

## A Cross-sectional Questionnaire based Study to Estimate Prevalence of Lower Back Pain and its Relation to Stress among Medical Students

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### Abstract

**Aim:** This study was undertaken to estimate the prevalence of LBP and its Relation to Stress Among medical Students

**Methodology:** A cross-sectional study among 200 medical students of SB Medical College & Hospital, Hazaribagh, Jharkhand, India was conducted. The questionnaires were distributed among the medical students during the period of 6 months. A questionnaire was designed by the researchers based upon a review of the literature. It included three parts: Sociodemographic characteristics (age, gender, year of study, weight, height, smoking, marital status, chronic diseases, and academic grade); A Standardized Nordic Questionnaire to assess musculoskeletal disorders and LBP; and A Kessler Psychological Distress Scale (K10) questionnaire to assess psychological stress.

**Results:** Our study included 200 students including 51% females and 49% males with a mean age of  $22.53 \pm 2.55$  years. Most of participating students were single (93.4%) and non-smokers (88%) with normal body mass index (BMI) values (51.4%). Out of 200 students, 22.4% were 1<sup>st</sup> year, 27.2% were 2<sup>nd</sup> year, 24.6% were 3<sup>rd</sup> year, and 25.8% were final year students. 34.4% of the students had normal stress levels and 60% had not experienced LBP.

Out of the 200 students with LBP, only 3% had been hospitalized. Overall, 18.5% of the students had LBP that interfered with their work activities and 27% had LBP within the last 7 days before answering the questionnaire

**Conclusion:** In this study, the prevalence of LBP was 40%. The prevalence of mild, moderate and severe stress was 26.6%, 20.4%, and 18.6% respectively. No significant association between LBP and psychological stress was found. Further, more studies on large scale should be done to evaluate the association between LBP and stress levels among medical students.

**Keywords:** LBP, stress, medical students

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## Introduction

According to the American Academy of Family Physicians (AAFP), the lower back pain defined as pain in the area between the last thoracic rib and above the inferior gluteal fold [1, 2]. LBP is one of the prevalent complaints among all age groups. At least 90% of the population has experienced LBP once in their life [3, 4]. In India, approximately 35% of people suffer from chronic LBP, which significantly hampers their day-to-day routine. [5] According to the study done by Global Burden of Disease (GBD) in 2018, musculoskeletal conditions were considered as the second-highest contributor to global disability. The same report indicated that lower back pain is the single leading cause of disability globally [6, 7]. Therefore, up to 40 % of adolescents suffer from LBP, as they reported limitations in day activities [8]. Cross-sectional data demonstrate that initial onset of lower back pain commonly occurs around the age of 30 [9] and peaks in occurrence between the ages of 45 and 60 years. [9, 10] Surprisingly, 39.8% of the adolescent population is also found to suffer from LBP. [11]

The medical school application and training process is demanding, with many medical students experience great deals of both physical and emotional stress. Psychological stress due to academic, ethical and financial pressures has led to high prevalence of psychological morbidity, including burn-out and depression [12, 13]. Low Back Pain was found to be the number 1 cause of years lived with disability and may have a significant impact on student Quality of Life (QOL) [14].

A study at an Austrian medical school declared that the incidence of LBP among medical students was 53% [15]. A study by Majra et al. [16] of medical students in southern India reveals an increase in health risk behaviors and a decline in health promoting behaviors among students over the years of their medical schooling. In

another study conducted in a medical school in Malaysia, Indian ethnicity came with a greater risk of being obese than other ethnic groups. [17] Commonly, medical students exposed to long periods of study in their exams, their clinical rotation, and the usage of computers for a long time is the cause factors to LBP. Also, students who have a little sleep, not doing any workout, are more exposed to have LBP [18]. A study of similar student groups in the same setting found that the mean hours spent by medical students in recumbent or sitting postures was 9.5 ( $\pm 5.34$ ) hours per day. [19]

The association between psychological stress and musculoskeletal pain in healthcare professionals has been well documented [20]. The high prevalence of psychological stress in medical students and its consequences on mental health have been reported [21]. There have been many international literatures related to stress and LBP among medical students, but very less data is available among Indian medical students.

## Methodology

A cross-sectional study among 200 medical students of SB Medical College & Hospital, Hazaribagh, Jharkhand, India was conducted. The questionnaires were distributed among the medical students during the period of 6 months.

## Inclusion criteria

All the medical students from the 1<sup>st</sup> year to the final year were included in this study.

