



Pattern of work-related musculoskeletal disorders among Nigerian Hospital workers

Olusola Ayanniyi¹, Oluwasegun Sunday Nudamajo²,
Chidozie Emmanuel Mbada³

ABSTRACT

¹Department of Physiotherapy, College of Medicine, University of Ibadan, Ibadan, Nigeria.

²Department of Physiotherapy, Ladoke Akintola University of Technology Teaching Hospital, Ogbomoso, Nigeria.

³Department of Medical Rehabilitation, College of Health Sciences, Obafemi Awolowo University, Ile-Ife, Nigeria.

Address for correspondence:

Olusola Ayanniyi,
Department of Physiotherapy, College of Medicine, University of Ibadan, Ibadan, Nigeria.
drayanniyi@gmail.com

Received: January 26, 2016

Accepted: March 28, 2016

Published: April 08, 2016

Background and objectives: Work-Related Musculoskeletal Disorders (WRMSDs) are recognized as leading causes of significant human suffering and loss of productivity. This study investigated the pattern of WRMSDs among hospital workers in Osun State, South-West, Nigeria. **Materials and Methods:** A total of 769 hospital workers participated in this descriptive study, yielding a response rate of 75.8%. However, only 742 questionnaires were found valid and used in the final analysis. The survey tool used in this study was a combination of the Nordic Questionnaire and a self-developed occupational health proforma. Data was analyzed using descriptive statistics of mean, percentage and frequency. **Results:** Working in erect standing posture (37.3%) and in bending position for 3 to 4 hours (40.7%) were mostly common among the hospital workers. Pattern of time spent working at a stretch and work breaks durations vary across different postures. Irrespective of work postures, work break time was often less than 30 minutes. The low back (61.1%) was the worst hit anatomical region, followed by neck (43.4%), shoulder (32.1%), and upper back (31.5%), while the elbow (12.7%) was the least affect body site. The 12-months WRMSDs prevalence, 12-months and 7 days activity limitation for low back disorder was 61.1%, 18.6% and 17.3% respectively. Nursing profession recorded a higher percentage of WRMSDs, in all the nine anatomically defined body part, followed by administrative officers and laboratory scientists. **Conclusion:** Work-related musculoskeletal disorders affects all sectors of hospital workforce with spinal related disorders being predominant. The pattern of WRMSDs and its associated activity limitation differs across vocational and professional groups with higher predilection among nursing professionals, followed by administrative officers and laboratory scientists. The low back was most injured anatomical site across vocational and professional groups.

KEY WORDS: Work-related musculoskeletal disorders; Hospital workers; Pattern, Nigeria

INTRODUCTION

Work-Related Musculoskeletal Disorders (WRMSDs) are described as the non-traumatic maladies of the muscles, tendons, ligaments, joints, nerves, and supporting structures such as the intervertebral disc [1, 2]. Although, the work-related aetiologies for soft-tissue disorders are multifarious and intricate, however, work activities such as repetitive forced motions, awkward postures, use of vibrating tools or equipment or by manual handling of heavy, awkward loads are commonly implicated [3]. As such, no occupational or professional group seems to be exempted from WRMSDs.

Health care workers who are supposed to provide care for persons suffering from WRMSDs are not immune from injury but may be more exposed to occupational risk factors [4, 5]. The actual rate are difficult to determine, but it appears that healthcare workers do suffer WRMSDs at rates that are comparable to or higher than other working population [5-11]. According to Morse et al [11], healthcare workers have the highest MSDs prevalence and incidence among various occupational/industry group, while patient handling tasks are so demanding. Waters et al [5] reported that healthcare workers face a lot of risk factors in the workplace for MSDs such as back and shoulder injuries.

There is substantial literature to confirm that health care professionals are susceptible to sustaining musculoskeletal

disorders during the course of their work routine especially those who are in direct contact with patients [11-15]. Specifically, high prevalence rates of WRMSDs have been reported among nurses [15-18], physiotherapists [4, 19-21], and dentists [22, 23]. There also, reports on prevalences of WRMSDs among other hospital workers [5-11]. Nonetheless, few studies have described the pattern of WRMSDs among various categories of hospital workers in Nigeria. The Nigeria's health sectors is faced with challenges such as high manual work tasks; and inadequate staffing owing low number of trained health professional relative to the population and severe brain drain [15, 17, 19]. Therefore, this study investigated the pattern of WRMSD among hospital workers in Osun State, South-West, Nigeria.

