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Work Related Musculoskeletal Disorders and Associated Factors among Nurses Working in Jimma Zone Public Hospitals, South West Ethiopia

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Abstract

Background: Musculoskeletal disorders represent a significant occupational problem among nurses; however, there is paucity of information on work related musculoskeletal disorder among nurses in Ethiopia.

Objective: To assess work related musculoskeletal disorders and associated factors among nurses working in Jimma Zone Public hospitals, South west Ethiopia.

Methods: Institutional based cross-sectional study was conducted in Jimma Zone public hospitals from March 12-27, 2015. Systematic random sampling technique was used to select 333 participants. Data were analyzed by using binary logistic regression and Odds ratios with 95% confidence intervals used to examine associations between dependent and independent variables.

Results: The prevalence of work related musculoskeletal disorders at any body site was 60.8% and the highest report 124 (67.8%) was seen in the lower back which was followed by the neck 44 (24%) and knees 43 (23.6%). Lifting and transferring dependent patients [AOR 2.1 (1.1-4.3)], giving wound care [AOR 4.2 (1.9-8.9)], working in medical ward [AOR 9.6 (2.4-38.3)] and Intensive care unit [AOR 3.4 (1.2-9.7)], working in mal-positions [AOR 9.7 (2.2-42.6)], working in the same positions for long period of time [AOR, 6.1 (1.3-28.7)], working with disoriented patients [AOR 2.6 (1.1-5.7) and bending or twisting back during work [AOR 5.1 (1.1-23.7)] were identified associated factors.

Conclusion: The prevalence of work related musculoskeletal disorders among nurses was high in the study area. Lifting and transferring dependent patients, giving wound care, working in medical ward and Intensive care unit, working in mal-positions, working in the same positions for long period of time, working with disoriented patients and bending or twisting back during work were identified associated factors.

Keywords: Work related musculoskeletal disorders; Predictors; Nurses; Jimma; Ethiopia

Background

Work Related Musculoskeletal Disorders (WMSDs) refers to disorders of muscles, skeleton, and related tissues as a results of work related event or activities which characterized by muscles, joints, tendons and ligament pain weakness, swelling, burning worldwide [8-12], numbness, tingling or dull ache over affected area. The major body regions involved include lower back as well as upper and lower limb extremities [1-3]. According to Bureau of Labour Statistics, WMSDs are conditions in which the work environment and performance of work contribute significantly to the condition and/or the condition is made worse or persists longer due to bending, climbing, crawling, reaching, twisting, overexertion, or repetitive motion [4]. Commonly reported WMSDs are sprains, strains, and tears, back pain, carpal tunnel syndrome, tendonitis, tenosynovitis and bursitis [4-6]. WMSDs can be prevented by one or a combination of having good physical appearance or proper posture, working only what

they can work (optimal load), be technical when lifting and lowering objects, use appropriate equipment and strengthen muscles and connective tissues by regular physical activity and proper nutrition [7].

Work related musculoskeletal disorders likely be are a major causes of morbidity and mortality around the world. For instance including nurses there is estimated 2 million deaths, 160 million new cases, more than 4.2 million cases of nonfatal injuries/illnesses, 70 million physician consultations and 130 million hospitals outpatient and emergency room visit each year worldwide [8-12].

The risk of hospital based nurses for Musculo-Skeletal Disorders (MSD), such as lower back pain/injury, and neck or shoulder problems, is a global challenge [13-15]. The magnitude of WMSDs varies from region to region. According to Bureau of Labour Statistics report, annual prevalence of WMSDs at any of body region is between 40%-85% among both Asian populations and Western populations [16]. In Nigeria, 84.4% of the nurses have had WMSDs once or more in their lifework [17]. The consequences of MSD generate not only suffering and disability for workers and their families, but also result in high costs for society, considering losses in productivity and wages,

benefits paid to workers and medical expenses [10]. In 2002, about 1.24 billion dollars paid out for work-related injuries, 40% of which were considered to be for MSDs [11]. It is the biggest cause of absence from work and Overexertion injuries might cause nurses to leave their profession [7,14].

Nurses in Africa are the health care workers available in most sub-Saharan nations' health facilities, performing a broad range of tasks and working in settings where no other health workers, including physicians, are available [18]. Significant factors associated with WRMSD among nurses are frequent/repetitive works, working in awkward postures, lifting of heavy objects, daily exposure to whole body vibration, routine overhead work, work with the neck in chronic flexion position, performing repetitive forceful tasks, organizational factor, psychosocial factors (work pace, autonomy, monotony, work/rest cycle, task demands, social support from colleagues and management and job uncertainty) and individual factors (age, gender, professional activities, alcohol/tobacco consumption) [3-5,19-21].

