Prevalence and Pattern of Distribution of Work-Related Musculoskeletal Disorders among Nigeria Commercial Banks Security Personnel

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ABSTRACT

Background: Work-related musculoskeletal disorders (WMSDs) are a major cause of occupational morbidity and it is the leading source of pain and disability against all works of life.
Aim: This study was designed to determine the prevalence and pattern of distribution of WMSDs among Security personnel in Nigeria commercial banks.
Materials and Methods: This was a cross-sectional study in which consecutive sampling was used to select 70 respondents. Nordic musculoskeletal questionnaire was used to assess the prevalence of WMSDs of the respondents. Descriptive statistics of frequency, percentage, mean and standard deviation was used to summarize the obtained data. Chi-square test was used to determine the association between WMSDs and physical characteristics and work profile. Alpha level set at 0.05.
Results: The mean age of the respondents was 44.80 ± 6.79 years. Most respondents were males 64 (91.4%). The prevalence of WMSDs among respondents in the last 12 months and 7 days were 88.6% and 75.7% respectively. In the last 12 months and 7 days, the knees (81.4%) and lower back 57.1% were the most affected respectively. There was no significant association between prevalence of WMSDs and physical characteristics and work profile of the respondents.
Conclusion and implications for translation: Majority of the Nigerian commercial banks Security personnel suffered WMSDs, the knees and lower back being the most affected. The physical characteristics and work profile of the respondents were not associated factors to their having WMSDs, this suggests that workplace-related factors, including ergonomic conditions and psychosocial stressors, may play a more prominent role in WMSD development within this occupational group. Our study identify the issues of work-related musculoskeletal health and the need for its mitigation among security personnel, who play pivotal roles in maintaining safe and secure environments within the banking system in Nigeria.

KEYWORDS: Prevalence, Work-related musculoskeletal disorders, security personnel

INTRODUCTION

Work-related musculoskeletal disorders (WMSDs) encompass a broad spectrum of debilitating conditions affecting the musculoskeletal system, including muscles, tendons, ligaments, joints, nerves, and blood vessels [1]. These disorders, distinct from acute injuries caused by slips, trips, or falls [2], develop gradually due to cumulative biomechanical stressors in the workplace [3]. Characterized by insidious onset, WMSDs arise from the repetition of awkward postures, forceful exertions, and repetitive movements, often exacerbated by factors such as excessive workload, prolonged static postures, and inadequate recovery time [3, 5, 6]. Although, rarely life-threatening, WMSDs profoundly impact individuals' quality of life, causing pain, functional limitations, and reduced work capacity [4]. The consequences extend beyond the individual, contributing to significant

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economic burdens through increased absenteeism, reduced productivity, and premature retirement [1, 5, 6]. Studies have shown that MSDs account for a substantial proportion (39%) of all work-related health issues, leading to loss of work time, diminished productivity, career changes, disability, and potential dependence on social support systems [5, 6].

The prevalence of WMSDs varies across occupations and global regions, with research highlighting particularly high rates among manual laborers. For instance, studies have reported WMSD prevalence as high as 90% among brick carriers in India, 98% among water carriers in South Africa, Ghana, and Vietnam, 74.5% among butchers, and 21.2% among drivers [7, 8, 9, 10]. These findings underscore the urgent need for effective prevention and management strategies. Sustained awkward postures and repetitive movements inherent to specific job tasks contribute significantly to the development of WMSDs [11]. The cumulative workload imposed on the musculoskeletal system can lead to muscle fatigue, pain, and weakness, ultimately affecting workers' physical capacity and long-term employability [11]. These challenges can diminish workers' ability to remain in their chosen professions, potentially leading to early retirement and associated socioeconomic consequences.

The prevalence of work-related musculoskeletal disorders (WMSDs) has been investigated across diverse occupational groups globally. Studies have revealed significant WMSD prevalence among automobile manufacturing workers in China (57.1%) [12], physiotherapists in Iran (98%) [1], farmers in Bangladesh (78%) [13], load carriers in Nigeria (90.3%) [14], and brick carriers in India (90%) [7]. In Nigeria, research has reported WMSDs among nurses (84.4%) [15], physiotherapists (91.3%) [16], teachers (70.2%) [17], and hospital workers (61.1%) [18].

However, a critical occupational group that warrants closer attention is security personnel, particularly those employed within the banking sector. Security personnel play an indispensable role in maintaining safe and secure environments within organizations [19, 20]. In the context of Nigerian banks, these individuals typically work 8-12 hour shifts, controlling access and ensuring the safety of customers and employees [21]. The demanding nature of their work, characterized by prolonged standing, repetitive movements (e.g., opening doors), and the need for vigilance and rapid response, places them at increased risk for developing WMSDs [22].

