

Prevalence of Work-Related Musculoskeletal Disorders among Health Care Professionals at Federal Medical Centre Asaba, Delta State, Nigeria

Ogbutor Udoji Godsdaiy^{1*}, Orukpe Trust¹, Nkemakonam Ezeonu¹, Ephraim Chukwuemeka¹, Chinenye Chiegboka¹, Ezunu Emmanuel¹, Ruth Kikachukwu Chibuzor², Collins Ogbeivor³ and Ogbutor Emeka Godson⁴

¹Department of Physiotherapy, Federal Medical Centre Asaba, Delta State Nigeria.

²Department of Internal Medicine, Federal Medical Centre Asaba, Delta State, Nigeria.

³Faculty of Medicine, Delta State University Abraka, Delta State, Nigeria.

⁴Rehabilitation Department, John Hopkins Healthcare Aramco, Dhahran, Kingdom of Saudi Arabia.

*Correspondence:

Dr. Ogbutor Udoji Godsdaiy: Department of Physiotherapy, Federal Medical Centre, Asaba, Delta State, Nigeria. Phone: +2348138474624.

Received: 15 Jun 2023; Accepted: 22 Jul 2023; Published: 28 Jul 2023

Citation: Godsdaiy OU, Trust O, Ezeonu N, et al. Prevalence of Work-Related Musculoskeletal Disorders among Health Care Professionals at Federal Medical Centre Asaba, Delta State, Nigeria. J Med - Clin Res & Rev. 2023; 7(7): 1-7.

ABSTRACT

Background: Musculoskeletal disorders (MSDs) are painful anatomical defects that are characterized by inflammatory and degenerative conditions in muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. Work-related musculoskeletal disorders (WRMSDs) are associated with absenteeism, lost productivity, increased health care, disability, and worker's compensation costs. Healthcare professionals are known to be at high risk for WRMSDs. Though several studies on WRMSDs among healthcare professionals have been conducted, the majority of these studies have been limited to certain professional groups such as physicians, nurses, physical therapists, and others. Therefore, this study aims to determine the prevalence and distribution of WRMSDs among seven different groups of healthcare professionals and to evaluate the multiple risk factors that contribute to the development of WRMSDs.

Methodology: It was a cross-sectional study conducted among physicians, dentists, physiotherapists, nurses, pharmacists, medical laboratory scientists, and radiographers of various clinical departments in the Federal Medical Centre Asaba. Different combinations of validated and standardized questionnaires were used for collecting data on the pattern of WRMSDs and the multiple job risk factors among healthcare professionals. Descriptive (frequency, mean, standard deviation, and percentages) and inferential (Chi-square test) statistics were used to analyze data. Alpha level was set at $P < 0.05$.

Results: A total of 278 questionnaires were completed, returned, and used for data analysis. The patterns of WRMSDs showed higher occurrence among nurses (100%), dentists (100%), and medical laboratory scientists (100%). Low back pain was the most complaint (79.8%) among health care professionals followed by shoulder (45.4%) and then neck (41.2%). The elbow (5.3%) and the ankle/feet (10.7%) were the least affected. Work-relatedness of musculoskeletal disorders was highest among nurses. Performing the same task over and over again, working with a large number of patients, and working overtime was the most commonly reported job risk factors for the development of WRMSDs.

Conclusion: As shown by the study, a large percentage of healthcare professionals have WRMSDs. As a result, a hospital workplace safety, continuous education, and skill development system that is based on the best available evidence of quality and safety best practices, as well as communication of behaviour change, is recommended.

Keywords

Health care professionals, Risk factors, Low Back Pain and WRMSDs.

Introduction

Musculoskeletal disorders (MSDs) are painful anatomical defects that are characterized by inflammatory and degenerative conditions in muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels [1]. These include clinical syndromes such as tendon inflammations and related conditions (tenosynovitis, epicondylitis, bursitis), nerve compression disorders (carpal tunnel syndrome, sciatica), and osteoarthritis. MSDs are usually characterized by musculoskeletal symptoms of pain, paresthesia, stiffness, swelling, redness, weakness, tingling, and numbness [2]. MSDs are an important public health challenge and one of the major complaints in the workplace [2]. Musculoskeletal injury resulting from a work-related activity is termed work-related musculoskeletal disorder (WRMSD) [1]. WRMSDs can affect the neck, shoulders, arms, elbows, wrists, hands, back, legs, and feet [3]. Body regions most commonly affected are the low back, neck, shoulder, forearm, and hand. Important risk factors for WRMSDs include extrinsic occupational factors (manual handling activities, frequent bending and twisting, forceful movement, repetitive heavy lifting, and awkward working posture), intrinsic personal factors (age, gender, body mass variability, and tobacco smoking) [4], and psychological factors (high job demand, low control, low mood and poor job satisfaction) [5]. WRMSDs are prevalent among workers of different occupations and across different geographical locations. In a study by Delp and Wang [5], among clerical workers in Los Angeles, the 12-month prevalence of musculoskeletal symptoms was 92%, with respondents reporting discomfort in more than one body region. In Australia, between 2014 and 2015, 30% of the population was reported to have developed at least one musculoskeletal condition, with the low back being the most affected body region with a prevalence of 16% among the population [7].

