



Relationship Between Musculoskeletal Disorder and Physical Activity Level among Nurses in Kano Metropolis

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Abstract

Musculoskeletal disorders are among the most prevalent occupational health problems in both developed and developing countries, these disorders affect the quality of life of most people during their life time, causes loss of work time or absenteeism, increase work restriction, transfers to another job. Two hundred and sixteen (216) nurses were recruited from selected hospitals in Kano metropolis using a multi-stage sampling technique. The International Physical Activity Questionnaire Short Form (IPAQ-SF) and Nordic questionnaire were used to assess the physical activity level and Musculoskeletal disorders respectively. Descriptive and chi-square statistics were used to analyse the data at alpha level of 0.05. The mean age of the study participants was 34.39 years. Males constituted 33.3% and female constituted 66.7%. The prevalence of Musculoskeletal disorders shows that it is high in weight bearing joints (Hip, Knee and ankle) compared to non-weight bearing joints (neck, shoulder). The physical activity level is high (51.4%), but a considerable proportion (25%) of the participants reported low physical activity. The results further revealed significant associations between Musculoskeletal disorders and body mass index, age and years of working experience ($p < 0.05$). However, there was no association between Musculoskeletal disorders and physical activity level were seen (> 0.05). This study concluded that there is high physical activity level among nurses in some selected hospital in Kano metropolis and Musculoskeletal disorders mostly occur in weight bearing joints. The manifestation of Musculoskeletal disorders is significantly associated with BMI, age categories and years of working experience and unrelated to physical activity level.

Keywords: *Musculoskeletal Disorders, Physical Activity, Nurses*

Introduction

Musculoskeletal disorders (MSDs) are injuries or pain in the human Musculoskeletal system, including the joints, ligaments, muscles, nerves, tendons and structures that support limbs, neck, and back according to the National Institute for Occupational Safety and Health (NIOSH)(CDC, 2016). MSDs can arise from a sudden exertion (e.g lifting a heavy object), or they can arise from making

the same motions repeatedly repetitive strain or from repeated exposure to force, vibration or awkward posture (CDC, 2016).

MSDs are among the most occupational health problems in both developed and developing countries, these disorders affect the quality of life of most people during their lifetime, causes loss of work time or absenteeism, increase work restriction and

transfers to another job (Holder *et al*, 1999). A number of intrinsic and extrinsic factors have been implicated in the aetiology of MSDs reported repetitious movement, awkward posture, and high force levels are three primary risk factors that have been associated with MSDs. Nurses are routinely transferring patients out of bed and from the floor. These work tasks put nurses at high risks for acute and cumulative MSDs. Nursing has suffered severe brain drain like most other health professions in Nigeria in recent years. Many Nigerian nurses have migrated to Europe, northern hemispheric countries and the oil-rich middle-east in search of better life and condition of services. This has contributed to the problem of inadequate staffing, and this has been associated with MSDs among Nurses (Fabunmi *et al*, 2008). Because nurses are already at risk for Musculoskeletal disorders, a reduction in professional Nursing staff and other changes in nursing care delivery are likely to lead to an even higher rate of these disorders (Salik & Oscar, 2004). Although several authors have reported the prevalence of MSDs among nurses in the developed population, however, data on the prevalence of MSDs are limited in sub-Saharan Africa for referencing.

According to Dhimitri *et al*, (2005), ergonomic intervention reduces the prevalence of Musculoskeletal symptoms by an average of 40% commonly in the back, neck, shoulder, elbow, wrist, ankle and knee pain as well as osteoarthritis affecting these anatomical sites (Hignet, 1996; Campo *et al*, 1996; Smith and Leggat, 2004; Alexopoulos *et al*, 2006). Consider providing at the workplace access to physiotherapist specially employed to deal with injuries to health staffs at the work station (Holder, 1999).

Musculoskeletal disorders result in persistent pain, loss of functional capacity and disability (may set in). These disorders have a multi-factorial genesis, including physical and individual factors and these, correspond to different clinical diagnosis. Some these are more specific; while others related to diffuse

Sings and symptoms, (Burdorf & Sorock, 1997). A study of Australian physical therapists suggests that workload is a significant factor in the sustaining Musculoskeletal disorders (Smith *et al*, 2005).

National population commission (NPC) in 2006 reported that Kano State has 9.38 million people, who received health services from less than 2000 health professionals. However, this significant inequality or ratio between general population and health professionals in Kano state is worsen in the present various disorders afflicting the professionals in the course of their work, especially nurses who have the overall higher percentage in hospitals workload, causing absenteeism, change of job or limiting them from offering their duty properly (Adegoke *et al*, 2008).