## Exclusion criteria

1. Students studying in health colleges other than medicine, such as pharmacy, dentistry, and applied medical science, were not included in this study
2. Students who did not prefer to be enrolled in the study and did not complete the questionnaires
3. Medical interns.

A questionnaire was designed by the researchers based upon a review of the literature. It included three parts: Sociodemographic characteristics (age, gender, year of study, weight, height, smoking, marital status, chronic diseases, and academic grade); A Standardized Nordic Questionnaire to assess musculoskeletal disorders and LBP; and A Kessler Psychological Distress Scale (K10) questionnaire to assess psychological stress.

The K10 is a self-administered questionnaire that is designed to assess the emotional conditions of the participants via 10 questions, in which each question is answered using a 5-point Likert scale that ranges from 1 “none of the time” to 5 “all of the time”; the lowest possible score is 10 and the highest score is 50. Scores between 10 and 50 are classified as follows: 20–24 indicates mild stress, 25–29 indicates moderate stress, and 30–50 indicates severe stress. The K10 questionnaire is widely used in the general health survey setting and has good psychometric properties with

a Cronbach's alpha of 0.89 [95% confidence interval (CI) 0.88–0.90].[22] The results were confirmative in another study that found K10 is a reliable and valid instrument for screening anxiety and depression with high Cronbach's alpha of 0.93.[23] Another questionnaire we adopted in this study is Standardized Nordic Questionnaire (NMQ), which is used to assess and analyze musculoskeletal symptoms also was proven as a valid and reliable screening tool with sensitivity ranging from 66% to 92%.[24]

### Results

Our study included 500 students including 51% females and 49% males with a mean age of  $22.53 \pm 2.55$  years. Most of participating students were single (93.4%) and non-smokers (88%) with normal body mass index (BMI) values (51.4%). Out of 200 students, 22.4% were 1<sup>st</sup> year, 27.2% were 2<sup>nd</sup> year, 24.6% were 3<sup>rd</sup> year, and 25.8% were final year students. 34.4% of the students had normal stress levels and 60% had not experienced LBP [Table 1].

**Table 1: General characteristics of medical students**

Variable		Number	%
Gender	Male	245	49
	Female	255	51
Mean age + SD (in years)		22.53 + 2.55	
Year of Study	First	112	22.4
	Second	136	27.2
	Third	123	24.6
	Fourth	129	25.8
BMI	Underweight	60	12
	Normal	257	51.4
	Overweight	105	21
	Obesity	78	15.6
Marital status	Single	467	93.4
	Married	33	6.6
Smoking	Yes	60	12
	No	440	88
Stress category	Well	172	34.4
	Mild	133	26.6
	Moderate	102	20.4
	Severe	93	18.6
LBP	Yes	200	40
	No	300	60

Out of the 200 students with LBP, only 3% had been hospitalized. Overall, 18.5% of the students had LBP that interfered with their work activities and 27% had LBP within the last 7 days before answering the questionnaire [Table 2].

**Table 2: Questionnaire for LBP severity**

Questionnaire		Number	%
Have you been hospitalized because of low back trouble?	Yes	6	3
	No	194	97
What is the total length of time that you have had low back trouble during the last 12 months?	0 days	125	62.5
	1-7 days	42	21
	8-30 days	11	5.5
	>30 but not every day	13	6.5
	Every day	9	4.5
Has low back trouble caused you to reduce your activity during the last 12 months?	Yes	37	18.5
	No	163	81.5
What is the total length of time that low back trouble has prevented you from doing your normal work (at home or away from home) during the last 12 months?	0 days	147	73.5
	1-7 days	38	19
	8-30 days	13	6.5
	>30	2	1
Have you seen by doctor, physiographer, chiropractor or other such person because of low back trouble during the last 12 months?	Yes	17	8.5
	No	183	91.5
Pain during the last 7 days?	Yes	54	27
	No	146	73

