Prevalence and Risk Factors of Musculoskeletal Pain among Nurses in Selected Hospitals of Kaski, Nepal

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Abstract:
Aims and Objectives: *To find out the prevalence and risk factors of musculoskeletal pain among nurses.*
Methodology: *A descriptive cross-sectional research design was used to conduct the study. The study was carried out at a Hospital of Pokhara Academy of Health Sciences and Gandaki Medical College Hospital and Research Centre of Kaski district, Nepal from July 2018 to December 2018. Proportionate stratified random sampling technique was used to select 180 nurses. Nurses with at least 1 year of working experience in the same clinical unit were included in the study.*
Results: *The study findings revealed that the prevalence of musculoskeletal pain was 86 percent with low back pain being the most common condition. A significant association of musculoskeletal pain was found with age (p= .041), body mass index (p< .001), years of clinical experience (p= .033) and job satisfaction (p= .038). Risk factors associated with musculoskeletal pain among nurses were being underweight (p= .001), lack of job satisfaction (p= .004) and attending excessive number of patients (p= .048).*
Conclusion: *The study concluded that musculoskeletal pain was prevalent in majority of the nurses with low back pain as the most common condition. Training and education on occupational health and safety are required for nurses to reduce the rate of musculoskeletal disorders and pain related to them.*
Key words*: Musculoskeletal pain, Prevalence, Risk factors*

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I.   Introduction

Musculoskeletal disorders and pain related to them are major source of ill health and disability around the world. Musculoskeletal pain is growing as an emerging problem in our modern societies representing the second largest cause of short term disability after common cold with low back pain being the most common condition[1]. Nepal with a high global burden of disease employs only a limited number of health professionals. Hence the problem of musculoskeletal pain cannot be overlooked among the health professionals in context of Nepal. In fact musculoskeletal pain involving low back and neck has been ranked as the leading cause of disability in Nepal with a 16.9 percentage increase in prevalence from 2005 to 2016 AD. It has also been considered as the seventh leading combined cause of death and disability in Nepal[2].

Health workers are among the top five professionals suffering from musculoskeletal pain[3]. Nursing being the most physically demanding occupation is ranked among the top occupations with high prevalence of musculoskeletal pain. Nurses contribute to about 33 percent of the total hospital work force and accounts for almost 60 percent of occupational injuries[4].

A number of hypotheses have been generated regarding the relevancy of development of musculoskeletal pain among nurses in less developed countries[5]. Reviews of number of studies have stated that the correct nurse to patient ratio is approximately 1: 5 in medical and surgical units and 1:2 in critical units [6]. In context of Nepal about 20-30 occupant hospital units are covered by 1-2 nurses in clinical settings[7]. The nurse-patient ratio is therefore much higher in Nepal as compared to that of the other developing as well as developed countries. Hence nurses in Nepal are anticipated to be at much higher risk of developing musculoskeletal disorders and pain related to it. Hence the current study aims to study the prevalence of musculoskeletal pain among nurses and the risk factors associated with it.

II.   Materials And Methods

This cross sectional study was carried out among nurses of Pokhara Academy of Health sciences and Gandaki Medical College Teaching Hospital and Research Centre, Pokhara, Kaski from July 2018 to December 2018. A total of 180 nurses were selected for this study.
Study Design: Quantitative, descriptive cross-sectional design.

Study Location: The study was conducted in selected hospitals of Kaski, a hospital of Pokhara Academy of Health Science (PAHS) and Gandaki Medical College Hospital and Research Centre (GMCTHRC) with similar organizational climate. PAHS is a public hospital situated in Pokhara Metropolitan-12, Nepal which targets for poor and medium class people. Gandaki Medical College Teaching Hospital and Research centre is a 750 bedded private hospital situated in Pokhara Metropolitan-9, Nepal.

Study Duration: July 2018 to December 2018 (6 months)

Sample size: 180 nurses

Sample size calculation:
Sample size was calculated by using standard formula and considering the following data.
Prevalence of musculoskeletal pain among Nurses in Rural Maharastra, India was reported to be 89.1 percent[8]. Thus based on this prevalence, with 95% confidence interval and 5% permissible error, sample size was calculated using standard formula (Cochran's sample size formula)
Then estimated sample size (n) was 150. However estimating 20% non-response rate, the precise sample size was 180.

