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Musculoskeletal disorders and contributing factors among student nurses

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Abstract

Introduction: Musculoskeletal disorders (MSDs) are injuries that affect the body's movement or its system, such as muscles, tendons, nerves, discs, and ligaments. **Objectives:** This study aimed to assess musculoskeletal disorders and identify the contributing factors and associations between musculoskeletal disorders and the selected variables among student nurses. **Materials and methods:** The tools used were a demographic profile, contributing factors, and a musculoskeletal disorder assessment tool. The questionnaire was shared via email to reach the targeted population. Data were analyzed using frequency, percentage and chi-square tests. **Results:** Regarding areas of pain and discomfort during the last 12 months, approximately 26.2% reported pain in the lower back region, 20.4% in the shoulder region, approximately 15.4% in the neck region, and 13.5% in the upper back region. There was a statistically significant association found between pain and discomfort in the neck and upper back region during the last seven days with prolonged sitting and standing p value. Prolonged sitting and standing and improper body mechanics were the main contributing factors. **Conclusion:** Most of the students experienced musculoskeletal pain and discomfort during the past 12 months in the lower back region, and some of them were not practicing proper body mechanics while handling the patients during their clinical posting.

Key words: Musculoskeletal disorders, contributing factors, nursing students

Introduction

Healthcare professionals, especially nurses, are at risk of musculoskeletal disorders (MSDs), as they are involved in the bedside caregiving process. A study conducted among health professionals from different clinical departments in a hospital reports, that working in the same position for a prolonged time, and handling patients while shifting were the reasons for work-related musculoskeletal disorders (Yasobant, S., & Rajkumar, P. 2014).

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The one-year incidence rate of WMSDs (work-related musculoskeletal disorders) was 20.7%. The risks for WMSDs were patient transfers and patient repositioning (Campo, Weiser, Koenig, & Nordin, 2008). MSD symptoms were prevalent in the shoulder region. The different risk factors identified were the type of department, age, exercise habits, working days, etc. (Lin, 2020). A study was performed among nurses from four different departments to assess musculoskeletal symptoms using a Nordic standardized musculoskeletal questionnaire. Approximately 85% of the nurses experienced at least one musculoskeletal symptom, and the most common symptom was low back pain. Long working hours and underweight were the associated risk factors (Attar, 2014). A study conducted among nursing students in Saudi Arabia to assess MSDs during clinical posting revealed that nursing students faced problems with MSDs due to practising improper body mechanics during clinical training hours. The majority of the students were facing problems in the lower back (Elsayed, 2019).

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A study conducted among dental students to determine the prevalence of musculoskeletal pain (MSP) revealed that approximately 68.3% of the students had MSD in any one part of the body. The factors associated with MSD are long clinical hours, obesity, and less exercise (Hashim, Salah, Mayahi, & Haidary, 2021). A study conducted among nursing assistants working in nursing homes revealed that more than 80% of them had MSDs, and the common symptoms were shoulder and low back pain (Cheung, Szeto, Lai, & Ching, 2018). A study conducted among nurses revealed that approximately 74.7% had MSDs in one year, and the most common sites affected were the back and neck (Luan et al., 2018). Hence, the researcher conducted this study to understand the contributing factors for musculoskeletal disorders (MSDs) that may help to plan interventions to prevent and manage musculoskeletal disorders among student nurses.

Objectives

The objectives of the study were to assess musculoskeletal disorders and to identify the contributing factors and associations between musculoskeletal disorders and the selected variables among student nurses.

Materials and methods

A descriptive survey was conducted in May 2021 among 260 students in selected nursing colleges of Udupi District, Karnataka, to assess musculoskeletal disorders and contributing factors. The sample size was calculated based on the estimation of the proportion formula. Nursing students between the ages of 19 and 25 years were selected through a convenient sampling technique. Tools used for the data collection were Tool 1 - "Contributing factors of musculoskeletal disorders" consisting of nine items, and the reliability was 1.00. Tool 2 "Musculoskeletal disorders assessment tool". In this tool, there were three main questions, and under each question, there were nine items, comprising a total of 27 items, and the reliability was 0.99.

Approval from the Kasturba Hospital Institutional Ethics Committee (IEC NO: 136/2021), administrative approval from the study settings, and CTRI registration (CTRI/2021/04/033082) was performed before the commencement of the study. Informed consent was obtained, and data were collected through online mode

using the Google form, which was sent directly to the participants through email.

Results

Data was collected from 260 samples and descriptive and inferential statistics were used for analysis.