MATERIALS AND METHODS

This study proposed a sample size of 1200 (i.e. 100 respondents from each of the 12 secondary and tertiary health institutions in Osun state, Nigeria). However, a total of 1015 copies of questionnaires were mailed out to the 12 study sites. Only, 769 copies of the questionnaires were returned, yielding a response rate of 75.8%. 27 copies of the returned questionnaires were considered invalid because of incomplete information and were excluded from analysis. Hence, only 742 copies of the questionnaires were used

in the final analysis. This study population consisted of 447 (60.2%) females and 295 (39.8%) males who were purposively recruited.

The respondents in this cross-sectional survey were consenting health care and hospital workers comprising accountants, administrators, doctors, laboratory scientists, nurses, pharmacists, physiotherapists, porters, technicians, security personnel and ward maids. The respondents were recruited from twelve hospitals namely, the Osun State General Hospitals in Osogbo, Iwo, Ede, Ilesa, Ikirun, Ila-Orangun, Ifon, Osu, Ikire, and Ejigbo respectively; Obafemi Awolowo University Teaching Hospitals Complex (i.e. Ife Hospital Unit, Ile-Ife and the Wesley-Guild Hospital, Ilesa); and the Ladoke Akintola University of Technology Teaching Hospital, Osogbo.

A three-section survey tool which was a combination of the Nordic Questionnaire and a self-developed occupational health proforma was used in this study. The Nordic questionnaire was developed by Kuorinka et al [24] for investigating musculoskeletal disorders. The Nordic questionnaire, based on its psychometric properties, either in the original version or modified have been employed in many studies [25-27]. In addition, the Nordic questionnaire has been found usable in the same cultural context [15, 17, 19] as the present study.

The survey instrument in this study contains three sections. Section A seeks information on demographic variables such as age, sex, marital status, and occupation. Section B contains 8-items that evaluate work variables and body chart, while section C contains 16-items that evaluate respondents' information on presence or absence of Work-Related Musculoskeletal Disorders (WRMSDs). Inclusion criteria for participation were; being a health worker in the selected public institution, having a minimum of two years of work experience and in full time employment of the hospital. Exclusion criterion was a positive history of systemic diseases such as uncontrolled diabetes mellitus or other co-morbidity which may affect the musculoskeletal system.

The Research Ethics Committee of the joint University of Ibadan/University College Hospital, Ibadan gave approval for this study. Administrative permission from each of the purposive selected hospitals were obtained. Each respondent gave signed informed consent to participate in the study following full disclosure. Questionnaires were mailed to designated contact persons in the selected hospitals, who in turn was responsible for its administration, retrieval and dispatch back to the researchers. Data collection was completed within a three-month time frame, in year 2011.

Data Analysis

Data was analyzed using descriptive statistics of mean, percentage and frequency. Data were analyzed using the SPSS Version 15 (SPSS Inc, Chicago, IL, USA).

RESULTS

The ages of the respondents in this study ranged between 17 to 63 years with the mean of 22.7 ± 1.57 years. Seventeen vocational and professional groups made up of clinical and non-clinical workers participated in this study. The respondents were largely females (447 (60.2%)), those with less than 10 years of work experience (533 (71.9%)) and of nursing profession (188 (25.3%)) (table 1).

Table 1. Socio-demographic characteristics of respondents (N=742)

Variable	Frequency	Percentage
Sex		
Male	295	39.8
Female	447	60.2
Age Group (Years)		
Less than 20	7	0.9
21-30	219	29.5
31-40	298	40.2
41-50	163	22
51-60	52	7
61-70	3	0.4
Marital Status		
Married	553	74.5
Single	171	23
Widowed	10	1.3
Divorced	6	0.8
Others	2	0.3
Work Experience (Years)		
Less than 5	307	41.4
5-10	226	30.5
11-15	64	8.6
16-20	60	8.1
21-25	30	4
26-30	43	5.4
31-35	12	1.6
Vocational/Professional Group		
Pharmacist	59	8
Nurse	188	25.3
Doctor	28	3.8
Physiotherapist	29	3.9
Laboratory scientist	75	10.1
Radiographer	7	0.9
Administrative officer	109	14.7
Porter/Ward maid	48	6.5
Clerks	88	11.9
Occupational Therapy	6	0.8
Technician	30	4.0
Health extension worker	15	2.0
Records officer	23	3.1
Security	18	2.4
Tailor	5	0.7
Catering	7	0.9
Engineer	7	0.9

Distribution of postures and work characteristics of the respondents is presented in table 2. Most respondents spent between five to six hours at work daily in sitting (38.9%), standing (37.3%) and walking (37.1%) respectively, while three to four hours were spent in work requiring bending among 40.7% of the respondents. Pattern of time spent working at a stretch and work breaks durations vary across different postures. For example, rates of daily work duration for 5-6 hours per day in sitting, standing and walking was 39%, 37% and 37% respectively. Irrespective of work postures, work break time was often less than 30 minutes (table 2).

