



ORIGINAL ARTICLE

Prevalence of Selected Musculoskeletal Disorders among the Students of Faculty of Allied Health Sciences, University of Peradeniya

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Abstract

Introduction: Musculoskeletal disorders (MSDs) can affect the ability, efficiency and effectiveness, well-being, productivity, absence from work, quality of work, and performance of individuals, as well as leading to restrictions on the normal activities of students. University life is a period in which individuals experience significant changes where it can lead to MSDs in undergraduates. MSDs may cause pain in the neck, shoulder, arm, wrist, hands, upper and lower back, hips, knees and feet.

Objectives: This current study was carried out to evaluate the prevalence of musculoskeletal disorders among the students of faculty of Allied Health Sciences, University of Peradeniya.

Methods: This was a cross sectional study. Data was collected through a self-administered questionnaire and total of 231 students responded.

Results: 26.4% students were mentioned that they did not affect with musculoskeletal disorders in any anatomical region. Neck problems (41.6%) were recorded with the highest percentage of trouble during last 12 months. Among nine anatomical regions, students were suffered with ankle/foot problems (18.9%) mostly which prevent their day-to-day activities, comparably high involvement of lower back problems (8.6%) lead to took medications and more students have seek for physiotherapy for their neck problems (7.4%). During last 7 days, students were complained that they had more trouble in neck region (20.3%). Wrist/hand was the least involved region in last 12 months and last 7 days.

Discussion and conclusion: Among all the students, 73.6% were affected with musculoskeletal disorders in any anatomical region. Neck was the most prevalent region that has been presented in all the variables. Lower back was the second most prevalent region and ankle was the third most prevalent region to affect in most variables.

Introduction

Musculoskeletal disorders are defined as 'muscular pain or injuries to the human support system that can occur after any damage to the muscular and nervous system including muscles, bones, ligaments, tendons, and blood vessels that result in a single event or cumulative trauma, negatively impacting daily activities' [1,2]. These disorders can affect the ability, efficiency and effectiveness, well-being, productivity, absence from work, quality of work, and performance of individuals [3,4], as well as leading to restrictions on the normal activities of students [5,6]. MSDs may cause pain in the neck, shoulder, arm, wrist, hands, upper and lower back, hips, knees and feet [7]. One study has revealed that the most common incidence of discomfort among students is in the shoulder, neck and lower back segments. In the same study, sex was one of the factors affecting the incidence of musculoskeletal disorders in students [8]. In another study, it was found that there was a high prevalence of pain in the back and knees in dormitory students [9].

University life is a period in which individuals experience significant changes. In addition to vocational education, university education also causes changes in personality development, individual life and health behaviors. This change is especially important in terms of attitudes and behaviors in the field of health; because the attitudes and behaviors of the students about health individually affect themselves, their family and society in their present and future life. The level of health of the societies is measured by the majority of healthy individuals in the society [10]. University experiences contribute to a health-related lifestyle related to their future, depending on their choices [11].

The current study was carried out to evaluate the prevalence of musculoskeletal disorders among the undergraduate students of Faculty of Allied Health Sciences, University of Peradeniya. As they are following six different degree programs, their study type, materials, engagement in extracurricular activities, sports and physical activity levels are vary. It may affect their studies as well as if they do wrong practices, they may affect with musculoskeletal disorders.

Materials and Methods

For this questionnaire based cross-sectional study, Six hundred and fifty three (653) registered students were taken as the study population and calculated study sample was 243. Students who were presented with recent fractures, any injuries, long-term illnesses like asthma etc. were excluded. Study year (Batch - 4th year, 3rd year, 2nd year, 1st year), degree program (Medical Laboratory Sciences-MLS, Pharmacy-PCY, Physiotherapy-PHY, Radiography/Radiotherapy-RAD, Nursing-NUR), sex (male, female) and body mass index - BMI category (underweight, normal weight, pre-obesity, obesity class I, obesity class II, obesity class III) were taken as the independent variables.