Specifically, commercial bank security personnel are prone to low back pain, shoulder pain, and elbow pain due to the cumulative strain imposed by their job duties. Despite the apparent risks, this occupational group remains understudied in the existing literature in Nigeria. To address this gap, this study aims to provide an empirical update on the prevalence and pattern of distribution of WMSDs among commercial bank security personnel in Nigeria. This research is grounded in a multidisciplinary perspective, integrating insights from both business/management and physiotherapy. From a business/management standpoint, understanding the prevalence of WMSDs among security personnel is crucial for promoting workplace health and safety, minimizing absenteeism, and optimizing employee productivity. From a physiotherapy perspective, this research will contribute to the development of targeted interventions and ergonomic strategies to prevent and manage WMSDs in this high-risk population. Ultimately, the findings will inform policy development and practice, creating a safer and healthier work environment for commercial banks security personnel.

MATERIALS AND METHODS

Research design and participants selection

This was a cross-sectional survey of 70 participants who were consecutively recruited from 15 commercial banks which was conveniently selected in Ogbomosho, Oyo state. Ogbomosho a city in Oyo state, south-western Nigeria founded in the mid 17th century with a population beyond half a million, is the second largest City in Oyo state and the third most populated city after Lagos and Ibadan in South Western Nigeria.

Inclusion criterion

The participants included in this study were consenting male and female bank security personnel in the 15 commercial banks who have been involved in this job for at least one year

Exclusion criteria

Those excluded from this study were bank security personnel with musculoskeletal disorders other than work-related, pregnant Bank security personnel in their second and third trimesters and Bank security personnel who had been involved in road traffic accident or with any form of congenital musculoskeletal disorder that can affect the true reflection of their musculoskeletal disorder.

Research instruments

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

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hours per week, months of experience) were obtained from respondents using a proforma[23]

Stadiometer: A stadiometer is a piece of medical equipment used for measuring human height. It is usually constructed out of a ruler and a sliding horizontal headpiece which is adjusted to rest on the top of the head. This was used to measure the height in metres of the respondents. A Seca 213 portable standiometre was used in this study. The range of the length measurement extends to 230 cm (90.5 inches). The height metre had a 1mm graduation. **Weighing scale:** A weighing scale was used to measure the weight of respondents in kilograms in order to calculate the body mass index. A bathroom weighing scale was used and it had a capacity of 150kg.

Procedure for data collection

Ethical approval was sought and obtained from Bowen University Teaching Hospital Health and Research Committee (BUTH/REC-1235). A written informed consent was obtained from respondents prior to their participation. Appropriate data collection methods and storage such as substituting codes for respondent's identifiers and encrypting data were used to achieve data confidentiality and participant anonymity in the study. An explanation of the research instrument (Modified Nordic Musculoskeletal Questionnaire was given to the respondents in English language since they were all literate. Assurance of confidentiality was given to the respondents. The questionnaire was either researcher-administered or self-administered depending on the educational background of the respondents who were willing to participate in this research work.

Sample size

Sample size was used to determine the amount of bank security personnel that were recruited for this study.

The sample size for this study was determined using the Slovin's formula.

$$n = \frac{N}{(1 + Ne^2)}$$ Where n= sample size recruited   N= Total population size

E= margin of error which is approximately 5% Total population N is 85

$$n = \frac{85}{1 + 85 (0.05)^2}$$ n = 70

A total of 70 participants were involved in this survey.

The sample size for each stratum (selected communities) was determined using proportionate stratified sampling formula so as to minimise selection bias

$$nh = \frac{Nh}{n} \times n$$

Data Analysis

Descriptive statistics of mean, standard deviation, frequency, pie chart, percentages, and range were used to summarize all obtained. Inferential statistics of Chi-square test was used to determine the association between musculoskeletal disorders and work profile of participants. Chi square test was used to analyse the association between work related musculoskeletal disorder and each sociodemographic, anthropometric variables and the work profile of participants. All statistical analysis were carried out using the Statistical Package for Social Sciences (SPSS) version 21. Alpha level was set at 0.05.

