International Journal of Pharmaceutical and Bio-Medical Science

ISSN(print): 2767-827X, ISSN(online): 2767-830X

Volume 05 Issue 01 January 2025

Page No : 27-36

DOI: https://doi.org/10.47191/ijpbms/v5-i1-07, Impact Factor:7.792

Prevalence and Pattern of Work-Related Musculoskeletal Disorders among Nigeria Hybrid Workers

Omotayo Olorunsogo Tabiti[1], Hamdallah Kofowora Olaleye[2], Precious C. Onyenweaku[3], Desmond A. Zaki[4], Wukari Joana O. Adeleke MSc[5]

[1]MSc, Department of Physiotherapy, Bowen University, Iwo, Nigeria, omotayo.

[2]BSc, Department of Physiotherapy, Bowen University, Iwo, Nigeria.

[3]MSc, School of Business and Creative Industries University of the West of Scotland. Paisley, PA1 2BE United Kingdom.

[4]MSc, Department of Physiotherapy, Federal University

[5]Department of Physiotherapy/Bowen University, Iwo, Nigeria

ABSTRACT

Background and Objectives: WMSDs are the largest contributors to the occupational diseases burden and are largely related to ergonomic factors found in the workplace. The aim of the study was to determine the prevalence and pattern of musculoskeletal disorders among hybrid workers in Lagos Island, Nigeria.

Methods: This was a descriptive cross-sectional study in which snowballing sampling was used to recruit the 100 respondents. Nordic Musculoskeletal Questionnaire was used to assess the prevalence and pattern of Work-related musculoskeletal disorders of the respondents. Descriptive statistics was used to summarize the obtained data. Chi-square test was used to determine the association between WMSDs and working profile and characteristics of respondents. Data was analyzed using SPSS version 21.0 with alpha level set at ≤ 0.05

Results: There was an uneven distribution of gender, 59(59.0%) male and 41(41.0%) female. The mean age of the respondents is 28.45 ±4.33 years. The prevalence WMSDs among respondents was 94(94.0%). The pattern of distribution of WMSDs across body parts was predominant in the lower back 69(69.0%), neck 64(64.0%), shoulders 47(47.0%), upper back 43(43.0%), wrist 42(42.0%). There was no significant association between prevalence of WMSDs and working profile and characteristics of respondents.

Conclusion and implications for translation: There was high prevalence of WMSDs among hybrid workers. The lower back and neck were the mostly affected, a tangible number of the respondents were overweight, and physical characteristics and work profile were not associated factors to their having WMSDs indicating the importance of concerned stakeholders to address psychosocial factors, ergonomic and workstations design to lessen musculoskeletal disorders among hybrid workers in order to improve their wellbeing and productivity in this sector. Our study highlights the issue of work-related musculoskeletal health and the need for prevention among Hybrid workers, which constitutes a major part of telework economic activity in Nigeria.

KEYWORDS: Prevalence, Work-related musculoskeletal disorders, Hybrid workers

ARTICLE DETAILS

Published On:
15 January 2025

Available on:
https://ijpbms.com/

INTRODUCTION

Globally, musculoskeletal disorders (MSDs) are the largest single cause of work-related illness, accounting for over 33% of all newly reported occupational illnesses in the general population that affect all persons regardless of age and sex and are prevalent across a wide range of industries and jobs[1] . Work-related musculoskeletal disorder (WMSDs) is one of the most important public health problems that affect both

formal and informal workers in both developing and developed countries and also creates a burden on the health system, economic and social costs and result in physical disability [2].Work-related musculoskeletal disorders (WMSDs) are a collection of painful illnesses caused by working situations that exacerbate an existing musculoskeletal disorder[4] . Work activity may play a role in the genesis, maintenance, or aggravation of WMSDs of the musculoskeletal and these disorders can leading to musculoskeletal pain, or even an activity limitation[3] . Musculoskeletal disorders have been described as the most notorious and common causes of severe long-term pain and physical disability that affect hundreds of millions of people across the world[5] . Muscle and joint strains, tears, carpal tunnel syndrome, hernias, arthritis, tendonitis, and other conditions can all be symptoms of work-related musculoskeletal disorders (WMSDs), which are caused by a variety of work-related tasks such as lifting, bending, and typing.