The standardized Nordic Musculoskeletal Questionnaire (NMQ)

A modified version of the Standardized Nordic Questionnaire (SNQ) [12] was used to assess the students' musculoskeletal complaints. The SNQ is a reliable and valid tool that has been used repeatedly among health professionals and students in various countries, to investigate MSDs [13-18]. Each student was asked to indicate whether she/he had an episode of pain or discomfort in different anatomical regions of the body during previous seven days (point prevalence) and 12 months (period prevalence), and to indicate the severity of MSDs in the previous 12 months (i.e. whether MSDs interrupted his/her normal daily activities and/or required treatment or medical consultation). Addition to the SNQ, one more question was asked whether the students took any physiotherapy treatment for their musculoskeletal disorders.

Informed written consent was obtained from the

students who were willing to participate in this study. Only 231 answered questionnaires were collected giving a rate of participation of 95%. Students were in the age range of 21 to 35 years and consisted of both girls and boys (83 males-35.9%, 148 females-64.1%). Study sample consisted of 57-4th (final) year, 54-3rd year, 55-2nd year and 65-1st year students. They were; 37-MLS, 37-PCY, 46-PHY, 54-RAD, 57-NUR students. Among the total sample of the students according to BMI categories, it was identified that 43-underweight, 151-normal weight, 19-pre-obese, 2-obesity class I and 2-obesity class II students. In the analysis, confidence level was set to 95% in all the tests. Therefore, statistical significant level was taken as 5% ($p < 0.05$) to identify statistically significant difference between means/proportions of the variables.

Ethical approval for this study was obtained from Ethics Review Committee, Faculty of Allied Health Sciences, University of Peradeniya.

Results

This study was conducted as a cross sectional descriptive survey at the faculty of Allied Health Sciences, University of Peradeniya.

According to the statistical analysis, 26.4% of students informed that they were not affected with any regional discomfort during last 12 months of period. Among the involvement of number of regions, 20.3% prevalence was found with involvement of two regions as the highest percentage (Table 1).

Students were stated that, during last 12 months period they had more troubles in the neck region at any time (41.6%), ankle/foot problems (18.9%) affect their day-to-day activities more compared with other regions, comparably high involvement of lower back problems (8.6%) lead to took medications and more students have seek for physiotherapy for their neck problems (7.4%). During last 7 days, students were complained that they had more troubles in the neck region (20.3%). Wrist/hand was the least involved region in last

Table 1: Involvement of number of anatomical regions and the prevalence.

Number of anatomical regions involved	Prevalence
No involvement of any anatomical region	26.4
One region	15.2
Two regions	20.3
Three regions	10.8
Four regions	7.8
Five regions	8.2
Six regions	4.8
Seven regions	2.6
Eight regions	0.9
Nine regions	3.0
Involvement of any anatomical region	73.6

Table 2: Regional involvement and the prevalence of selected musculoskeletal disorders.

Anatomical region	Prevalence (%)				
	During last 12 months;				During last 7 days had trouble in
	Had a trouble in the region at any time	Trouble affect the normal day-to-day activities	Met a doctor/physician or took medications due to the regional trouble	Took physiotherapy treatments because of the trouble	
Neck	41.6	15.5	8.3	7.4	20.3
Shoulder	29.6	12.1	3.0	4.1	16.8
Elbows	26.3	11.6	3.0	4.5	16.4
Wrist/ hand	10.2	5.1	2.6	2.6	4.7
Upper back	18.9	8.7	4.1	2.1	9.4
Lower back	39.4	17.9	8.6	7.1	19.6
Hip/thigh	24.2	7.2	3.0	2.6	8.9
Knee	32.6	12.7	7.6	5.5	13.9
Ankle/foot	34.7	18.9	8.5	5.1	19.9

Table 3: Regional involvement in last 12 months at any time.