Hongyun et al. reported a high 12-monthly prevalence of musculoskeletal symptoms (91.2%) among Chinese healthcare professionals, with the lower back (12-month prevalence of 72.8%) being the region most affected by musculoskeletal symptoms. In a study by Davis and Kotowski [8], the prevalence of musculoskeletal pain among nurses in Africa was estimated to be 64% yearly (low back pain) and 41% for neck pain. In a similar study among Nigerian sonographers the estimated prevalence of work-related musculoskeletal symptoms was 88% with back pain being most prevalent (45%) [9].

Healthcare professionals (doctors, nurses, physiotherapists, radiologists, pharmacists, and others) are exposed to a range of work-related risk factors that may result in various occupational diseases, of which musculoskeletal disorders (MSDs) are common. WRMSDs have severe impacts on the quality of life and performance of workers. WRMSDs are associated with absenteeism, lost productivity, increased health care, disability, and worker's compensation costs (10). Mbada et al. [11] reported that

the prevalence of WRMSDs among HCPs in a Nigerian Teaching Hospital Resulted in an increase in the request for sick leaves from the workers. Aside from workers' performance, WRMSDs also have significant impacts on their quality of life (QoL). Work-related musculoskeletal disorders (WRMSDs) are responsible for morbidity in many working populations [12].

Healthcare professionals are known to be at high risk for WRMSDs [4,13]. It is estimated that almost one-third of all cases of sick leave among healthcare professionals are related to MSDs [14]. Though several studies on WRMSDs health care professionals have been conducted, the majority of these studies have been limited to certain professional groups such as physicians, nurses, physical therapists, and others [14,15]. To the best of the researcher's knowledge, there have been no studies on the prevalence of WRMSDs among healthcare professionals in south-south Nigeria. Therefore, this study aims to determine the prevalence and distribution of WRMSDs among seven different groups of healthcare professionals (physicians, dentists, physiotherapists, nurses, pharmacists, medical laboratory scientists and radiographers) working full-time at the federal medical Centre, Asaba. This study will also evaluate the multiple risk factors that contribute to the development of WRMSDs and identify the high-risk group (s)

Method Design

A cross-sectional analytical study comprising male and female clinical staff in the various clinical departments at the Federal Medical Centre Asaba. A non-probability Convenience sampling technique was used to select the participants for this study. The sample size was calculated using a sample size calculator, with a 95% confidence interval and margin error of 5%. A total number of 278 participants were required for the study. Only healthcare professionals between the ages of 21 and 65 who work full-time, have practiced at the Federal Medical Center Asaba for at least a year, and are employed full-time were included in this study.

Materials

Research Instruments

A Self-Administered Questionnaire

Adapted from the Nordic Musculoskeletal Questionnaire. This was used to assess the 12-month prevalence of WRMSDs, body regional distribution and the occupation with the most prevalence of WRMSDs. It is an 11-item questionnaire, with 9 items addressing the body parts which include the Neck, Shoulders, Elbows, Wrists/Hands, Upper back, Lower back, Hip/Thighs, Knee, Ankles/Feet and the other 2 items addressing the duration of pain and its work-relatedness respectively. The validity of the questionnaire was examined against clinical history and the result showed several dissimilar answers varying between 0% to 20% [16]. The Nordic Musculoskeletal questionnaire, when used to assess pain within the past 7 days, has a sensitivity that ranges between 66% and 92% and a specificity that ranges between 71% and 88%. The sensitivity was highest at the shoulders and lowest at the neck, while the specificity was highest at the elbows and lowest

at the shoulders. The reliability test carried out with the test-retest method for the Nordic musculoskeletal questionnaire showed that the number of different answers varied between 0% to 23% [16]. The Nordic musculoskeletal questionnaire has a good reliability for assessing musculoskeletal symptoms with a kappa coefficient that varies between 0.64 and 0.71 for pain in the past one week, 0.73 and 0.82 for pain in the past year and between 0.59 and 0.78 for pain in the past year that interferes with work or leisure.