A report by the International Labour Organisation (ILO) ranked WMSDs as the leading cause of absenteeism in the workplace among work-related illnesses with over 160 million people affected per year in which workers with WMSDs are less likely than those with other health issues to be present at work[6] (ILO 2013). The prevalence of WMSDs varies among countries and sectors; workers of the informal sector appear to be more exposed than those of the formal sector[3]. Biomechanical factors such as physical workload, repetitive movements, force intensity, awkward postures, exposure to hand- and whole-body vibrations, and localized pressure are among the primary contributors to the development of WMSDs[7]. Additionally, numerous studies have highlighted how psychosocial risk factors such job-related stress, inadequate support from managers or co-workers, a high mental burden, and a lack of acknowledgement for completed tasks in the workplace can impact the onset of WMSDs, either by amplifying biomechanical exposure or by triggering stress mechanisms[7]. The interaction between biomechanical exposures and psychosocial risk factor can serve as both etiological factors, influencing the onset of pain or significant functional impairment, and prognostic factors for chronicity or long-term disability[7]. More than any other group of diseases, WMSDs are said to have a substantial negative influence on quality of life, result in missed work or absenteeism, increase work restrictions, force people to transfer to another job, or cause disabilities. They also have a significant financial cost to the person, the organization and society at large and the effects of WMSDs have a broad and diverse cost burden, affecting both the society and individual levels[(8,9)] . Systematic reviews on WMSDs in respective occupations across several countries have provided distinct prevalence rates, body distributions and risk factors. In the healthcare sector, up to 90% of physiotherapists have WMSDs during their careers, and these mostly occur at the lower back while about 71.85% of nurses experienced these disorders which primarily presented at the lower back, neck and shoulders[10]. Seventy-seven percent of farmers were observed to have WMSDs, commonly at the lower back per year as most construction workers (51.1%) were similarly noted to have these disorders in this body region. A study on school teachers in Enugu, Nigeria showed that 70.2% of the teachers had work-related MSDs predominantly in the shoulder (62.3%) and neck (57.9%) regions[11] .

Hybrid workers are people who operate in a flexible work environment that combines in-office, remote, and on-the-go work and also this type of work environment gives employees the freedom to select where and how they are most productive[12]. The adoption of telework and hybrid work, characterized by alternating office-based and remote work, experienced a rapid increase due to the sudden onset of the COVID-19 pandemic[12]. Depending on the regulations of the organization, positions in UX design, digital marketing, product management, web development, and data analytics are a few examples of those that lend themselves well to hybrid work. According to a report by My Job Mag, remote workers are more in Lagos than in other states in Nigeria and organizations are adopting a hybrid system of work to create a balance between the traditional 9am-5pm and remote work. Since the COVID-19 pandemic, many companies have been forced to adopt remote or hybrid work model to ensure their operations continue. Hybrid work arrangements increase the duration of time spent in a seated posture, this is probably that suitable equipment, whether pertaining to workspace setup or ergonomically designed tools, may not be readily available at home to facilitate prolonged screen work. Hybrid work, which entail visually and cognitively demanding tasks, often lead to prolonged static postures without breaks, resulting in sustained activation of type I muscular motor units in the neck, shoulders, and back. This prolonged activation can lead to dysfunction of motor units, activation of nociceptive pathways, and centralization of pain, ultimately triggering shoulder, neck, dorsal, and lumbar pain [7]. Hybrid workers can be exposed to WMSDs due to the poor environmental conditions in which they do their work and lack of knowledge on ergonomic practices both at home and in the office workstations. WMSDs being a major concern is not only due to the pain and disability suffered by individual workers but also due to its economic impact not just on the employer but also on the society as a whole[13] . Because of the absence of ergonomic support in their home offices, the use of non-ergonomic furniture, the workload, the various awkward posture adopted while working and extended laptop usage, hybrid workers are susceptible to developing work-related musculoskeletal disorders (WMSDs)[14]. Work-related musculoskeletal disorders (WMSDs) being a major health issue for developing countries like Nigeria because of their high prevalence among workers and on account of the paucity of ergonomic preventative measures in the workplace[3]. A search through literature has revealed multiple studies done

on telework, office workers and generally on computer users and their relation with work-related musculoskeletal disorders [15,16]. However, there is a dearth of empirical evidence on the prevalence and pattern of WMSDs hybrid worker. About the time of search, there seems to be no study of research on the prevalence and pattern of WMSDs among hybrid workers in Nigeria hence this study aims to bridge the knowledge gap by investigating the prevalence and pattern of WMSDs among hybrid workers in Lagos Island, Nigeria.

