Original Article

Work Related Musculoskeletal Disorders (WMSDs) And Their Coping Strategies Among Nurses of Services Hospital Lahore

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Objective: To determine work related factors of musculoskeletal disorders, frequency of WMSDs and the use of coping strategies to prevent WMSD samong nurses working in indoor departments of Services hospital, Lahore.

Methods: Nurses from indoor departments of Services Hospital (n = 200) using non-probability convenient sampling were included in this cross-sectional study. Musculoskeletal symptoms over the past year and past week were assessed using the Nordic Standardized Musculoskeletal Questionnaire. For qualitative variables frequency, percentages were calculated and chi-square test was applied to see the significant difference between variables. Data was analysed using SPSS statistics V-23.

Results: One hundred ninety four (97%) of the nurses had WMSDs once or more in the last 12 months or last 7 days' time period. Frequency shows that WMSDs occurred mostly in low back (56.1%), shoulder (38.2%), and ankle 34.4%.Working in the same positions for long periods (87.3%), treating an excessive number of patients in one day (74.5%) and continuing to work while injured or hurt (64.2%) were the most perceived job risk factors for WMSDs. Getting help in handling heavy patients (80.7%) and modification of nursing procedures in order to avoid re-injury (65.1%) were the top two coping strategies.

Conclusions: One hundred ninety four (97%)of nurses had an episode of WMSD which mostly affected the low back. Two coping strategies used by majority of nurses were getting help in handling heavy patients and modification of nursing procedures. Educational programs targeted on prevention and coping strategies for musculoskeletal disorders are recommended for nurses.

Keywords: WMSDs, nurses.

Introduction

Nursing is a healthcare profession that is concerned with the maintenance and health promotion of patients. The International Labor Organization ILO and the WHO consider MSD as a work related disease, which is also referred as a "new epidemic" that should be researched and solved.[1] WMSD is an injury of the musculoskeletal system which is caused or aggravated by work related tasks such as lifting, pushing and pulling and its symptoms include pain, swelling, stiffness, tingling and numbness.[2] Nursing population that constitute almost 33% of hospital workforce are at high risk of developing WMSDs with reported occupational injuries of 60%.[3,4] WMSDs not only have a significant impact on quality of life but also have huge impact on work related absence.[1] Therefore WMSDs have an impact on individual level as well as on health system.[5-7] MSD prophylaxis is needed in many countries to allow workers to avoid symptoms of MSDs and in result improve work productivity.[8,9] In developed countries many programs for prevention of MSD have been implied in hospitals with the following evidence based practices in use, (1) patient handling equipment/devices, (2) no-lift policies, (3) training on proper use of patient handling equipment/devices, and (4) patient lift teams. Multiple intrinsic and extrinsic factors have been implicated in the etiology of WMSDs. Repetitious movement, awkward postures and high force level are the three primary risk factors which are associated with WMSDs[10] in nurses.

The 2016 Global Burden of Disease (GBD) data for non-communicable diseases identified the profound burden of disease associated with musculoskeletal health. DALYs for musculoskeletal conditions was increased to 61.6% between 1990 and 2016, with an increase of 19.6% between 2006 and 2016.[11,12] Musculoskeletal conditions comprised the second highest global volume of years lived with disability in 2016.[13] In the healthcare sector, occupational musculoskeletal disorders are common, with prevalence rates of work-related MSDs reported from 28%to 96% over a one-year time period [14] including those among nurses, for example, in Europe from 10% to 50% in France[15] and 89% in Portugal,[16] from 35.1% to 47% in USA[17] and in Africa 80.8% in Uganda.[18]