Subjects and Selection Methods: A Proportionate stratified random sampling technique was used to obtain the desired sample.
Two hospitals were selected from Kaski district.
A list of number, names and working experience of nursing staffs of each department of selected hospitals were taken from the nursing administrative section. On the basis of the total number of nurses in the selected hospitals, the proportion of nurses to be selected from each hospital was calculated as
Total number of nurses in 2 hospitals= 390
Total number of nurses in a hospital of PAHS = 145
With the required sample size of 180, number of nurses selected for the study from hospital of PAHS=145/390 *180 = 67
Total number of nurses in GMCTHRC= 245
With the required sample size of 180, the number of nurses selected from GMCTHRC = 245/390*180= 113

The different units/ departments of the selected hospitals were considered as different strata. Number of nurses to be selected from different units (strata) from each of the hospitals was calculated proportionately.

A separate list of names of nurses meeting the inclusion criteria was developed from the list obtained from administrative section. Out of 390 nurses, 80 nurses did not meet the inclusion criteria. From the list of nurses who met the inclusion criteria, required numbers of nurses were selected using simple random sampling (lottery method) without replacement from each unit. All of the randomly selected nurses consented to participate in the study.

Inclusion criteria:
Nurses with at least one year of working experience in clinical settings (unit) of the selected hospitals and willing to participate were included in the study.

Procedure and Methodology
The study was carried out after the approval of research proposal from the Institutional Review Committee (IRC) of Tribhuvan University, Institute of Medicine for ethical clearance. A written request letter from Pokhara Nursing Campus was submitted to the Institutional Review Committee (IRC) of the selected hospitals for permission to conduct the research. After the approval from IRC of different hospitals, Director of Hospital, Matron and Ward Incharge were briefed about the objectives, process and importance of the study and formal permission was taken.

Prior to data collection, informed consent was taken from randomly selected nurses of various unit after giving information about the nature of the study and their role in research. It was distributed and collected by the researcher herself so as to prevent contamination of the data and gain feasibility.

A three section questionnaire was employed to obtain data from the subjects. Part I of the questionnaire included questions related to the demographic and work related characteristics of the nurses. The second part of the questionnaire was a Symptom survey segment which assessed the prevalence of musculoskeletal pain over the past year. The symptom survey segment was adapted from Nordic Musculoskeletal Questionnaire and consists of questions referring to nine body areas. The third part of the questionnaire consisted of questions on perception of nurses on factors that may contribute to development of musculoskeletal pain among nurses. It included 17 conditions and tasks at work that could contribute to musculoskeletal pain to be scored on a scale of 0 to 10[4].

A total of 180 questionnaires were administered to the nurses. Only 2 questionnaires were not returned yielding a 98.8% response rate.

Statistical Analysis

After the completion of the data, data were checked for its completeness and accuracy. The obtained data was edited, coded and entered on the same day by the researcher herself. Data was entered into the computer using the software Epi-data version 3.1 and transferred into Statistical Package for Social Science (SPSS-16 version) for further analysis. Data was analyzed and interpreted according to the objectives of the study and research questions. Both descriptive and inferential statistics were used to analyze the data. Descriptive statistics (mean, frequency, percentage and standard deviation) was used to describe the socio-demographic and work related characteristics. Inferential statistics (Chi-square and Logistic regression) were used. Quantitative data were presented as mean and standard deviation. Qualitative data were presented as frequencies and percentage. Chi- square test was used to find out the association between musculoskeletal pain and selected socio-demographic and work related characteristics of nurses. Logistic regression was used to identify the risk factors of musculoskeletal pain among nurses. The level of significance was considered at 5% with p value< .05 and 95% confidence interval.