MATERIALS AND METHODS

Research design and participants selection

This was a cross-sectional survey of 100 participants who were consecutively recruited from 5 companies in Lagos Island. The 5 companies, Access bank Oyin Jolayemi branch in Victoria Island, Earnipay limited, Anchor software limited, Wema bank Marina branch, G-pay instance solutions, were conveniently selected while snowballing sampling was used to recruit the 100 Hybrid workers for this survey. Lagos is the city with the highest population in Nigeria and one of the most densely populated cities in Africa due to its urbanization with over fifteen million people and a major economic hub attracting a significant number of migrants from other parts of the country and beyond

Inclusion criterion

The participants included in this study were consenting male and female in the aforementioned companies in Lagos Island who have been involved in this job for at least one year

Exclusion criteria

Those excluded from this study were Hybrid workers with musculoskeletal disorders other than work-related, pregnant Hybrid workers in their second and third trimesters and Hybrid workers 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 hours per week, months of experience) were obtained from respondents using a proforma[23]

Stadiometer: A Seca portable stadiometer made in India 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, the range of the length measurement extends to 230 cm (90.5 inches) with the height metre had a 1mm graduation. This was used to measure the height in metres of the respondents. **Weighing scale:** A bathroom weighing scalewith a capacity of 150kg was used to measure the weight of respondents in kilograms in order to calculate the body mass index. It is from brand called Venus digital weighing scale, EPS 2001 made in India.

Procedure for data collection

Ethical approval was sought and obtained from Bowen University Teaching Hospital Health and Research Committee (BUTH-HREC) with approval number BUTH/REC-2127. 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 and level of comprehension of the respondents who were willing to participate in this research work.

Sample size

Sample size calculation was used to determine the amount of Hybrid workers 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 = $\frac{129}{1 + 129\,(0.05)^2}$ = 98 Hybrid workers.

Therefore the minimum number of respondents enlisted for this study was 98

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 data. 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 physical characteristics (age, gender, educational level, height, weight, body mass index) and the work profile of the respondents. All statistical analysis were carried out using the Statistical Package for Social Sciences (SPSS) version 21. Alpha level was set at 0.05.

RESULTS

Characteristics of the Respondents

There was an unequal distribution of the respondents based on gender as 59(59.0%) of them are male and 41(41.0%) of them are female. The average age of the respondents is 28.45 ±4.33 years. The range of the ages of the respondents was between 21 and 40 years old. Respondents who were between the ages of 26 to 30 had the highest representation 54(54.0%). All the respondents had tertiary education 100(100.0%). The working experience varied between ½ and 15 years. The mean of the years of experience was 4.90±3.02 (years). Those who had been working for 3 to 9 years had the highest representation 62(62.0%); 26(26.0%) of them had been working for 2 years or less and 12(12.0%) had been working between 10 to 20 years. Those who work for 8 hours daily had the highest representation. Those who work 40 hours weekly had the highest representation. The average height of the respondents was 1.72±0.09 (metres). Their height varied between 1.50m and 1.93m. The average weight of the respondents was 72.78±11.83 (Kg). The weight recorded ranges between 50kg and 110kg. The average body mass index (BMI) of the respondents was 24.57±3.94 Kg/m^2. The range of their BMI is between 17.30 and 40.40 Kg/m^2. Majority of the respondents are Normal weight 54(54.0%) followed by 41(41.0%) who are over-weight, 4(4.0%) who are obese and 1(1.0%) who are underweight. Table 1 was used to represent the information on the physical characteristics and work profile of the respondents.