Table 1

Frequency and percentage of sample characteristics

<i>N=260</i>		
Variables	Frequency (f)	Percentage (%)
Age in years		
Mean age - 20.6		
19-21	209	80.4
22-25	51	19.4
Gender		
Male	40	15.4
Female	220	84.6
Year of Study		
Second year BSc Nursing	90	34.6
Third year BSc Nursing	92	35.4
Fourth year BSc Nursing	78	30.0
Height (cm)		
Mean height-161.4		
141-150	17	6.5
151-160	109	41.5
161-170	97	37.3
171-180	32	12.3
181-190	5	1.9
Weight (kg)		
Mean weight-55.9		
41-50	98	38.7
51-60	92	35.4
61-70	42	16.2
71-80	26	10.8
81-90	2	0.8
BMI		
≤18.5	38	14.6
18.6-24.9	197	75.8
25-29.9	22	8.5
≥30	3	1.2

The data in Table 1 show that the majority, 209 (80.4%), were in the age group of 19-21 years, with a mean age of 20.6 and a standard deviation of 1.151.

Approximately 220 (84.6%) were females, 92 (35.4%) were third year BSc Nursing students, and the mean height and weight were 161.4 cm and 55.9 kg, respectively. Approximately 197 (75.8%) students had a normal body mass index.

Table 2*Contributing factors in frequency and percentage**N=260*

Contributing factors	Frequency (f)	Percentage (%)
History of musculoskeletal disorders		
No	260	100.0
History of surgery		
No	260	100.0
Long-time standing		
No	138	53.1
Yes	122	46.9
If yes, duration in hours		
1-5	50	19.2
6-10	68	26.2
11-15	2	0.8
16-20	2	0.8
Long Time Sitting		
No	219	84.2
Yes	41	15.8
If yes duration in hours		
1-5	35	13.5
6-10	6	2.3
After doing exercises/activities		
No	116	44.6
Yes	144	55.4
Genetically related MSDs		
No	260	100.0
Yes	0	
Spinal Anaesthesia received		
No	260	100.0
Yes	0	
Proper body mechanics followed		
Yes	209	80.4
No	51	19.6

The data presented in Table 2 show the contributing factors, of which 122 (46.9%) reported musculoskeletal pain during prolonged standing with a duration of 1-5 hours, 50 (19.2%), and 6-10 hours 68 (26.2%). Approximately 41 (15.8%) reported a prolonged sitting period of 1-5 hours. Most of them (144, 55.4%) reported musculoskeletal pain after exercising, and 51 (19.6%) reported as not practicing any proper body mechanics.

Table 3*Musculoskeletal Disorders in Frequency and Percentage**N=260*

Musculoskeletal Disorders	Pain and discomfort during the last 12 months		Last 12 months consulted a physician		Pain and discomfort during last 7 days. <i>Frequency (%)</i>	
	<i>Frequency (%)</i>		<i>Frequency (%)</i>			
	No	Yes	No	Yes	No	Yes
Neck	220 (84.6)	40 (15.4)	251 (96.5)	9 (3.5)	244 (93.8)	16 (6.2)
Shoulder	207 (79.6)	53 (20.4)	249 (95.8)	11 (4.2)	242 (93.1)	18 (6.9)
Upper back	225 (86.5)	35 (13.5)	251 (96.5)	9 (3.5)	254 (97.7)	6 (2.3)
Elbows	252 (96.9)	8 (3.1)	256 (98.5)	4 (1.5)	257 (98.8)	3 (1.2)
Wrist/Hands	240 (92.3)	20 (7.7)	254 (97.7)	6 (2.3)	254 (97.7)	6 (2.3)
Lower back	192 (73.8)	68 (26.2)	247 (95)	13 (5)	230 (88.5)	30 (11.5)
Hips/Thighs	235 (90.4)	25 (9.6)	255 (98.1)	5 (1.9)	252 (96.9)	8 (3.1)
Knees	239 (91.9)	21 (8.1)	250 (96.2)	10 (3.8)	254 (97.7)	6 (2.3)
Ankles/Feet	229 (88.1)	31 (11.9)	253 (97.3)	7 (2.7)	255 (98.1)	5 (1.9)

The data presented in Table 3 show the area of pain and discomfort during the last 12 months and 7 days and the consulting physicians for the last 12 months for musculoskeletal problems. Approximately 68 (26.2%) participants reported pain in the lower back region, 53 (20.4%) in the shoulder region, approximately 40 (15.4%) in the neck region, and 35 (13.5%) in the upper back region.

Table 4*Association between contributing factors and MSDs**N=260*

Contributing Factor	Pain and Discomfort last 12 Months (Lower Back)			df	p
	No	Yes			
Prolonged Standing	No	Yes			
No	123	15	35.573	1	0.000
Yes	69	53			
After doing Exercises	No	Yes			
No	101	15	18.961	1	0.000
Yes	91	53			
<i>Pain and Discomfort Last 7 Days</i>					
Neck					
Prolonged Sitting	No	Yes			
No	211	8			
Yes	33	8	15.040	1	0.000
Prolonged Sitting	Upper Back				
No	216	3		1	0.020
Yes	38	3	5.418		

The data presented in Table 4 show that there was a statistically significant association between pain experienced while standing for a prolonged period of time ($=35.573, p=0.000$) and pain and discomfort after *exercising* ($=18.961,$

$p=0.000$), pain and discomfort lasting 12 months in the lower back region, pain during prolonged sitting, pain and discomfort during the last 7 days in the neck ($=15.040$, $p=0.000$) and upper back region ($=5.418$, $p=0.020$).