In Asia 78.6% in China,[19] 85% in Saudi Arabia,[20] 88% in Iran[21] and 89.1% in India.[22] There is a little published data on WMSDs on nurses in Pakistan. According to the 2013 estimates, the nurse-to-patient ratio in Pakistan was 1:50, whereas the ratio prescribed by the Pakistan Nursing Council is targeted at 1:10 in general areas and 1:2 in specialized areas.[23] This is much higher than the ratio in developed countries. Therefore, a higher rate of WMSDs in Pakistani nurses can be anticipated. Unfortunately, this issue received little attention. Possible reasons can be a lack of awareness regarding the topic, lack of resources, funds for researchers and a communication gap between researchers and the target audience. We conducted this study with objectives to determine work related factors that predict musculoskeletal disorders, to access the frequency of WMSDs and to determine the use of coping strategies to prevent WMSD among nurses working in indoor departments of Services hospital, Lahore.

Methods

It was a descriptive cross-sectional study conducted among nurses working in indoor departments of Services hospital Lahore for a time period of 3 months. Sample size was 200. The sample size was estimated using WHO statistical software S size having confidence interval of 95% and Relative precision of 10% taking anticipated population frequency 66%.[26] Non-probability convenient sampling technique was used. All nurses including student nurses with two years of work experience were included into the study. Absence at work at the interview time. Nurses with any diagnosed musculoskeletal disorder. Nurses who had given birth in the last 3 months. Nurses with history of recent trauma. Nurses having co-morbid illness.

In this study we defined WMSDs as musculoskeletal symptoms (pain, numbness, aching, stiffness) that resulted from a work-related event. Questionnaire compromising of 4 sections were used. First section included socio demographic section to collect some general information of participants such as age, gender, height, weight, marital status and history of any comorbid illness. We also collected information on their working characteristics: department, seniority, working intensity, duration of shift work, and so forth. The second section of the questionnaire investigated WMSDs. It also assessed whether sick leave had been taken because of WMSDs. The data collecting team explained all the symptoms to nurses and was available to answer any query. The nurses responded yes or no to whether they had experienced these symptoms in last 7 days and last 12 months period. This section was adapted from the previously validated and modified version of the standardized Nordic Questionnaire of Musculoskeletal Symptoms (SNQ) that was established by Kuorinkaet al.[23] The SNQ was used to evaluate nine body areas including four upper limb segments (neck, shoulders, elbows and wrists/hands), three lower limb segments (hips, knees and ankles/feet) and two trunk segments (upper back and lower back). The third section inquired about the work factors that predict towards the WMSDs and the fourth section inquired about the use of coping strategies. The questionnaire was distributed among nurses working in different major and minor departments of services hospital Lahore. 84% of nurses were taken from major wards including Surgery, Medicine, Gynaecology, Paeds medicine and Orthopaedics. While the remaining 16 percent subjects were included from minor wards including Dermatology, Endocrinology, Psychology, ENT, Eye, Urology. Data was double entered in SPSS version 23.00 for validation. All discrepancies were corrected by referring to original questionnaire. Weight and height were used to calculate the BMI which was further coded into underweight, normal and obese. We used algorithms for descriptive statistics (frequency and percentage) to describe the socio demographic characteristics of the participants. The frequency of MSDs was calculated as the percentage of nurses who developed symptoms of MSDs in at least one of the nine positions on the body (showed in the Nordic Questionnaire). The chi-square test was used for qualitative data. A probability level of 0.05 or less was used to indicate statistical significance.

Results

The questionnaire was distributed among 220 nurses working in indoor departments of services hospital Lahore. Out of which 200 nurses agreed to be part of this research. A group of 6 students from class 4th year SIMS collected the data from nurses and rechecked every questionnaire that it was filled and answered any query of nurses regarding questionnaire. 194(97%)of nurses working in Services hospital Lahore was suffering from MSDs as shown in **(Fig-2).** The socio demographic characteristics **(Table-1)** showed 111 (55.5%) of nurses were in the age range of 20-29 years, 54 (27%) nurses were in age range of 30-39 years and 35 (17.5%) nurses were in age group of >40 years. 105