Standing was the most adopted posture at work (304 (41%)). Only 235(83.6%) of 281 respondents whose job duties requires sitting have chairs with back rest. However, only 170 (72.3%) of these 235 participants made use of the back rest at work. Distribution of vocational and professional group and their most commonly assumed work postures is presented in table 3. Clinical workers, engineers and caterers mostly assumed standing posture,

while administrative workers and others most commonly assumed sitting posture (table 3).

Table 4 shows the anatomical distribution of prevalence of WRMSDs and activity limitation. On the overall, the result on shows that spinal disorder (low-back - 63.3%, neck - 27.5%), followed by lower limb (knee - 27.5%, ankle - 21.7%) were mostly affected, while the least report of WRMSDs was the upper limb (elbow - 7.4%). Similar pattern showing higher prevalence of spinal disorder affecting the low-back and the upper limb as the least affected body part was found in the anatomical distribution of WRMSDs based on 12-months prevalence and also for 12-months' and 7-days activity limitation respectively (table 4). Table 5 shows the distribution of WRMSDs. Sitting posture led to the highest percentage of neck disorder (44.61%) while standing posture accounted for highest percentages of other forms of WRMSDs (table 5). The distribution pattern of WRMSDs across vocational and professional groups are presented in tables 6. The highest rates of WRMSDs was found among nurses, followed by administrative officers and laboratory scientists.

Table 2. Distribution of postures and work characteristics of the respondents

Work characteristics	Sitting n(%)	Posture Standing n(%)	Bending n(%)	Walking n(%)
Daily duration (Hours)				
1-2	11(3.9)	23(7.6)	5(9.6)	6(5.7)
3-4	52(18.6)	69(22.8)	21(40.4)	27(25.7)
5-6	109 (38.9)	113 (37.3)	15 (28.8)	39 (37.1)
7-8	101 (36.1)	93 (30.7)	7 (13.5)	28(26.7)
9-10	6 (2.1)	5 (1.7)	2 (3.8)	3(2.9)
11-12	1 (0.4)	0	0	2 (1.9)
13-14	0	0	2(3.8)	0
15-16	0	0	2(3.8)	0
Working at stretch				
Yes (n=250)	115 (40.9)	93 (30.6)	8(15.4)	34(32.4)
No (492)	165	210	46	71
Work duration before rest (Hours)				
0 - 0.9	8 (5.0)	24 (11.4)	7 (15.2)	7 (9.9)
1 - 1.9	39 (24.2)	59 (28.1)	16 (34.8)	17 (23.9)
2 - 2.9	44 (27.3)	59 (28.1)	8 (17.4)	24 (33.8)
3 - 3.9	19 (11.8)	22 (10.5)	5 (10.9)	7 (9.9)
4 - 4.9	35 (21.7)	28 (13.3)	4 (8.7)	7 (9.9)
5 - 5.9	11 (6.8)	4 (1.9)	0	4 (5.6)
6 - 6.9	9 (3.2)	9 (4.3)	6 (13.0)	5 (7.0)
7 - 7.9	0	4 (1.9)	0	0
8 - 8.9	0	1 (0.5)	0	0
Nil	119	93	8	34
Rest Duration (Hours)				
0 - 0.5	109 (66.1)	153 (72.9)	36 (78.3)	42 (59.2)
0.6 - 1.0	37 (22.4)	42 (20.0)	7 (15.2)	21 (29.6)
1.1 - 1.5	0	1 (0.5)	0	0
1.6 - 2.0	14 (8.5)	11 (5.2)	3 (6.5)	9 (12.7)
2.6 - 3.0	6 (3.6)	3 (1.4)	0	0
3.6 - 4.0	1 (0.6)	0	0	0
Nil	115	93	8	34
Total (N=742)	280	303	54	105