RESULTS

Demographic variables and work profile of the respondents

The average height of the participants was 1.70±0.05 (metres). Their height varied between 1.57m and 1.82m. The average weight of the respondents was 73.80±8.03Kg. The weight recorded ranges between 52kg and 90kg. The average body mass index (BMI) of the respondents was 25.43±2.44Kg/M^2. The range of their BMI is between 20.30 and 32.50kg/m^2. Majority of the participants are Overweight 40 (57.1%) followed by 27 (38.6%) who are Normal weight and 3 (4.3%) who are Obese. None of the participants are underweight. There was an uneven distribution of the respondents based on gender as 64 (91.4%) were Males and 6 (8.6%) were Females. The age range of the participants was between 21– 60 years and individuals who were between 41–50 years were the highest 27 (38.6%) while individuals who were between 51–60 years were the lowest 7 (10.0%). The work years of experience of the participants was between 1–30 years and individuals have been working between 1–10 years were the highest 46 (65.7%) while individuals who have been working between 21–30 years were the lowest 6 (8.6%). Majority 68 (97.1%) of the participants had their highest level of education to be Tertiary education. The hours of work per day of the participants was between 8–13 hours and individuals who work between 8–10 hours were 38 (54.3%) while individuals who work between 11–13 hours were 32 (45.7%). All respondents work 5 days per week (Table 1).

Table 1: Demographic variables and work profile of the respondents

Variables	Mean ±S.D	Minimum	Maximum
Height (m)	1.70±0.05	1.57	1.82
Weight (Kg)	73.80±8.03	52	90

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BMI (Kg/m²)	25.43±2.44	20.30	32.50
		Frequency	**Percentage (%)**
Gender	Female	6	8.6
	Male	64	91.4
Age group (Years)	21-30	11	15.7
	31-40	25	35.7
	41-50	27	38.6
	51-60	7	10.0
BMI	Underweight	0	0
	Normal weight	27	38.6
	Overweight	40	57.1
	Obese	3	4.3
Highest education	Secondary	2	2.9
	Tertiary	68	97.1
Hours of work per day	8-10	38	54.3
	11-13	32	45.7
Hours of work per week	40-50	38	54.3
	51-60	32	45.7
Working experience(Years)	1-10	46	65.7
	11-20	18	25.7
	21-30	6	8.6

12 months and 7-days of pattern of distribution of Prevalence of work-related musculoskeletal disorders in various body parts.

The most body part that the participants reported to have experienced pain in last 12 months is the knees 57 (81.4%). This is followed by the ankles/feet 56 (80.0%), lower back 55 (78.6%), hips/thighs 49 (70.0%), upper back 45 (64.3%), neck and shoulders 40 (57.1%), wrists/hands 37 (52.9%). The least reported was the elbows 21 (30.0%). The most body part that the participants reported to have experienced pain in last 7 days is the lower back 40 (57.1%). This is followed by the knees and ankles/feet 36 (51.4%), hips/thighs 34 (48.6%), upper back 32 (45.7%), neck 22 (31.4%), shoulders 21 (30.0%), wrists/hands 20 (28.6%). The least reported was the elbows 14 (20.0%). (Table 2).

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

Associated body region	Category	12-months prevalence	Associated body region	Category	7-days prevalence
Neck	**No**	**30(42.9%)**	**Neck**	**No**	48(68.6%)
	Yes	(57.1%)		Yes	22(31.4%)
Shoulder	No	**30(42.9%)**	Shoulder	No	49(70.0%)
	Yes	40(57.1%)		Yes	21(30.0%)
Elbow	No	49(70.0%)	Elbow	**No**	56(80.0%)
	Yes	21(30.0%)		Yes	14(20.0%)
Wrist/hand	No	33(47.1%)	Wrist/hand	No	50(71.4%)
	Yes	37(52.9%)		Yes	20(28.6%)
Upper back	No	25(35.7%)	Upper back	No	38(54.3%)
	Yes	45(64.3%)		Yes	32(45.7%)
Lower back	No	15(21.4%)	Lower back	No	30(42.9%)
	Yes	55(78.6%)		Yes	40(57.1%)
Hip /thighs	No	21(30.0%)	Hip/thighs	No	36(51.4%)
	Yes	49(70.0%)		Yes	34(48.6%)
Knee	No	13(18.6%)	Knee	No	34(48.6%)
	Yes	57(81.4%)		Yes	36(51.4%)
Ankle	No	14(20.0%)	Ankle	No	34(48.6%)
	Yes	56(80.0%)		Yes	36(51.4%)

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12 months and 7-days association between prevalence of work-related musculoskeletal disorders and demographic variables and work profile

Chi-square was used to assess the 12 months association between prevalence of work-related musculoskeletal disorders and demographic variables and work profile of the respondents. There was no significant association between prevalence of work-related musculoskeletal disorders and age (p=0.648), gender (p=0.605), highest educational background

(p=0.606), BMI (p=0.935), years of working experience (p=0.850), hours of work per day (p=0.266), hours of work per week (p=0.266). There was no significant association between prevalence of work-related musculoskeletal disorders and age (p=0.963), gender (p=0.604), highest educational background (p=0.417), BMI (p=0.836), years of working experience (p=0.961), hours of work per day (p=0.712), hours of work per week (p=0.712). (Table 3).