A Self-Administered Questionnaire

This structured questionnaire was used for assessing the job risk factors among health care professionals. It is a 17-item, closed-ended questionnaire with a yes or no response.

Procedure for Data Collection

Ethical approval was obtained from the Ethics and Research Committee of the Federal Medical Centre, Asaba before the commencement of the study. The purpose of the study was explained to the participants to seek their consent and participation in the study.

Data was gathered using two structured questionnaires (Nordic musculoskeletal questionnaire and Job risk factors assessment questionnaire). The questionnaire was divided into three different sections; the first one collected socio-demographic data (such as age, gender, total years of working experience, total working hours per week recreation, smoking etc.), the second section collected information about the job risk factors, while the third section collected information on the prevalence of musculoskeletal disorder. The Nordic musculoskeletal questionnaire contained 11 items, with 9 closed-ended questions with “yes or no” responses addressing the different body parts which include the Neck, Shoulders, Elbows, Wrists/Hands, Upper back, Lower back, Hip/Thighs, Knee, Ankles/Feet and 2 open-ended questions addressing the duration of pain and its work-relatedness respectively. The job risk factors questionnaire contained a 17-item, closed-ended questions in which the participants responded with yes or no.

Data Analysis

Data was analyzed using IBM for statistical package of social sciences (SPSS version 26) software and summarized using percentage, frequency, mean, and standard deviation. Chi-square was also used to test the association between the characteristics of participants and the prevalence of musculoskeletal disorders. Alpha level was set at $p < 0.05$.

Results

Socio-demographic of participants

A total of 278 healthcare professionals participated in the study of which 105 (37.8%) were males and 173 (62.2%) were females. For marital status, 100 (36.0%) were single, 176 (63.3%) were married and 2 (0.7%) were separated. For age, 26-30 was the age group with the highest percentage (25.5%) followed by 31-35 (26.3%), while the 51-55 age group had the least percentage (7.9%). For work experience, 1-10 years of working experience had the highest percentage among the respondents. The mean

height, weight, body mass index, and total working hours per week was $1.68 \pm 0.093\text{m}$, $78.48 \pm 9.84\text{kg}$, $28.02 \pm 4.93\text{kg/m}^2$, and $43.58 \pm 6.07\text{h}$ respectively.

Prevalence Of Work-Related Musculoskeletal Disorder Among Health Care Professionals

In the study population, 262 (94.2%) of the participants reported symptoms (Musculoskeletal pain) at least in one part of their body, over the past 12 months (Figure 1). The study shows that 10.3% reported WRMSDs in only one body region, while 12.2% and 77.5% reported in two and three or more body regions respectively. Among all the symptoms, low back pain was the highest (79.78%), followed by shoulder pain (45.4%) and neck pain (44.8%), whereas ankle pain (10.7%) and elbow pain (5.3%) were the least reported as shown in Table 2.

The study reported that among the participants that have musculoskeletal disorders, 58.3% were found to be of work-related origin. Work-related pain was found to be high in Nurses (31.3%), Physiotherapists (9.2%), and dentists (6.1%), whereas non-work-related pain was found to be predominant in Radiographers, physicians, lab technicians and pharmacy as shown in Table 3.

Table 1: Sociodemographic data of characteristics of study participants.

Variable	Category	Freq (percentage)	Min	Max	Mean \pm SD
Age (years)	21-25	18 (6.5)			
	26-30	71 (25.5)			
	31-35	73 (26.3)			
	36-40	42 (15.1)			
	41-45	24 (8.6)			
	46-50	28 (10.1)			
	51-55	22 (7.9)			
Gender	Male	105 (37.8)			
	Female	173 (62.2)			
Height (m)			1.5	1.9	1.68 \pm 0.093
Weight (Kg)			55.0	105.0	78.48 \pm 9.84
BMI (kg/m ²)			19	42	28.02 \pm 4.93
Occupation	Dentist	20 (7.2)			
	Doctor	30 (10.8)			
	Lab	30 (10.8)			
	Nurse	118 (42.4)			
	Pharmacy	30 (10.8)			
	Physiotherapy	30 (10.8)			
	Radiology	20 (7.2)			
Marital status	Single	100 (36.0)			
	Married	176 (63.3)			
	Separated	2 (0.7)			
Total years of working Experience	1-10	154 (55.4)			
	11-20	106 (38.1)			
	21-30	18 (6.5)			
	31-35	0 (0.0)			
Alcohol	Yes	17 (6.1)			
	No	211 (75.9)			
	Occasional	50 (18.0)			
Smoking	Yes	11 (4.0)			
	No	253 (91.0)			
	Occasional	14 (5.0)			
Sport	Yes	38 (13.7)			
	No	116 (41.7)			
	Occasional	124 (44.6)			
Recreation	Yes	60 (21.6)			
	No	80 (28.8)			
	Occasional	138 (49.6)			

Shifts	One	0 (0.0)		
	Two	30 (10.8)		
	Three	118 (42.4)		
	Four	0 (0.0)		
	None	130 (46.8)		
Job Rotation	Yes	256 (92.1)		
	No	22 (7.9)		
Total working hours per week		35	63	43.58 ± 6.07

Table 2: Body regional distribution of work-related musculoskeletal disorder (n=262).

