RESEARCH PAPER

Prevalence and Distribution of Musculoskeletal Pain among University Students - An Analytical Cross Sectional Study

A.Kishwanth[1], V.Mazhalaiarasi[2], R.Hariharan[3], M.Keerthiga[4], S. Madhanagopal[5], *Chrysolyte Mohanan[6], Antony Leo Aseer[7] and Ponmathi Paramanandam[8]

[1]UG Student, Sri Ramachandra Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Porur, 600116 Chennai.
[2]UG Student, Sri Ramachandra Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Porur, 600116 Chennai.
[3]UG Student, Sri Ramachandra Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Porur, 600116 Chennai.
[4]UG Student, Sri Ramachandra Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education Research, Porur, 600116 Chennai.
[5]UG Student, Sri Ramachandra Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Porur, 600116 Chennai.
*[6]*Corresponding author: Assistant Professor, Sri Ramachandra Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Porur, 600116 Chennai.*
[7]Professor and Principal, Sri Ramachandra Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Porur, 600116 Chennai.
[8]Assisstant Professor Sri Ramachandra Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Porur, 600116 Chennai.
[1]kishwanthvj26@gmail.com, [2]mazhalaiarasi@gmail.com, [3]hari72375@gmail.com, [4]keerthiga011103@gmail.com, [5]madhanmg32@gmail.com, [6]chrysolyte@sriramachandra.edu.in, [7]antonyleo@sriramachandra.edu.in and [8]ponmathi.p@sriramachandra.edu.in
[1]ORCID ID: https://orcid.org/0009-0007-7625-8314, [2]ORCID ID: https://orcid.org/0009-0009-9303-9863, [3]ORCID ID: https://orcid.org/0009-0005-5452-6088, [4]ORCID ID: https://orcid.org/0009-0002-0735-3549, [5]ORCID ID: https://orcid.org/0009-0002-1942-4332, [6]ORCID ID: https://orcid.org/0000-0002-7058-7447, [7]ORCID ID: https://orcid.org/0000-0002-8489-7243 and [8]ORCID ID: 0000-0003-1410-6351,

Received: 28th Feb, 2026; Revised: 6th March 2026; Accepted: 7th April, 2026; Available Online: 20th April, 2026

ABSTRACT
Background: The incidence of musculoskeletal pain (MSP) among university students, especially health-related faculties, has always shown a clear tendency to increase over the last years. The musculoskeletal pain among health-related faculties is mainly attributed to the presence of long periods of sitting, academic demands, lack of ergonomics, and a worse lifestyle. The occurrence of musculoskeletal pain first affects their capacity in terms of functional ability.
Materials and Methods: Analytical cross-section of students who are pursuing under graduation in health-related subjects of a medical college was used. The data collection for the present research was based on self-administered questionnaires, demographic variables, life style patterns, Nordic Musculoskeletal Questionnaire and the International Physical Activity Short Form.
Results: A high prevalence of MSP was observed, with 73.6% of students reporting pain in at least one body region during the past 12 months. Low back pain (44.6%) and neck pain (42.3%) were the most commonly affected regions. Female students reported a higher prevalence of MSP across all body regions. Body mass index showed a significant association with MSP, whereas gender, academic department, sedentary behaviour, and physical activity level were not significantly associated.
Conclusion: Musculoskeletal pain is highly prevalent among undergraduate health science students, particularly lower back and neck pain. These findings highlight the need for early preventive strategies, including ergonomic education, regular physical activity, posture correction, and reduction of prolonged sedentary behaviour within academic settings.
Keywords: *International Physical Activity Questionnaire; Musculoskeletal pain; Nordic Musculoskeletal Questionnaire; Physical activity; Sedentary behaviour; University students.*
How to cite this article: Kishwanth A, Mazhalaiarasi V, Hariharan R, Keerthiga M, Madhanagopal S, Mohanan C, Aseer AL, Paramanandam P. Prevalence and Distribution of Musculoskeletal Pain among University Students - An Analytical Cross Sectional Study. Int J Drug Deliv Technol. 2026;16(39s): 104-113. DOI: 10.25258/ijddt.16.39s.13
Source of support: Nil.
**Author for Correspondence: chrysolyte@sriramachandra.edu.in*

Conflict of interest: None

INTRODUCTION

Musculoskeletal disorders (MSDs) and musculoskeletal pain (MSP) are public health issues affecting people all over the globe. Musculoskeletal disorders and musculoskeletal pain can be regarded as injuries to the musculoskeletal system of the body[1,2]. The musculoskeletal system comprises the joints, ligaments, muscles, nerves, and tendons of the body[3,4]. Musculoskeletal disorders and musculoskeletal pain have been identified as a significant problem among students in the fields of medicine, physiotherapy, and occupational therapy in the context of higher learning institutions[5–7]. The academic life of medical, physiotherapy, and occupational therapy students comprises long hours of study, clinical rotations, and significant levels of psychological stress. This makes the students vulnerable to musculoskeletal disorders and musculoskeletal pain[8–10].

