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# Prevalence of Work-Related Musculoskeletal Disorders and Quality of Work Life Among a Nigerian University Academic Staff

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## Abstract

Musculoskeletal disorders are commonest work-related illnesses causing significant economic burden in terms of lost wages, treatment, and compensation. The study assessed the prevalence of work-related musculoskeletal disorders (WRMSKD) and quality of work life (QWL) among University of Medical Sciences academic staff.
Fifty nine academic staff (36 males, 23 females) were purposefully recruited for the study. Questionnaire on Nordic, Quality of work life and Visual Analogue Scale were used to assess the prevalence WRMSKD, QWL and pain intensity. Questionnaires were given the respondents; they were retrieved after they due completion. Data were analyzed using descriptive and inferential statistics. Alpha level was set at $P<0.05$.
Results showed that 51 (86.4%) reported 12-months prevalence of WRMSKD. Thirty-six respondents, (61%); reported WRMSKD in the last 7 days. The body part most affected was the neck (33 55.9%); 51(86.4%) reported that pain was caused by work. There was an inverse relationship between pain intensity and each of work experience ($r = -0.289$, $P = 0.026$), cadre ($r = -0.312$, $P = 0.016$) and extra working hours ($r = -0.372$, $P = 0.004$).
This study showed that there was high prevalence of WRMSKD among academic staff and neck was most prevalent. Pain intensity was inversely related to each of the work experience, cadre, and extra-working hours.

## Introduction

Work-related Musculoskeletal Disorders (WMSDs) are among the main occupational health challenges in today's world and exist in numerous occupations (Soroush, *et al.*, 2018). Globally, musculoskeletal disorders are one of the most common work-related illnesses and causing significant economic burden in terms of lost wages, treatment, and compensation and also responsible for considerable impact on the quality of life (Sirajudeen *et al*., 2010). However, work related musculoskeletal disorders increase sickness absenteeism and early retirement resulting in poor productivity at work (Sirajudeen *et al*., 2010). Statistically, about 91 percent of worker in the United Kingdom are affected by WMSDs (Glover, *et al.*, 2005). In Australia, approximately 85 percent were reported (Cromue,*et al*., 2000) while Nigeria reported at 91.3 percent (Babatunde *et al*., 2008) making Nigeria one of the countries with the highest percentage prevalence of work related musculoskeletal disorders.

Work-related musculoskeletal disorders have been identified with a wide range of inflammatory and degenerative conditions affecting the muscles, ligaments, tendon, nerves, bones, and joints which can occur from a single or cumulative trauma (Allsop *et al*., 2010). Common symptoms of WMSDs are pain, aching, stiffness, fatigue, discomfort, tingling sensations and any of these could appear in the shoulder, upper back, chest, elbow, neck, wrist, lower abdomen, hip, knee or ankle (Ojule *et al.*, 2020). Risk factors for WMSDS are enumerated involving work ergonomics, such as awkward position in sitting and standing while using instrument of workplace. Activities involving heavy load can result in acute injury but most WMSDs are from motions that are repetitive or from maintaining a static position (Weston *et al*., 2016).

Furthermore, work related musculoskeletal disorders are characterized by persistent pain, activity limitation, limitations in mobility, dexterity, and function resulting in

participation restrictions especially in social roles with associated impact on mental wellbeing and at a broader level impact on the progress and prosperity of the communities (Campo *et al.*, 2008). Consequently, work performance and output of affected individuals are impaired leading to early retirement, diminished work force, working hours and productivity which are part of the factors that contribute to work output (Boot *et al*., 2019).

Quality of work life (QWL) is a multidimensional concept and it is measured to understand the people, labor and organization (Leitão *et al*., 2019). Quality of work life reflects in employee's reaction to their job satisfaction and mental health; in fact, it is a comprehensive and complete plan that focuses on enhancement of employee's satisfaction and it is necessary to recruit, retain and make job satisfaction in all organizations (Kermansaravi *et al*., 2014). Lau *et al.*, (2000) described QWL as the favourable working environment that supports and promotes satisfaction by providing employees with rewards, job security, and career growth opportunities. Saraji and Dargahi (2006) identified QWL variables as fair pay and autonomy, job security, health and safety standards at work, reward systems, recognition of efforts, training and career advancement opportunities, participation in decision making, interesting and satisfying work, trust in senior management, balance between the time spent at work and with family and friends, level of stress experienced at work, amount of work to be done, occupational health and safety at work. A Nigerian study showed that, there is higher incidence of WMSDs with effect on their total work efficiency among university staffs (Oluka, *et al.*, 2020). Also, a statistically significant association was found to exist between work posture and quality of work output (Ojule *et al.*, 2020).