Body region	Yes	No
Neck	108 (41.2)	154 (58.8)
Shoulder	119 (45.4)	143 (54.6)
Elbow	14 (5.3)	248 (94.7)
Hand/wrist	66 (25.2)	196 (74.8)
Upper back	87 (33.2)	175 (66.8)
Lower back	209 (79.8)	53 (20.2)
Hip/Thigh	42 (16.0)	220 (84.0)
Knee	102 (38.9)	160 (61.1)
Ankle/feet	28 (10.7)	234 (89.3)

Table 3: Musculoskeletal pains and work-relatedness among different participants (n=262).

	Dentist	Doctor	Lab	Nurse	Pharm	Physio	Rad	Total
Non-Work Related	1.5%	6.9%	8.4%	13.7%	6.1%	0.8%	4.6%	42.0
Work-related	6.1%	3.1%	3.1%	31.3%	3.1%	9.2%	2.3%	58.0

Job Risk Factors among Healthcare Professionals

Figure 2 shows job risk factors among healthcare professionals. Performing the same task over and over again (95.7%), treating a large number of patients in one day (94.2%) and working overtime (86.3%) were reported as the highest job risk factors among all participants. Figure 3 shows the highest job risk factors for the different healthcare professionals.

Association between the Respondent's Socio- Demographic Characteristics and Prevalence of Wrmsds

Table 4 describes the association between the respondent's socio-demographic characteristics and the prevalence of WRMSDs. There is a significant association between age and prevalence of WRMSDs ($\chi^2=19.728$, $p=0.003$). There is a significant association between gender and prevalence of WRMSDs ($\chi^2=4.417$, $p=0.036$). There is a significant association between BMI and prevalence of WRMSDs ($\chi^2=7.264$, $p=0.026$). There is a significant association between sport and prevalence of WRMSDs ($\chi^2=34.553$, $p<0.001$). There is a significant association between recreation and prevalence of WRMSDs ($\chi^2=16.809$, $p<0.001$). There is a significant association between shifts and prevalence of WRMSDs ($\chi^2=19.728$, $p<0.001$). There is a significant association between marital status and prevalence of WRMSDs ($\chi^2=19.577$, $p<0.001$). There is a significant association between occupation and prevalence of WRMSDs ($\chi^2=28.499$, $p<0.001$). There is a significant association between the years of experience and prevalence of musculoskeletal disorder ($\chi^2=13.670$, $p=0.001$).

Prevalence

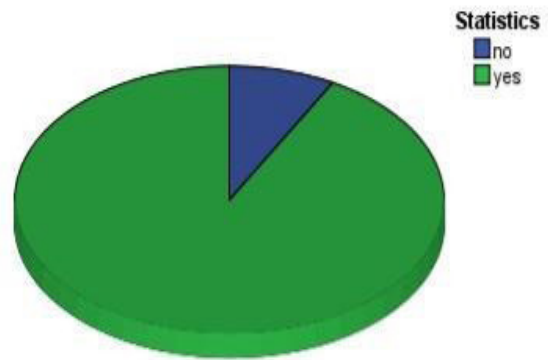


Figure 1

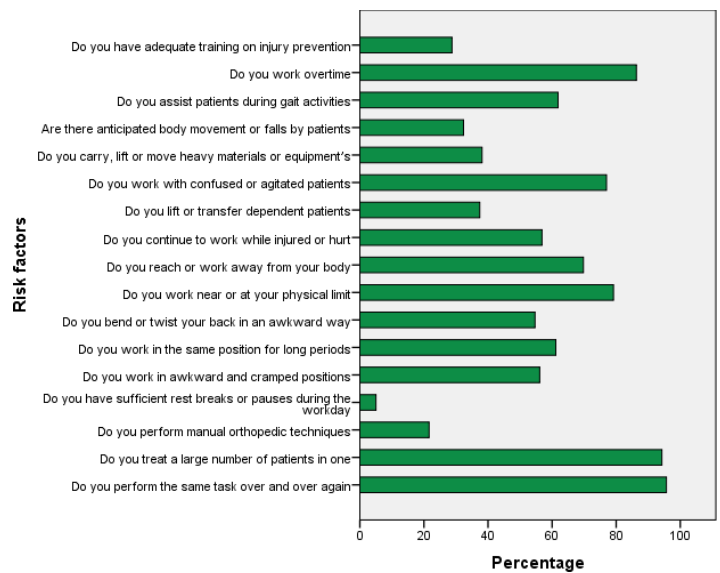


Figure 2: Self-reported job risk factors among all participants.