III.   Result

Table no 1 demonstrates that the age of the nurses ranged from 20-59 with a mean age of 27.57 and standard deviation of 8.29. With regard to body mass index, 60.7 percent had normal body mass index. More than half (57.3%) of the nurses were single. Nearly half (46.2%) of the nurses were found performing physical exercises. Almost all of the nurses (91.0%) had no any history of musculoskeletal disorder. Similarly 62.9 percent of the nurses had completed their diploma in Nursing.

Table no 1: Socio-demographic Characteristics of the Nurses

n=178

Characteristics	Number	Percent
Age in Completed Years		
20-29 years	102	57.3
30-39 years	40	22.5
40-49 years	25	14.0
50-59 years	11	6.2
(Mean age ± SD = 27.57± 8.29) years		
Body Mass Index(BMI) (kilograms/metre^2)		
<18.50 (Underweight)	36	15.2
18.5-24.99 (Normal)	101	60.7
25-29.99 (Overweight)	31	17.4
>30 (Obese)	10	6.7
(Mean BMI± SD= 22.26±3.65) kg/m^2		
Marital Status		
Single	102	57.3
Married	76	42.7
Perform Physical Exercise		
Physical Exercise per day (n=82)	82	46.1
< 30 minutes	58	32.6
≥ 30 minutes	24	13.5
History of Musculoskeletal disorder	16	9.0
Back Pain	7	3.9
Arthritis	6	3.3
Prolapsed Intervertebral disc (PIVD)	3	1.7
Level of Education		
Auxiliary Nurse Midwife (ANM)	7	3.9
PCL nursing	114	62.9
Bachelor in Nursing	52	30.3
Masters in Nursing	5	2.9

Table no 2 reveals that majority (88.2%) of the nurses were working as staff nurse. Regarding working department, more than half (69.6%) of the nurses were working along general units. More than half (60.7%) of the nurses had a clinical experience of less than 5 years and almost all (92.1%) of the nurses worked for more than 40 hours a week. Similarly 62.4 percent of the nurses worked in department with less than 3 staffs a shift. Majority (87.1%) of the nurses had not received any training on occupational health and safety. Regarding psychosocial factors, 52.5 percent of the nurses reported to have received support from supervisor or co-worker at work place. More than half (65.7%) of the nurses were satisfied with their job. Likewise 46.1 percent of the nurses reported that their job was safe. Most (92.1%) of the nurses had to attend excessive number of patients.

Majority (88.2%) of the nurses had to frequently lift or transfer dependent patients. Eighty six percent of nurses had to perform manual handling of patients.

Table no 2: Work Related Characteristics of the Nurses

n=178

Characteristics	Number	Percent
Current Job Title		
Auxiliary Nurse Midwife	7	3.9
Staff Nurse	157	88.2
Nursing Incharge	14	7.9
Working Department		
Critical unit	96	53.9
General unit	82	46.1
Years of Clinical Experience		
1 - 5 years	108	60.7
6 -10 years	46	25.8
11-15 years	5	2.8
16-20 years	19	10.7
Working Hours per week		
≤40 hours a week	14	7.9
>40 hours a week	164	92.1
Average Number of Nursing Staffs a Shift		
≤3	111	62.4
>3	67	37.6
Training on Occupational Health and Safety	23	12.9
Job Satisfaction		
Yes	117	65.7
Support from supervisor		
Yes	93	52.2
Job safety		
Yes	82	46.1
Attending excessive number of patients		
Frequent	164	92.1
Lifting or transferring dependent patients		
Frequent	157	88.2
Manual handling of patients		
Frequent	153	86.0

Critical unit - Intensive care unit, Operation theatre, Haemodialysis, Geriatric and Emergency ward
General unit - Medical ward, Surgical ward, Paediatric ward, Obstetrics and gynaecology ward, Psychiatric ward, Orthopaedic ward and outpatient department

Table no 3 shows that majority (86.0%) of the nurses reported musculoskeletal pain persisting in at least one of the 9 anatomical sites and lasting for more than 3 days. Among nurses with complaints of musculoskeletal pain, more than half (66.7%) of the nurses had experienced pain at more than one anatomical site in the past year.