Work-related musculoskeletal injuries have negatively impact on nurses' quality of life, health and patient care and also consequences of the problem include job change, job loss, and chronic pain; however, to our knowledge there is paucity of information on work related musculoskeletal disorder among nurses in Ethiopia. Thus, the findings of this study provide insight for nurses, nurse managers and health care industry administrators to work on the identified factors leading WMSDs which will improve productivity and efficiency of nurses. This in turn boosts the achievement of the hospital and also it helps nurse tutors to give pre service training on body mechanics and ergonomics. So the purpose of this study was therefore; to assess work related musculoskeletal disorders and associated factors among nurses working in Jimma Zone Public Hospitals.

Methods

Study area and period

The study was conducted in four public hospitals in Jimma Zone, from March, 12-27 (for two weeks), 2015. Jimma is one of the 18 zones of the Oromia Regional State in Ethiopia. Jimma city is the capital of Jimma zone located at 352 km to south west of Addis Ababa. Based on the information from Jimma Zone and town Health Bureau, the population projection of 2014/15 of the zone was 3090112 and Jimma town was 184,925 respectively. The zone has a total area of 119,316 km2. In this zone there are four public hospitals (Jimma University Teaching Hospital (JUTH), Shenen Gibe, Limu Genet and Agaro District Hospitals) and one defense hospital. From the four public hospitals, the first two are situated in Jimma town which is the capital city of the zone, whereas the latter two are at Limu town which is 72 km far from Jimma town and Agaro town which is 45 km far from Jimma town respectively. Except JUTH which is teaching Hospital, the three are district hospitals. In addition to this the zones has 112 health centers and Jimma town administrative has 4 health centers. There are 611 enrolled nurses in Jimma zone public hospitals among these 518 of them were in JUTH, 32 in Shenen gibe, 27 in Agaro hospital and 34 in Limmu District Hospital.

Study design

Institutional based cross sectional study using quantitative data collection methods was used.

Source and Study population of this study was all nurses who were working in Jimma Zone public Hospitals during data collection period. All nurses those had greater than12 months' work experience were included in the study while nurses those were critically ill during data collection period, pregnant nurses and disabled were excluded from the study.

Sample size and sampling technique

The sample size was calculated using a single population proportion sample size calculation formula using the assumptions of margin of error of 4% with 95% confidence intervals, α=0.05 (level of significance), P=50% assumed the proportion of work related musculoskeletal disorders. After using correction formula and adding 10% non-response rate, the final sample size was 333.

Number of nurses obtained from respective hospital human resource department. Then proportional allocation to sample size was done to each hospital and sampling frame was developed based on lists obtained from Human Resource department and study unit was identified using systematic random sampling after calculating the kth value that was 2. The first nurse was selected based on lottery method and the subsequent study unit was selected with interval of two in the list of sampling frame. If a nurse was absent after two attempts and/or fulfilled inclusion or exclusion criteria, the nurse in the position immediately before or after were selected.

Data collection procedures and quality control

Data collection instrument was adapted from Dutch musculoskeletal questionnaire and after review of other relevant literatures [16,18,22-24]. Questionnaires were prepared in English and has semi- structured questionnaire. Face to face validity was checked by the experts to see the validity of the tools and it was adapted from the questionnaires with the sensitivity test greater than 85% .The questionnaire arranged according to particular objective it addresses. It has six parts: socio- demographic characteristics, work history and life style, prevalence of WMSDs, factors related to patient condition, factors related to organization and job risk factor. Data was collected using self-administered questionnaire. Questionnaires were distributed and collected back by data collection facilitators. A total of six Diploma Nurses were involved in data collection.

Data quality control

Prior to the actual data collection, pre-testing was done on 5% of the total study subjects (17 nurses) at Bedelle hospital, which is not included in analysis of the real study. Wording, organization and structuring of the questionnaire were checked and amended accordingly such as sequences, relevancy, clarity or repeated ideas. Data collection facilitator and supervisor were trained for one day intensively about questionnaires and data collection procedure that includes the relevance of the study, objective of the study, confidentiality of the information, and informed consent. Daily close supervision was done by supervisor and each filled questionnaire was checked daily for completeness. Finally, the data were carefully entered and cleaned before the beginning of the analysis.