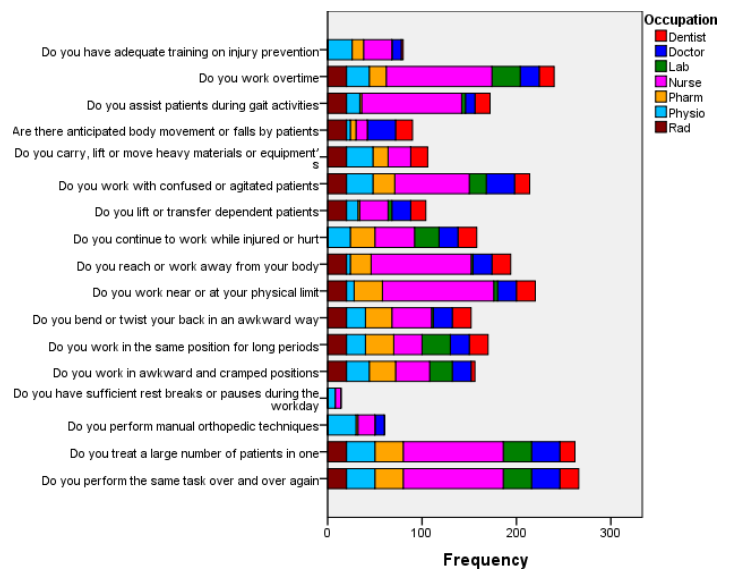


Figure 3: Self-reported job risk factors among different participants.

Table 4: Association between the respondent's socio-demographic characteristics and prevalence of WRMSDs.

Prevalence				
	Do not have MSDs n (%)	Have MSDs n (%)	χ^2	p
Age group (Years)				
21-25	4 (22.22)	14 (77.78)	19.728	0.003
26-30	4 (5.63)	67 (94.37)		
31-35	8 (10.96)	65 (89.04)		
36-40	0 (0.0)	42 (100)		
41-45	0 (0.0)	24 (100)		
46-50	0 (0.0)	28 (100)		
51-55	0 (0.0)	22 (100)		
Gender				
Female	6 (3.47)	167 (96.53)	4.417	0.036
Male	10 (9.52)	95 (90.48)		
BMI				
Underweight	0 (0.0)	0 (0.0)	7.264	0.026
Normal	8 (8.89)	82 (91.11)		
Overweight	8 (7.55)	98 (92.45)		
Obese	0 (0.0)	82 (100.0)		
TWHW				
<45	10 (4.90)	194 (95.10)	2.963	0.227
46 – 55	4 (6.45)	58 (93.55)		
56 and above	2 (16.67)	10 (83.33)		
Alcohol				
No	14 (6.64)	197 (93.36)	1.623	0.444
Occasion	2 (4.00)	48 (96.00)		
Yes	0 (0.0)	17 (100.0)		
Smoking				
No	16 (6.32)	237 (93.68)	1.678	0.432
Occasion	0 (0.0)	14 (100.0)		
Yes	0 (0.0)	11 (100.0)		
Sport				
No	2 (1.72)	114 (98.28)	34.553	<0.001
Occasional	4 (3.23)	120 (96.77)		
Yes	10 (26.32)	28 (73.68)		
Recreation				
No	2 (2.50)	78 (97.50)	16.809	<0.001
Occasional	4 (2.90)	134 (97.10)		
Yes	10 (16.67)	50 (83.33)		
Shifts				
None	16 (12.31)	114 (87.70)	19.328	<0.001
Three	0 (0.0)	118 (100.0)		
Two	0 (0.0)	30 (100.0)		
Rotation				
No	0 (0.0)	22 (100.0)	1.459	0.227
Yes	16 (6.25)	240 (93.75)		
MS				
Married	2 (1.14)	174 (98.86)	19.577	<0.001
Separated	0 (0.0)	2 (100)		
Single	14 (14.00)	86 (86)		
Occupation				
Dentist	0 (0.0)	20 (100)	28.499	<0.001
Doctor	4 (13.33)	26 (86.67)		
Lab	0 (0.0)	30 (100)		
Nurse	0 (0.0)	118 (100)		
Pharmacy	6 (20.0)	24 (80.0)		

