

BACK PAIN AMONG MEDICAL STUDENTS AND ITS ASSOCIATED RISK FACTORS

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ABSTRACT

Objective: The aim of the study was to identify the frequency and risk factors associated with low back pain among medical and dental students.

Study Design: Cross-sectional study.

Place and Duration of Study: The study was conducted at Hitec Medical Institute, Taxila from May to October 2024.

Patients and Methods: A validated questionnaire was used to collect data from 207 students. Data was analyzed to assess the prevalence of low back pain and its contributing factors. The chi-square test was applied to determine the association between exercise and back pain. The mean age and BMI of participants were 21.36 ± 0.501 and 19.2 ± 0.613 respectively.

Results: A higher prevalence of pain was observed among female students (63.3%). Third-year students reported more back pain compared to first- and second-year students. Key contributing factors included prolonged sitting (25%), uncomfortable seating, exam-related stress (18.4%), and improper posture (17.4%). A significant association was found between regular exercise and reduced back pain ($P = 0.005$).

Conclusion: Back and neck pain are common among medical and dental students with significant contributing factors such as prolonged sitting and poor posture. Implementing strategies like posture correction, ergonomic interventions, and promoting regular physical activity may help alleviate pain and improve musculoskeletal health in this population.

Keywords: Back Pain, Neck Pain, Medical students

INTRODUCTION

Low back and neck pain affects a significant proportion of the population. An increased prevalence of back pain and neck pain are reported among Medical students.^{1,2} During the period of medical training, students are exposed to stress, long study and training hours in hospital wards and clinics.³ The nature of medical student's daily work increases the risk of

musculoskeletal pain (MSP) among medical students.³ The Global Burden of Disease (GBD) 2021 low back pain study claims that more than 800 million people will have low back pain by 2050. According to studies, it was found that lower back pain had the sixth highest burden out of the 291 conditions which were studied previously.⁴ Certain factors such as age, gender, body mass index as well as behavioral and psycho-social factors like physical exercise, stress, sleeping hours, long sitting hours, seats, duration of reading and posture increase the risk of back pain.⁵ A study of student groups found that the mean hours spent by medical students in recumbent or sitting postures was $9.5 (\pm 5.34)$ hours per day.⁶ According to a study in China, the prevalence of musculoskeletal disorders was 67.6% occurring

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frequently in lower back, neck and shoulder regions. A study conducted in Karachi, Pakistan concluded that medical students have an increased prevalence of low back pain associated with factors such as long sitting hours.⁷ Posture related back pain was the primary contributor to back pain.⁸

Back pain is an increasingly prevalent issue among medical students due to the rigorous demands of their training which often involves prolonged periods of study and high levels of computer usage. In a student-centered learning curriculum as in our private medical college, students are primarily responsible for preparing and engaging with course materials through extensive computer work. This reliance on digital learning and sedentary study habits has the potential to exacerbate back pain, impacting both academic performance and long-term health. Understanding the prevalence and contributing factors of back pain in this context is essential for implementing early interventional strategies. Addressing modifiable risk factors can help to prevent or reduce the burden of back pain, fostering better physical well-being and quality of life for future healthcare providers.

The main aim of this study is to determine the frequency of neck and back pain and the factors associated with it. Our study aimed to promote awareness among medical students regarding back pain management and prevention strategies. This study would carve-out a way to curb the rising cases of low back and neck pain.