(52.5%) nurses were married while 95(47.5%) nurses were unmarried. The BMI was calculated which categorized the respondents11(5.5%) of nurses as underweight, 107(53.5%) as healthy and 82 (41%) of nurses as overweight.71(35.5%) of nurses were working in surgical departments while 37 (18.5%), 31(15.5%) and18(9%) belonged to Medic- ine, Gynaecology and Paeds Medicine department respectively.141(70 %) of nurses had the service experience of 2 to 10 years, 38(19%) had the experi- ence of 11 to 20 years and 21(10.5%) had above 20 years job experience. 37(18.5%) of nurses had their first episode of MSD before training while majority of nurses that is 59(30%) had their first episode of MSD during training as a student nurse, 72(36%) had first episode during first 5 years of service. 72(36%)of nurses was doing no leisure time physical activity, 86(43%) was doing slow walk 20(10%) brisk walk while 22(11%) used to do aerobics and gym. As depicted in **(Table-2)** 169(87%) nurses out of 194 were working in the same position for long periods(standing, bend over, sitting, kneeling)and 143(74%) were treating large no of patients in one day. Figure-1 showed the percentage of different body areas affected by MSD in last 7 days and last 12 months. While analysing the results showed that the lower back, shoulder and ankle are the most affected sites. Number of nurses practicing different coping strategies to reduce the risk of developing WMSDs are shown in **(Table-3).** The relationship between different factors that contribute toward MSDs are shown in Table no 4. There is a significant difference (p value=0.04) between lower back pain and no of preschool children. A significant difference (p value=0.00)is also seen between working in the same posture for long duration and presence of MSDs. Long working shifts and MSD shows a significant difference(p value=0.04). Lifting/carrying heavy equipment and not enough breaks during heavy work in this sample showed insignificant relationship with lower back pain(p value of >0.05).

Table-1: Socio Demographic characteristics.

Variable		N	Percentage
Age	20-29 Years	111	55.5%%
	30-39 years	54	27%
	40-49 Years	28	14%
	50-59 Years	07	3.5%
Marital status	Married	105	52.5%
	Unmarried	95	47.5%
No of Preschool children	0	144	12.9%
	1-2	54	72%
	>2	02	27%
BMI	Under weight (<18.5)	11	5.5%
	Healthy (18.5- 24.9)	107	53%
	Overweight (>25)	82	41%
Duration of service	2-10 years	141	70.5%
	11-20 Years	38	19%
	>20 years	21	10.5%
Department	Surgery	71	35.5%
	Medicine	37	18.5%%
	Gynae/Obs	31	15.5%
Medicine minor (peads medicine, Derma, Psyc.)		31	15.5%
Endocrine, Surg Minors (ortho, Neuro, Eye, ENT, Urology)		30	15%
Duty Type	Permanent	167	83.5%
	On rotation	33	16%
First episode of MSD	Before training	37	18.5%
	As a student nurse	59	29.5%
	First 5 years of services	72	36%
	After 5 years	32	16%
Physical leisure time activity	No leisure activity	72	36%
	Slow walk	86	43%
Duration of service	Brisk walk	20	10%
	Acrobic/gym	22	115%