Table no 3: Prevalence of Musculoskeletal Pain among Nurses

n=178

Musculoskeletal Pain	Number	Percent	95%CI
Yes	153	86.0	0.81-0.91
No	25	14.0	
Musculoskeletal Pain among Nurses (n=153)			
Pain along single body site	51	33.3	0.23-0.43
Pain along more than one body site	102	66.7	0.55-0.76

CI: Confidence Interval

Table no 4 depicts that the prevalence of musculoskeletal pain was highest along the lower back (61.8%) followed by ankles/ feet (34.8%) and neck (29.2%).

Table no 4: Musculoskeletal Pain among Nurses in Different Body Regions

n=153

Body regions*	Number	Percent	95% CI
Lower back	110	61.8	0.55-0.69
Ankles/Feet	62	34.8	0.28-0.42
Neck	52	29.2	0.22-0.36
Shoulder	44	24.7	0.18-0.31
Upper back	40	22.5	0.16-0.29
Hip/Thighs	40	22.5	0.16-0.29
Knees	37	20.8	0.15-0.27
Wrists/ Hands	31	17.4	0.12-0.23
Elbows	23	12.9	0.08-0.18

*Multiple responses CI: Confidence Interval

Table no 5 reveals that nearly half (43.1%) of the nurses reported lower back as the most significantly affected body part as a result of musculoskeletal pain followed by ankle/ feet (14.4%) and neck (9.1%).

Table no 5: Musculoskeletal Pain among Nurses According to the Most Significant Body Part Involved

n=153

Body Region	Number	Percent
Lower back	66	43.1
Ankles / Feet	22	14.4
Neck	14	9.1
Hip/Thighs	14	9.1
Upper back	11	7.2
Shoulder	8	5.2
Wrists/Hands	7	4.6
Knees	6	3.9
Elbows	5	3.3

Table no 6 demonstrates that among the nurses suffering from musculoskeletal pain, more than half (63.4%) of the nurses reported some interference with work as a consequence of musculoskeletal pain. Similarly more than half (65.4%) of the nurses had complains of some interference outside work and 68.0 percent had complains of interference with the sleep. More than half (62.1%) of the nurses had not sought any kind of treatment. However majority (89.5%) of the nurses had changed ward/ department as a result of musculoskeletal pain.

Table no 6: Effect of Musculoskeletal Pain among Nurses

n=153

Effect	Number	Percent
Interference with Work		
No interference	35	22.9
Some interference	97	63.4
Had to take sick leave due to pain	21	13.7
Interference Outside Work		
No interference	46	30.1
Some interference	100	65.4
Had to stop enjoying activity due to pain	7	4.5
Interference with Sleep		
No interference	45	29.4
Some interference	104	68.0
Affects every night	4	2.6
Treatment Sought due to Pain	58	37.9
Changed Ward (Department) due to Pain	137	89.5

Table no 7 reveals the association between musculoskeletal pain and socio-demographic characteristics of the nurses. Musculoskeletal pain among nurses was found to be significantly associated with age (p= .041) and Body mass index (p< .001).

Table no 7: Association between Musculoskeletal Pain and Selected Socio-demographic Characteristics of Nurses

Characteristics	Musculoskeletal Pain		χ^2	p-value
	Yes **n (%)**	**No** **n (%)**		
Age in Years <30 years ≥ 30 years	83 (81.4) 70 (92.1)	19 (18.6) 6 (7.9)	4.155	.041*
Body Mass Index Underweight Normal Overweight and obese	23 (63.9) 95 (94.1) 35 (85.4)	13 (36.1) 6 (5.9) 6 (14.6)	20.027	.000*
Marital Status Single Married	85 (83.3) 68 (89.5)	17 (16.7) 8 (10.5)	1.360	.244
Physical Exercise Yes No	71 (86.6) 82 (85.4)	11 (13.4) 14 (14.6)	0.05	.823
Education Status Below Bachelors Bachelors and above	101 (83.5) 52 (91.2)	20 (16.5) 5 (8.8)	1.931	.247

* p value significant at < .05 χ^2 =Chi-square CI= Confidence Interval

Table no 8 reveals the association between musculoskeletal pain and work related characteristics of thenurses. Musculoskeletal pain among nurses was found to be significantly associated with years of clinical experience (p= .033), job satisfaction (p= .038) and attending excessive number of patients (p= .005).