PATIENTS AND METHODS

A cross-sectional study was conducted at Hitec Medical Institute from May to October 2024 following Ethical Approval (vide letter no. HITEC-IRB-38-2024 dated: 06-06-2024) on a sample of 207 students of 1st, 2nd and 3rd year MBBS and BDS students. The sample size was calculated using the WHO sample size calculator. The margin of error was taken as 5% with the confidence level of 95% & the anticipated frequency was 50% while the total population was 450. The calculated sample size was 207. Non-probability convenience sampling technique was adopted for sample selection. Diagnosed cases of structural deformity and Spondylosis were excluded from the sample. Self-designed Proforma based on a validated Oswestry low back pain disability questionnaire was used for data collection. Questionnaires were distributed among 1st, 2nd, and 3rd year MBBS and BDS students studying at Hitec medical and dental institute. The years above these were excluded because they were considered clinical years

and had lesser hours spent sitting in the classroom. Response by students were noted regarding their back and neck pain. Data were analyzed by using SPSS-28. Mean and standard deviation were calculated for numerical variables. Numerical variables include age, height, and weight. Categorical variables include gender, class, and questions related to back pain. Frequency and percentages were calculated for categorical variables. The chi-square test was applied to find out the association between back pain and physical activities like exercise and sports.

RESULTS

The mean age for the medical students was found to be 21.36 ± 0.501 and the mean BMI was 19.2 ± 0.613 . Out of 207 students, 76 (7%) were males and 131 (63%) were females. Approximately 125 (60.3%) students were suffering from neck and back pain. More females 96 (63.3%) were comparatively suffering from neck and back pain than males 29 (36.7%) as shown in the bar chart below.

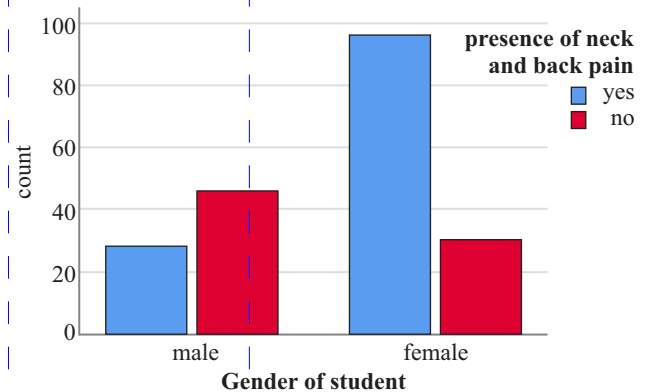


Fig 1: Bar chart showing the frequency of neck and back pain among male and female student

Out of 125 students suffering from back pain, 73 (35.7%) reported back pain during medical school and 52 (25.5%) had back pain before coming to medical school. About 83 (40%) of the total students had localized pain, 25% reported it in the neck region, 18.8% in the upper back and 16.9% in the lower back.

The regions in which pain was localized are shown in the Table I:

The presence of back pain was higher among the Students of 3rd year as compared to 1st and 2nd year and those who had back pain spend almost 8 to 12 hours sitting per day.

The time duration during which back pain developed in

the life of medical students is shown in the Table I.

Table I: Data on back and neck pain regarding site and trigger of pain

Category	Subcategory	Frequency	Percent
Frequency of Pain in Localized Region	Neck	52	25.1
	Upper Back	38	18.8
	Lower Back	35	16.9
	Total	126	60.9
Cross Tabulation: Neck and Back Pain	MS1 (1st Year) - Yes	21	-
	MS2 (2nd Year) - Yes	41	-
	MS3 (3rd Year) - Yes	63	-
	MS1 (1st Year) - No	45	-
	MS2 (2nd Year) - No	27	-
	MS3 (3rd Year) - No	5	-
	Total Students	202	-
When Neck and Back Pain Started	During Medical School	53	25.6
	Before Medical School	72	35.7
	Total	125	61.4
Subjective Triggers of Back Pain	Exam-Related Stress	36	18.4
	Sitting/Uncomfortable Benches	53	25.6
	Improper Body Postures	36	17.4
	Total Triggers	125	61.4

Long sitting hours or uncomfortable benches were the most triggering (25%) factor for back pain, whereas stress during the exam period and improper body postures turned out to be 18.4% and 17.4% respectively as shown in Table I.

In comparison of hours during the day, in working (college) hours moderate pain is reported the most and mild pain is seen during rest hours at night as shown below.