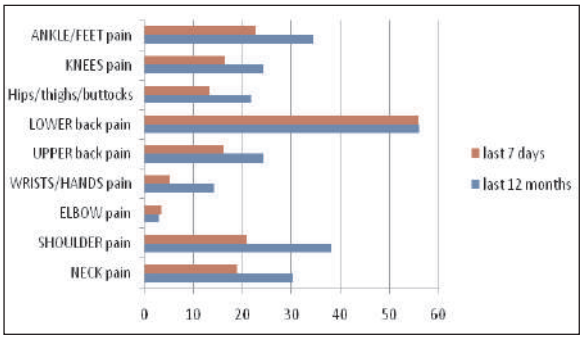

Fig-1: Pain in different body parts in last 7 days and 12 months

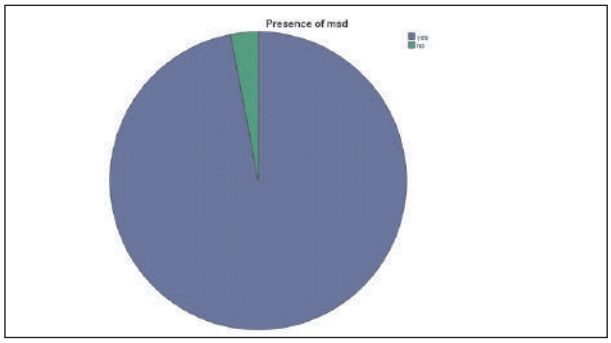

Fig-2: Frequency of WMSDs in nurses

Table-2: Frequency of WMSDs and its contributory work factors.

Contributory Factors	Frequency n (194)	Percentage (%)
Working in the same positions for long periods (Standing, bend over, sitting, kneeling)	169	87.3%
Treating an excessive number of patients in one day	143	74.5%
Carrying, lifting, or moving heavy materials or equipment (e.g., continuous passive motion machines)	144	22.6%
Not enough rest breaks or pauses during the workday	100	52.45%
Continuing to work while injured or hurt	124	64.2%
Working with confused or agitated patients	116	60.4%
Assisting patients during gait activities.	97	50.5%

Table-3: Frequency of WMSDs and its contributory work factors.

Strategies	Frequency n (200)	Percentage (%)
I get someone to help me handle a heavy patient.	161	80.7%
I select techniques/procedures that will not aggravate or provoke any discomfort.	130	65.1%
I got training to avoid musculoskeletal disorders.	98	49.1%
I thought of leaving nursing profession due to musculoskeletal disorders.	32	16%
I had to consult physiotherapist/doctor due to pain.	81	40.6%
Sick leaves due to WMSDs	118	59%

Table-4: Relationship of different work factors with MSDs.

Contributory Factors	Chi-square value	P-value
Age of Nurses	2.19	0.534
No of preschool children	9.39	0.042
Physical leisure time activity	4.55	0.207
Working in same posture for longer duration	16.10	0.006
Not enough breaks during work	6.30	0.17
Long working shifts	6.56	0.038
Moving /Carrying Heavy Equipment	0.002	0.50
Duration of service	0.81	0.66
Assisting patients during gait activities	0.03	1.00
Treating excessive no of patients in one day	0.56	0.37
Continuing to work while injured or hurt	0.005	0.62
Working with confused or agitated patients	0.019	6.62

Discussion

In Pakistan, where most of the hospitals lack the necessary equipment to assist nurses in their work, nurses are more prone to be affected by various problems especially musculoskeletal disorders. Moreover, public sectors hospitals have increased patient turnover as these provided free of cost treatment. In our study we found the overall frequency of WMSDs among nurses of SHL, Pakistan to be 97% which was higher than reported by previous studies conducted at different settings, 10% to 50% in France,[13] 89% in Portugal,[14] from 35.1% to 47% in USA,[16] 78.6% in China,[9] frequency of WMSD came out to be85% in a study conducted in Saudi Arabia[20],88% in Iran[21] , in Egypt to be 97%[24]and a comparatively lower frequency of musculoskeletal disorders of 31.6% among Pakistani nurses.[23] Prevalence of musculoskeletal disorders noted to vary across different occupational groups and nations. Variations in instrument use, organizational differences in work settings, and cultural differences in the perception and reporting of pain are adduced for the variation in rates of WMSDs in the different studies. In our study, a high percentage of nurses (36%) experienced first episode of MSD during first five years of job while 29.5% experienced it during their training as student nurses, these results are consistent with the study conducted among nurses in Zimbabwe.[25]The factors responsible for this might be not enough breaks for student nurses and strict

supervision by senior nurses. It is also observed that after 50 years of age and with more than 20 years of clinical practice the prevalence of musculoskeletal disorders decline.[26] The lower rate of WMSDs among very senior nurses in terms of both age and clinical practice may be attributed to less patient but more administrative duties that often come with rise in job cadre. Another explanation might be that experienced and older nurses have increased level of knowledge about injury prevention, avoid harmful physical load, and have developed better coping strategies for musculoskeletal problems than the less experienced and younger nurses.[26]