Operational Definition

Work-related musculoskeletal disorders

In this study WMSD refers to self-reported pain or discomfort at least once in the last one year after work or following work by nurses in one or more of the following body regions : Low back, Neck, Knees, Upper back, Wrists/Hands, Shoulder, Ankles/Feet, Elbow and Hips/Thighs.

Mal-positions

Inappropriate working postures like awkward and cramped position that nurses may use during work (nursing care).

Data entry and analysis procedures

The data were entered into Epi-Data version 3.1 and then exported to SPSS version 21.0 for analysis. Percentage, Frequency, mean and standard deviation were calculated. Binary logistic regression analysis was done to see the association between the predictor and the outcome variable (WMSD). Those variables with P-value <0.25 in bi-variable logistic regression analysis were included in multivariable logistic regression analysis. The P value less than 0.05 was considered significant. An odds ratios with 95% confidence intervals was used to examine associations between dependent and independent variables.

Ethical Consideration

Ethical clearance and approval letter to conduct study was obtained from Jimma University Collage of Health Sciences, Institutional Review Board to communicate with Hospitals administrative body in Jimma zone. Permission letter was obtained from administrative body of each hospital. The study has no risk and exceptional benefits. Finally after ensuring that the study has no risk and informing its benefit, verbal consent was obtained from the subjects included in the study immediately before the distribution of questionnaire. The research assistants were trained by the principal investigators on how to keep the confidentiality and anonymity of the responses of the respondents (nurses' information) in all aspect. The right of the respondents to refuse answer for few or all of the questions was respected.

Results

Characteristics of the study participants

Three hundred thirty three questionnaires were distributed, and 301 nurses returned questionnaires which makes response rate of 90.4%. The reasons for non-response were refusal and heavy workloads. Among the participants, majority 253 (84.1%) were working at JUTH, 168 (89%) were in the age group between 20-29 years, 159 (52.8%) were males, and 180 (59.8%) were single. Regarding the educational status, 178 (59.1%) were Diploma Nurses and their mean salary was 2402.2 ± 871.7EB. Among the respondents, 277(92%) were non-obese (BMI<25 kg/m^2), while only 24 (8%) were obese (BMI>25 kg/m^2) (Table 1). Regarding the life style of respondents, 282(93.7%) were not smoker and 226 (75.1%) not drink alcohol. Out of 301 respondents, 137 (45.5%) were engaged in different type of physical exercises.

		Frequency (n=301)	%
Sex	Male	159	52.8
	Female	142	47.2
Age	20-29	268	89
	30-39	16	5.3
	>40	17	5.6
Marital status	Married	119	39.5
	Single	180	59.8
	Divorced	2	0.7
Educational Qualification	Diploma in Nursing	178	59.1
	Bachelor degree in Nursing	120	39.9
	Master's degree in Nursing	3	1
Salary	<1800 EB	79	26.2
	1800-2350 EB	78	25.9
	>2350 EB	144	47.8
Organization	JUSH	253	84.1
	Shenen Gibe	16	5.3
	Limu Genet	17	5.6

	Agaro	15	5
	<25(non-obese)	277	92
Body mass index	>=25(obese)	24	8

Table 1: Socio-Demographic Characteristics of nurses working in Jimma Zone public Hospital, South West of Ethiopia March, 2015.

Prevalence of work-related musculoskeletal disorders

From the 301 respondents, 183 (60.8%) of them experienced WMSD at least in one body region during the last 12 months. The highest 12-months prevalence of WMSD was reported in the lower back (67.8%), followed by the neck (24.0%) and knees (23.6%), but least in the Elbow /forearm (2.7%) (Table 2).

Body region	Frequency(n=183)	Percentage (%)
Lower back	124	67.8
Neck	44	24
Knees	43	23.6
Ankles/Feet	36	19.7
Hips/Thighs	29	15.8
Upper back	28	15.3
Shoulder	26	14.1
Wrist/hand	13	7.1
Elbow /forearm	5	2.7

Table 2: Body region and work related musculoskeletal disorders among nursing professionals working in Jimma Zone public Hospitals, Murch, 2015.

Of all of the 183 respondents that indicated WMSDs, 76 (41.5%) reported that they had treated themselves or had sought treatment from other health practitioners for WMSDs and 26.2% of them reported that they have changed their working unit due to WMSD. Highest percentage of the respondents (67.4%) experienced their first episode of WMSDs in the first five years of clinical practice, and 14.9% during 5-15 years of nursing practice.