Academic staff includes personnel who hold an academic rank with titles such as professor, associate professor, assistant professor, lecturer, instructor, or the equivalent of any of these academic ranks whose primary assignment and principal activity is instruction or research (Academic 2003). The work tasks of academic staff often involves significant use of a "head down" posture, such as frequent reading, marking of test/exams. It has been postulated that sustained awkward sitting posture (lordosed or kyphosed, overly arched, or slouched) can result in higher intradiscal pressure and may be injurious to spinal postural health (Pynt, 2002). Therefore, awkward postures while sitting have been described as possible risk factors for the presence of musculoskeletal pain (Burdorf, 1997). This study aim to determine the prevalence of work related musculoskeletal disorders.

## Materials and Methods:

**Respondents:**
Respondents were academics who are permanently employed in University of Medical Sciences, Ondo.

**Inclusion Criteria:**
Respondents were apparently healthy permanent academic staff of University of Medical Sciences of not less than 12 months in office.

**Exclusion Criteria:**
Respondents presented with no obvious physical impairment, had history of tumor (benign or malignant) in the last 12 months and had trauma in the last 12 months.

**Site:**

The site of the study was the Department of Physiotherapy, University of Medical Sciences, Ondo, Ondo State, Nigeria.

**Instruments:**

The instruments employed in the study were a socio-demographic questionnaire that contained questions on age, gender, marital status, years of experience and cadre. Other instruments used for this study were:

1. The Nordic questionnaire: It was developed from a project funded by the Nordic Council of Ministers (Kuorinka, *et al*., 1987). It is a questionnaire that assesses the presence of pain in several regions of the body within the past 12 months, past 7 days and if the pain had prevented the participants from carrying out his/ her Activities of Daily Living (ADL) in the past 12 months. The participant having read the questions indicates yes or no depending on the area where the pain is present.
2. The Visual Analogue Scale (VAS). It is often used in epidemiologic and clinical research to measure the frequency of various symptoms (Dauphin *et al*., 1999). It is a rating scale of 10 points in order if their severity with the left extremity marked (0) indicating "no pain" and the right extremity marked (10) indicating "worst or unbearable pain". Each participant marked the line with respect to the level or severity of their pain.

**Study Design:**
This study was a cross-sectional survey.

**Sampling Technique:**
The sampling technique used for this study was the purposive sampling technique.

**Determination of Sample Size:**
The sample size for this study was based on the formula.
$n= N/ 1+ (Ne^2)$ (Seville and Consuelo, 2007).
Where:
N = the population size
e = the precision level which may be estimated to be 50% = 0.05
where N is 70
therefore, $n = 70/1+ (70 \times 0.05^2)$
$70 \times 0.0025 = 0.175$
$1 + 0.175 = 1.175$
$n = 70/ 1.175 = 59.57$ approximately 60
therefore, n = 60
The sample size for this study was 60.

**Procedures:**
Ethical approval was obtained from the Ethic and Health Research Committee of the University of Medical Sciences, Ondo, Ondo State and permission for data collection was also obtained. Respondents having met the inclusion criteria gave their informed consent after the purpose and protocol for the study was explained to them and so given questionnaires to fill. The questionnaires they filled were in 3 sections. Section A was a Socio-Demographic questionnaire, Section B was the Quality of work life questionnaire and Section C was the Nordic questionnaire.

The level of pain intensity was assessed using VAS.

**Data Analysis:**
Data collected were analyzed using descriptive and inferential statistics. Chi square was used to examine the association between the prevalence and quality of work life. Spearman Rho was used to determine the relationship between the prevalence some sociodemographic variables. Alpha level was set at 0.05.

## Results:

**Socio-Demographic Characteristics of The Respondents:**

Presented in table 1 is the socio-demographic variable of respondents. There were 36 (61%) males, 23 (39%) females. Fifty seven (96.6%) were married and 2 (3.4%) were single.

| Variables | Frequency | Percentage |
|---|---|---|
| Male | 36 | 61 |
| **Female** | 23 | 39 |
| **Marital Status** | | |
| Married<br>Single | 57<br>2 | 96.6<br>3.4 |
| **Cadre** | | |
| Lecturer 2 | 22 | 37.3 |
| Lecturer1 | 30 | 50.8 |
| Senior Lecturer | 6 | 10.2 |
| Reader | 1 | 1.7 |