The prevalence of musculoskeletal pain among medical and health students is alarming[11]. According to a study done at King Faisal University on the prevalence of musculoskeletal disorders among medical students in Saudi Arabia, the prevalence of musculoskeletal disorders among medical students was 81% at least once in their lifetime. In addition to this, the study revealed that the 12-month period prevalence of musculoskeletal disorders was 73.8%[3]. In another study done by King Abdulaziz University in Jeddah, Saudi Arabia, on the prevalence of musculoskeletal disorders among medical students, it was revealed that the prevalence of musculoskeletal disorders was 82.2%[2]. According to a different study on the incidence of musculoskeletal problems among medical students conducted in Bahrain and Malaysia, the prevalence was 73.4% and 65.1%, respectively, over a 12-month period[1,12]. Similar results from a study in South Africa on the prevalence of musculoskeletal disorders among occupational therapy and physiotherapy students, revealed 76.5% of occupational therapy and physiotherapy students experienced musculoskeletal disorders[10].

The aetiology of musculoskeletal pain among this group of people is multifactorial. It is the result of a complex interplay of various physical, ergonomic, and psychosocial factors[13]. One of the major physical factors is the sedentary lifestyle that is a part of their academic curriculum. Medical students are required to study a lot. A major part of their study involves sitting in lecture halls or libraries due to which assuming unnatural postures becomes unavoidable. Sitting for long hours in deviated postures is harmful to the spinal column. A study has proved that a significant correlation exists between the hours of study and the development of musculoskeletal pain[2,3]. A study conducted at Nineveh University in Iraq revealed that 63.8% of the medical students were complaining of low back pain. The pain was considered a major burden for the students[9].

Another factor is the lack of exercise that is commonly found among health students who prioritize academic demands. Lack of exercise is considered to be a major contributor to the development of musculoskeletal disorders. A study conducted at Taif University revealed that a significant correlation exists between MSDs and the levels of physical activity. Moderate levels of physical activity were found to prevent MSDs. Excessive physical demands are also considered to be a major contributor to the development of MSDs. Physiotherapy clinical students of various universities in Nigeria revealed that the low back pain prevalence was reported to be 47.8% and was attributed to the handling of patients during exercises[13].

The widespread use of digital technology has given rise to many ergonomic issues. The widespread use of gadgets such as smartphones, laptops, and tablets for educational purposes is the major cause of neck and shoulder pain. The prolonged use of such gadgets leads to a "forward head posture" which exerts pressure on the neck[7]. A study done in Central India showed that the neck pain prevalence rate was 51.8% among medical students, which was significantly associated with gadget addiction and computer use[12]. The same trend has been observed in Saudi Arabia, where the study showed that smartphone addiction was significantly associated with MSDs[3].

In addition to the physical factors, psychosocial factors are also important contributors to the overall stress[1,4]. Medical education is known to be highly demanding, and this leads to high levels of perceived stress and burnouts[4,14]. A study done at Taif University showed that 48.7% of the health students suffered from burnout, which was significantly correlated with the presence of MSDs[14]. Emotional distress may be expressed physically by muscle tension. A study done in Sikkim, India, and another done at Umm Al-Qura University showed that the higher the perceived stress, the higher the MSP score[1,4]. Sleep quality was identified as a significant risk factor that may lead to the development of MSDs. The study showed that students with musculoskeletal pain have significantly more psychological distress and sleep quality than those without pain[1,5].

Demographic factors and lifestyle factors are other factors that influence pain. It was consistently found in various studies conducted in various countries, including those conducted at Umm Al-Qura University and King Saud University, that female students were suffering from MSDs much more than male students[4,11]. This could be attributed to physiological differences between the two genders and the different levels of pain thresholds[4]. Furthermore, BMI was found to be related to MSDs in a study conducted in Bahrain[15].

It is important to note that the effects of these health problems are not limited to the health of the student, as the pain could influence the quality of life and academic performance[3,8]. The early onset of health problems such as MSDs could cause future health professionals to be afflicted with future health problems and disabilities[16]. However, there is a lack of awareness of the importance of

ergonomics among undergraduate students[10,12]. Most undergraduate students view MSP as an unavoidable component of their studies, not as a preventable health problem[7]. This highlights the need to address this problem through urgent intervention to address the health of future health professionals[13,14,17].

The aim of this study was to establish the prevalence of MSPs and identify risk factors among undergraduate students pursuing courses in health-related fields.

METHODS

Study Design

This is an analytical cross-sectional study. The cross-sectional nature of the study is deemed appropriate because both the exposure variables, such as physical activity, duration of study, sedentary behaviour and the outcome variable that is the musculoskeletal symptoms can be gauged simultaneously in the population of interest at a single point in time. This has been a common study design in epidemiology for the estimation of disease burden and investigation of associations between risk factors and health outcomes.

Study Population and Settings

The study subjects were undergraduate students who were studying health-related subjects in a medical college. This cohort of students was chosen because they have a tendency to remain with long study hours in front of the screen, experiencing academic stress and staying in uncomfortable positions during lectures and study sessions. Also, they spend long hours in uncomfortable positions while attending clinical postings. The study subjects from all departments were considered so that the prevalence of MSD can be seen in various educational levels.