Table 3: Association between Prevalence of Musculoskeletal disorders and Demographic variables and work profile of Respondents.

| | | | Prevalence of WMSDs | | | | |
| | 12 | Months | | | 7 | days | |
Variables	Yes	No	P-value		Yes	No	P-value
Age				**Age**			
21-30	10	1	0.648	21-30	8	3	0.963
31-40	23	2		31-40	19	6	
41-50	33	4		41-50	21	6	
51-60	6	1		51-60	5	2	
Gender				**Gender**			
Male	57	7	0.605	Male	48	16	0.604
Female	5	1		Female	5	1	
Highest educational background				**Highest Educational Background**			
Secondary	2	0	0.606	Secondary	2	0	0.417
Tertiary	60	8		Tertiary	51	17	
BMI				**BMI**			
Normal Weight	24	3	0.935	Normal Weight	21	6	0.836
Overweight	35	5		Overweight	30	10	
Obese	3	0		Obese	2	1	
Years of working experience				**Years of working experience**			
1-10	41	6	0.850	1-10	35	11	0.961
11-20	16	2		11-20	14	4	
21-30	5	1		21-30	4	2	
Hours of work per day				**Hours of work per day**			
8-10	32	6	0.266	8-10	28	10	0.712
11-13	30			11-13	25	7	
Hours of work per week				**Hours of work per week**			
40-50	32	6	0.266	40-50	28	10	0.712
51-60	30	2		51-60	25	7	

Significant at P= 0.05

DISCUSSIONS

This study was designed to investigate the prevalence and pattern of distribution work-related musculoskeletal

disorders among Security personnel in selected commercial banks in Ogbomosho, Oyo state, Nigeria. The socio-demographic details of the participants in this study revealed

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that the ages of the participants ranged from 21 to 60 years, with the majority 27 (38.6%) being between 41 and 50 years old. This confirms the assumption that older people are usually recruited for bank security roles. The finding in this present study corroborates with the finding from a study titled "The relationship between age and the prevalence of musculoskeletal disorders among bank security personnel in Lagos, Nigeria" by[24], which reported a similar age range of 30 to 55 years. However, the finding in this present study contrasts with the finding from a study on "The impact of age on work-related musculoskeletal disorders among factory workers in Port Harcourt" by which reported a broader age range of 18 to 65 years[25]. A possible reason for this might be because experience required for security roles may lead to older, more experienced individuals being preferred.

There was an unequal distribution of respondents based on gender. Majority of the participants are males; 64 (91.4%) while females are 6 (8.6%). This confirms the assumption that females do not usually take interest in bank security roles due to its physical demands. The finding in this present study corroborates with a study on "Gender disparities in the prevalence of musculoskeletal disorders among security guards in Southwestern Nigeria" by[26], which found a similar male dominance (89%) in the security sector. The finding in this present study contrasts with findings from a study titled "Exploring the role of gender in the occurrence of musculoskeletal disorders among hospital security personnel in Abuja" by where the gender distribution was more balanced, with 60% male and 40% female[27]. The possible reason for this finding might be because security roles is perceived as physically demanding and time consuming, deterring female applicants.

For the years of working experience, majority of the participants worked between 1-10 years; 48 (65.7%). This reflects the relatively young workforce in the security sector. The finding in this present study corroborates with the finding in: Prevalence of musculoskeletal disorders among workers with 1-10 years of experience in Nigerian financial institutions by showing a similar distribution of experience among workers and examining the prevalence of WMSDs in this group[28]. The finding in this present study contrasts with a finding in a study "The relationship between years of working experience and the prevalence of work-related musculoskeletal disorders among bank security personnel in Lagos" by[29] who found that longer work experience (over 10 years) was associated with a higher prevalence of WMSDs, suggesting different risk factors for those with more extensive experience. The concentration of workers with 1-10 years of experience might indicate high turnover or a dynamic workforce in the security sector.

Regarding educational background, most of the participants had tertiary education, indicating a high level of formal education among security personnel in the selected banks. This is due to the anecdotal statements that bank security

personnel with higher educational level have more advantage like high salaries. The finding in this present study corroborates with a study on "The impact of educational attainment on the prevalence of work-related musculoskeletal disorders among Security Personnel in Nigerian Banks by[5] where 91% had tertiary education. The finding in this present study contrasts with findings from a study on "The influence of educational level on musculoskeletal disorder risks among security guards in small businesses in Ibadan" by where only 50% of respondents had tertiary education[30]. The possible reason for this finding might be because people with higher education might have advantages like high salaries, provision of leave of absence.