**Table 1:** SOCIO DEMOGRAPHIC VARIABLES OF RESPONDENTS. N=59

Shown in table 2 are the descriptive characteristics of respondents. The minimum age of respondents was 22 years, the maximum age was 59 years, the mean age was 43.The minimum VAS Score was 0, the maximum was 6, the mean VAS score was 3.The minimum job duration at the University of Medical Sciences, Ondo, Ondo State was 1 year and the maximum was 6 years. The mean work experience was 11 years

| Variables | Minimum | Maximum | Mean± SD |
|---|---|---|---|
| Age (years) | 22 | 59 | 43.15 ± 9.73 |
| Work Experience (years) | 4 | **34** | 11.41 ± 5.52 |
| Duration of Present Job (years) | 1 | 6 | 4.03 ± 1.63 |
| Duration of extra hours (days) | 0 | **30** | 5.14 ± 6.10 |
| Duration of relaxation (Hrs) | 2 | 8 | 3.90 ± 1.51 |
| Visual Analogue Scale | 0 | 6 | 3.03 ± 1.22 |

**Table 2:** Descriptive Characteristics of Respondents. N=59

**12 Months and 7 Days Prevalence of Work related Musculoskeletal Disorders Among Respondents:**
Revealed in table 3 is the 12 months and 7 days prevalence of work-related musculoskeletal disorders among respondents. Fifty-one (86.4) respondents reported having musculoskeletal pain in the last 12 months while 36 (61.0%) respondents reported having musculoskeletal pain in the last 7 days.

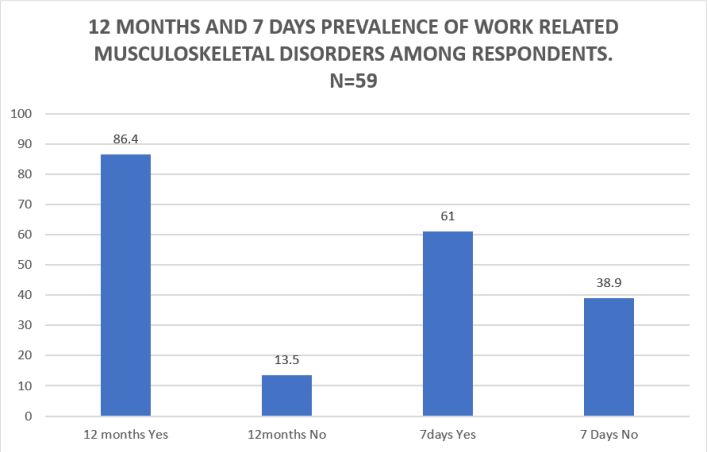


**Figure 1:** 12 Months and 7 days prevalence of work related musculoskeletal disorders among respondents. N=59

**12 Months and 7 Days Prevalence Across the Body Parts:**
Presented in Table 4 is the 12 months and 7 days prevalence across the body parts.
Thirty three (55.9%) reported pain at the neck in the last 12 months, 18(30.5%) reported pain at the upper back in the last 12 months, 31(52.5%) reported pain at the low back in the last 12 months. Twenty four (40.7%) reported pain at the neck in the last 7 days, 21(35.6%) reported pain at the upper back in the last 7 days, 19(32.2%) reported pain at the lower back in the last 7 days.

| Variable | 12 months | | 7 days | |
|---|---|---|---|---|
| | Frequency | Percentage (%) | Frequency | Percentage (%) |
| **Neck**<br>Yes<br>No | <br>33<br>26 | <br>55.9<br>44.1 | <br>24<br>35 | <br>40.7<br>59.3 |
| **Right Shoulder**<br>Yes<br>No | <br>26<br>33 | <br>44.1<br>55.9 | <br>17<br>42 | <br>28.8<br>71.2 |
| **Left Shoulder**<br>Yes<br>No | <br>10<br>49 | <br>16.9<br>83.1 | <br>16<br>43 | <br>27.1<br>72.9 |
| **Right Elbow**<br>Yes<br>No | <br>11<br>48 | <br>18.6<br>81.4 | <br>8<br>51 | <br>13.6<br>86.4 |
| **Left Elbow**<br>Yes<br>No | <br>2<br>57 | <br>3.4<br>96.6 | <br>2<br>57 | <br>3.4<br>96.6 |
| **Right Wrist/Hand**<br>Yes<br>No | <br>11<br>48 | <br>18.6<br>81.4 | <br>7<br>52 | <br>11.9<br>88.1 |
| **Left Wrist / Hand**<br>Yes<br>No | <br>3<br>56 | <br>5.1<br>94.9 | <br>10<br>49 | <br>16.9<br>83.1 |
| **Upper Back**<br>Yes<br>No | <br>18<br>41 | <br>30.5<br>69.5 | <br>21<br>38 | <br>35.6<br>64.4 |
| **Lower Back**<br>Yes<br>No | <br>31<br>28 | <br>52.5<br>47.5 | <br>19<br>40 | <br>32.2<br>67.8 |
| **Hips/Thighs/ buttocks** | 16 | 27.1 | 9 | 13.3 |