The eligibility criteria consisted of individuals who were currently enrolled and willing to participate voluntarily, but as an exclusion criterion, individuals were not taken into account if they have a history of significant musculoskeletal trauma, congenital musculoskeletal deformities, inflammatory joint diseases, and long-term systemic diseases affecting individuals, which have significant independent effects on locomotor function and increased physical activity levels.

Sample Size Determination and Sampling Technique

The sample size was calculated based on previous studies which found the prevalence of musculoskeletal disorders in university and medical students. After defining an acceptable confidence level at 95% and setting an acceptable margin of error, we found that the minimum sample size to be considered had sufficient statistical power to identify any association using a Chi-square test. The data collected ranged between 250 to 400 responses[1].

Because of logistical constraints and ease of access, convenience sampling was used, though utmost effort was made to ensure maximization from all levels of study and both sexes.

Data Collection

The data was collected through a structured self-administered questionnaire method by making use of Google Forms. The major rationale behind adopting this method was convenience and accessibility, as well as time efficiency, because it can access all years of students.

Informed consent was sought for the questionnaire at the beginning, whereby participants were told the purpose of carrying out the research, their own free will to participate in this study, the importance of maintaining the collected information on a higher confidential basis, and the right of the participant to withdraw from the research at any given time without any academic or personal consequence. Further, only those who consented electronically could go further.

To measure the presence of musculoskeletal symptoms, the **Standardized Nordic Musculoskeletal Questionnaire (NMQ)** was used. The NMQ has been validated as a research instrument for the measurement of the presence of musculoskeletal symptoms, the distribution of these musculoskeletal symptoms in nine body regions, which include neck, shoulders, elbows, wrists/hands, upper back, lower back, hips/thighs, knees, and ankles/feet. From the questionnaire, the experience of musculoskeletal symptoms in the past 12 months, 7 days, and the impact on daily activities were established.

Before the actual data collection process, the questionnaire was administered to 30 undergraduate students as part of a pilot study with the aim of validating the clarity, understand ability, content validity, and reliability of the questionnaire before the actual process. Following the results from this study, some of the questions were changed, especially those which were not clear, and the design of the questionnaire was modified accordingly. The results from this study were not used in the next process, and after the necessary changes were made, the questionnaire was administered to the participants.

The answers were automatically recorded in a password-protected spreadsheet that could only be accessed by the researchers. Also, for the purpose of ensuring the quality of the data, only valid questionnaires were considered for the research, while no duplicates or invalid answers were considered during the cleaning process. It took two months to complete collecting the questionnaires, which enabled us to cover a wider range of students from different medical courses at various year of study.

Structure of the Questionnaire

The informed consent form that the participants of the survey have to sign was the initial step of the process. It is through the initial step of the process that the participants of the survey get information about the survey and the rights and the fact that the results of the survey of the participants will be kept confidential.

All that this second part of the survey sought to address were details concerning the characteristics of the group of individuals. An outstanding example of such a case within this particular study is the fact that when using this particular research as an example, such detailed basics as

age, gender, height, weight, program, year of study, and residence are just a clear illustration of the details provided to this effect. However, by this section of the research, one would be in a position to define a given group of individuals as well as define the level of activity and its ties to musculoskeletal problems.

The third set of questions were regarding the academic factors/lifestyle factors. The questions were the same as in the case discussed, i.e., the hours of study done in a day, the hours of study done in front of the screens in a day, the hours of sleep done in a day, the breaks taken in the number of hours of sitting, the breaks taken in the number of sports/exercise sessions, etc. The nature of the questions being posited by the group may be linked to the theme physical activities.

The fourth section of the questionnaire covered the musculoskeletal pain and symptoms that the respondents experienced during the last year. This covers areas of the body where pain was felt, the intensity of pain, and how long it has stayed, and the level at which the pain affected the daily activities of the respondents. This section will try to establish the prevalence of symptoms and how they are spread among the respondents.

The individual levels of activity of the individual respondents themselves were dealt with in the fifth section of the survey through the amounts or frequencies of physical activity on a weekly basis.

The sixth section of the survey was associated with the activity patterns within the general public, considering the frequency and duration of the activities.

The levels of activity of the respondents were objectively identified in relation to the aforementioned analysis of the results on the application of the **International Physical Activity Questionnaire (IPAQ)** - Short Form, as it directly addressed the identification of the level of activity of the respondents within the last seven days in relation to high levels of physical activities, moderate levels of physical activities, involvement in strolling, and having sedentary time characterized by high, moderate, or low levels of physical activity.

The last part expressed gratitude to all the participants who took part in the research. In conclusion, the questionnaire was not complicated and only took 10-15 minutes to be completed.

Ethical Considerations

1. Ethical clearence was obtained by the institutional ethics committee **(IEC Registration No: CSP-III/25/DEC/32/560).**
2. Clinical Trial Registry – India**: CTRI/2026/02/103274**

The study adhered to ethical considerations in all aspects. The study was purely voluntary, and electronic consent was obtained from all the participants prior to the collection of the data. The confidentiality and privacy of the data provided by the participants were maintained, providing anonymity to the data. The data collected herein were for the sole purpose of the study.