		Prevalence of the regional problems in last 12 months at any time (%)								
		Neck	Shoulder	Elbow	Wrist/hand	Upper back	Lower back	Hip/thigh	Knee	Ankle/foot
Study year	4 th year	50.9	30.2	25.9	3.7	20.4	46.3	17.0	26.8	37.5
	3 rd year	44.0	23.9	34.7	18.0	18.8	45.1	24.5	36.0	31.4
	2 nd year	37.0	24.1	20.4	9.3	18.9	34.0	30.2	37.0	28.3
	1 st year	35.0	38.3	25.0	10.3	17.5	33.3	25.0	31.1	40.7
	Total	41.6	29.6	26.3	10.2	18.9	39.4	24.2	32.6	34.7
Degree program	MLS	34.3	22.9	14.3	14.3	26.5	34.3	25.7	27.8	35.1
	PCY	33.3	14.3	25.0	8.1	16.7	16.7	14.3	22.2	26.5
	PHY	51.2	43.6	33.3	9.5	12.5	47.6	25.0	47.6	31.0
	RAD	36.5	23.5	21.6	4.1	18.4	44.2	8.0	28.3	33.3
	NUR	49.1	39.6	34.0	15.1	20.8	47.2	43.6	35.2	43.6
	Total	41.6	29.6	26.3	10.2	18.9	39.4	24.2	32.6	34.7
Sex	Male	42.1	24.3	24.3	12.0	26.0	41.9	20.0	30.8	33.3
	Female	41.3	32.4	27.3	9.2	15.1	38.2	26.4	33.6	35.4
	Total	41.6	29.6	26.3	10.2	18.9	39.4	24.2	32.6	34.7
BMI category	Under weight	20.0	21.1	15.0	4.9	12.5	35.0	35.0	31.7	32.5
	Normal weight	43.8	29.3	26.8	11.4	21.9	39.4	19.1	30.3	34.0
	Pre- obesity	50.0	27.8	33.3	11.1	16.7	42.1	36.8	38.9	47.4
	Obesity class I	100.0	50.0	50.0	50.0	0.0	100.0	50.0	50.0	50.0
	Obesity class II	50.0	50.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0
	Total	40.3	28.0	25.0	10.3	19.1	39.5	24.5	31.3	34.8

12 months and in last 7 days (Table 2).

Among all the students during the time period of last 12 months, they were complained about regional involvement by means of 41.6% of neck, 29.6% of shoulder, 26.3% of elbow, 10.2% of wrist/hand, 18.9% of upper back, 39.4% of lower back, and 24.2% of hip/thigh, 32.6% of knee and 34.7% ankle/foot (Table 3).

Study year

Among all, neck, upper back and lower back pro-

blems were more prevalent in 4th year students while the 3rd year students have shown higher prevalence in elbow and wrist/hand problems. Hip/thigh and knee problems were identified more in 2nd year students and the highest percentage of shoulder and ankle/foot problems were found in 1st year students (Table 3).

Degree program

Physiotherapy undergraduates were presented with the highest prevalence of neck, shoulder, lower back and knee problems while elbow, wrist/hand, hip/thigh

and ankle/foot problems were highly prevalent in nursing students. The highest percentage of upper back problems has shown by MLS students (Table 3).

Sex

Higher prevalence of neck, wrist/hand, upper and lower back problems were presented in males and higher prevalence of shoulder, elbow, hip/ thigh, knee and ankle/ foot problems were presented in females (Table 3).

BMI category

There were two students per each was included in obesity class I and II BMI categories. In those, almost all the students have problems in most of the regions. Among remaining three BMI categories, underweight students were not presented with a higher prevalence of any regional involvement. Pre-obesity students have shown the highest prevalence in neck, elbow, lower back, hip/thigh, knee and ankle problems and normal weighted students were presented with the highest prevalence of shoulder, wrist/ hand and upper back problems (Table 3).