Table 3. Vocational and professional group and most assumed work postures

Posture	Sitting		Standing		Bending		Walking		Total
Group	n	(%)	n	(%)	n	(%)	n	(%)	
Pharmacist	25	(42.4)	28	(47.5)	2	(3.39)	4	(6.78)	59
Nurse	34	(18.1)	110	(58.5)	15	(7.98)	29	(15.4)	188
Doctor	12	(42.9)	12	(42.9)	3	(10.7)	1	(3.57)	28
Physiotherapist	3	(10.4)	26	(89.7)	0		0		29
Laboratory scientist	30	(40.0)	43	(57.3)	2	(2.67)	0		75
Radiographer	0		7	(100.0)	0		0		7
Administrative officer	88	(80.7)	8	(7.34)	3	(2.75)	9	(8.26)	109
Porter/Ward maid	6	(12.5)	9	(18.8)	10	(20.8)	23	(52.1)	48
Clerks	49	(55.7)	14	(15.9)	3	(3.41)	22	(25.0)	88
Occupational Therapy	5	(83.3)	1	(16.7)	0		0		6
Technician	4	(13.3)	11	(36.7)	11	(36.7)	4	(13.3)	30
Health extension worker	4	(26.7)	9	(60.0)	0		2	(13.3)	15
Records officer	12	(52.2)	3	(13.0)	4	(17.4)	4	(17.4)	23
Security	4	(22.2)	10	(55.6)	0		4	(22.2)	18
Tailor	4	(80.0)	1	(20.0)	0		0		5
Catering	0		5	(71.4)	1	(14.3)	1	(14.3)	7
Engineer	0		5	(71.4)	0		2	(28.6)	7

Table 4. Anatomical distribution of prevalence of work-related musculoskeletal disorders and activity limitation

Body site	Overall pattern n(%)	Musculoskeletal Injury		
		12-months pattern n(%)	12-months Activity Limitation n(%)	7-days Activity Limitation n(%)
Low back	470 (63.3)	453 (61.1)	138 (18.6)	128 (17.3)
Neck	204 (27.5)	322 (43.4)	77 (10.4)	69 (9.3)
Knee	204 (27.5)	0	0	0
Ankle	161 (21.7)	203 (27.4)	72(9.7)	73 (9.8)
Upper back	145 (19.5)	234 (31.5)	80 (10.8)	73 (9.8)
Hip/ Thigh	140 (18.9)	227 (30.6)	67 (9)	70 (9.4)
Shoulder	134 (18.1)	238 (32.1)	52 (7)	59 (8)
Wrist/ Hand	116 (15.6)	197 (26.5)	58 (7.8)	50 (6.7)
Elbow	55 (7.4)	95 (12.8)	32 (4.3)	36 (4.9)

Table 5. Distribution of work postures and work-related musculoskeletal disorders

Posture	Sitting		Standing		Bending		Walking	
Body site	n(%)		n(%)		n(%)		n(%)	
Low back	173	(36.81)	194	(41.28)	39	(8.3)	64	(13.61)
Neck	91	(44.61)	78	(38.24)	17	(8.33)	18	(8.82)
Knee	42	(20.59)	97	(47.55)	21	(10.29)	44	(21.57)
Ankle	29	(18.01)	86	(53.42)	10	(6.21)	36	(22.37)
Upper back	54	(37.24)	57	(3.31)	15	(10.35)	19	(13.1)
Hip/ Thigh	33	(23.57)	70	(50)	13	(9.29)	24	(17.14)
Shoulder	47	(35.08)	60	(44.78)	9	(6.72)	18	(13.42)
Wrist/ Hand	41	(35.35)	49	(42.24)	13	(11.21)	13	(11.2)
Elbow	22	(40)	22	(40)	3	(5.46)	8	(14.54)

Table 6. Distribution pattern of work-related musculoskeletal disorders across vocational and professional groups

	Neck	Shoulder	Upper Back	Elbow	Low Back	Hand	Hip	Knee	Ankle
	%	%	%	%	%	%	%	%	%
Pharmacist	2.7	1.6	1.8	0.8	5.8	1.2	1.3	2.2	2.8
Nurse	6.7	4.9	4.9	1.9	17.9	4.9	7.8	10	8
Doctor	0.8	0.4	0.7	0.3	2.3	0.7	0.4	0.7	0.4
Physiotherapist	0.8	0.9	1.1	0.1	2.7	0.9	0.7	0.8	0.4
Laboratory scientist	3.8	2.6	2.8	0.4	5.9	1.3	1.5	1.5	1.5
Radiographer	0.1	0.3	0.1	0.1	0.3	0.1	0.5	0.3	0.4
Administrative officer	4.0	2.2	2.3	0.9	8.5	1.9	1.9	2.8	1.6
Porter/Ward maid	1.5	0.7	1.1	0.3	3.9	0.5	1.5	2.3	2.0
Clerks	3.4	1.6	1.9	1.2	6.7	1.3	1.6	2.8	2.0
Occupational Therapy Technician	0.4	0.1	0.4	0	0.7	0.3	0.1	0	0
Health extension worker	1.2	0.7	0.5	0.3	2.6	0.8	0.1	1.1	0.9
Records officer	0.4	0.3	0.3	0	1.2	0.4	0.3	0.5	0.4
Security	0.4	0.4	0.5	0.5	2.2	0.4	0.4	0.4	0.3
Tailor	0.4	0.7	0.7	0.4	1.1	0.3	0.4	1.3	0.9
Catering	0.3	0	0.1	0.1	0.5	0	0.3	0	0.1
Engineer	0.3	0.5	0	0	0.9	0.1	0	0.8	0
Engineer	0.3	0.3	0.4	0	0.1	0.4	0	0	0.1