Table 1: Characteristics and work profile of the respondents

Variables	Mean ±S. D	Minimum	Maximum
Age (Years)	28.45±4.33	21	40
Years of Experience (Years)	4.90±3.02	½ year	15
Average working hour(daily)		6	12
Average working hour(weekly)		18	100
Years of Experience (Years)	4.90±3.02	½ year	15
Weight of the Respondents (Kg)	72.78±11.83	50	110
Height of the Respondents (m)	1.72±0.09	1.50	1.93
Body Mass Index (Kgm^2)	24.57±3.94	17.30	40.4
		Frequency	**Percentage (%)**
Gender	Female	6	8.6
	Male	64	91.4
Age group (Years)	20-25	22	22.0
	26-30	54	54.0
	31-35	17	17.0
	36-40	7	7.0
Body Mass Index (Kgm^2)	Normal	54	54.0
	Overweight	41	41.0
	Obese	4	4.0
	Underweight	1	1.0
Highest educational level	Primary	0	0
	Secondary	0	0
	Tertiary	100	100
Hours of work per day	6-9	72	72.0
	10-12	28	28.0
Hours of work per week	18-39	14	14.0
	40-64	80	80.0
	65-79	5	5.0

	80-100	1	1.0
Workingexperience (Yrs)	≤2	26	26.0
	3-9	62	62.0
	10-20	12	12.0

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

Most of the respondent 94(94.0%) reported that they experienced musculoskeletal disorder in areas of their body in the last 12 months. The most body part that the respondents reported to have experienced musculoskeletal disorder in last 12 months is the lower back 69(69.0%). This is followed by neck 64(64.0%), shoulders 47(47.0%), upper back 43(43.0%), wrist 42(42.0%). The least reported was elbow 11(11.0%). Most of the respondent 59(59.0%) reported that they experienced musculoskeletal disorder in areas of their body in the last 7 days. The most body part that the respondents reported to have experienced musculoskeletal disorder in last 7 days is the lower back 40(40.0%). This is followed by neck 36(36.0%), shoulders 22(22.0%). The least reported was the elbow 4(4.0%). 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	36(36.0%)	**Neck**	**No**	64(64.0%)
	Yes	64(64.0%)		Yes	36(36.0%)
Shoulder	No	53(53.0%)	Shoulder	No	78(78.0%)
	Yes	47(47.0%)		Yes	22(22.0%)
Elbow	No	89(89.0%)	Elbow	**No**	96(96.0%)
	Yes	11(11.0%)		Yes	4(4.0%)
Wrist/hand	No	58(58.0%)	Wrist/hand	No	85(85.0%)
	Yes	42(42.0%)		Yes	15(15.0%)
Upper back	No	57(57.0%)	Upper back	No	82(82.0%)
	Yes	43(43.0%)		Yes	18(18.0%)
Lower back	No	31(31.0%)	Lower back	No	60(60.0%)
	Yes	69(69.0%)		Yes	40(40.0%)
Hip /thighs	No	80(80.0%)	Hip/thighs	No	90(90.0%)
	Yes	20(20.0%)		Yes	10(10.0%)
Knee	No	69(69.0%)	Knee	No	88(88.0%)
	Yes	31(31.0%)		Yes	12(12.0%)
Ankle	No	72(72.0%)	Ankle	No	87(87.0%)
	Yes	18(18.0%)		Yes	13(13.0%)

Association between WMSD of last 12 months and the WMSD of last 7 days and each Characteristics and work profile of the respondents.

Table 3 shows the summary of the Chi-square test of association between prevalence of work-related musculoskeletal disorder in 12 months and in the last 7-days and characteristics and work profile of respondents. The result showed that there was no significant association between prevalence and each characteristics and work profile of the respondents.

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**			
20-25	21	1	0.083	20-25	10	11	0.058
26-31	53	1		26-31	32	27	
32-37	14	3		32-37	14	2	
37-43	6	1		37-43	3	1	
Gender				**Gender**			

Male	53	6	0.093	Male	34	25	0.738
Female	41	0		Female	25	16	
Highest educational background				**Highest Educational Background**			
Secondary	0	0	0.927	Secondary	0	0	0.170
Tertiary	100	0		Tertiary	100	0	
BMI				**BMI**			
Underweight	4	0	0.191	Underweight	2	2	0.813
Normal	54	1		Normal	31	23	
Overweight	29	4		Overweight	25	16	
Obese	7	1		Obese	1	0	
Years of working experience				**Years of working experience**			
<=2	25	1	0.839	0-4	25	25	0.347
3-9	58	4		5-8	26	12	
10-20	11	1		9-15	8	4	
Hours of workper day				**Hours of work per day**			
<=8	52	3	0.866	**5-8**	30	19	0.764
>8	42	3		**9-12**	29	22	
Hours of work per week				**Hours of work per week**			
<=40	48	2	0.674	20-40	30	19	0.666
>40	46	4		41-60	26	19	
				61-80	3	2	
				81-100	0	1	