Physiotherapy	4 (13.33)	26 (86.67)		
Radiography	2 (10.0)	18 (90.0)		
Year of Experience				
1-10	16 (10.40)	138 (89.61)	13.670	0.001
11-20	0 (8.3)	106 (91.7)		
21-30	0 (0.0)	18 (100.0)		
31-35	0 (2.9)	0 (97.1)		

Discussion

The findings of this study show that 92 % of healthcare professionals have WRMSD, and among the participants, 79.8% had suffered lower back pain. Other body locations commonly affected were the shoulder (45.4%), neck (41.2%), knee (38.9%) and upper back (33.2%). According to Ganuyi et al. [17] on Patterns of occurrence of work-related musculoskeletal disorders and its correlation with ergonomic hazards among healthcare professionals working at the University of Maiduguri Teaching Hospital in Nigeria, low back pain was the most common complaint (71.6%) among health care professionals, followed by shoulder (46.8%) and neck (42.2%), which is similar to this study. WRMSDs in the low back and neck may be caused by prolonged standing, frequent twisting and bending, as well as carrying and transporting patients or heavy objects, whereas shoulder pain may be directly related to patient-care duties such as lifting and transferring patients [17]. The elbow (5.3%) and ankle/feet (10.7%) were the least impacted locations, which validates the findings of Yasobant et al. [18].

The prevalence of musculoskeletal disorders varies across occupational groups and over national boundaries. The subjectivity of terms, variations in assessment tools, organizational differences in work settings, and cultural differences in the perception and reporting of pain and disorders are adduced for the variation in rates of WRMSDs in the different studies [11]. From this study, an association was found between occupation and a 12 months prevalence of WRMSDs among health care professionals. The highest prevalence of WRMSDs was found among nurses (100%), dentists (100%), and medical laboratory scientists (100%). This is consistent with the findings of other authors who have reported a high prevalence of WRMSDs among nurses [18-21], dentists [18,22,23] and medical laboratory scientists [24,25].

Nurses are believed to constitute about 33% of the hospital workforce and are at particularly high risk of occupational injuries accounting for about 60% [20,26]. In the present study, the major complaints for nurses were the low back (85%) and knee (55%), shoulder (55%) and upper back (45%). The high rate of low back pain among nurses in this study is comparable to previous studies that have established variable rates of work-related low back pain in nurses from different populations during a 12-month period [20,21,27-29]. The reason for the increase in WRMSDs among nurses may be attributable to treating a large number of patients (38.1%), performing the same task over and over again (38.1%), working near or at the physical limit (42.5%), and working overtime (40.3%), which were the most perceived job risk factors precipitating WRMSDs among nurses in this study.

The result obtained from this study showed that the most frequent WRMSDs for dentists were reported in the neck (90%), lower back (60%), upper limb (50%) and shoulder (30.0%). This is similar to the findings of Nowell et al. [30], who found that the most common WRMSDs among orthodontists were low back pain (59%), neck pain (56%), and shoulder pain (47%). Some studies have shown that improper working habits and deficiency of the basic knowledge of ergonomics are factors that probably predispose dentists to WRMSDs [18,22,23]. According to Shaikh et al., [23], the most possible explanation for neck pain among dentists is due to prolonged static load as a result of sustained muscle activity in the sternocleidomastoid or trapezius muscles. Overloading of the shoulders during prolonged periods of arm elevation and leaning forward in sitting or standing positions could likely lead to the high prevalence of shoulder pain reported by dentists in the study. Moreover, the coexistence of musculoskeletal disorders in more than one body region among dentists might be caused by unusual body postures during dental treatment, excessive working hours without intermittent rest periods, and disorganized working conditions [23]. In this study the job risk factors which likely cause WRMSDs among dentists include working in the same positions for long periods (7.2%), twisting the back awkwardly while working (7.2%) and continuing to work while injured (7.2%).