DISCUSSION

This study investigated the pattern of WRMSDs among hospital workers in Osun State, South-West, Nigeria. The high response rate of 75.8% obtained in this study may be indicative of willingness of the hospital workers to participate in a research that seems to directly affect them. Also, the higher female involvement in this study compared with the male counterparts (60.2% vs. 39.8%) can be attributed to the high participation of nurses, which is a female dominated profession in this study's context.

From the result of this study, hospital staff work mostly in standing posture, while between 3-8 hours is spent in a work posture. Work break of about 30 minutes only is often observed by the hospital workers, while hours of continuous work in a fixed work posture varies widely. It is adduced that excessive workload that hospitals workers have to cope with on daily basis may be the reason for long hours in work positions with little or no break in-between. Furthermore, this study revealed poor practice of ergonomics among the hospital workers. For example, some workers whose job details requires sitting, do not use their back rest while working. However, non-usage of seat back rest could also be due to poor or inappropriate ergonomic design of such chairs. Non-usage of back rest among deskbound workers is implicated as a risk factor for musculoskeletal injury over a long time [28].

From this study, the pattern of 12-month WRMSDs obtained, reveals that the low back (61.1%) was the worst hit anatomical region, followed by neck (43.4%), shoulder (32.1%), upper back (31.5%), hips (30.6%), and hand (26.5%), while the elbow (12.7%) was the least affect body site. Similar patterns of WRMSDs showing high prevalence of low-back pain and low rates of elbow disorders among health care workers has been reported

by previous investigator [15, 23, 29, 30]. Specifically, this study's rate of 63.3% for low back disorder is comparable with the prevalence of 57.7% reported by Bejia [6], 65.5% by Karahan et al [8], 70% by Carta [31], and 70.9% by Landry et al [9]. In a contextually related study by Fabunmi et al [17] on prevalence of WRMSDs among healthcare workers, low back disorder (78%) was the most commonly reported disorder while elbow disorder (23.4%) was the least. Unwholesome work environment, understaffing, excessive workload, lack of appropriate and needed work equipment, excessive patient manual handling, and working long hours in sitting and standing are implicated for WRMSDs among these hospital workers.

In addition to the foregoing, the finding of this study revealed that WRMSDs interferes with activity limitation at one time or the other. This finding agrees with earlier submissions that WRMSDs are leading causes of significant human suffering and worker disability [17, 32-35]. Furthermore, this study shows that nine out of the 17 different vocational and professional groups experienced WRMSDs in all the nine designated anatomical sites. Therefore, the finding of this study shows that musculoskeletal disorders are shared disorders that cut across all vocational and professional group in the health sector and may not be exclusive to a particular occupational group. According to previous investigators [4, 5], no category of healthcare workers are immuned from occupational risk factors and injury. Particularly, health workers who are in direct contact with patients are reported to be vulnerable to sustaining musculoskeletal disorders during the course of their work routine [11-15].

The rates of WRMSDs obtained in this study differ across the different vocational and professional groups. Boyer et al [36] acknowledges that hospital workers are a heterogeneous population with varied rates of WRMSDs

caused by job details and work environment of the hospital jobs. Likewise, the World Health Organization [37] has regarded “work-related” diseases as multi-factorial to show that numerous risk factors including physical, work environment, psychosocial, individual, and socio-cultural contribute to the work-related diseases. According to this study, nurses have higher rate of WRMSDs in almost all the body sites, which may be as a result of poor and prolonged work posture (in sitting and standing) and in activity limitation. Literature is replete on higher rates of WRMSDs among nurses compared with other groups of hospital workers in the health sector [8, 10, 30, 38]. The higher rates of WRMSDs among nursing professionals may be as a result of excessive amount of work, manual patient handling, and maintenance of poor and prolonged work postures/positions in the course of their work.