Discussion

The present study shows during the last 12 months, approximately 68 (26.2%) reported pain in the back region, and 53 (20.4%) reported pain in the shoulder region. Others have reported pain in the neck region 40(15.4) and upper back region 35(13.5).

A study performed among healthcare workers reported that back pain (45.7%), neck pain (28.5%) and elbow pain were the least reported (5%) among all symptoms. Among healthcare professionals, most nurses face musculoskeletal problems (Yasobant, 2014). Approximately 47.8% of nurses reported having MSDs in one year (Thinkhamrop et al., 2017).

In the present study, contributing factors show that approximately 122 (46.9%) reported musculoskeletal pain during prolonged standing with a duration of 1-5 hours, i.e., 50 (19.2%), and 6-10 hours, i.e., 68 (26.2%). Similar results are found in previous studies performed among home care nurses (Carneiro, Braga, & Barroso, 2017). Back pain is a common problem, and the factors associated with it are obesity and less physical exercise (Alnaami et al., 2019).

An association between pain and discomfort in the neck and upper back region during the last 7 days with prolonged sitting and standing was found in this study. A study was conducted to identify musculoskeletal symptoms and risk factors, in which 85.8% of the musculoskeletal disorder symptoms were in the right shoulder region and the neck (62.2%). Factors associated with MSDs were age, area of work, exercise habits, job title, type of department, and the number of work days per week (Lin, 2020). There was a relationship between the clinical hours per day and MSDs. Wrong posture and improper body mechanics are risk factors for MSDs (Elsayed, 2019).

Conclusion

Most of the students experienced musculoskeletal pain and discomfort during the last 12 months in

the lower back region, and some of them were not practicing proper body mechanics while taking care of the patients during their clinical posting. Nurses must know the basic body mechanisms and ergonomic positions, which will be very helpful for nurses to take care of patients in the clinic. Hence, more emphasis should be given to following body mechanics while taking care of patients.

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References

- Alnaami, I., Awadalla, N. J., Alkhairy, M., et al. (2019). Prevalence and factors associated with low back pain among health care workers in southwestern Saudi Arabia. *BMC Musculoskeletal Disorders*, 20(1). doi:10.1186/s12891-019-2431-5
- Carneiro, P., Braga, A.C., & Barroso, M. (2017). Work-related musculoskeletal disorders in Home Care Nurses: Study of the main risk factors. *International Journal of Industrial Ergonomics*, 61, 22-28. doi:10.1016/j.ergon.2017.05.002
- Campo, M., Weiser, S., Koenig, K. L., & Nordin, M. (2008). Work-related musculoskeletal disorders in physical therapists: a prospective cohort study with 1-year follow-up. *Physical therapy*, 88(5), 608-619.
- Cheung, K., Szeto, G., Lai, G., & Ching, S. (2018). Prevalence of and factors associated with work-related musculoskeletal symptoms in nursing assistants working in nursing homes. *International Journal of Environmental Research and Public Health*, 15(2), 265. doi:10.3390/ijerph15020265.
- Elsayed, A. A. (2019). Work-related musculoskeletal disorders among nursing students during clinical training. *Am J Nurs*, 7(6), 952-7.
- Hashim, R., Salah, A., Mayahi, F., & Haidary, S. (2021). Prevalence of postural musculoskeletal symptoms among dental students in the United Arab Emirates. *BMC Musculoskeletal Disorders*, 22(1). doi:10.1186/s12891-020-03887-x
- Lin, S. C., Lin, L. L., Liu, C. J., Fang, C. K., & Lin, M. H. (2020). Exploring the factors affecting

- musculoskeletal disorders risk among hospital nurses. *PLoS One*, 15(4), e0231319.
- Luan, H. D., Hai, N. T., Xanh, P. T., et al. (2018). Musculoskeletal disorders: Prevalence and associated factors among district hospital nurses in Haiphong, Vietnam. *BioMed Research International*, 2018, 1-9. doi:10.1155/2018/3162564.
- Smith, D. R., & Leggat, P. A. (2004). Musculoskeletal disorders among rural Australian nursing students. *Australian Journal of Rural Health*, 12(6), 241-245. doi:10.1111/j.1440-1854.2004.00620.x.
- Thinkhamrop, W., Sawaengdee, K., Tangcharoensathien, V., et al. (2017). Burden of musculoskeletal disorders among registered nurses: Evidence from the Thai Nurse Cohort Study. *BMC Nursing*, 16(1). doi:10.1186/s12912-017-0263-x.
- Yasobant, S., & Rajkumar, P. (2014). Work-related musculoskeletal disorders among health care professionals: A cross-sectional assessment of risk factors in a tertiary hospital, India. *Indian Journal of Occupational and Environmental Medicine*, 18(2), 75.