DATA MANAGEMENT

The type of data collected was processed and stored by the researchers alone. The data was clean, coded, and ready to be analyzed statistically after the completion of the data collection process. The responses were considered after ensuring the responses were complete and validated.

STATISTICAL ANALYSIS

The collected data was coded and analyzed using statistical software. Descriptive statistics such as frequencies, percentages, means, and standard deviations were employed to describe the study participants and the prevalence of musculoskeletal disorders. Chi-square tests were employed to examine the relationship between musculoskeletal disorders and potential risk factors. Logistic regression analysis was employed to establish independent predictors of musculoskeletal pain. A p-value of <0.05 was deemed statistically significant.

RESULTS

Prevalence of Musculoskeletal Disorders

There have been some findings concerning the rather high prevalence rate of musculoskeletal disorders in undergraduate students. Some of the undergraduate students, who took part in the study, have experienced more musculoskeletal pain, which is pain in at least one musculoskeletal body area. The pain experienced in the lower back, neck, and shoulder regions can be some of the musculoskeletal disorders experienced by undergraduate students, which have been confirmed by the study, as observed by other studies too[8,9,18].

The general prevalence of musculoskeletal pain, and the prevalence of musculoskeletal pain over a given period of time, for all participants of the study, has been depicted in the following Charts 1 and 2. Also, the number of students who are suffering from musculoskeletal pain and those students who are not suffering from musculoskeletal pain have been depicted in the following graph, to reveal the actual scenario of musculoskeletal pain.

Chart 1: A diagram showing a pie chart of MSK pain in relation to the total number of students involved in the research. The total number of participants involved in the research was equally divided and categorized based on the presence of MSK pain among the students.

Chart 1: Overall prevalence of musculoskeletal pain among participants

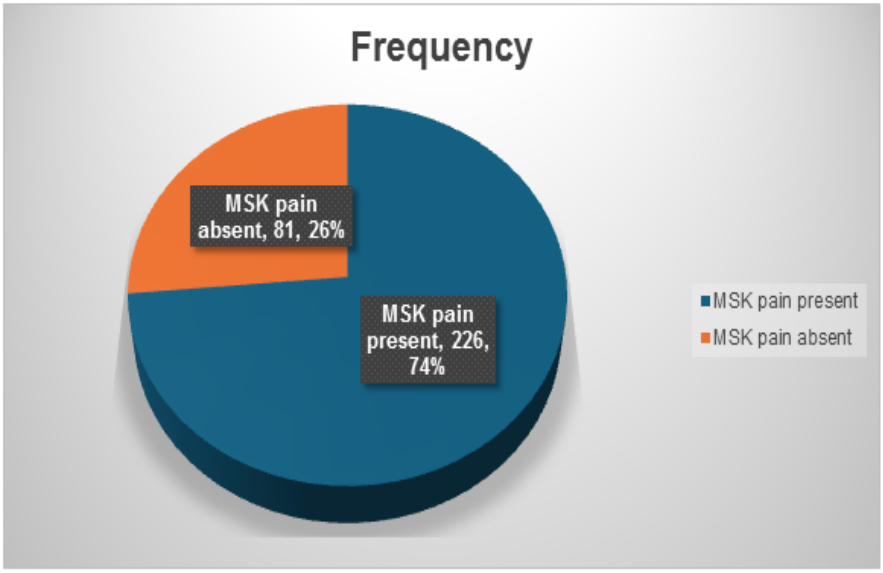

Chart 1: MSK = Musculoskeletal, Total sample size (N) = 307, Values are presented as frequency (n) and percentage (%), Percentages were calculated using the total study population as the denominator and Data is based on self-reported musculoskeletal pain status among participants.

This is due to the fact that we already know the total number of students who were considered in relation to conducting the above research, which is presented as 226 students (74%), who experienced the presence of MSK pain, whereas others who were presented as 81 students (26%) did not experience any pain.

Chart 2 shows the comparison of musculoskeletal pain prevalence. The data given represents information on all the participants who have musculoskeletal pain, categorized according to two different periods, namely last 12 months and last 7 days.