The highest rate of 12-months WRMSDs in nurses based on body site affected was the low-back (17.9%), followed by knee (10.0%), ankle (8.0%), hip (7.8%) and neck (6.7%). This observed 12-months WRMSDs pattern is somewhat consistent with literature. Low-back pain is acknowledged as one of the most important WRMSDs among nurses [15-18, 39]. However, earlier studies have reported varying rates of 12-month time period work-related low-back pain in nurses with a range of 19.8 to 79.4% [15]. The skewed range in work-related low-back pain among nursing professionals reported in the different studies is implicated on organizational and work environment differences; cultural variations in perception and expression of pain; and methodological differences in studies with respect to subjectivity of terms and concepts and variations in instrument.

Furthermore, the result of this study show that administrative officers and laboratory scientists also have high occurrence of WRMSDs. This finding reveals that WRMSDs is not limited to clinical workers but a common malady among hospital staff. Similar findings have been documented in earlier studies [8, 40]. The prevalence of WRMSDs among administrative staff and non-clinical can be ascribed to job demands involving long sitting hours among administrative workers, prolong standing in carrying out laboratory works, poor postural habits, walking long distances within the hospital premises and frequent stair climbing in the course of work. Choobineh et al [41], confirms that specific work demands and/or the employees’ work environment predisposes to development of WRMSDs over time. A number of studies have reported that the nature and demands of hospital work such as manual patient handling, awkward postures during patient care, and working long hours and shift works, potentially are risk factors for WRMSDs [5-10]. Unfortunately, hospital workers represents a growing industrial sector with increasing rates of non-fatal injuries and illnesses [7]. While rates of occupational injury among healthcare workers are on the rise over the last decade, conversely, two of the most hazardous industries (i.e. agriculture and construction), are reported safer today than they were a decade ago [8].

The findings of this study confirms the need for effective educative and ergonomic programmes for prevention of WRMSDs among hospital workers. Proposed programme elements to mitigate WRMSDs among the health workers may involve workplace ergonomic design, safe patient handling program and safe patient handling legislation and periodic ergonomic assessments. However, the findings of this study have potential limitations that bothers on the descriptive cross-sectional nature of the study. Similar, to other related studies, it is plausible that respondents may find it challenging to discriminate between WRMSDs and musculoskeletal disorders of other causes. Adegoke et al [19] submits that it may be challenging to distinguish between WRMSDs and other musculoskeletal disorders since the overt manifestation with respect to work demands may be similar. Also, since this study investigated 12-months period experience of WRMSDs, there are likelihoods of recall bias leading to given vague responses on prevalence and pattern of WRMSDs. Having a non-response bias of 24.2% in this study represents a significant limitation, as refusal to participate in the study may be a reflection of how they felt toward the topic. Another limitation of this study, nuisances on the wide disparity in age and years of experience among the respondents. This study is simply descriptive, and did not control for the possible effects of age and working experience on WRMSDs. In general, literature report a direct association between older age and higher rates for musculoskeletal disorders [42-46].

CONCLUSION

Work-related musculoskeletal disorders affects all sectors of hospital workforce with spinal related disorders being predominant. The pattern of WRMSDs and its associated activity limitation differs across vocational and professional groups with higher predilection among nursing professionals, followed by administrative officers and laboratory scientists. The low back was most injured anatomical site across vocational and professional groups.

REFERENCES

1. National Institute for Occupational Health and Safety (NIOSH). Musculoskeletal Disorders and Work-related factors. United States Department of Health and Human Service. 1997. www.cdc.gov. Accessed 12/08/2014.
2. Rosecrance JC, Cook TM. Upper extremity Musculoskeletal Disorders: Occupational association and a model for prevention. *Central European Journal for Occupational and Environmental Medicine*. 1998; 4(3):214-231.
3. Washington State Department of Health (WSDH). Work-Related Musculoskeletal Disorders. 2002. www.doh.wa.gov. Accessed 06/07/2015.
4. Waldrop S. Work-related injuries: Preventing the Physical Therapists from becoming the patient. 2010. www.apta.org. Accessed 16/08/2014.
5. Waters T, Galinsky T, Caraso C. NIOSH Research Effort to Prevent Musculoskeletal Disorders in the Healthcare Industry. *Orthopaedic Nursing*. 2006; 25(6):380-389.
6. Bejia I. Prevalence and factors associated with low back pain among hospital staff. *Joint Bone Spine*. 2005; 72(3). 254-259.
7. Haney LL. An integrated approach to the prevention of back pain injuries in Healthcare workers. American Society of Safety Engineers Professional Development Conference and Expositions. OnePetro. 2002. www.onepetro.org/mslib/app/newsearch.com. Accessed 20/10/2014.