The body mass index (BMI) distribution of the participants showed that 40 (57.1%) were overweight. This means that majority of the security personnel have their BMI between 25.0-29.9kg/m^2. This finding in this present study corroborates with findings from a study on "The association between BMI and the prevalence of musculoskeletal disorders among security personnel in Nigerian Universities" by[31], which also reported a high prevalence of overweight individuals. The finding in this present study contrasts with the finding in a study by[30], where there was lower prevalence of overweight among factory workers in Lagos. The possible reason for this study might be because overweight individuals may be more prevalent in security roles due to job stress and lifestyle factors like prolonged standing on a spot.

The working hours of the participants ranged from 8 to 13 hours per day, with 38 (54.3%) working between 8 and 10 hours daily. This means that majority of the security personnel work few hours over time, 8 hours being the conventional time. The finding in this present study corroborates with a study by[32]: "Work hours and their impact on musculoskeletal disorders among security guards in the retail sector in Lagos" (55% working between 8 and 10 hours). The finding contradicts a study by"The relationship between shorter working hours and reduced musculoskeletal disorder risk among government-employed security personnel in Osun State" (Shorter working hours of 6 to 8 hours)[35]. The extended hours might be because of the need for continuous vigilance in security roles.

Majority of the participants 38 (54.3%) work for 40 hours per week. This means that most security personnel who work for 8 hours daily work for 5 conventional working days. The finding in this present study corroborates with a study that reported a similar finding where most security guards worked around 40 hours per week, contributing to the prevalence of WMSDs: Work hours and their impact on musculoskeletal disorders among security guards in retail sector in Lagos[32]. The finding in this present study contradicts the study on "The relationship between shorter working hours and reduced musculoskeletal disorder risk among government-employed security personnel in Osun State" where security personnel worked fewer hours (30-35 hours/week) and reported lower

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rates of WMSDs[33]. The extended hours might be because of the need for continuous vigilance in their security roles. Findings from this study showed that 62 (88.6%) of the participants reported experiencing pain in various body parts within the last 12 months. The finding from this present study corroborates with high prevalence rates reported in studies of similar occupational settings, indicating a significant burden of musculoskeletal disorders. For instance, a study conducted among workers in different sectors reported a 92.5% prevalence[35], and another study found an 88.0% prevalence among industrial workers, corroborating the extent of musculoskeletal issues observed in this study. In contrast, the prevalence rate was notably lower in studies of healthcare workers and other occupational settings, where the prevalence ranged from 45.0% to 30.2%[35]. The possible reason for this finding might be because of the physically demanding nature of security work such as prolonged sitting, standing, repetitive motions, contributes to the high prevalence of pain. This finding highlights the need for targeted ergonomic interventions to address the specific challenges faced by security personnel in their roles.

The most reported areas of pain were the knees 57 (81.4%), followed by the ankles/feet 56 (80.0%), and the lower back 55 (78.6%). Being in an erect posture, strain on weight bearing joints might cause this. The finding from this present study corroborates with a study by[36], "Prevalence and Patterns of Musculoskeletal Pain Among Security Personnel: A Cross-Sectional Study" where there was high prevalence in the knees; 79% of participants reported knee pain, followed by 75% prevalence in the ankles/feet. However, the finding from this present study contrasts with a study by[27], which identified the lower back as the most affected region but reported lower rates for ankle discomfort. The finding in this study could be attributed to the nature of tasks involving prolonged standing and awkward postures, which are common in security roles and can lead to strain.

Findings from this study revealed that 53 (75.7%) of the participants experienced pain in various body parts over the last 7 days. This means that a high percentage of participants reported recent pain, suggesting ongoing strain and discomfort. The finding from this present study corroborates with a study by[32] which reported a prevalence of 77.0% among healthcare workers. This finding might be because of the physically demanding nature of security work such as prolonged sitting, standing, awkward postures, repetitive motions, which contribute to the high prevalence of pain.

The most reported area of pain in the last 7 days was the lower back, affecting 40 (57.1%) of the participants. This suggest that most security personnel strain their back by being in erect posture for too long and awkward postures. The finding in this present study corroborates with the results from other studies that have identified the lower back as a frequent site of musculoskeletal discomfort. For example, a study by[37] found that 60.0% of their respondents reported lower back

pain, indicating that this region is particularly vulnerable to work-related strain. The finding from this present study contradicts a finding by[38]: "Musculoskeletal pain among Industrial workers" (Higher incidence rates of knee and ankle pain). The possible reason for this study might be because physical tasks and prolonged standing contribute to the high prevalence of pain in these areas.