Chart 2: Prevalence of musculoskeletal pain in past 12 months and past 7 days

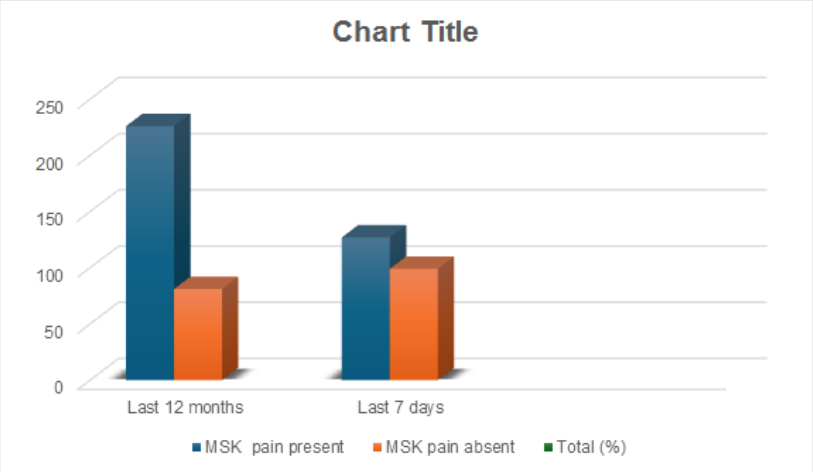

Chart 2: MSK - Musculoskeletal, Total sample size (N) = 307, Values are presented as frequency (n), Last 12 months refers to the 12 month prevalence of self-reported musculoskeletal pain, Last 7 days refers to the 7 days prevalence of self-reported musculoskeletal pain, Percentages where applicable, were calculated using the total study population as the denominator.

Among 307 participants, in the last 12 months, 226 participants (73.6%) have felt pain of MSK origin. The rest of the participants, namely 81 (26.3%), did not perceive any pain.

In last 7 days, there are a total of 127 participants who said that they experienced pain recently accounting to 41.4%.

Musculoskeletal Pain among Participants and Factors Associated

Table 1 shows the characteristics of the study population, the percentage of Musculoskeletal pain as obtained from the participants of the study with consideration of their activity level with the use of International Physical Activity Questionnaire (IPAQ). In this case, the participants of the study were classified on the basis of the time taken while engaging in activities that can be

categorized as either vigorous or the time taken while engaging in moderate activities, coupled with the time taken while engaging in walks.

The implication of all these characteristics indicates that the prevalence of MSK pain was fairly high amongst all the participants, irrespective of the different demographic group and their lifestyle habits. It has been noticed that out of all the variables, BMI is somewhat significant, indicating that there is a possibility of establishing a link between body weight and the causation of MSK pain. However, there was no possibility of establishing the link between gender, department of study, sedentary lifestyle, or any level of physical activity with MSK pain. This would suggest that the pain associated with MSK may be accounted for that a number of different factors are working against one demographic factor.

Table 1: Characteristics of study participants

Characteristics	Total Observed n (%)	MSK pain Present (%)	MSK pain Absent (%)	P Value
Gender				
Male	125 (40.7 %)	86 (68.8 %)	39 (31.2 %)	0.68
Female	182 (59.3 %)	120(65.9 %)	62 (34.1 %)	
BMI Category (kg/m^2)				
Underweight(<18.5)	40 (13.02%)	23 (57.5%)	17 (42.5%)	
Normal(18.5-24.9)	168 (54.72%)	132 (78.5%)	36 (21.5%)	0.05
Overweight(25-29.9)	79 (25.73%)	58 (73.5%)	21 (26.5%)	
Obese(>30)	20 (6.51%)	15 (75%)	5 (25%)	
Department/ Course				
Physiotherapy	67 (21.82 %)	55 (82.09 %)	12 (17.91 %)	
MBBS	28 (9.1 %)	24 (85.7 %)	4 (14.3 %)	
Dental	22 (7.1 %)	14 (63.6 %)	8 (36.4 %)	0.32
Nursing	29 (9.4 %)	23 (79.3 %)	6 (20.7 %)	
Occupational therapy	41 (1.3%)	30 (75 %)	11 (25%)	
Pharmacy	56 (18.2 %)	36 (64.3 %)	20 (35.7 %)	
Allied Health Science / Others	64 (20.8 %)	46 (71.9 %)	18 (28.1 %)	
Sedentary lifestyle(>6hours sitting/day)				
Yes	64 (20.8 %)	48 (75 %) 171	16 (25 %)	1.00
No	228 (74.2 %)	(75 %)	57 (25 %)	
IPAQ(Physical activity level)				
Low activity	95(30.94 %)	71 (74.77 %)	24 (25.26 %)	
Moderate activity	200 (65.15%)	154 (77 %)	46 (23 %)	0.663
High activity	0 (0 %)	0	0	

Data are presented as number (n) and percentage (%). MSK = Musculoskeletal. BMI = Body Mass Index (kg/m^2). IPAQ = International Physical Activity Questionnaire. A sedentary lifestyle was defined as sitting for more than 6 hours per day. P values were calculated using the Chi-square test.

Distribution by Anatomical Region

Low back pain was common in a majority of the students, particularly those with a sedentary lifestyle as well as poor ergonomic posture. On the other hand, neck pain manifested itself in a majority of students using smartphones and laptops. However, accompanied with shoulder pain, it became evident that these two had a similar pain mechanism[10,13].

As may be seen from the results of the data analysis, it has been observed that musculoskeletal symptoms have a high prevalence rate, particularly with regard to the lower back (44.63 %) as well as the neck (42.3 %), and these body parts have been observed to be the most prevailing parts of the body where there are signs of pain during a period of 12 months. This statement can be supported by the reason that these body parts have been observed to be the first parts of the body that have signs of pain, according to other studies[4]. There is a huge difference in terms of the prevalence of pain, which has been reported by female students, where it can be approximated that 77.78 % of the pain was due to the cause of upper back pain, while it was only 22.22 % cause among the male students. Additionally, 62.5 % of the activities carried out by the female gender have equally been interfered with due to back pains, which have resulted due to the learning hours that need to be covered by the students, as well as the pressures that they have felt[4,14].