Significant at P= 0.05

DISCUSSION

This study was designed to determine the prevalence and pattern of work-related musculoskeletal disorders among hybrid workers in Lagos Island, Nigeria. Being an emerging topic as at the time this research was carried out, there seemed to be no empirical studies that been carried out among Hybrid workers in Nigeria. In the present study, the overall prevalence of the work-related musculoskeletal disorder among the hybrid workers in the last 12-months preceding data collection was 94.0% indicating that at least nine out of ten of hybrid workers in this study reported experiencing musculoskeletal pain. The prevalence of WMSDs among hybrid workers is higher than that observed in other occupations in Nigeria School teachers (70.2%), Physiotherapists (91.3%), Load carriers(90.3%), administrative staff (31%), Computer users (93.2%), Tailors (76%)[17].

The findings from this study revealed that majority of the respondents with prevalence of WMSDs ranges from 21-40 years old with the mean age of 28.45 ±4.33 years. This is in line with the fact that the tech industry has a high concentration of younger workers. This present finding is similar to the age range (20-45 years) of a study on the "Work-Related Musculoskeletal Disorders and Associated Factors among Bankers in Ethiopia[18]. This present finding differs from the average age of 37.35 ± 8.43 of a study on "Effects of Risk Factors Related to Computer Use on Musculoskeletal Pain in Office Workers[19]. A plausible explanation for this present finding is tech industries often require fresh ideas and perspectives which younger people bring and the difference in the prevalence of WMSDs between this present and the later might be in the type of population studied and the sampling method adopted. In this study, there was an unequal distribution of the respondents based on gender as 59(59.0%) of them are male. This is assumed to be due to the fact that the tech industry is male dominated. The present finding of this study is similar to a study done on "Magnitude of work-related Musculoskeletal

Disorders and its Associated factors among computer user bankers in South Gondar Zone, Northwest Ethiopia[20]. The study reported 73.2% male respondents. This present finding contradicts the gender percentage in a study which reported that majority of the respondents were females (54.5%). In his study of "Individual and work-related risk factors for musculoskeletal pain among computer workers in Nigeria[21] The plausible explanation for the finding of this present study could be that there were more male respondents working at the company the data was obtained. All of the hybrid workers (100.0%) represented in the study had pursued higher education in the tertiary institution. implying that all the respondents pursued education beyond secondary education. This finding is similar to previous study that reported three-fourths of the respondents (75.8%) had a bachelor's degree[20]. This finding could imply that the occupation requires extensive formal education and various professional certifications as prerequisite to be a hybrid worker.

Majority of the respondents in this present study are of normal weight. Even though majority of the respondents had normal weight, more than one-third of the respondents were over-weight (41.0%). This could be because the workers spend more time sitting or engaging in sedentary activities, leading to a lack of physical activity and contributing to weight gain. Workers may also rely on convenience foods which are often high in calories, sugar and unhealthy fats, contributing to weight gain. This present finding contradicts a past study on "Prevalence and determinants of musculoskeletal disorders among information technology sector employees of Ahmedabad, Gujarat" who reported majority of respondents (> 70%) had BMI in the unhealthy range (pre-obese)[22]. The plausible explanation may be attributed to difference in the job description and the job demands of the population of study.The respondents had working experiences that varied between half a year and 15 years. The mean of the years of experience was 4.90±3.02 (years). This present finding differs from a study on "prevalence of work-related musculoskeletal disorder in sitting professionals" who reported their average experience was 4.55±1.66 years, ranging from 1 to 6 years[23]. The wide range of experience in this present study could be due to organizations adopting flexible work arrangements, appealing to both early career and experienced workers, the job description and job demands. Those who work for 8 hours daily had the highest representation in this study which is similar to a study on prevalence of musculoskeletal pain among computer users working from home during the COVID-19 pandemic: a cross-sectional survey which reported the daily working hour from 6-8 hours[24]. The possible reason for this finding could be company policies. The employers might require or encourage standard the labour code of 8 hours workdays.