| | | | | |
|---|---|---|---|---|
| Yes<br>No | 43 | 72.9 | 50 | 84.7 |
| **Knees**<br>Yes<br>No | 17<br>42 | 28.8<br>71.2 | 6<br>53 | 10.2<br>89.8 |
| **Ankles/ Feet**<br>Yes<br>No | 13<br>46 | 22.0<br>78.0 | 3<br>56 | 5.1<br>94.9 |

**Table 3:** 12 Months and 7 days prevalence across the body parts. N=59

**Prevention of activities of daily living by pain in the last 12 months. N=59:**

Shown in table 4 is the prevention of Activities of Daily Living (ADL) by pain in the last 12 months. Four (6.8%) reported prevention of Activities of Daily Living caused by pain at the neck in the last 12 months. Ten (16.9%) reported prevention of Activities of Daily Living caused by pain at the upper back in the last 12 months. Twelve (20.3%) reported prevention of Activities of Daily Living caused by pain at the lower back in the last 12 months.

| Variable | 12 months | |
|---|---|---|
| | Frequency | Percentage (%) |
| **Neck**<br>Yes<br>No | 4<br>55 | 6.8<br>93.2 |
| **Right Shoulder**<br>Yes<br>No | 4<br>55 | 6.8<br>93.2 |
| **Left Shoulder**<br>Yes<br>No | 3<br>56 | 5.1<br>94.9 |
| **Right Elbow**<br>Yes<br>No | 2<br>57 | 3.4<br>96.6 |
| **Left Elbow**<br>Yes<br>No | 1<br>58 | 1.7<br>98.3 |
| **Wrist/Hand**<br>Yes<br>No | 11<br>48 | 18.6<br>81.4 |
| **Upper Back**<br>Yes<br>No | 10<br>49 | 16.9<br>83.1 |
| **Lower Back**<br>Yes<br>No | 12<br>47 | 20.3<br>79.7 |
| **Hips/ Thighs/ buttocks**<br>Yes<br>No | 4<br>55 | 6.8<br>93.2 |
| **Knees**<br>Yes<br>No | 3<br>56 | 5.1<br>94.9 |
| **Ankles/ Feet**<br>Yes<br>No | 0<br>59 | 0<br>100 |

**Table 4:** Prevention of activities of daily living by pain in the last 12 months. N=59

Presented in table 5 is the result of association between 12 months and 7 days prevalence of musculoskeletal disorders and quality of work life among respondents. Fifty one (86.4%) reported that pain in the last 12 months was caused by their work, 36(61.0%) reported that pain in the last 7 days was caused by their work.

| Variable | Frequency | Percentage (%) | $x^2$ | P |
|---|---|---|---|---|
| **Pain caused by work 12 months**<br>Yes<br>No | 51<br>8 | 86.4<br>13.6 | 0.054 | 0.816 |
| **7 days** | | | | |
| Yes | 36 | 61.0 | 3.422 | 0.040 |
| No | 23 | 38.9 | | |
| No | | 23 | 38.9 | |

Key: $x^2$- Chi square, p- Significance level set at p= <0.05

**Table 5:** Association between 12 months and 7 days prevalence of musculoskeletal disorders and quality of work life among respondents. N = 59

**Relationship between pain intensity and socio demographic variable of respondents:**

Shown in table 7 is the relationship between pain intensity and socio demographic variable of respondents. There was an inverse relationship between pain intensity and each of work experience (r = -0.289, P = 0.026), cadre (r = -0.312, P = 0.016) and extra working hours (r = -0.372, P = 0.004).

| Variables | R | P |
|---|---|---|
| Age | -0.178 | 0.177 |
| Work Experience | -0.289 | 0.026* |
| Cadre | -0.312 | 0.016* |
| Duration of present job | -0.201 | 0.128 |
| Extra working hours | -0.372 | 0.004* |
| Relaxation hours | 0.021 | 0.873 |

Key

r- Spearman rho test of relationship

p- Significance level set at p= <0.05

**Table 7:** Spear Man Rho test of relationship between pain intensity and socio demographic variables. n = 59

**Discussion:**

This study assessed the prevalence of work related musculoskeletal disorders and Quality of Work Life among University of Medical Sciences academic staff, the association between quality of work life and pattern of work related musculoskeletal disorders and the relationship between pain intensity and socio demographic variables of respondents were also examined.