Table 2: Region-wise distribution of musculoskeletal pain and its effects on activities using Nordic Musculoskeletal Questionnaire amongst the participants.

Body region (NMQ)	N (%)	Pain in the past 12 months n (%)		Pain in the past 7 days n (%)		Pain interfered with activity n (%)	
		Male	Female	Male	Female	Male	Female
Neck	130(42.3 %)	46(35.38%)	84(66.15%)	24(18.46%)	41(31.53%)	27(20.76%)	65(50%)
Shoulder	106(34.53%)	39(36.79%)	67(63.21%)	22(20.75%)	32(30.18%)	31(29.24%)	42(39.62%)
Arm/Hand	48 (15.64 %)	13(27.08%)	35(72.92%)	5(10.41%)	17(35.41%)	9(18.75%)	11(22.91%)
Upperback	72(23.45 %)	16(22.22%)	56(77.78%)	8(11.11%)	33(45.83%)	11(15.27%)	45(62.5%)
Lowerback	137(44.63%)	52(37.96%)	85(62.04%)	33(24.08%)	45(32.84%)	41(29.92%)	67(48.90%)
Hip/Thigh	54(17.59 %)	22(40.74%)	32(59.23%)	9(16.66%)	12(22.22%)	9(16.66%)	24(44.44%)
Knee	70(22.80 %)	26(37.14%)	44(62.86%)	11(15.71%)	20(28.57%)	13(18.50%)	27(38.57%)
Ankle/Foot	64(20.85 %)	17(26.56%)	47(73.44%)	8(12.5%)	22(34.37%)	8(12.5%)	29(45.31%)

Data are presented as number (n) and percentage (%). NMQ = Nordic Musculoskeletal Questionnaire. Percentages for gender are calculated within each body region category. Pain in past 12 months and pain in past 7 days, refer to self-reported musculoskeletal symptoms. Pain interfering with activity indicates limitation of daily or academic activities due to pain.

Comparison of Body Mass Index, Physical Activity, and Sedentary Behavior in Various Academic Departments

The table 3 shows a comparison of the average body mass index, total physical activities, and sedentary behavior time of the students of various departments. The physical activities were carried out with the International Physical Activity Questionnaire. The sedentary behavior of the respondents was indicated by the average time of each day spent sitting. The results are presented as averages with standard deviation for each department of the university.

There were differences in BMI, physical activities, and sedentary time among the different academic departments. Perhaps this could be attributed to the design of the syllabus across various courses.

The results are able to show that there is a strong correlation between the lifestyle behavior and the physical well-being across the academic departments. It has been iterated that the prevalence rate of Lower Back Pain/Neck Pain (44.63 % and 42.3 %) indeed has a strong correlation with the sedentary behaviour time as shown in Table 3. The risk factors that health sciences students are vulnerable to due to the devices they utilize have been well-supported by the research [7,12]. There is a gender difference that can be seen in all of the data above. For example, there is a large 77.78% difference in upper back pain for women. These findings are in line with recent research showing that female students exhibit higher levels of activity interference symptoms than their male counterparts[4].

Table3: Comparison of Body Mass Index, Physical Activity, and Sedentary Behaviour in Various Academic Departments

Department	N	Mean BMI (kg/m^2)	Summated Physical Activity(IPAQ) Mean±SD	Summated sedentary behaviour time (hrs/day) Mean±SD
Physiotherapy	67 (21.8 %)	23.44	862.79±669.70	6.00±1.39
MBBS	28 (9.1 %)	24.00	799.82±604.47	5.75±1.55
Dental	22 (7.1 %)	21.61	798.54±698.77	5.91±1.29
Nursing	29 (9.4 %)	21.34	876.30±451.33	5.97±1.29
Occupational therapy	41 (1.3%)	25.07	946.34±590.55	5.95±1.29
Pharmacy	56 (18.2 %)	22.08	729.00±639.24	5.96±1.27
Allied Health Science	64 (20.8 %)	23.42	770.93±615.59	5.94±1.28

Data are presented as number (n) and percentage (%) for sample distribution and as mean ± standard deviation (SD) for continuous variables. BMI = Body Mass Index (kg/m^2). IPAQ = International Physical Activity Questionnaire. Summated physical activity is expressed in MET-minutes per week according to IPAQ scoring guidelines. Summated sedentary behaviour time represents the average sitting duration in hours per day.

DISCUSSION

Prevalence and Distribution of Musculoskeletal Pain

The highest prevalence rates were found at Majmaah University in Saudi Arabia, with 87.5% of the students infected with MSP[14]. The next highest prevalence rate that was found was for the medical students at a location in the state of Sikkim in India, which was 73%[1]. The same rate was seen in the case of Umm Al-Qura University as well, where the prevalence rate for the infection of MSP among the university's students was for 70.7%. While the prevalence rates for MSP often come against its variants while carrying out research related to the specific condition, higher rates are always seen. For example, while carrying out the research related to the LBP prevalence rate among the medical students at a location in Iraq, the rate was found to be 67.9%[9], while neck pain was seen in 65.2% of the students at a location in central India itself[12].