Findings from this study showed that 94.0% and 59.0% of the respondents reported that they experienced musculoskeletal disorders in the last 12 months and 7 days respectively. This is consistent with a previous study on "Musculoskeletal disorder symptoms assessment among office workers of a manufacturing company" that reported a prevalence of 95.3% in the last 12 months[25]. The prevalence rate in this present study contradicts a study on "Prevalence and Determinants of Musculoskeletal Disorders among Information Technology Sector Employees of Ahmedabad, Gujarat" who reported a prevalence which is lower compared to this present study[22]. The plausible explanation for this disparity might be due to the difference in perception of study participants on reporting of musculoskeletal pain, workload, work setting and sample size, inadequate ergonomic setup in both office and home workstations particularly in shared households and moreover the COVID 19 pandemic has caused a sudden transition to new ways of work for which employees may not be adequately prepared. Though this study revealed that all anatomical body parts were affected but the lower back and neck were the most affected body part both in 12 months (69% and 64%) and 7 days (40% and 36%) prevalence respectively this pattern of distribution of WMSDs in different body part is similar to what has been reported in majority of studies that involve computer usage for prolong period in a sedentary place; which is similar to a systematic review that reported fifteen out of twenty-five studies reported that the lower back, neck, upper back, and shoulder were the most affected body parts[26]. The present finding is also consistent with a study on "prevalence of work-related musculoskeletal disorder in sitting professionals" who reported highest suffered region of the body was lower back for the 12 months[23] but contradicts this present study by reporting the neck as the most affected body part in the 7 days prevalence. This finding differs slightly from a study that reported the neck and shoulder as the most affected body parts on "Magnitude of Work-Related Musculoskeletal Disorders and its associated Factors among Computer User Bankers in South Gondar Zone, Northwest Ethiopia[20] The plausible explanation for this difference in the present study and the later could be due to differences in assessment tools, workplace health and safety practices, study design, nature of population studied and sample size. This finding is in line with assumption that prolonged sitting with poor posture while working with the computer alters the natural curvature of the spine, leading to uneven distribution of forces and stress on the muscles and joints and moreover it is particularly difficult to maintain proper posture when working with a computer in an unergonimically suitable workstations set up both at home and office because working with a computer entails sitting for extended periods of time and hybrid workers often adopt poor posture patterns like slouching, crossing their legs,on the furniture, on bed at home etc while working. This can put strain on the spine, pelvis, muscles, tendons, joints, bones, and discs, which can result in pain, fatigue of type 1 muscle fibres and deformity.

The prevalence of work-related musculoskeletal disorders was not significantly associated with any Characteristic (age, sex, gender, and educational status etc) or working profile variables. This present finding implies that age, sex, gender, educational status, work profile variables are not factors that predispose hybrid workers to WMSDs this might imply that other factors such as psychosocial factors such job-related stress, inadequate support from managers or co-workers, a high mental burden, and a lack of acknowledgement for completed tasks in the workplace might have impacted the onset of WMSDs, either by amplifying biomechanical exposure or by triggering stress mechanisms. This present finding is similar to a study that reported no significant association between musculoskeletal disorder and age and musculoskeletal disorder and daily working hour[25]. This present study contradicts a study that reported WMSD prevalence had significant associations with sex, age, working hours and work experience[27]; the plausible explanation for the contrast with this present study might be due to difference in the study area of population and moreover it might be because the sample size, statistical test of choice and sampling techniques adopted for this present study couldn't detect association.