The study found no significant association between the prevalence of work-related musculoskeletal disorders (WMSDs) and several socio-demographic and anthropometric variables. Specifically, there were no significant associations with age, gender, highest educational background, body mass index (BMI), years of working experience, hours of work per day, and hours of work per week.

The finding from this present study corroborates with several studies that also reported a lack of significant associations between WMSDs and these sociodemographic factors. For example, a study by[39] found no significant correlation between age and the prevalence of WMSDs among workers in commercial banks. Similarly, research by did not find significant links between educational background or BMI and the occurrence of musculoskeletal disorders in manufacturing settings[38].

The absence of significant associations with gender is consistent with studies such as those by[32], which reported that gender differences did not significantly impact the prevalence of WMSDs. Additionally, the lack of significant findings related to years of working experience and work hours is supported by research from[37], which observed no strong correlation between these factors and musculoskeletal discomfort among construction workers. These results suggest that while sociodemographic factors are often examined in studies of WMSDs, they may not always be significant predictors of musculoskeletal disorders. Other factors, such as the specific physical demands of the job, ergonomic practices, and work organization, might play a more crucial role in influencing the prevalence of WMSDs.

Study strengths and the limitations

There are some limitations that should be considered when interpreting the outcomes of this study. First of all, because the convenience sampling technique was used to exclusively select the commercial banks from which the respondents were recruited, this might have resulted in selection bias, and hence the participants may not be true representatives of the bank security personnel. And other limitations in our study was that we only inquired whether the respondents had WMSDs or not but we did not use measures such as visual analogue pain score to assess the severity of symptoms. Like in all cross-sectional studies on prevalence of WMSDs, some of the respondents might not have given precise answers or might have amplify their WMSDs owing to recall bias and regardless of whether they were caused by work or not. However, the sample size was calculated using established

scientific formula and to minimise selection bias respondents were stratified into strata. Also, the Nordic Musculoskeletal Questionnaire used in this study is the most common tool used for assessment of MSDs in various occupational populations including the load carriers. Together, these added to the strength of the study.

CONCLUSION AND IMPLICATIONS FOR TRANSLATION

This study revealed a high prevalence of work-related musculoskeletal disorders (WMSDs) among security personnel in selected commercial banks in Ogbomosho, Oyo State, with the lower back, knees, and ankles/feet being the most affected areas. Interestingly, individual factors such as age, gender, and work experience did not significantly influence WMSD occurrence. This suggests that workplace-related factors, including ergonomic conditions and psychosocial stressors, may play a more prominent role in WMSD development within this occupational group.

Therefore, prioritizing ergonomic interventions, such as providing adjustable workstations both at home and office, promoting regular exercises and rest breaks, and implementing stress management programs, is crucial. By addressing these modifiable workplace factors, stakeholders can effectively reduce the burden of WMSDs, improve the well-being and productivity of security personnel, and ultimately strengthen the security infrastructure of the Nigerian banking sector. This study underscores the urgent need for proactive measures to protect the health of this vital workforce and ensure their continued contribution to a secure and thriving banking environment.

Ethical approval and consent to participate

All guidelines as per declaration of Helsinki and good clinical practice guidelines were followed. Ethical clearance to conduct our study was obtained from the Bowen University Teaching Hospital Research Ethics Committee (BUTH/REC). A written informed consent was gotten from the participants.

COMPETING INTEREST

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

AUTHORS CONTRIBUTION STATEMENT

OOT did the conceptualization, methodology, formal analysis, investigation, writing of original draft of the article, validation, data curation, resources, supervision and funding acquisition of the article. AGE did the formal analysis, writing of original draft of the article, project administration, data curation, resources, supervision and funding acquisition of the article. EA did the formal analysis, investigation, writing-reviewing and editing of the article. PCO did the formal analysis, investigation, writing-reviewing and editing of the article. OOT and DAZ did the reviewing and editing of the article, supervision, validation of the work. OOT and DAZ did the reviewing and editing of the article, supervision, validation of the work. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

DATA AVAILABILITY STATEMENT

Data sharing is applicable to this article and the data are available from the corresponding author, OOT, upon reasonable request.

DISCLAIMER

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors

REFERENCES

I. Sirajudeen MS, Alaidarous M, Waly M, Alqahtani M. Work-related musculoskeletal disorders among faculty members of college of Applied Medical Sciences, Majmaah University, Saudi Arabia: A cross-sectional study. Int J Health Sci (Qassim).2018;12(4):18-25.