8. Karahan A, Kar S, Abbasoghu A, Dogan N. Low back pain: Prevalence and associated factors among hospital staff. *Journal of Advanced Nursing*. 2009; 65(3):516-524.
9. Landry MD, Ramon SR, Sulway C, Golithy YM, Hamzan E. Prevalence and risk factors associated with low back pain among Healthcare providers in a Kuwaiti Hospital. *Spine*. 2008; 33(5):539-545.
10. Slovák A, Carder M, Money A, Turner S, Agius R. Work-related musculoskeletal conditions: evidence from the THOR reporting system 2002-2005. *Occupational Medicine Advance Access*. 2009; 10: 1093.
11. Morse T, Fekieta R, Rubenstein H, Warren N, Alexander D, Wawzyniecki P. Doing the heavy lifting: Health Care Workers Take Back Their Backs'. *New Solution: A Journal of Environmental and Occupational Health Policy*. 2008; 18(2):207-219.
12. Bork BE, Cook TM, Rosecrance JC, et al. Work-related musculoskeletal disorders among physical therapists. *Phys Ther*. 1996; 76: 827-835.
13. Evanoff BA, Bohr PC, Wolf LD. Effect of participatory ergonomic team among hospital orderlies. *Am J Ind Med*. 1999; 35(4): 358-365.
14. Lipscomb JA, Love CC. Violence toward health care workers: an emerging occupational hazard. *American Association of Occupational Health Nurses Journal*. 1992; 40(5): 219-228.
15. Tinubu BMS, Mbada CE, Oyeemi AL, Fabunmi AA. Work-Related Musculoskeletal Disorders among Nurses in Ibadan, South-west Nigeria: a cross-sectional. *BMC Musculoskeletal disorders*. 2010; 11: 12.
16. Ando S, Ono Y, Shimaoka M, Hiruta S, Hattori Y, Hori F, Takeuchi Y. Associations of self-estimated workloads with musculoskeletal symptoms among hospital nurses. *Occupational and Environmental Medicine*. 2000; 57:211.
17. Fabunmi AA, Oworu JO, Odunaiya NE. Prevalence of Musculoskeletal Disorders among Nurses in University College Hospital, Ibadan. *West African Journal of Nursing*. 2008; 19(1):21-25.
18. Luimeab JL, Koesc BW, Miedemb HS, Verhaard JA, Burdorfa A. High incidence and recurrence of shoulder and neck pain in nursing home employees. *Journal of Clinical Epidemiology*. 2005; 58(4):407-413.
19. Adegoke BOA, Akodu AK, Adewale AL. Work-related musculoskeletal disorders among Nigerian Physiotherapists. *BMC Musculoskeletal Disorders*. 2008; 9:112
20. Hanson H, Wagner M, Monopoli VO, Keysor J. Low Back Pain in Physical Therapists: A cultural approach to analysis and intervention. *Work: A Journal of Prevention, Assessment & Rehabilitation*. 2007; 28(2):145-151.
21. Siqueira GR, Cahu FGM, Vieira RAG. Occurrence of low back pain in Physiotherapists from the city of Recife, Pernambuco, Brazil. *Revista Brasileira de Fisioterapia*. 2008; 12(3).
22. Diniz de Carvalho MV, Soriano EP, Caldas AF, Campello RIC, Ferreira de Miranda H, Cavalcanti FID. Work-Related Musculoskeletal Disorders among Dental students. *Journal of Dental Education*. 2009; 73(5): 624-630.
23. Alexopoulos EC, Stathi I-C, Charizani F. Prevalence of MSD in dentists. *BMC Musculoskeletal Disord*. 2004; 5: 16.
24. Kuorinka I, Jonsson B, Kilborn A, Vinterberg H, Biering-Soreson F, Andersson G, Jorgesen K. Standardized Nordic Questionnaire for the analysis of Musculoskeletal Symptoms. *Applied Ergonomics*. 1987; 18(3):233-237.
25. Crawford JO. The Nordic Musculoskeletal Disorders Questionnaire. *Occupational Medicine*. 2007; 57: 300-301.
26. Descatha A, Roquelaure Y, Chastang J-F, Evanoff B, Melchior M, Mariot C, Ha C, Imbernon E, Goldberg M, Leclerc A. Validity of Nordic-style questionnaires in the surveillance of upper-limb work-related musculoskeletal disorders. *Scand J Work Environ Health*. 2007; 33(1): 58-65.