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 snowball sampling technique was used to exclusively recruit the respondents, this might have resulted in selection bias, and hence the participants may not be true representatives of the hybrid workers in Lagos Island, Nigeria. 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 or underestimate 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. Also, the Nordic Musculoskeletal Questionnaire used in this study is the most common tool used for assessment of MSDs in various occupational populations including hybrid workers. Together, these added to the strengths of the study. It is therefore recommended that, further studies should adopt a different research design like longitudinal study and mixed assessment tools for stronger research evidence and also that future researchers need to assess the time lost by the workers during the periods when they are off sick and/or hospitalized and also capture the costs incurred by hybrid workers in seeking medical attention

CONCLUSION AND IMPLICATIONS FOR TRANSLATION

The finding of this study showing high prevalence of work-related musculoskeletal disorders among hybrid workers calls for the urgent development and implementation of preventive measures. The lower back, neck and shoulder were the most affected body parts, a tangible number of the respondents were overweight. The prevalence of work-related musculoskeletal disorders did not show a significant association with characteristic variables and work profile of the respondents. These findings emphasize the importance of addressing the promotion of physical activity, psychosocial factors, ergonomic and workstations design to lessen musculoskeletal disorders among hybrid workers. Therefore, concerned stakeholders should intervene to prevent the debilitating effects of work-related musculoskeletal disorders and to ensure the well being of hybrid workers so as to improve their productivity in the sector. Our study highlights the issue of work-related musculoskeletal health and the need for prevention among Hybrid workers, which constitutes a major part of telework economic activity in Nigeria. The outcome of our student can be used to advocate with policymakers and organization employers to develop specific approaches, including ergonomics, in occupational health and safety programmes and policies in Nigeria.

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 Health Research Ethics Committee (BUTH-HREC). A written informed consent was gotten from the participants.

Acknowledgement

The authors thank all Hybrid workers in Lagos Island, Nigeria, who participated in this study.

Competing interest

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

Author 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. HKO and did the formal analysis, writing of original draft of the article, project administration, data curation, resources, supervision and funding acquisition of the article. PCO did the formal analysis, investigation, writing-reviewing and editing of the article. did the formal analysis, investigation, writing-reviewing and editing of the article. OOT did the reviewing and editing of the article, supervision, validation of the work.DZA and JOA 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.

Source of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not for- profit sectors"

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 author.

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. Luna Kiran Adhikari*, Pramodh Chaudhary, Raj Kumar Sangroula, Roja Thapaliya, Janak Kumar ThapaInternational Journal of Community Medicine and Public Health *Adhikari LK et al. Int J Community Med Public Health. 2023;10(3):1035-1041* http://www.ijcmph.com

III. Kaboré PA, Schepens B. Work-related musculoskeletal disorders and risk factors among weavers: A cross-sectional study. S Afr J Physiother. 2023 ;79(1):1904. doi: 10.4102/sajp.v79i1.1904. PMID: 38855078; PMCID: PMC11157636.

IV. Kristen : "Are you at risk for a work-related musculoskeletal disorder?". Retrieved December, 2023, from www.verywellhealth.com/work-related-musculoskeletal-disorder-7968083

V. Hinge health (2023): "What are work-related musculoskeletal disorders (WMSDs)?". Retrieved November 5, 2023, from www.hingehealth.com/resources/articles/work-related musculoskeletal-disorders/

VI. ILO , 2013, *Rapport sur la prévention des maladie professionnelles*, International Labour Organisation, viewed 13 February 2023, from https://www.ilo.org/global/topics/safety-and-health-at-work/events-training/events-meetings/world-day-for-safety/WCMS_204903/lang--fr/index.htm consulté le. [Google Scholar]

VII. Yves Roquelaure, Julie Bodin, Florence Cros, Alexis Descatha, Marc Fadel 1The Digital Economy and Hybrid Work Call for a Review of Compensation Criteria for Musculoskeletal Disorders La Medicina del lavoro 2024;115(3):e2024019 DOI: 10.23749/mdl.v115i3.16072

VIII. Punnett L, Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. Journal of Electromyography and Kinesiology, 2004;14:13-23.

IX. European Agency for Safety and Health at Work (2019): "Work-related MSDs: prevalence, costs and demographics in the EU". Retrieved November 19, 2023, from Work-related musculoskeletal disorders: prevalence, costs and demographics in the EU | Safety and health at work EU-OSHA (europa.eu)

X. Milaković M, Koren H, Bradvica-Kelava K, Bubaš M, Nakić J, Jeličić P, Bucić L, Bekavac B, Čvrljak J and Capak M . Telework-related risk factors for musculoskeletal disorders. Front. Public Health 2023;11:1155745. doi: 10.3389/fpubh.2023.1155745

XI. Korhan O, Mackieh A. A model for occupational injury risk assessment of musculoskeletal discomfort and their frequencies in computer users. Safety Science, 2010; 48(7):868-877.