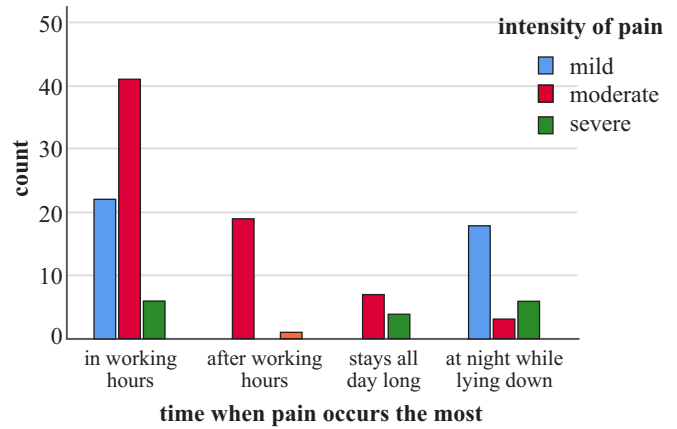


Fig 2: Frequency of pain Intensity in different hours of the day

During working hours at school, level of comfort of benches/chairs was also analysed and results were as follows.

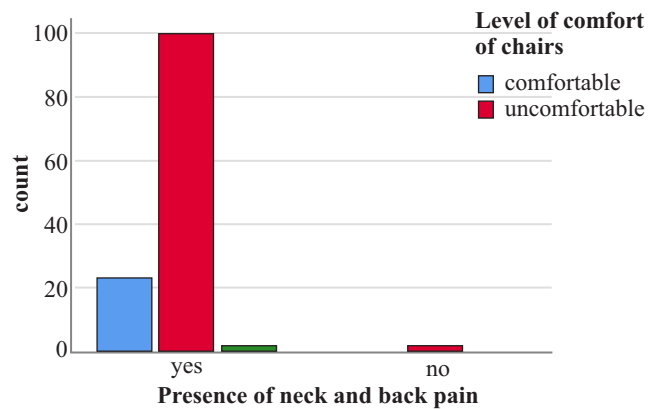


Fig 3: Frequency of pain associated with level of comfort of the chair

The most common method used by the students to minimize the pain was changing posture

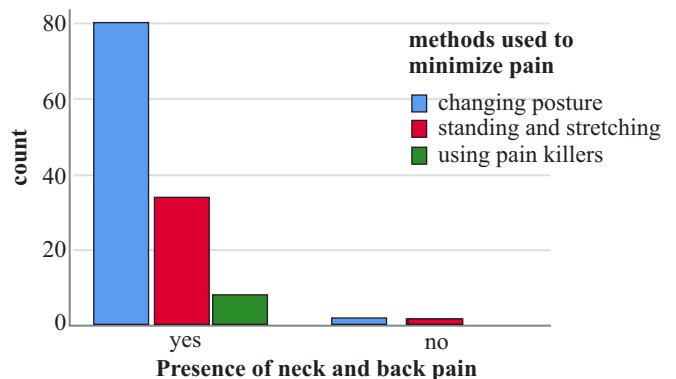


Fig 4: Methods used to reduce back/neck pain and association with walk and sports

Chi square test showed significant association of back pain with exercise ($P=0.005$). Students doing exercise were less experiencing the pain as compared to the students not doing the exercise.