Materials and Method

Research Design

The study was a descriptive cross-sectional survey.

Inclusion Criteria / Exclusion Criteria

All nurses working under Kano State Government hospitals have an equal chance to participate in this study. Nurses who develop MSDs due to previous infections, trauma, road traffic accident or assault were excluded from this study.

Sample Size and Sampling Technique

Selecting hospitals for this study was determined using multi-stage sampling technique as follows. There are eight (8) local Governments within Kano metropolis, So, three 3 hospitals were selected randomly from each local Government (making 24 hospitals). Out of these 24 hospitals, 10 of them were randomly selected again and out of these 10 hospitals, 30 nurses were randomly selected from each hospital. A total of 226 Nurses were recruited for the study.

Data Collection Instrument

A modified Nordic questionnaire was adopted from Tinubu *et al* (2010) was used to assess the Musculoskeletal disorders, and International Physical Activity Questionnaire

short version (IPAQ-SF) was used to assess the physical activity during the past week among the Nurses (Craig *et al*, 2003).

Data Collection Procedure

A letter that introduced the researcher and the purpose of the study was obtained from the department of physiotherapy, Bayero University Kano and was taken to each of the hospital selected in Kano State. Ethical approval was sought for and obtained from the Ministry of Health Kano State. Each potential participant was briefed about the purpose of the study and they signed the consent form after a full understanding of its contents. Then the research instrument was administered to those that gave consent of participation.

Data Analysis Procedure

Descriptive statistic of frequencies, mean, standard deviations, charts and percentages were used to summarize data. A two by three Chi-square analysis was used to determine the association between the prevalence of MSDs and physical activity level and each of their age categories, years of work experience, daily hours at work, and nature of the work. All the analysis was performed using the statistical package for social science SPSS version 20 at a probability level of $\alpha=0.05$.

Result

A total of 226 questionnaires were distributed to the participants (nurses working within Kano metropolis) and 216 questionnaires were completed and returned making a 95.5 percent response rate. The prevalence of Musculoskeletal disorders reported in the last 12 months in the different body region of Nurses in Kano metropolis is reported in Table 1, Lower back pain (61.1%) was the most reported, followed by shoulder pain (44.4%) and elbow (25.0%) the least reported pain.

The reported Musculoskeletal pain in the last 7 days showed that lower back pain (56.9%) was the highest, followed by the ankle (45.8%)

and least reported pain in the neck and upper back (22.2%) among Nurses in Kano metropolis (Table 2).

Illustrated in Table 3 was the chi-square statistical test to determine the association between Musculoskeletal disorders in various body regions and physical activity level categories. The results showed that the participants who reported participation in high physical activity level had a higher occurrence of Musculoskeletal disorders. And results showed that there was a significant association between Musculoskeletal disorders and physical activity level at somebody region like the neck, hip, knee and ankle ($p<0.05$). Also, the results showed that there was no significant association between Musculoskeletal disorders and physical activity level at somebody regions like shoulder, elbow, upper back, lower back, and wrist among nurses participant from selected hospitals in Kano metropolis ($p>0.05$).

Table 4 showed the association between Musculoskeletal disorders in various body regions and BMI categories. There was a significant association between Musculoskeletal disorders and BMI categories in somebody regions like neck, shoulders, hip, knee, and ankles ($p<0.05$). The results also showed that there was no significant association between Musculoskeletal disorders and BMI categories in somebody regions like elbow, upper back, lower back and wrist among nurses participants from selected hospitals in Kano metropolis ($p>0.05$).

The occurrence of Musculoskeletal disorders was more among nurses with 1-6years of working experience compared to nurses with extreme years of working experience of 31-36 years. There was a statistically significant association between Musculoskeletal disorders and years of working experience in somebody regions like the neck, shoulder, elbow, lower back, hip and knees ($p<0.05$). Also, the results showed that there was no significant association between

Musculoskeletal disorders and years of working experience at somebody regions like the upper back, ankle and wrist among nurses participant from selected hospitals in Kano metropolis ($p>0.05$) (Table 5).

The occurrence of Musculoskeletal disorders was lower in age range 46-60years compared to 15-30years and 31-45years of age categories. There was a statistically significant

association between Musculoskeletal disorders and age categories in most of the different body regions ($p<0.05$) among the nurses' participants from selected hospitals in Kano metropolis. Although there was some certain in-significant association between Musculoskeletal disorders and age categories in only 2 body region (Ankle and Wrist) ($p>0.05$) (Table 6).