The "upper quadrant" or locations such as the neck/shoulders and back/lumbar region are mostly targeted. In Ethiopia, neck pain is ranked as a highly complained pain at a frequency of 49.2%. The same complaint among healthcare students across Dammam in Saudi Arabia accounted for 54.6%. In central Saudi Arabia, pain complaints involved shoulder pain among 34.1% of students. In addition, this body region was targeted by pain complaints among students at a frequency of 34.07%. Low back pain is commonly complained about due to its debilitatory nature. All these body regions complained of pain with significant prevalence rates over a period of 12 months, with frequencies such as those in Nigeria (46.9%)[12,16] Bahrain (52.1%)[1] and Riyadh (32.5). Pain prevalence rates among students in these specific body regions may be related to the current education environment presses.

Demographic and Physical Risk Factors

While reviewing the above table, it was observed that a significant association was found between gender and MSP, where in all the studies, vulnerability for severe symptoms was more for female gender than male gender[4,5,11]. The physical factor, that is, Body Mass Index, is of immense importance, where a significant increase was observed between MSDs and students in Bahrain, and a significant predictor was observed for low back pain severity in Saudi Arabia.

Fundamentally, the number of sedentary activities they took part in, apart from those that resulted from their way of living, can be categorized as one of the factors that contributed to the quantities of pain they had. It should be noted that much of their time was spent undertaking many sitting activities over 6 hours every day, which can be regarded as one of the significant risk factors that affect their pain levels[8]. By scrutinizing this research, it will be easy to establish that there indeed is some form of physical exercise that protects them from neck pain and further injuries, as there was minimal musculoskeletal pain that resulted from their physical activities compared to those that were less active in Taif. In addition, there was minimal neck pain that resulted from their physical activity compared to those that were less active in Ethiopia[7]. The activities they took part in, such as using a mobile phone/tablet for over 6 hours a day, is considered to be one of the risk factors that led to neck pain, implying that it was due to prolonged study hours.

Academic and Psychosocial Stressors

The intensity of the academic workload is directly proportional to the intensity of the pain. In the table, the academic workload, which was more than 4-6 hours a day[2,3] where the students working hours per week was between 51-90 hours[4], was significant for the intensity of the pain. This is not only a physical factor but also involves the psychosocial aspect. The high levels of perceived stress, which were strongly related to MSP in India[1] and Saudi Arabia[4,5] where the stress levels were high, also reflect the psychosocial stress experienced by the subjects. Academic burnout was also reported in the study among healthcare students in Taif, where 48.7% experienced academic burnout, which was significantly related to MSDs[14]. Mental exhaustion leads to physical tension.

Other notable factors that can be identified through synthesis revolve around sleep hygiene. Essentially, this accounts for the fact that it was established that quality of sleep, as well as duration of sleep, being less than 7 hours was highly correlated with neck pain, shoulder pain, and as well as back pain[5,8]. This would imply that there is a cycle involved where academic-related issues affect sleep, leading to a reduction of pain threshold.

The Functional Impact

The impact in terms of function, consequently, which comes from MSP among students, is a severe effect. The "Oswestry Disability Index" among some students reflects this. MSP ranks very high among the contributors to "years lived with disability" among people. The most startling thing to emerge from this study was the figure of 66.3% of the MSP population that was revealed by the students selected for health-related courses in physiotherapy and occupational therapy. They are going to be professionals with a pre-existing condition that implies not only longevity but quality of the length of their professional life.

Implications for Practice

From the high prevalence of MSDs in undergraduate students, the imperative of addressing the issue from the point of view of preventive measures needs to be considered at an early stage. Ergonomic education programs, exercises, and prevention of posture and stress in academic programs have also been suggested. This will help in the prevention of the effects of musculoskeletal disorders, considering the improved performance of students promoting good health[2,3].

Limitations

- The study had a recall bias.

- From the study, it was not possible to determine causality with regard to the association between sedentary behaviours and MSK pain.
- The small sample size used in the study refers that the study was conducted based on one institution and could not be applicable to all medical students.
- The lack of information on the degree of psychological stress and sleeping habits that can trigger the development of MSK pain.

Future Research Recommendation

- It is better to use a multi-center study design. This may enable the results to be generalized to other medical centers.
- Objective physical activity and sedentary behaviour assessment, i.e., by accelerometer or physical activity monitor can add robustness.
- Research the various factors-stress, sleep, academic pressure, etc. Create a predictable model with different factors affecting musculoskeletal pain.
- Evaluation and analysis of intervention programs: training on posture, ergonomic interventions, exercise breaks during lectures.

CONCLUSION

Some of the key results of the study focused on the fact that musculoskeletal pain is prevalent among medical college students. The areas of the body that experienced the highest degree of pain were the neck, lower back, and shoulder areas. Physical activity levels were lower, and sedentary activity levels were higher. A greater level of pain was significantly related to lower levels of physical activity. Among the different departments that were part of the study, students who spent the most time sitting experienced a higher degree of pain. In conclusion, the fact that the addition of physical activity to the curriculum of the medical college would enhance the alleviation of the pain experienced by the students was established enhancing their good health and well-being.