Table II: Chi-Square Test

	Value	df	<i>p</i> value
Pearson Chi-Square	7.886	1	.005

DISCUSSION

This study was conducted on medical and dental students to determine the prevalence and factors associated with neck and back pain. The majority of the students (61.9%) were found to be suffering from neck pain and back pain which is rather alarming. The proportion of the students suffering from back pain (35.7%) was greater than the students suffering from neck pain (25.1%). Upper back pain was reported among 18.8% students whereas 16.9% students reported lower back pain. More females 96(63.3%) were suffering from neck and back pain than males 29 (36.7%). This situation is indicative of a serious health threat to the younger generation. The results are comparable to another study conducted among the medical students of Malaysia which also showed similar alarming results. The prevalence of musculoskeletal pain (at least one body site) was reported among 45.7% students in the past week and 65.1% students in the previous year. The prevalence of low back pain was the highest in the past week and in the previous year (27.2%, and 46.1% respectively), followed by neck pain (24.1% and 41.8% respectively).⁹ The study conducted in Serbia, 75.8% medical students reported low back pain at some point in their lives, 59.5% in the last 12 months, and 17.2% suffered at the moment of survey. Chronic low back pain was reported by 12.4% of the students. Occurrence of low back pain was higher in the females as compared to males.¹ Another study conducted by Aymeric Amelot et al in France also showed an increased prevalence of low-back pain which was reported among 835/1243 (72.1%) students. Frequency of low back pain was variable, 523 (42.1%) of students suffered several times a month, 232 (18.7%) several times a week, and 80 (6.4%) several times a day.¹⁰ In our study, 25% of students reported the pain to be in their neck region which shows that the increased neck pain must be due to long hours of bending of neck for study purposes among medical students. Medical students have more sitting hours in a day because lectures and study time engage them almost twice as much. In other words, medical students have a

considerably more sedentary lifestyle. A similar study also showed a 12-month low back pain prevalence of 63% among physiotherapy students.¹¹ Another study¹² did not support the opinion of “sitting” to be associated with low back pain. It further stated that low back pain is uncommon in the first decade of life, but prevalence increases steeply during the teenage years. It was noted that mostly 3rd year medical students reported back pain while there was a lower ratio of students suffering from back pain in 2nd and 1st years subsequently which shows that the incidence of back pain has something to do with the increase in age and increase in study stress. The results are also comparable with another study conducted in KSA which showed that one of the factors significantly associated with musculoskeletal pain in at least one body site at any time was being in the clinical year rather than the basic sciences years ($P=0.032$).¹³

In our study 35% of the students reported that they had back pain before coming to medical school and only 25% started having it during medical school which shows that despite long sitting hours, a sedentary lifestyle might be the cause of developing back pain among students. Our study showed that the most triggering factor for back pain was not the stress of exams but it was long uncomfortable hours sitting on benches that mostly triggered back pain. The study conducted among medical students in Bangladesh also supported that Ergonomic features of chairs i.e. back support, adjustable back support and adjustable sitting surface significantly ($p < 0.05$) influenced the outcomes.¹⁴ Although the lack of exercise was reported as a risk factor for low back pain in the study done in Ethiopia which is in accordance with our research as our data also showed that most of the students who had back pain were never involved in healthy sports or exercise while on the other hand those students who were not suffering from back pain reported that they were involved either in sports or twenty to thirty minutes of walking per day which proved to be beneficial for them.

These findings offer insight into the significant impact of back and neck pain on medical students, which needs to be addressed. Universities should take preventive measures in order to provide their students with a decent environment for a successful academic life. In addition, developing and implementing corrective measures to improve the quality of life of medical students are warranted. Variables which were not assessed in this study but should be investigated in further studies are smoking and psychological distress.

CONCLUSION

The study revealed the association of several factors with the occurrence of back and neck pain among medical students at the medical institute such as inadequate physical activity, prolonged study sessions, and poor neck posture. However, regular physical exercise demonstrated a protective effect, reducing the risk of back and neck pain among medical and dental students.

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Authors Contribution

Anwar Bibi: Conception of study / Designing / Planning, Analysis / Interpretation / Discussion

Raima Siddiqui: Manuscript Writing

Nadia Nisar: Critical Review, Facilitated for Reagents / Material Analysis

Aashi Ahmed: Critical Review, Facilitated for Reagents / Material Analysis

Mohsin Raza: Experimentation / Study Conduction

Momina Butt: Experimentation / Study Conduction

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