Work history

Concerning Working Unit, 21.9% of the respondents were working at the surgical ward, 11.3% at the OPD, 11.0% at OR, 10.6% at Medical and 10% at the Pediatrics ward. Majority (90%) of the respondents were staff nurses in position while 78.1% had 1-5 years of experience. Two hundred thirty two (77.1%) had no previous occupation and only 38 (12.6%) of them had part time job or they had done extra-shifts at another clinic/hospital outside their normal shift. The mean number of hours per week they had done was 52.29 ± 12.95. Majority 190 (63.1%) of the respondents worked in mixed (day and night) shift (Table 3).

Work related characteristics		Frequency (n=301)	%
Working Unit	Medical ward	32	10.6
	Surgical Ward	66	21.9
	Pediatrics ward	30	10
	Neonatology ward	9	3
	ICU	16	5.3
	OR	33	11
	Recovery room	2	0.7

	OPD	34	11.3
	Psychiatry	9	3
	Ophthalmology	6	2
	Obstetrics and gynecology ward	15	5
	chronic illness	5	1.7
	TB and ART clinic	9	3
	MCH	8	2.7
	Dental clinic	10	3.3
	Other*	16	5.3
Work Experience in Nursing	5-Jan	235	78.1
	10-Jun	45	15
	15-Nov	3	1
	>16	18	6
Position	staff nurse	271	90
	Head nurse	24	8
	Supervisor	2	0.7
	Matron	2	0.7
previous occupation	No	232	77.1
	Yes	69	22.9
Part time job	No	263	87.4
	Yes	38	12.6
Work schedule (shift)	Day	89	29.6
	Night	22	7.3
	Mixed	190	63.1
Work shift	Constant	66	21.9
	Rotational	235	78.1
*Other-admission office, supervision, nursing director office and matron, referral clinic			

Table 3: Work History of Nursing Professionals of Jimma zone public Hospitals, South West of Ethiopia, March, 2015.

Actual activities

With regard to daily actual nursing activities, majority 174 (57.8) of nurses reported that lifting or transferring dependent patients, 127 (42.2%) bed-making and 122 (40.5%) wound dressing related with WMSDs (Table 4).

Variables	Frequency	%
Lifting and transferring dependent patients	174	57.8
Bed-making	127	42.2
taking patients vital signs	70	23.3

Wound dressing	122	40.5
Administering medication	62	20.6
Bed bath	66	21.9
Performing manual orthopedic techniques	40	13.3
Writing reports	17	5.6

Table 4: Actual nursing activities at Jimma Zone Public Hospitals, South West of Ethiopia March, 2015.

Organizational related variables

Majority of the respondents 74.4% reported that no available materials especially for patient handling and 71.1% indicated that the working environment is not conducive. Majority (77.1%) of the respondents reported no training on manual handling or ergonomics (how to prevent occupational hazards).

Patient condition related variables

Majority of the respondents reported that they work all the time (each day): patients with disabilities (62.8%), patient with emergencies (54.5%), and work with disoriented patients (50.2%) (Table 5).

Patient condition	All the time In %	Most of the time In %	Some of the time In %	A little of the time In %	None of the time In %
Patient with disabilities	62.8	27.2	6.6	1.7	1.7
patient with emergencies	54.5	23.9	13.6	1.7	6.3
Disoriented patients	50.2	27.2	17.6	3.7	1.3

Table 5: Patient condition of nursing professionals of Jimma Zone Public Hospitals, South West of Ethiopia, March, 2015.

Condition at work /respondents' problem perception on Job risk

Table 6 shows the responses of the respondents, how much of problem job tasks/conditions were to the respondents. Majority of the respondents reported major problems in Carrying, lifting, and moving heavy materials or equipment (68.4%), working in the same positions for long period (44.9%), bending or twisting back in work place during work (63.5%) and Working in mal-positions (62.1%) (Table 5).

Job risk	No problem in %	Minimal to moderate problem in %	Major problems in %
Carrying, lifting, or moving heavy materials or equipment	6.3	25.2	68.4
Working in the same positions for long period	7.3	24.9	67.8
Working in mal-position	12.3	26.2	61.5
Bending or twisting back	12	24.6	63.5
Performing the same task over and over	24.9	39.5	37.5
Reaching or working away from your body	24.9	42.9	32.2
Continuing to work while injured or hurt	22.9	39.2	37.9

Table 6: Condition at work (respondents' problem perception on job risk) for nurses working in Jimma zone public hospitals, South West of Ethiopia March, 2015, N=301.