In the present study, having one preschool child and being much engaged in other tasks of a caring nature in the leisure time, such as caring for handicapped children or elderly relatives, predicted LBP, the results are consistent with the multiple previous studies.[27] The highest percentage of WMSDs in nurses over 12 months according to body sites is of low back (56%) followed by shoulder (38.2%) and ankle (34.4%). This distribution pattern is consistent with literature. LBP(low back pain) is one of the most important WMSDs among nursing professionals.[27]However, previous studies have documented various rates of work related low back pain (LBP) in nurses for a 12-month time period, a study conducted among nurses in Ibadan, southwest Nigeria[26] showed 44.1% LBP followed by neck and knees (28% and 22.4%). Similarly, a study conducted among nurses in Zimbabwe[25]found LBP was the most common WMSDs reported (67.9%). Likewise frequency of WMSDs in nurses of SHL over last 7 days followed a similar pattern with LBP (56%), ankle (22.6%) and shoulder (20.8%).

Working in the same posture for long duration, treating excessive number of patients and continuing to work when injured or hurt were the most happening job risk factors precipitating WMSDs among the nurses in our study with percentages of 87.3%, 74.5% and 64.2% respectively. These findings are not consistent with previous reports indicating manual patient handling, transferring or moving patients as important predictors of musculoskeletal disorders and low back pain among nurses. Different studies[26,28] implicated lifting patients as the most common mechanism for musculoskeletal disorders among nurses. In our study working in the same posture for longer duration and long working shifts showed a significant relationship with MSDs. In our setup nurses usually do not lift or transfer patients, particularly male patients. This aspect of direct patient care is often handed over to male nursing assistants. This is probably the reason we did not find a significant association between presence of MSD and lifting heavy patients.

Coping strategies play a crucial role in rehabilitation and prevention of injuries as well as musculoskeletal disorders. From this study, getting assistance or support from staff in handling heavy patients, modification of nursing procedure in order to avoid re-injury or stressing an injury and getting training to avoid MSDs were three mostly used coping strategies in reducing the risk of WMSDs (80.7%, 65.1% and 49.1% respectively). These coping strategies among Pakistani nurses seem like previous findings. Workers performing strenuous work are often advised to prevent problems and to cope with musculoskeletal symptoms by changing their working techniques, using lifting equipment, taking breaks and avoiding strenuous work tasks.[26,24] Less than half of those with WMSDs visited other health practitioners for treatment or engaged in self-treatment according to a study conducted in Nigeria[26]. Similarly in this study,40.6% of nurses consulted doctors or physiotherapist due to pain. This percentage is less than half of those suffering from WMSDs. It can be adduced that those who sought medical care represent the more severe cases and the more serious pathology. However, this study did not assess the severity of pain or discomfort from WMSDs of the respondents. As there is increased burden of patients in the public sector as well as private sector, more nurses including the male nurses should be appointed.To improve nurses' understanding regarding WMSDs and to reduce the incidence of WMSDs, workshops and seminars should be conducted regularly. Training should be held to familiarize nursing students with concept of ergonomics.

Conclusion

A high proportion of nurses of Services Hospital Lahore reported WMSDs at some body site (with percentage of 97%) in their occupational lives with the low back being affected most often.The knowledge about ergonomics was generally poor among the nurses. Working in the same positions for long periods and treating anexcessive number of patients in one day were the most perceived job risk factors for WMSDs. While getting help in handling heavy patients, modification of nursing procedures in order to avoidstressing an injury and modifying patient's/nurse position were the top three coping strategies.

Less than half of those with WMSDs visited other health practitioners for treatment or engaged in self-treatment.

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