REFERENCES

1. Thejaswi SG, Mukerji A, Baliga S, Dewan SK, Verma A. Musculoskeletal pain among medical students and its association with perceived stress level: A cross-sectional study. J Educ Health Promot. 2023 Jan 1;12(1).
2. Abumohssin AG, Alghamdi AA, Magboul MA, Asali FW, Mahrous MS, Basaqr AA, et al. Association Between Musculoskeletal Pain and Studying Hours Among Medical Students in Jeddah, Saudi Arabia. Cureus. 2023 Sep 13;
3. Alshakhs AM, Almarzoug HA, Alhamaid YA, Alsemaeel HS, Alhejji MS, Al-Alwan MK, et al. Association between Musculoskeletal Pain and Studying Hours among Medical Students in Saudi Arabia. Ann Afr Med. 2025 Jul 1;24(3):628–35.
4. Alsulaihebi HS, Alsulaihebi AS, Alsaedi ZK, Alsharif SY, Mahamid AW, Babateen OM. Musculoskeletal disorder prevalence and its correlation with stress in medical students: A cross sectional survey. J Family Med Prim Care. 2024 Apr;13(4):1524–9.
5. Alanazi SA, Kashoo FZ. Musculoskeletal Pain Among University Students and Its Correlations with Risk Factors: A Cross-Sectional Study. J Clin Med. 2025 Sep 1;14(17).
6. Alsaadi SM. Musculoskeletal Pain in Undergraduate Students Is Significantly Associated with Psychological Distress and Poor Sleep Quality. Int J Environ Res Public Health. 2022 Nov 1;19(21).
7. Weleslassie GG, Meles HG, Haile TG, Hagos GK. Burden of neck pain among medical students in Ethiopia. BMC Musculoskelet Disord. 2020 Jan 8;21(1).
8. Alshehri MM, Alqhtani AM, Gharawi SH, Sharahily RA, Fathi WA, Alnamy SG, et al. Prevalence of lower back pain and its associations with lifestyle behaviors among college students in Saudi Arabia. BMC Musculoskelet Disord. 2023 Dec 1;24(1).
9. Alhadeethi A, Elkhawaga H, Khalil MH, Basheer AA. Prevalence of Low Back Pain and Its Associated Factors Among Medical Students at Nineveh University in Iraq: A Cross-Sectional Study. Cureus. 2024 Jul 30;
10. Ogunlana MO, Govender P, Oyewole OO. Prevalence and patterns of musculoskeletal pain among undergraduate students of occupational therapy and physiotherapy in a South African university. Hong Kong Physiotherapy Journal. 2021 Jun 1;41(1):35–43.
11. Behairy M, Odeh S, Alsourani J, Talic M, Alnachef S, Qazi S, et al. Prevalence of Lower Back Pain (LBP) and Its Associated Risk Factors Among Alfaisal University Medical Students in Riyadh, Saudi Arabia: A Cross-Sectional Study. Healthcare (Switzerland). 2025 Jul 1;13(13).
12. Behera P, Majumdar A, Revadi G, Santoshi J, Nagar V, Mishra N. Neck pain among undergraduate medical students in a premier institute of central India: A cross-sectional study of prevalence and associated factors. J Family Med Prim Care. 2020;9(7):3574.
13. Alshagga MA, Nimer AR, Yan LP, Ibrahim IAA, Al-Ghamdi SS, Radman Al-Dubai SA. Prevalence and factors associated with neck, shoulder and low back pains among medical students in a Malaysian Medical College. BMC Res Notes. 2013;6(1).
14. Alqahtani N, Abdulaziz A, Hendi O, Mahfouz MM. Prevalence of burnout syndrome among students of health care colleges and its correlation to musculoskeletal disorders in Saudi Arabia. Int J Prev Med. 2020 Jan 1;11(1).

15. Algarni AD, Al-Saran Y, Al-Moawi A, Bin Dous A, Al-Ahaideb A, Kachanathu SJ. The Prevalence of and Factors Associated with Neck, Shoulder, and Low-Back Pains among Medical Students at University Hospitals in Central Saudi Arabia. Pain Res Treat. 2017;2017.
16. Tantawy SA, Rahman AA, Ameer MA. The relationship between the development of musculoskeletal disorders, body mass index, and academic stress in Bahraini University students. Korean Journal of Pain. 2017;30(2):126–33.
17. Vincent-Onabajo GO, Nweze E, Kachalla Gujba F, Ali Masta M, Usman Ali M, Alhaji Modu A, et al. Prevalence of Low Back Pain among Undergraduate Physiotherapy Students in Nigeria. Pain Res Treat. 2016;2016.
18. Abdulaziz AA, Althaqafi AM, Hindi AM, Khan SA, Atalla AA, Hendi OM. Prevalence of musculoskeletal disorders and its correlation to physical activity among health specialty students. Int J Prev Med. 2019;10(1):19–24.