Medical laboratory scientists are exposed to several risk factors in the workplace which could cause MSDs. The result obtained from this study showed that the most frequent WRMSDs for medical laboratory scientists were reported in the low back (55%), knee (53%), upper limb (40%) and neck (40.0%). Agrawal et al. [31] found that incorrect sitting posture acquired by medical laboratory professionals when performing computer-related tasks, which is also influenced by the chair, has a significant role in WRMSD risk [31]. It is known that when a person sits in a chair, the natural tendency for most people is to slouch over or slouch down in the chair after some time, and this posture can overstretch the spinal ligaments and strain the discs and surrounding structures in the spine and absence of low back support adds the impact of it on the musculoskeletal system [31]. Laboratory scientists' workstations requiring prolonged standing could also contribute to WRMSD. In the study done by Agrawal et al., [31], few participants rated the height of the table appropriate even while doing standing work, and literature has shown that if work table height does not match the user, the risk increases [32]. Prolonged and uneven weight distribution while standing leads to standing with increased lordosis, which gets compensated with rounding of the upper back ultimately leading to musculoskeletal symptoms because of altered posture and mechanics. The result of this study shows that working in awkward or cramped positions (8.6%), working in the same position for a long period (10.8%) and working overtime (10.8%) are the major risk factors that could predispose medical laboratory scientists to WRMSD.

Work-relatedness of MSDs were highest among nurses (31.3%), which was followed by physiotherapist (9.1%) and dentist (6.1%). Generally, the job risk factors that may lead to the development of WRMSD, as identified by the respondents include performing

the same task over and over again (95.7%), working with a large number of patients (94.2%), and working overtime (86.3%). This is in contrast to a study by Chinonyelum et al., [24] on work-related musculoskeletal disorders among health workers at the national orthopaedic hospital, Enugu which reported who working in an awkward position (73.3%), working in the same position for a long period of time (71.4%) and working while injured or hurt (70.5%) as the profound risk factors. These risk factors exert continuous pressure on the muscle tissue predisposing them to exhaustion with the accumulation of lactic acid that causes pain [24]. The findings of this study also show that HCPs do not have adequate training on risk prevention (28.8%) which may be a major factor leading to the development of WRMSDs.

Conclusion

The present study showed that WRMSDs are prevalent among healthcare professionals in one or more body regions. The areas which are majorly affected include the low back, shoulder, neck, knee and upper back. The highest prevalence of WRMSDs was found among nurses, dentists, and medical laboratory scientists. Work-relatedness of musculoskeletal disorders was highest among nurses. Performing the same task over and over again, working with a large number of patients and working overtime were the most commonly reported job risk factors for the development of WRMSDs. This study also highlights the fact that most HCPs do not have adequate training in injury prevention. Therefore, we recommend that awareness, education and training programs on the prevention of musculoskeletal disorders be made more readily available to healthcare professionals, especially those who are at high risk of developing WRMSDs such as nurses, dentists, and medical laboratory scientists, with the aim of reducing the occurrence of WRMSDs among them and to promote efficiency in patient care.

References

1. Bolarinde SO, Oyewole I, Abobarin AF. Work-related musculoskeletal disorders among nurses in various speciality areas in a Nigerian tertiary health institution. *Journal of Emergency Practice and Trauma*. 2019; 5: 41-46.
2. Etana G, Ayele M, Abdissa D, et al. Prevalence of Work Related Musculoskeletal Disorders and Associated Factors Among Bank Staff in Jimma City Southwest Ethiopia An Institution-Based Cross-Sectional Study. *Journal of Pain Research*. 2021; 14: 2071-2082.
3. Akrouf QAS, Crawford JO, Al Shatti AS, et al. Musculoskeletal disorders among bank office workers in Kuwait. *Eastern Mediterranean Health Journal*. 2010; 16: 94-100.
4. Smith DR, Ohmura K, Yamagata Z, et al. Musculoskeletal disorders among female nurses in a rural Japanese hospital. *Nursing Health Sciences Internet*. 2003; 5: 185-188.
5. Bongers PM, Kremer AM, Laak Jter. Are psychosocial factors risk factors for symptoms and signs of the shoulder, elbow, or hand/wrist. A review of the epidemiological literature. *American Journal of Industrial Medicine*. 2002; 41: 315-342.