Table 1: Prevalence of Musculoskeletal Disorders among Nurses in the Last 12 Months

Variables		N=number of sample	Valid percent (%)
Neck	Yes	63	29.2
	No	153	70.8
Shoulder	Yes	96	44.8
	No	120	55.6
Elbow	Yes	54	25.0
	No	162	75.0
Wrist	Yes	63	29.2
	No	153	70.8
Upper Back	Yes	84	38.9
	No	132	61.1
Lower Back	Yes	132	61.1
	No	84	38.9
Hip	Yes	90	41.7
	No	126	58.3
Knee	Yes	66	30.6
	No	150	69.4
Ankle	Yes	75	34.7
	No	141	65.3

Table 2: Prevalence of Musculoskeletal Disorders for the Last 7 Days among Nurses in Kano Metropolis.

Variables		N=number of sample	Valid percent (%)
Neck	Yes	48	22.2
	No	168	77.8
Shoulder	Yes	60	27.8
	No	156	72.2
Elbow	Yes	57	26.4
	No	158	73.1
Wrist	Yes	63	29.2
	No	153	70.8
Upper Back	Yes	48	22.2
	No	168	77.8
Lower Back	Yes	123	56.9
	No	93	43.1
Hip	Yes	83	38.9
	No	132	61.1
Knee	Yes	60	27.8
	No	156	72.2
Ankle	Yes	99	45.8
	No	117	54.2

Table 3: Association of Musculoskeletal Disorders and Physical Activity Level

Variables		Low PAL (%)	Moderate PAL (%)	High PAL (%)	X ²	p-Value
Neck	Yes	36	18	36	6.00	0.050*
	No	18	33	75		
Shoulder	Yes	27	27	42	4.13	0.127
	No	27	24	69		
Elbow	Yes	18	15	21	4.72	0.940
	No	36	36	90		
Upper Back	Yes	24	18	42	1.03	0.600
	No	30	33	69		
Lower Back	Yes	36	36	60	4.96	0.084
	No	18	15	51		
Hip	Yes	36	18	36	18.63	0.000*
	No	18	33	75		
Knee	Yes	33	12	21	32.03	0.000*
	No	21	39	90		
Ankle	Yes	24	24	27	10.97	0.004*
	No	30	27	84		
Wrist	Yes	12	18	33	2.20	0.332
	No	42	33	78		

PAL= Physical activity level; X² = chi-square; * = significant at p<0.05

Table 4: Association of Musculoskeletal Disorders and BMI Categories

Variables		Under WT (%)	Normal WT (%)	Over WT (%)	Obese WT (%)	X ²	p-Value
Neck	Yes	3	34	17	9	8.66	0.033*
	No	0	88	50	15		
Shoulder	Yes	0	47	34	15	8.78	0.031*
	No	3	75	33	9		
Elbow	Yes	0	26	22	6	4.08	0.243
	No	3	96	45	18		
Upper Back	Yes	0	50	28	6	4.32	0.241
	No	3	72	39	18		
Lower Back	Yes	0	75	39	18	6.91	0.067
	No	3	47	28	6		
Hip	Yes	3	37	38	12	17.58	0.000*
	No	0	85	29	12		
Knee	Yes	3	20	31	14	30.42	0.000*
	No	0	102	36	12		
Ankle	Yes	3	34	32	6	14.20	0.002*
	No	0	88	35	18		
Wrist	Yes	0	33	24	6	3.14	0.372
	No	3	89	43	18		

WT- Weight; X² = chi-square; * = significant at p<0.05

Table 5: Association of Musculoskeletal Disorders and Years of Working Experience

Variables		1-6 Years	7-12 Years	13-18 Years	19-24 Years	25-30 Years	31-36 Years	X ²	p-Value
Neck	Yes	36	6	3	0	15	3	31.12	0.000*
	No	72	15	39	15	9	3		
Shoulder	Yes	45	6	15	6	21	3	21.99	0.001*
	No	63	15	27	9	3	3		
Elbow	Yes	18	6	24	0	6	0	34.29	0.000*
	No	90	15	18	15	18	6		
Upper Back	Yes	36	12	15	9	9	3	7.67	0.175
	No	72	9	27	6	15	3		
Lower Back	Yes	63	12	24	6	24	3	19.17	0.002*
	No	45	9	18	9	0	3		
Hip	Yes	42	3	18	9	15	3	13.38	0.020*
	No	66	18	24	6	9	3		
Knee	Yes	18	3	33	3	9	0	62.05	0.000*
	No	90	18	9	12	15	6		
Ankle	Yes	39	6	21	3	6	6	10.39	0.065
	No	69	15	21	12	18	3		
Wrist	Yes	30	3	15	6	6	3	5.54	0.354
	No	70	30	18	21	18	6		