Factors associated with WMSD among nurses in Jimma zone public hospitals

Multi variable logistic regression analysis was done to identify predictors of work-related musculoskeletal disorders: Lifting or transferring dependent patients, giving wound care, working unit, working in the same positions for long period, working in mal-positions, giving care for disoriented patients and bending or twisting back during work were factors significantly associated with WMSDs among nurses. Nurses those who left and moved patients in their daily activities were 2.1 times more likely to have WMSDs as compared to those who didn't lift or move patients with 95% CI of 1.1-4.3. Nurses those who gave wound care in their daily activity were 4.2 times more likely to have WMSDs as compared to those who didn't with 95% CI of 1.9-8.9. Nurses those worked in medical ward were 9.6 times and ICU 3.4 times more likely at risk for developing work related musculoskeletal disorders with 95% CI 2.4-38.3 and 1.2-9.7 as compared to those worked in outpatient departments respectively.

Nurses who perceived job risks like using mal- positions and working in the same position as a problem were 9.7 and 6.1 time more likely to have WMSDs as compared to those who didn't perceived as a problem with 95% CI 2.2-42.6 and 1.3-28.7 respectively, while those perceived bending or twisting back as a problem during work 5.1 time more likely to have WMSDs as compared to those who didn't perceived it with 95% CI 1.1-23.7.Nurses who worked all the times with disoriented patients were 2.6 times more likely at risk to develop WMSDs with 95% CI 1.1-5.7 than those worked sometimes with such patients (Table 7).

Variable	category	COR (95%CI)	AOR (95%CI)
Lifting or transferring dependent patients	Yes	4.4 (2.6-7.4)	2.1 (1.1-4.3)
	No	1	1
Wound dressing	Yes	4.2 (2.5-7.1)	4.2 (1.9-8.9)
	No	1	1
Working unit	Outpatient dep't	1	1
	Medical	3.3 (1.3-8.1)	9.6 (2.4-38.3)
	Surgical	1.7 (0.9-3.3)	1.1 (0.5-2.6)
	Pediatrics	1.5 (0.7-3.3)	1.4 (0.5-4.1)
	OR/ICU	2.3 (1.1-4.8)	3.4 (1.2-9.7)
	Other inpatient dep't	1.8 (0.8-4.3)	1.2 (0.4-3.6)
Working in the same positions for long period	Problem	8.0 (2.6-24.5)	6.1 (1.3-28.7)
	No problem	1	1
Working in mal- position	Problem	6 (4.3-31.0)	9.7 (2.2-42.6)
	No problem	1	1
Performing the same task over and over	Problem	2.5 (1.5-4.3)	1.5 (0.6-3.7)
	No problem	1	1
Working with disoriented patients	All the time	3.9 (2.1-7.2)	2.6 (1.1-5.7)
	Most of the time	3.1 (1.6-6.1)	2.3 (0.9-5.6)
	Some or less time	1	1
Bending or twisting back	Problem	9.3 (4.0-22.0)	5.1 (1.1-23.7)
	No problem	1	1

Table 7: A multivariable logistic regression analyses of the various risk factors for reported WMSD among Nurses Working in Jimma Zone Public Hospitals, South West Ethiopia, March, 2015.

Discussion

The prevalence of WMSDs at anybody region in this study was 60.8% which indicates that significant number of nurses working in Jimma zone public hospitals experienced work related musculoskeletal disorders in last one year. This might decreases nurses' productivity, efficiency and effectiveness during their working hours as most nurses might spend on sick leave days in these public hospitals. If appropriate measures not taken, in long term time this might leads to severe threat to nurses' work force in public hospitals as they might leave the job. The prevalence of WMSDs among nurses varied according to studies. For instance higher prevalence of WMSDs among nurses in mainland China 70% [25], rural Malaysia 73.24% [16], Nigeria 78% [17] and Uganda 80.8% [18]. This difference might be attributed to work setting organizational differences, differences in the perception on reporting of pain and discomfort, sample size difference, the study population is vary in sex (females are dominant in prior studies). However, the current flinging is relatively comparable with to report from Netherlands (57%) by Engels et al. [26].

The highest prevalence of 12 months period WMSDs in nurses according to body sites in this study was the lower back (67.8%), followed by the neck (24.0%) and then knees (23.6%). This pattern is consistent with literature. Many studies indicates that lower back pain is the most common MSD [13,17,18,20,22,25]. The LBP in this study (67.8%) is similar with the study conducted in Iran (66.1%) [13], but slightly higher than the study in Uganda (61.9%) [18] .The prevalence of neck and knee region in this study was comparable with the study in Nigeria [17].