XII. European Agency for Safety and Health at Work (2019): "Work-related MSDs: prevalence, costs and demographics in the EU". Retrieved November 19, 2023, from Work-related musculoskeletal disorders: prevalence, costs and demographics in the EU | Safety and health at work EU-OSHA (europa.eu).

XIII. Ferreira E.J. and E.A. Strydom (2016): Managing work-related musculoskeletal disorders in the virtual office. Journal of Contemporary Management, 2016;13(1):117-143.

XIV. Okezue Obinna Chinedu., Anamezie Toochukwu Henry., John Jeneviv Nene and John Davidson Okwudili. Work-Related Musculoskeletal Disorders among Office Workers in Higher Education Institutions: A Cross-Sectional Study. Ethiopia. Ethiopia Journal Health, 2020;30(5):715-724.

XV. Vieira E, Schneider P, Guidera C, Gadotti I, Brunt D. (2016): Work-related musculoskeletal disorders among physical therapists: A systematic review. Journal of Back and Musculoskeletal Rehabilitation, 2016;9(3):417-28.

XVI. Ojukwu CP, Anyanwu GE, Eze B, Chukwu SC, Onuchukwu CL, Anekwu EM. Prevalence, pattern and correlates of work-related musculoskeletal disorders among school teachers in Enugu, Nigeria. Int J Occup Saf Ergon. 2021;27(1):267-277. doi: 10.1080/10803548.2018.1495899.

XVII. 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.

XVIII. Kasaw Kibret, A., Fisseha Gebremeskel, B., Embaye Gezae, K., & Solomon Tsegay, G. Work-Related Musculoskeletal Disorders and Associated Factors Among Bankers in Ethiopia, 2018. Pain Research and Management, 2020;(1), 8735169.

XIX. Bilge Basakci Calik., Nesrin Yagci., Mucahit Oztop & Derya Caglar. Effects of Risk Factors Related to Computer Use on Musculoskeletal Pain in Office Workers. International Journal of Occupational Safety and Ergonomics, 2020; DOI: 10.1080/10803548.2020.1765112.

XX. Demissie, B., Yenew, C., Amsalu, A., Yideg Yitbarek, G., Dagnew Baye, N., Walle, G., ... & Tegegne, E. Magnitude of work-related Musculoskeletal Disorders and its Associated factors among computer user bankers in South Gondar Zone, Northwest Ethiopia, 2021. Environmental Health Insights, 2020;16.

XXI. Abaraogu, UO., Okorie, PN., Duru, DO., & Ezenwankwo, EF. Individual and work-related risk factors for musculoskeletal pain among computer workers in Nigeria. Archives of Environmental & Occupational Health, 2018;73(3): 162-168.

XXII. Panchal S, Viramgami AP, Pingle S (2020). Prevalence and Determinants of Musculoskeletal Disorders among Information Technology Sector Employees of Ahmedabad, Gujarat. Journal Comprehensive Health, 2020;8(2): 28-32.

XXIII. Arora, S. N., & Khatri, S. Prevalence of work-related musculoskeletal disorder in sitting professionals. International Journal Community Med. Public Health, 2022;9:892.

XXIV. Gosain, L, Ahmad, I, Rizvi, MR, Sharma, A., & Saxena, S. Prevalence of musculoskeletal pain among computer users working from home during the COVID-19 pandemic: a cross-sectional survey. Bulletin of Faculty of Physical Therapy, 2022;27(1):51.

XXV. Noraziera M. Norzaida A. Musculoskeletal disorder symptoms assessment among office workers of a manufacturing company. Journal of Advanced Research in Occupational Safety and Health, 2018; 3:1-7

XXVI. Demissie, B, Bayih, ET., & Demmelash, A A. A systematic review of work-related musculoskeletal disorders and risk factors among computer users. Heliyon 2024;10(3):e25075

XXVII. Chinedu, OO., Henry, AT., Nene, J J & Okwudili, JD. Work-related musculoskeletal disorders among office workers in higher education institutions: A cross-sectional study. Ethiopian journal of health sciences, 2020; *30*(5).