Table no 8: Association between Musculoskeletal Pain and Selected Work Related Characteristics of Nurses

Characteristics	Musculoskeletal Pain		χ^2	p-value
	Yes **n (%)**	**No** **n (%)**		
Working Department General unit Critical units	86 (81.90) 67 (43.79)	19 (18.06) 6 (56.21)	3.479	.062
Years of Clinical Experience ≤5 years >5 years	 88 (81.48) 65 (92.86)	 20 (18.52) 5 (7.14)	4.553	.033*
Average Number of Nursing Staffs per Shift ≤3 >3	 94 (84.68) 59 (88.06)	 17 (15.31) 8 (11.94)	0.394	.530
Training on Occupational Health and Safety Yes No	 20 (80.0) 133 (86.9)	 5 (20.0) 20 (13.07)	0.854	.355
Support from Supervisor Yes No	82 (88.17) 71 (83.53)	11 (11.83) 14 (16.47)	0.793	.373
Job Satisfaction Satisfied Dissatisfied	96 (82.76) 57 (91.93)	20 (17.24) 5 (8.06)	4.310	.038*
Job Safety Yes No	68 (82.93) 85 (88.54)	14 (17.07) 11 (11.46)	1.155	.283
Attending excessive number of patients Rare Frequent	8 (57.1) 145 (88.4)	6 (42.9) 19 (11.7)	8.019	.005*
Lifting dependent patients Rare Frequent	16 (18.1) 137 (87.3)	5 (2.9) 20 (12.7)	1.075	.374
Manual handling of patients Rare Frequent	20 (80.0) 133 (86.9)	5 (20.0) 20 (13.1)	0.377	.539

* p value significant at < .05 χ^2 =Chi-square OR= Odds ratio CI= Confidence Interval

Table no 9 demonstrates that among the nurses suffering from musculoskeletal pain, attending an excessive number of patients in one day (63.4%), working in same position for a prolonged period of time (56.2%) and lifting/ transferring dependent patients (47.1%) were the most perceived risk factors of musculoskeletal pain.

Table no 9: Perception on Job Factors Contributing to the Development of Musculoskeletal Pain among Nurses (Greater than 7 on a scale of 0-10)

n=153

Job Factors	Major Problem	
	Number	Percent
Attending an excessive number of patients in one day	97	63.4
Working in the same position for long periods	86	56.2
Lifting or transferring dependent patients	72	47.1
Work Scheduling	58	37.9
Working in an awkward or cramped position	55	36.0
Inadequate training on injury prevention	53	34.6
Not enough rest breaks or pauses during the work day	52	34.0
Continuing to work while injured or hurt	51	33.3
Carrying, lifting or moving heavy materials or equipments	49	32.0
Bending or twisting your back in an awkward way	45	29.4
Unanticipated (unexpected) sudden movement or fall by patient	41	26.8
Working with confused or agitated patients	29	19.0
Working near or at your physical limit	27	17.7
Reaching or working away from your body	25	16.3
Assisting patients during gait activities	25	16.3
Performing the same task over and over	21	13.7
Performing manual nursing techniques	20	13.1

Table no10 reveals the logistic regression of the factors that could contribute to musculoskeletal pain among nurses. Variables which were significantly associated with musculoskeletal pain (p< .05) were entered into logistic regression. Variance Inflation Factor (VIF) was calculated (VIF<10) to check Multicollinearity among independent variables. Goodness of fit was assessed using Hosmer and Lemeshow Test (x^2=12.157, p= .144). The model explained 34.0 percent (Nagelkerke R square) of the variance and correctly classified 87.1 percent of the cases.

Nurses having BMI less than 18.50 (underweight) had 66 percent higher odds of having musculoskeletal pain than nurses having normal body weight (OR= 0.331 CI =0.084-1.310).Overweight and obese nurses were 3.5 times more likely to have musculoskeletal pain than nurses with normal body weight (OR=3.459 CI=0.824-14.520). Similarly nurses dissatisfied with their job were 3.59 times more likely to have musculoskeletal pain as compared to nurses who were satisfied with their job (0R=3.598 CI=1.01-12.783) .Nurses who attend excessive number of patients had 89.9 percent higher odds of having musculoskeletal pain (OR=0.104 CI=0.022-0.491). Body mass index, job satisfaction and excessive work load were significant contributor of musculoskeletal pain.