27. Mesquita CC, Ribeiro JC, Moreira P. Portuguese version of the standard Nordic musculoskeletal questionnaire: cross cultural and reliability. *Journal of Public Health, Springer Verlag*. 2010; 18(5): 461-466
28. National Institute for Occupational Health and Safety (NIOSH). Health Care Workers. NIOSH safety and health topics. 2006. www.cdc.gov/niosh. Accessed 21/05/2015.
29. Salik Y, Özcan A. Work-related musculoskeletal disorders: A survey of physical therapists in Izmir-Turkey. *BMC Musculoskeletal Disord*. 2004; 5: 27.
30. Mbada CE, Obembe AO, Alade BS, Awotidebe TO, Johnson OE, Soremi OO. Work-Related Musculoskeletal Disorders among Health Workers in a Nigerian Teaching Hospital. *TAF Prev Med Bull*. 2012; 11(5): 583-588.
31. Carta A. A survey on Musculoskeletal Disorders in Physiotherapists. *Giornale Italiano di Medicina del Lavoro ed Ergonomica*. 2007; 29(3): 583-4.
32. Alexanderson K, Norlund A. Sickness absence - causes, consequences, and physicians' sickness certification practice. A systematic literature review by the Swedish Council on Technology Assessment in Health Care. *Scandinavian Journal of Public Health*. 2004; 32: 1-263.
33. Canadian Centre for Occupational Health and Safety (CCOHS). Work-related Musculoskeletal Disorders. 2005. www.ccohs.ca/oshanswers/diseases/rmirs.html
34. Häkkinen M, Viikari-Juntura E, Martikainen R. Job experience, work load, and risk of musculoskeletal disorders. *Occup Environ Med*. 2001; 58: 129-135.
35. Larese F, Fiorito A. Musculoskeletal disorders in hospital nurses: a comparison between two hospitals. *Ergonomics*. 1994; 37: 1205-1211.
36. Boyer J, Galizzi M, Cifuentes M, d'Errico A, Gore R, Punnett L, Slatin C. The Promoting Healthy Safe Employment (PHASE) in Healthcare Team. *Am. J. Ind. Med*. 2009; 52: 551-562.
37. World Health Organization (WHO). Identification and Control of Work-Related Diseases. Report of a WHO Expert Committee. Technical Report Series. No. 714. Geneva: WHO, 1985.
38. Chetty L. Musculoskeletal Injury Pattern at an Occupational Health Physiotherapy Clinic in the United Kingdom. *Internet Journal of Rheumatology*. 2010; 6(2).
39. Yip YB. A study of work stress, patient handling activities and the risk of low back pain among nurses in Hong Kong. *Journal of Advanced Nursing*. 2001; 36:794-804.
40. Zarina AR, Atiya AS. Prevalence of Work-related Upper limb symptoms among office workers. *Asia Pacific Journal of Public Health*. 2009; 21(3): 252-258.
41. Choobineh AR, Tabatabaei SHR, Tozihian M, Ghadami F. Musculoskeletal problems among workers of an Iranian communication company. *Ind. J. Occup. Environ. Med*. 2007; 11: 32-36.
42. Holmstrom E, Engholm G. Musculoskeletal disorders in relation to age and occupation in Swedish construction workers *American Journal of Industrial Medicine*. 2003; 44 (4):377-384
43. Hotopp U. The ageing workforce: A health issue *Economics and Labour Market Review*. 2007; 1(2): 30-35
44. Taimela S, Laara E, Malmivaara A, Tiekso J, Sintonen H, Justen S, Aro T. Self-reported health problems and sickness absence in different age groups predominantly engaged in physical work. *Occupational and Environmental Medicine*. 2007; 64(11): 739-746.
45. Silverstein M. Meeting the challenges of an aging workforce. *American Journal of Industrial Medicine*. 2008; 51:269-280
46. Okunribido O, Wynn T. Ageing and work-related musculoskeletal disorders: A review of the recent literature. Prepared by the Health and Safety Laboratory for the Health and Safety Executive 2010 RR799. <http://www.hse.gov.uk/research/rrpdf/rr799>.

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Source of Support: Nil, Conflict of Interest: None declared