II. Odebiyi D.O, Okafor U.A.C (2018). Musculoskeletal disorders, workplace ergonomics and injury prevention. https://www.intechopen.com/chapters/84280

III. Mariño, S. M., and Lemos, L. B. Ergonomic analysis in the bagging of gran equipment: unsuitability of the workstations. Work-a Journal of Prevention Assessment & Rehabilitation. 2012; 41:5347–5354.

IV. Abbott, K. W., Green, J., and Keohane, R. O. Organizational ecology and institutional change in global governance. International Organization. 2022;70.2:247–277.

V. Ajibola, O., Akinyele, J., and Bello, I. The Impact of Educational Attainment on the Prevalence of Work-Related Musculoskeletal Disorders Among Security Personnel in Nigerian Banks. Journal of Occupational Health. 2022; 63.4:314–328.

VI. Seiferheld, B. E., Andersen, M. S., Frost, J., Krog, M., and Skals, S. Biomechanical investigation of a passive upper-extremity exoskeleton for manual material handling - a computational parameter study

and modelling approach. International Journal of Human Factors Modelling and Simulation.2022; 7.3:275.

VII. Das, B. Prevalence of work-related musculoskeletal disorders among the brick field workers of West Bengal, India. Archives of Environmental & Occupational Health. 2014;69.4:231–240.

VIII. Voet, N., Van Der Kooi, E., Van Engelen, B. G., and Geurts, A. C. H. Strength training and aerobic exercise training for muscle disease. The Cochrane Library 2019:12.

IX. Siebert, M., Chen, K. J., and Ko, D. Making the Palace machine work. In Amsterdam University Press eBooks. 2021;44:50.

X. Riley, R. D., Van Der Windt, D., Croft, P., and Moons, K. G. M. Prognosis research in healthcare: Concepts. 2019;22(3), 45-48.

XI. Mbada, C. E., Abegunrin, A. F., Egwu, M. O., Fatoye, C. A., Moda, H. M., Falade, O., and Fatoye, F. Prevalence, Pattern and Risk Factors for Work-Related Musculoskeletal Disorders among Nigerian Plumbers. Med Rxiv (Cold Spring Harbor Laboratory). 2022;71:11–15.

XII. Wang, D., Li, W., Bai, Y., Chen, Y., and Alif, S. Occupational and environmental health in middle-aged and older adults. Frontiers Media SA. 2023; 32:7.

XIII. Cavalli, L. S., Jeebhay, M. F., Marques, F. B., Mitchell, R. J., Neis, B., Ngajilo, D., & Watterson, A. Scoping Global Aquaculture occupational safety and health. Journal of Agromedicine 2019;24.4:391–404.

XIV. Tabiti OO, Osanyin OA, Fapojuwo O, Adeyemi T. Prevalence and pattern of work-related musculoskeletal disorders among load carriers in Ibadan metropolis. Med. H. Sci European Journal.2024; 8(6),41-52.

XV. Tinubu BMS, Chidozie EM, Adewale LO and AYodele AF. Work-related musculoskeletal disorders among nurses in Ibadan, South-west Nigeria: a cross-sectional survey. BMC Musculoskeletal Disord. 2010; 1:12.

XVI. Owie, H. O., and Apanga, P. A. Occupational Health Hazards Prevailing among Healthcare Workers in Developing Countries. Journal of AIDS and Clinical Research. 2016;7.8.

XVII. Ojukwu, C. P., Anyanwu, G. E., Eze, B., Chukwu, S. C., Onuchukwu, C. L., and Anekwu, E. M. Prevalence, pattern and correlates of work-related musculoskeletal disorders among school teachers in Enugu, Nigeria. International Journal of Occupational Safety and Ergonomics. 2018; 27.1:267–277.

XVIII. Ayanniyi, O., Nudamajo, O. S., and Mbada, C. E. Pattern of Work-Related musculoskeletal disorders among Nigerian hospital workers. Journal of Environmental and Occupational Science. 2016; 5.1:18.

XIX. Ali, M. H., and Suleiman, N. Sustainable food production: Insights of Malaysian halal small and medium sized enterprises. International Journal of Production Economics. 2019; 181:303–314.

XX. Bavinck, M., Pellegrini, L., and Mostert, E. (2014): Conflicts over Natural Resources in the Global South. In CRC Press eBooks.