Work-related musculoskeletal injuries have negatively impact on employees' quality of life, health and patient care and also

consequences of musculoskeletal injuries include job change, job loss, and chronic pain [27]. WMSDs are preventable by educating the staffs about the use of proper body mechanics and modifying the work environment. Adjust the height of working surfaces to reduce long reaches and awkward postures, reduce the weight and size of items that workers must lift and provide mechanical lifting equipment which are the recommendations made by OSHA (2000) to prevent MSDs [28].

In this study some risk factors of WMSDs were identified. Perceived job risk factors like working in mal-position, working in the same position for long time and bending or twisting the back during work were among the identified. This shows that the nurses used improper work posture during their nursing activities. This is similar with the study in Iran [20] and India [22]. The study conducted in Nigeria [17] also indicated that working in the same position for prolonged time is associated with WMSDs and the study in Brazil by Foncica [10] shows poor posture of the back during work is associated predictors for WMDs. The nursing activities like lifting and transferring dependent patients and giving wound care were also the identified risks. Similarly the study conducted in Nigeria [17] and India [22] indicated lifting and transferring dependent patients was significantly associated factor with WMSDs. This all are not surprising because of poorly equipped hospitals in the low income countries as they use patient manual handling and shortage of staffs; while in high income countries nurses use mechanical lifting equipment like sliding sheets, lifting hoists, and slings etc. for patient handling [28-31]. A reason for this was found in the response of the nurses when 74.4% of the nurses stated that there is not available material for patient handling and only (29.9%) of respondents had used work equipment always during their nursing activities. This means that they had been manually handling patients (e.g. lifting patients from and to bed, turning patients side to side, repositioning patients, etc.). Majority (71.1%) of respondents in this study also reported that their working environment is not conducive which can be the reason for affecting the working posture, working for long time in the same position. Giving care for patients with wound may also take long time and affects the work posture depending on condition of working environment and type of wounds that can put nurses on risk.

In this study the work unit was also identified as a risk for WMSDs; medical ward and theatre/ICU were significant adjusting with all other variables, which is similar with the study conducted on LBP in Nigeria [29] .This, is might be due to nursing activities, patient condition and the nature of works may vary in work units. Dependent patients (e.g. unconscious patients in coma, patients with neurologic disorders, patients on complete bed rest, etc.) who cannot assist or move themselves or require the nurses to care for them totally are admitted in the medical ward which put the nurses more at risk. Factors, like bending, lifting and transferring, bed bathing, bed-confined patients, etc. could be possible reasons why risk is high in the medical units. Also in theatre ward nurses may stand for long period and close monitoring and working with critically ill patients in Intensive care unit may put nurses on risk. Working with disoriented patient was also identified as a risk in this study. This is obvious that such patients are not co-operating with nurses during giving care. This is inconsistent with the study in Nigeria [17]. This is might be due to difference in sample size and number of staff nurses assigned working unit.

As any other cross-section study, this study has strength and limitation. It is the first of its kind to report self-reported WMSDs among nurses in Ethiopia. In addition to this the study was conducted in the zone which consists both teaching and district hospitals that may represents the real nursing activities that may impose nurses to the risk of WMSDs. However; as a weakness of the study, we consider that nurses may under report or may exaggerate the pain and discomfort following nursing activity. On the other hand, it is very difficult to know whether or not the reported MSD was totally following nursing actions.

Conclusion

The prevalence of WMSDs at anybody region in this study was 60.8% that indicates that significant number of nurses working in Jimma zone public hospitals experienced work related musculoskeletal disorders in last one year. Lifting or transferring dependent patients, giving wound care, working units, working in the same positions for long period, working in mal-positions, giving care for disoriented patients and bending or twisting back during work were factors that significantly associated with WMSDs among nurses. The findings suggested that nurses in Jimma zone public hospitals should follow the principles of body mechanics during lifting and transferring patients to prevent injuries.

Acknowledgements

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

The authors' responsibilities were as follows: TMR designed the study, did the analysis and drafted the manuscript. TBL supervised the study, ensured quality of the data and assisted in the analysis and interpretation of the data. GNG supervised the study, and assisted in the analysis of the study. The corresponding authors did the analysis and drafted the manuscript and had the responsibility to submit the manuscript for publication.

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