Discussion

Among all the students, 73.6% were affected with musculoskeletal disorders in any anatomical region. Similar percentage was found in a study done in 2016; 73.1% students suffered with regional discomfort [19]. Another two studies reported much higher percentages than the current study with 81.5% [20] and 87.1% [21] respectively in 2018 and 2019. Neck was the most prevalent anatomical region of discomfort in the current study. Studies done in 2019 [21] and 2016 [19] among university undergraduates had the same results. A study conducted in 2017 among medical students has shown that they suffered more discomfort in the lower back area [22].

According to the current study, Neck (41.6%), lower back (39.4%) and ankle (34.7%) were the predominantly affected regions which were a more or less similar to previous study findings as follows; A study among coaching students (students who are studying to become sports coaches) in 2019 reported that 43% of students were affected with musculoskeletal disorders in neck region and lower back and ankle discomfort among 36% students [21]. Another study stated that the students were most affected with low back pain (80%), followed by neck pain (38.3%) and shoulder pain (35%) [22]. A study conducted among nursing personnel in 2016 has concluded that neck (48.9%) was the most prevalent discomfort region followed by ankle (47.2%) and upper back (40.7%) regions [19].

According to the study year; first year students were more affected with ankle region and third year students were more affected with lower back area while second and fourth year students were more complained about

discomfort in their neck region. First year students complain of ankle discomfort may be due to more engagement in walking, sports and other extracurricular activities in their first year. Third year students have more laboratory work and practical, therefore they may more complained on low back discomfort. Second and fourth year students have more lectures and clinical placements, they may have to flex their neck while engage in their work, therefore, it may end up with more neck discomfort. According to the degree program; MLS students more complained on ankle and RAD students were more complained on lower back while the students belongs to other three degree programs; PCY, PHY and NUR complained about neck discomfort. According to the analysis, both males and females were more prevalent on neck and lower back discomfort. According to the BMI category; under weighted students were more complained on lower back and hip discomfort while normal weighted and pre-obese students were complained more on neck.

The highest percentages of neck, shoulder, lower back and knee problems were observed in physiotherapy undergraduates and this may be as a result of utilization of their hands in forward leaning position with prolong standing for their practical and clinical sessions. Nursing students were presented with highest percentages of elbow, wrist/hand, hip/thigh and ankle/foot problems and this may relate with their clinical training and practical sessions where most of the time they have to stand, manual handling and bending forward position. Medical laboratory sciences undergraduates have shown the highest percentage of upper back problems among all five degree programs and it can be due to their leaning forward seated position during the laboratory practical.

Conclusion

Among all the students, 73.6% were affected with musculoskeletal disorders in any anatomical region. Neck was the most prevalent region that has been presented in all the variables. Lower back was the second most prevalent region and ankle was the third most prevalent region to affect in most variables.

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Conflict of Interest

There are no conflicts of interest.

Authors Contribution

All the authors equally contributed to this study.