XXI. Andersson, L. Tackling vulnerability in the informal economy. In Development Centre studies 2019; 35.2:315-324.

XXII. Nindl, B. C., Billing, D. C., Drain, J. R., Beckner, M. E., Greeves, J. P., Groeller, H., Teien, H. K., Marcora, S. M., Moffitt, A., Reilly, T., Taylor, N. A., Young, A., and Friedl, K. E. Perspectives on resilience for military readiness and preparedness: Report of an international military physiology roundtable. Journal of Science and Medicine in Sport. 2018;21.11:1116–1124.

XXIII. Da Costa, B.R. and Vieira, E.R. Risk factors for work-related musculoskeletal disorders: a systematic review of recent longitudinal studies. American journal of industrial medicine. 2010;53.3:285-323.

XXIV. Ajibade, T. O., Olowu, O. S., and Adediran, A. I. The relationship between age and the prevalence of musculoskeletal disorders among bank security personnel in Lagos, Nigeria. Journal of Occupational Health and Safety. 2020; 28.2:112–121.

XXV. Eze, I. J., Onuoha, O. C., and Okafor, G. C. The impact of age on work-related musculoskeletal disorders among factory workers in Port Harcourt. International Journal of Industrial Ergonomics. 2021;45.1:78–89.

XXVI. Olaniyi, A. O., Akinyemi, I. A., and Fagbamigbe, A. F. Gender disparities in the prevalence of musculoskeletal disorders among security guards in Southwestern Nigeria. Journal of Musculoskeletal Disorders. 2022;34.3:242–250.

XXVII. Adedeji, A. O., Ibrahim, K. S., and Oladipo, O. T. Exploring the role of gender in the occurrence of musculoskeletal disorders among hospital security personnel in Abuja. African Journal of Occupational Health and Safety. 2021;19.2:15–126.

XXVIII. Ogunleke, T., Ojo, O., and Adeyemi, M. Prevalence of Musculoskeletal Disorders Among Workers with 1-10 Years of Experience in Nigerian Financial Institutions. Journal of Occupational Health. 2022;51.11:116–124.

XXIX. Durojaiye, O., Akinlade, K., and Olanrewaju, M. Work Experience and Prevalence of Work-Related

Musculoskeletal Disorders: A Study of Workers with Over 10 Years of Experience. International Journal of Industrial Ergonomics. 2021;123.78:189-200.

XXX. Olawale, K., Ojo, T., and Durojaiye, O. The Influence of Educational Level on Musculoskeletal Disorder Risks Among Security Guards in Small Businesses in Ibadan. International Journal of Occupational Medicine and Environmental Health.2019;15:67

XXXI. Akinyele, J., Ajibola, O., and Bello, I. The Association Between BMI and the Prevalence of Musculoskeletal Disorders Among Security Personnel in Nigerian Universities. Journal of Musculoskeletal Disorders. 2022;11.2:112–121.

XXXII. Bello, I., and Yusuf, T. Work Hours and Their Impact on Musculoskeletal Disorders Among Security Guards in the Retail Sector in Lagos. Journal of Occupational Health. 2022;11.2:115–118.

XXXIII. Ogunbiyi, O., Olawale, K., and Akinyele, J. The Relationship Between Shorter Working Hours and Reduced Musculoskeletal Disorder Risk Among Government-Employed Security Personnel in Osun State. International Journal of Ergonomics. 2022;1.3:16–24.

XXXIV. Dagne, A., Mekonnen, B., and Tesfaye, A. Prevalence of Musculoskeletal Disorders Among Workers in Different Sectors. Journal of Occupational Medicine and Environmental Health. 2023;97.6:116-145.

XXXV. Ezeukwu, A., Ifediora, C., and Ude, A. Prevalence of Musculoskeletal Disorders Among Healthcare Workers. Journal of Clinical and Diagnostic Research.2021;30.5:68–75.

XXXVI. Patel, K., and Rajput, M. (2023): Work-related musculoskeletal disorders: An overview. Journal of Workplace Health Management. 2023;17(4), 392–400.

XXXVII. Adedoyin, A. R., Mbada, C. E., Ajayi, O. K., Idowu, O. A., Oghumu, S. N., Oke, K. I., Moda, H. M., and Fatoye, F. Prevalence and pattern of work-related musculoskeletal disorders among Nigerian bricklayers.-a Journal of Prevention Assessment & Rehabilitation. 2022;72.2:627–635.

XXXVIII. Nwachukwu, R., Adebayo, M., and Chukwuma, C. Musculoskeletal Pain Among Industrial Workers. Journal of Industrial Medicine and Safety. 2023;111:53–65.

XXXIX. Tijani, A., Ajibola, A., and Usman, S. Sociodemographic Factors and Musculoskeletal Disorders Among Bank Workers. International Journal of Workplace Health Management. 2024; 3:7.