Table no 10: Logistic Regression of Factors Contributing to Musculoskeletal Pain among Nurses

n=178

Factors	Musculoskeletal Pain		Adjusted OR (95% CI)	p-value
	Yes n (%)	No n (%)		
Age				
<30 years	83 (81.4)	19 (18.6)	0.866(0.190-3.196)	.853
≥30 years	70 (92.1)	6 (7.9)	1	
Body Mass Index				
Underweight	23 (63.9)	13 (36.1)	1	.001*
Normal	95 (94.1)	6 (5.9)	0.331(0.084-1.310)	.115
Overweight and Obese	35 (85.4)	6(14.6)	3.459(0.824-14.520)	.09
Working Department General unit				
Critical units	86 (81.90)	19 (18.06)	1	
	67 (43.79)	6 (56.21)	0.335(0.111-1.010)	.052
Years of clinical experience				
≤ 5 years	88 (81.48)	20 (18.52)	1	
> 5 years	65 (92.86)	5 (7.14)	0.866(0.190-3.956)	.296
Job satisfaction				

Satisfied	96 (82.76)	20 (17.24)	1	
Dissatisfied	57 (91.93)	5 (8.06)	3.598(1.01-12.783)	.004*
Attending excessive number of patients				
Frequent	145(88.4)	19 (11.7)	1	
Rare	8 (57.1)	6 (42.9)	0.104(0.022-0.491)	.048*

*p value significant at < .05 OR= odds ratio CI= confidence interval

IV.   Discussion

This cross sectional study design was used to find out the prevalence and risk factors of musculoskeletal pain among nurses working in selected hospitals of Kaski.

The result of this study indicated an eighty six percent prevalence of musculoskeletal pain persisting in any body part and lasting for at least 3 days. However previous studies have documented various rates of musculoskeletal pain over a 12 month period in a variety of population. The prevalence of musculoskeletal pain reported in the study is comparable to the prevalence rate reported by studies performed on clinical nurses from Saudi Arabia (85.0%), Nigeria (85.0%), China (81.8%) and India (89.1%) [9]. However the prevalence reported by the study is lower than the reported prevalence of musculoskeletal pain in Portugal and Malaysia[10].The differences in the results may be attributed to the differences in demographic characteristics, range of disease condition, practice settings, study participants and availability of basic equipments in clinical settings.

Among the different body sites, the highest prevalence of musculoskeletal pain among nurses according to the study was at Lower back (61.8%) followed by ankles/feet (34.8%) and neck (29.2%).This distribution pattern of musculoskeletal pain among nurses is consistent with that reported in the literature as lower back pain was the most common complaint of nurses in our nursing population. This finding is similar to the findings reported by the study conducted in Nigeria which concluded an annual prevalence of ankle pain and neck pain as 35.0 percent and 29.2 percent respectively[4]. However unlike the current study findings many other studies documented neck pain and shoulder pain as the second and third most commonly affected anatomical site due to musculoskeletal pain.

Previous studies have documented different rates of lower back pain over a 12 month period ranging between 40.0 to 80.0 percent. The current study findings revealed 61.8 percent prevalence of lower back pain. This finding is in line with the findings of a study conducted in China where the prevalence of lower back pain was documented as 62.7 percent [11]. In contrast to the study findings, a high prevalence of lower back pain (78.0%) was reported by a study conducted at Shahid Gangalal Hospital, Kathmandu [7].

The present study also concluded that more than half of the nurses reported some interference in work, sleep and outside activities as a result of musculoskeletal pain. Only 13.7 percent of the nurses reported absenteeism (sick leave) as a consequence of musculoskeletal pain. These findings are similar to the findings of study conducted by Ribeiro, Florentino and Loureiro[1]. Abseentism may not be greater because nurses often turn to self medication as a treatment of musculoskeletal pain.