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References

- Mirzaei R, Moussavi NSA, Asadi KB, Ansari H (2014) Comparative assessment of upper limbs musculoskeletal disorders by rapid upper limb assessment among computer users of Zahedan Universities. *J Health Scope* 3: e15226.
- Gupta A, Bhat M, Mohammed T, Bansal N, Gupta G (2014) Ergonomics in dentistry. *Int J Clin Pediatr Dent* 7: 30-34.
- Ataei SS, Heydari P, Varmazyar S (2017) Investigation of correlation of musculoskeletal disorders with work ability index and allowable load lifting limit. *Iran J Ergon* 4: 14-23.
- Moussavi-Najarkola SA, Mirzaei R (2012) Assessment of Musculoskeletal Loads of Electric Factory Workers by Rapid Entire Body Assessment. *Health Scope* 1: 71-79.
- Choobine A, Soleimanejad E, Daneshmandi H, Mohamadbeigi A, Izadi KH (2012) The prevalence of musculoskeletal disorders and postural assessment by Rula method in general dentists in Shiraz in 1389. *Izadi KH Dentistry* 24: 310-317.
- Seifi S, Eftekharian S, Sarrafan N, Gholinia H (2016) Ergonomic evaluation of frequency and risk factors of musculoskeletal disorder of specialist dentists of Babol Dentistry Faculty. *J Urmia Univ Med Sci* 27: 330-335.
- Graham C (2002) Ergonomics in dentistry, Part 1. *Dent Today* 21: 98-103.
- Shokri S, Ghalehnoei M, Taban E, Ahmadi O, Kouhnavard B (2015) Evaluation of Prevalence of Musculoskeletal Disorders among Students Using Portable Computer in Faculty of Health, Qazvin University of Medical Sciences. *J Health Res Commun* 1: 9-15.
- Kazemi S, Rafighi M (2017) Investigation the Musculoskeletal Disorders in Students of Dormitories of TarbiatModares University. 10th University Students Conference on Innovations in Health Sciences.
- Ayaz S, Tezcan S, Akinci F (2005) Hemşirelik Yüksekokulu Öğrencilerinin Sağlığı Geliştirme Davranışları. *Cumhuriyet Üniversitesi Hemşirelik Yüksek Okulu Dergisi* 9: 26-34.
- Mathews D (2008) Assessing sleep quality in young adult collage students aged 18-24 in relation to quality of life and anthropometrics. Master of Science Thesis, University of Maine.
- Kuorinka I, Jonsson B, Kilbom A, Vinterberg H, Biering-Sorensen F, et al. (1987) Standardised nordic questionnaires for the analysis of musculoskeletal symptoms. *Appl Ergon* 18: 233-237.
- Smith DR, Wei N, Zhang YJ, Wang RS (2006) Musculoskeletal complaints and psychosocial risk factors among physicians in mainland China. *Int J Ind Ergon* 36: 599-603.
- Smith DR, Wei N, Zhao L, Wang RS (2004) Musculoskeletal complaints and psychosocial risk factors among Chinese hospital nurses. *Occup Med (Lond)* 54: 579-582.
- Smith DR, Mihashi M, Adachi Y, Koga H, Ishitake T (2006) A detailed analysis of musculoskeletal disorder risk factors among Japanese nurses. *J Safety Res* 37: 195-200.
- Leggat PA, Smith DR, Clark MJ (2008) Prevalence and correlates of low back pain among occupational therapy students in Northern Queensland. *Can J Occup Ther* 75: 35-41.
- Lorusso A, Vimercati L, L'Abbate N (2010) Musculoskeletal complaints among Italian x-ray technology students: A cross-sectional questionnaire survey. *BMC Res Notes* 3: 114.
- Smith DR, Choe MA, Chae YR, Jeong JS, Jeon MY, et al. (2005) Musculoskeletal symptoms among Korean nursing students. *Contemp Nurse* 19: 151-160.
- Azma N, Rusli BN, Noah RM, Oxley JA, Quek KF (2016) Work related musculoskeletal disorders in female nursing personnel: Prevalence and impact. *International Journal of Collaborative Research on Internal Medicine and Public Health* 8: 294-315.
- Ain AQ, Hamna M, Fatima M (2018) Musculoskeletal pain and discomfort among medical student of university of Lahore, Pakistan. *Rawal Medical Journal* 43: 252-256.
- Santoshi JA, Jain S, Popalwar HJ, Pakhare AP (2019) Musculoskeletal disorders and associated risk factors in coaching students: A cross-sectional study. *J Family Med Prim Care* 8: 929-933.
- Ansari S, Rezapoor M, Hematgar MA, Ghazi AS, Varmazyar S (2017) Musculoskeletal disorders and its related risk factors among students of Qazvin University of Medical Sciences. *J Hum Environ Health Promot* 2: 161-167.