From the study, it was observed that the number of male lecturers were more than the female lecturers. This could be because the male professionals find it easy to pursue higher degrees than the females. Amidst the respondents, close to ninety percent reported 12 months prevalence of musculoskeletal pain across different body parts and more than 60% reported musculoskeletal pain in the last 7 days. This findings was similar to the report of Ojoawo et al (2016) where a 12 months prevalence of 71.7% was reported

among academics at Obafemi Awolowo University, Ile Ife. The implication is that there was a high prevalence of work related musculoskeletal disorder among the academics in the domain of the study. One of the causes of musculoskeletal pain is related to overload of mechanical tissue anchored on doing a work repeatedly. Another factor is poor ergonomics which stemming from inappropriate monitor height; leading to repetitive neck flexion when the tip of the monitor is not at a horizontal level with the eye sight. (van Vledder et al., 2015). This may suggests the predominance of work related musculoskeletal pain among the academic staff.

Within the last 12 months, the respondents reported that the body part affected mostly by musculoskeletal disorder was the neck, followed by lower back and the right Shoulder. Meanwhile in the last 7 days, most musculoskeletal pain was reported to be experienced at neck, upper back and lower back. This was similar to the study carried out by Ojoawo *et al* (2016) where the most common body part affected over a period of 12 month was the neck, followed by the low back. The work tasks of academic staff often involves significant use of a "head down" posture, such as frequent reading, marking of test/exams. This predispose the muscle and the structure of the neck to repeated injury which precipitate pain and discomfort

It has to be noted that most of the academics in university are addicted to computer usage due to the nature of their work, searching the internet for information, forming lecture and other presentation and many other computer related activities. Adedoyin et al., (2005) reported that a high prevalence of musculoskeletal disorders among computer operators which may be attributable to bad ergonomics; which is highly applicable to the findings of this study. It has been postulated that sustained awkward sitting posture (lordosed or kyphosed, overly arched, or slouched) can result in higher intradiscal pressure and may be injurious to spinal postural health (Pynt, 2002). This could also be attributed to poor posture in sitting, forward head and shoulder especially when using computer system: Monitors and laptops or reading of text, document for prolonged hours. Furthermore, the musculoskeletal disorder responsible for preventing activities of daily living is low back, followed by wrist or hand and upper back. Duties of academic staff involves prolonged sitting, especially in reading, preparing lectures, marking examinations, collation of results and attending series of meetings (Billy *et al*., 2014). All these activities connote sitting. If someone cannot sit comfortably for an appreciable period of time doing his work, there may be need to seek for help; which may necessitate hospital visit then absent from work . Sitting for a long time may precipitate injury to the lumbar region especially the intervertebral disc and ligament. Literatures has confirmed that long time sitting resulted into back discomfort and if the sitting is sustained for a prolong period, the muscular endurance will be affected (Waongenngarm, et al., 2015, Lis et al 2007). The reason for the findings in this study may not be far-fetched from these reports

In this study, there was no significant association between prevalence of musculoskeletal disorder with cadre of the staff. What this implies was that the experience of musculoskeletal disorder is not informed by the cadre of an academic. It has to be noted that the work load and responsibility in academic may not depend solely on the cadre but the number of academics versus the workload in such a department. Therefore, position someone is does not determine having musculoskeletal pain or not.

On the contrary there was an inverse relationship between pain intensity and each of work experience, cadre, and extra-working hours. In other words, the higher the cadre and work experience, the lower the pain intensity felt, and the longer the extra working hours, the lower the pain intensity reported. It seems as though, as an individual is getting older in the job, increasing in rank and spending more time in the job, the body adapts to the system. The body system is getting adapted to the nature of the job overtime thereby coping with the pain. This is similar to a study conducted by Huaruo *et al*., (2020), which reported that the ability of work adaptability can be cultivated and developed which is the interaction between the individual and the environment and it is also an ability that enables individuals to develop.

Although, a larger percentage of the respondents reported having musculoskeletal disorders over 12 months and 7days. However, it was only the seven-day prevalence that was association quality of work life. The inference from the study is that the seven-day prevalence was associated with work quality of life. This could suggest that extra-curricular activities outside work station impart the incidence of musculoskeletal disorders amidst the academic staff of University of Medical Sciences, Ondo.

## Conclusion:

This study has shown that there was high prevalence of musculoskeletal disorders among academic staff of University of Medical Sciences, Ondo. Neck is the most prevalent site followed by low back. There was an inverse relationship between pain intensity and each of work experience, cadre, and extra-working hours.

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