with the quality of sleep and age of the food vendors. The most prevalent WMSD body sites were the low back and knees. More than half of the food vendors had acute sleep disturbances. Therefore, it is recommended that adequate awareness, sensitization, and education be done on proper ergonomic practices among food vendors. Also, there should be adequate rest periods in between shifts. Food vendors should have a regulatory body that can provide the means to

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