6. Delp L, Wang PC. Musculoskeletal disorders among clerical workers in Los Angeles A labour management approach. *American Journal of Industrial Medicine*. 2013; 56: 1072-1081.
7. Parliament of Australia. ParlInfo-basic search Internet. Aph.gov.au. 2019.
8. Davis KG, Kotowski SE. Prevalence of Musculoskeletal Disorders for Nurses in Hospitals, Long-Term Care Facilities, and Home Health Care. *Human Factors: The Journal of the Human Factors and Ergonomics Society*. 2015; 57: 754-792.
9. <https://www.semanticscholar.org/paper/Patterns-of-Work-related-Musculoskeletal-Disorders-Oke-Adeyekun/260db219eebd7182b3e4697c7dde9b8e95f728b3>
10. <https://www.cdc.gov/workplacehealthpromotion/health-strategies/musculoskeletal-disorders/index.html>
11. Mbada C, Obembe A, Alade B, et al. Work-Related Musculoskeletal Disorders among Health Workers in a Nigerian Teaching Hospital. *TAF Preventive Medicine Bulletin*. 2012; 11: 583.
12. Daraiseh N, Genaidy A, Karwowski W, et al. Musculoskeletal outcomes in multiple body regions and work effects among nurses: the effects of stressful and stimulating working conditions. *Ergonomics*. 2003; 46: 1178-1199.
13. Thornton LJ, Barr AE, Stuart-Buttle C, et al. Perceived musculoskeletal symptoms among dental students in the clinic work environment. *Ergonomics*. 2008; 51: 573-586.
14. Alexopoulos EC, Stathi IC, Charizani F. Prevalence of musculoskeletal disorders in dentists. *BMC Musculoskeletal Disorders*. 2004; 5.
15. Guo H, Chang Y, Yeh W, et al. Prevalence of Musculoskeletal Disorder among Workers in Taiwan: A Nationwide Study. *Journal of Occupational Health*. 2004; 46: 26-36.
16. Kuorinka I, Jonsson B, Kilbom A, et al. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. *Applied Ergonomics*. 1987; 18: 233-237.
17. Ganiyu S, Muhammad I, Olabode J, et al. Patterns of occurrence of work-related musculoskeletal disorders and its correlation with ergonomic hazards among health care professionals. *Nigerian Journal of Experimental and Clinical Biosciences*. 2015; 3: 18.
18. Yasobant S, Rajkumar P. Work-related musculoskeletal disorders among health care professionals: A cross-sectional assessment of risk factors in a tertiary hospital India. *Indian Journal of Occupational and Environmental Medicine Internet*. 2014; 18: 75.
19. Punnett L, Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. *Journal of Electromyography and Kinesiology online*. 2004; 14: 13-23.
20. Tinubu BM, Mbada CE, Oyeyemi AL, et al. Work-Related Musculoskeletal Disorders among Nurses in Ibadan, South-west Nigeria a cross-sectional survey. *BMC Musculoskeletal Disorders online*. 2010; 11.
21. Chiwaridzo M, Makotore V, Dambi JM, et al. Work-related musculoskeletal disorders among registered general nurses: a case of a large central hospital in Harare, Zimbabwe. *BMC Research Notes online*. 2018; 11.
22. Kierklo A, Kobus A, Jaworska M, et al. Work-Related Musculoskeletal Disorders among Dentists-A Questionnaire Survey. 2011; 18: 79-84.
23. Shaikh S, Siddiqui AA, Alshammary F, et al. Musculoskeletal Disorders Among Healthcare Workers: Prevalence and Risk Factors in the Arab World. *Handbook of Healthcare in the Arab World*. 2021; 1-39.
24. Chinonyelum IE, Ifeyinwa NE, Ngozika US, et al. Work-related musculoskeletal disorder among health workers a cross-sectional survey of National Orthopaedic Hospital, Enugu. *Journal of Scientific Research and Studies*. 2017; 4: 318-332.
25. Agrawal P, Maiya A, Kamath V, et al. Work related musculoskeletal disorders among medical laboratory professionals a narrative review. *International Journal of Research in Medical Sciences online*. 2014; 2: 1262.
26. Akodu AK, Ashalejo ZO. Work-related musculoskeletal disorders and work ability among hospital nurses. *Journal of Taibah University Medical Sciences*. 2019; 14: 252-261.
27. Yan P, Li F, Zhang L, et al. Prevalence of Work-Related Musculoskeletal Disorders in the Nurses Working in Hospitals of Xinjiang Uygur Autonomous Region. *Pain Research and Management*. 2017; 1-7.
28. Tariah HA, Nafai S, Alajmi M, et al. Work-related musculoskeletal disorders in nurses working in the Kingdom of Saudi Arabia. *Work*. 2020; 65: 421-428.
29. Krishnan KS, Raju G, Shawkataly O. Prevalence of Work-Related Musculoskeletal Disorders Psychological and Physical Risk Factors. *International Journal of Environmental Research and Public Health*. 2021; 18: 9361.
30. Newell, Theresa M, Kumar S. Prevalence of musculoskeletal disorders among orthodontists in Alberta. *International Journal of Industrial Ergonomics*. 2004; 33: 99-107.
31. Agrawal PR, Kamath V, Maiya AG, et al. Risk factors for work-related musculoskeletal disorders among medical laboratories professionals. *International Journal of Medical Science and Public Health*. 2016; 6: 530-538.
32. Bridger R. *Introduction to Ergonomics*. CRC Press. 2008.