Regarding the association of musculoskeletal pain with socio-demographic characteristics of the respondents, the study findings revealed a statistically significant association between the musculoskeletal pain and age. This finding is similar to the findings of in which age was significantly associated with musculoskeletal pain (x^2=289.885, p< .01)[11]. Likewise the study findings are also consistent with the findings of study conducted among Thai nurses (P< .05) and Tunisian nurses (p< .001). As age is often co-related with job tenure, this association may be due to cumulative effects of long term exposure of nurses to adverse working conditions contributing to musculoskeletal pain.

The present study also concluded a statistically significant association between musculoskeletal pain and Body mass index. This finding is in line with several studies which concluded a significant association between musculoskeletal pain and Body mass index (p< .001)[12].SimilarlyYitayeh et al.[13] in a cross sectional study also found that musculoskeletal pain was significantly associated with Body mass index revealing that obese nurses were 3.5 times more likely to have musculoskeletal pain than nurses with normal BMI.

This cross sectional study also aimed to study nurse's perception on job risk factors that may contribute to their musculoskeletal condition. According to the study findings 63.41 percent of the nurses perceived that attending an excessive number of patients per day were the most common job risk factor contributing to the musculoskeletal pain. The other most perceived job risk factors of musculoskeletal pain were working in the same position for prolonged period of time (56.2%) and lifting or transferring dependent patients(47.1%).These findings are consistent with the previous reports indicating patient handling and transferring dependent patients as the most important predictors of musculoskeletal pain [4,8]. Tseukora et al.[14] also reported that attending an excessive number of patients in one day was the most perceived risk factor of musculoskeletal pain among nurses. Systematic review of many studies also reported that musculoskeletal pain may have an association with tasks and items related to work and postures. Cultural differences in perception and reporting of pain and disorders are adduced for the variation in rates of musculoskeletal pain in different studies.

This study also aimed to study the factors that contribute towards developing musculoskeletal pain among nurses. Logistic regression analysis of the factors indicated BMI (underweight), lack of job satisfaction and not enough rest breaks during the work day were the risk factors of musculoskeletal pain among nurses. These findings are consistent to the findings of the studies conducted which concluded that heavy work load and not enough rest breaks were the risk factors of musculoskeletal pain among nurses[11,16]. The present study also revealed that lack of job satisfaction was an important predictor of musculoskeletal pain among nurses which coincides with few studies which aimed to find the association between musculoskeletal pain and psychological factors [17, 18].

Unlike the other studies that focused on low back pain only, this study examined pain along multiple body sites among the nurses. However, this study was conducted among nurses in selected hospitals of Kaski district, so this limits the generalizability of the findings to other setting because this may not necessarily reflect the characteristics of nurses in Nepal as a whole. This study investigates 1 year period prevalence of musculoskeletal pain among nurses and hence chances of recall bias may be high.

V. Conclusion

Based on the findings of the study, it can be concluded that majority of the nurses reported musculoskeletal pain in at least one of the nine anatomical sites persisting for at least 3 days. This study further showed that there was significant association of musculoskeletal pain with age, body mass index, and years of clinical experiences, job satisfaction and attending excessive number of patients. Among the nurses suffering from musculoskeletal pain, attending an excessive number of patients in one day, working in same position for a prolonged period of time and lifting/ transferring dependent patients were the most perceived risk factors of musculoskeletal pain. Among various factors, body mass index (underweight), lack of job satisfaction and frequently attending excessive number of patients were major predictors of musculoskeletal pain. Thus it may be beneficial for hospital administrators to adopt certain strategies such as shorter shifts and inclusion of additional breaks for nurses to prevent musculoskeletal disorders and pain related to them.
The high prevalence of musculoskeletal pain amongst nurses, as the study results show, is a clear indication that priority should be given to provide more comprehensive surveillance on musculoskeletal pain.

Ergonomic programs like health education and training on occupational health and safety should be provided to the nurses in an attempt to improve their working conditions. This intervention might be helpful to improve their musculoskeletal conditions.

Acknowledgement

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