X² = chi-square

* = significant at p<0.05

Table 6: Association of Musculoskeletal Disorders and Age Categories

Variables		18-30 Years	31-45 Years	46-60Years	X ²	p-Value
Neck	Yes	39	9	15	19.32	0.000*
	No	63	70	20		
Shoulder	Yes	38	35	23	8.55	0.013*
	No	64	44	12		
Elbow	Yes	14	33	7	19.23	0.000*
	No	88	46	28		
Upper Back	Yes	31	39	14	6.77	0.034*
	No	71	40	21		
Lower Back	Yes	56	46	30	10.85	0.004*
	No	46	33	5		
Hip	Yes	33	33	24	14.06	0.001*
	No	69	46	11		
Knee	Yes	18	32	16	15.49	0.000*
	No	84	47	19		
Ankle	Yes	36	29	10	0.74	0.681
	No	66	50	25		
Wrist	Yes	27	27	9	1.52	0.488
	No	75	52	26		

X² = chi-square

* = significant at p<0.05

Discussion

This study investigated the relationship or association between Musculoskeletal disorders in nine body regions and physical activity level among nurses in some selected primary and secondary health care within Kano metropolis. The study found that a little more than half of the participants (51.4%) engaged in high physical activity level and about 25.0% of the participants reported a low level of physical activity in the last 12 days. These findings are similar to findings of a study conducted in New Zealand (Harcombe, 2009). However, the proportion of those that reported participation in the high physical activity level in the present study is less than those reported by Harcombe (2009). In the study of Harcombe, 70% nurses reported high participation in physical activity to compare to other workers who were non-nursing workers. The lower participation rate in physical activity in the present study in comparison with Hamcombe's study could be due to the lower sample size (216) compare to 280 participants used in their study. Studies have shown that nurses were predominantly female

and with a mean age of 44, which is similar to our present study.

From the studied nurses, the anatomical site with the highest 12-month cumulative incidence of MSDs was the low back, followed by the neck, shoulder, wrist/hands and knee, which is also similar to the finding of this study. In addition, findings from the current study show the highest anatomical sites were Hip and knee. This finding contradicts the pattern observed by June and Cho (2011). In which the highest anatomical sites was low back.

Studies have shown that Musculoskeletal problems are particularly common in health care workers who are in direct contact with patients. Reports from other population have shown that nurses, nursing aides, and orderlies have the highest rates of MSDs in the medical industry (Thornton *et al*, 2008). The high prevalence of Musculoskeletal disorders among nurses is thought to be due to physical work demands, as well as to work organizational factors, of which scheduling is an important component.

Relationship between Musculoskeletal disorders among nurses has been found to increase with age and Body mass index (BMI) (Yasobant&Rajkumar, 2014). In the present study, there was a significant association between the Musculoskeletal disorders and age categories. The results showed that the occurrence of Musculoskeletal disorders was lower in age range 46-60years compared to 15-30years and 31-45years of age categories. Also, the association was found between Musculoskeletal disorders and BMI categories and the occurrence was more among overweight compare to underweight and normal body weight with weight-bearing joints (Hip, Knee, and Ankle) as the most anatomical sites of Musculoskeletal disorders. This study supports the role of biomechanical factors for the relationship between BMI and symptoms in the lower extremity.

According to a research conducted in Ibadan by Tinubu et al (2010) reported that a high percentage of the nurses experienced their first episode of MSDs in the first five years of clinical practice. And this is consistent with our findings in this study were by nurses with years of clinical experience range from 1-

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6years shows high Musculoskeletal disorders compared to other group categories. The reason may be due to inadequate knowledge on proper lifting techniques and other nursing procedures compare to experienced nurses who adopted proper lifting techniques and other nursing techniques.

Conclusion

This study concluded that there is a high physical activity level among nurses in Kano metropolis and a High Prevalence of Musculoskeletal disorders which mostly occur in weight-bearing joints. The manifestation of Musculoskeletal disorders is significantly associated with BMI, age categories and years of working experience and unrelated to physical activity level. The study recommended a regulated physical activity and vigilance for Musculoskeletal injuries.

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Conflict of interest

Nil

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