**Table 3: Relation between LBP severity and stress**

Questions		Stress category			
		Well (69)	Mild (53)	Moderate (41)	Severe (37)
Have you been hospitalized because of low back trouble?	Yes	1 (1.45%)	1 (1.89%)	3 (7.32%)	1 (2.7%)
	No	68 (98.55%)	52 (98.11%)	38 (92.68%)	36 (97.3%)
What is the total length of time that you have had low back trouble during the last 12 months?	0 days	58 (84.05%)	31 (58.49%)	19 (46.34%)	17 (45.9%)
	1-7 days	9 (13.04%)	9 (16.98%)	15 (36.58%)	9 (24.3%)
	8-30 days	1 (1.45%)	3 (5.66%)	5 (12.19%)	2 (5.4%)
	>30 but not every day	1 (1.45%)	8 (15.09%)	2 (4.88%)	2 (5.4%)
	every day	0 (0.0%)	2 (3.77%)	0 (0.0%)	7 (18.9%)
Has low back trouble caused you to reduce your activity during the last 12 months?	Yes	6 (8.70%)	15 (28.3%)	6 (14.63%)	10 (27%)
	No	63 (91.3%)	38 (71.7%)	35 (85.37%)	27 (73%)
What is the total length of time that low back trouble has prevented you from doing your normal work (at home or away from home) during the last 12 months?	0 days	62 (89.85%)	37 (69.81%)	23 (56.1%)	25 (67.6%)
	1-7 days	5 (7.25%)	13 (24.53%)	12 (29.27%)	8 (21.6%)
	8-30 days	2 (2.9%)	2 (3.77%)	6 (14.6%)	3 (8.1%)

	>30 days	0 (0.0%)	1 (1.89%)	0 (0.0%)	1 (2.7%)
Have you been seen by a doctor, physiotherapist, chiropractor or other such person because of low back trouble during the last 12 months?	Yes	1 (1.45%)	2 (3.77%)	9 (21.9%)	5 (13.5%)
	No	68 (98.55%)	51 (96.23%)	32 (78.1%)	32 (86.5%)
Pain during last 7 days?	Yes	4 (5.8%)	14 (26.41%)	11 (26.8%)	25 (67.6%)
	No	65 (94.2%)	39 (73.58%)	30 (73.2%)	12 (32.4%)

## Discussion

To the best of our knowledge, there are only few reports in the literature that specifically address the occurrence of LBP in medical students. Yucel and Torun [25] reported that medical students had the highest prevalence of LBP compared with dentistry, pharmacology, and health sciences students. BMI, sex/gender, or young age was not significantly associated with LBP, which is consistent with previous studies [25]. We have not been able to investigate tobacco and coffee consumption in students having LBP, but in previous studies, no significant correlation was found between coffee consumption and LBP.[26]

A general trend of increasing LBP with each class year was noted with a slight dip in the third year. The reason for this could be increasing levels of work, stress, anxiety, dissatisfaction, and book bag load with each year. Further, with each progressing year in the MBBS curriculum, clinical postings increase requiring longer periods of standing. Students stand with heavy bags on their backs, promoting bad body posture and strained backs.

We assume that these issues are due to students' long periods of sitting with fixed postures during lectures. [27] In a study conducted among older Americans (age range 60–80), the prevalence of LBP was higher among obese men and women, 31.2% and 25.1%, respectively. Unexpectedly, we found that students with normal BMI values had the highest

recorded rate of LBP (58.8%); only 14.3% of obese students reported LBP. The contrast between the two results is due to the different age groups involved and the higher prevalence of chronic diseases among the American sample. [28]

In a study on the general U.S. population, Strine, et al. reported a LBP prevalence of 15.0-15.9% and NP prevalence 1.8-3.7% in people ages 18-34 [29]. A study by Nolet, et al. reported an association of worsening neck pain with poorer physical health-related quality of life, while a study by Mesas, et al. reported higher work absenteeism in patients with chronic pain that were stronger in younger patients compared to older patients [30,31]. Karahan, et al. reported age, female gender, smoking, occupation, perceived stress and heavy lifting as significant independent risk factors for low back pain in hospital staff [32].

Previously most of the work has mainly focused on musculoskeletal pain (MSP) in students, and rarely has it specifically dealt with LBP. Alshagga et al [33] have studied the prevalence of MSP among Malaysian medical students. The authors found that 45.7% and 65.1% of all students had at least one site of MSP in the past week and in the past year, respectively. Among Chinese medical students, MSP was reported most commonly, especially LBP with a prevalence rate of 46.9% in the past week and 67.6% in the past year. [34] Algarni et al [35] recently reported that the prevalence of MSP in Saudi medical students was also high and comparable to the reported rates

from the Malaysian and Chinese studies. They found that 85.3% of all the students had MSP in at least one body site at any time, 54.4% in the past week, and 81.9%, in the past year.

Universities should take preventive educative measures in order to provide their students with a healthy environment for a successful academic life. So, it would be healthy to reserve a few hours exclusively for sports activities. One of the weaknesses of this study remains the absence of measures of stress and anxiety in the questionnaire.

### Conclusion

In this study, the prevalence of LBP was 40%. The prevalence of mild, moderate and severe stress was 26.6%, 20.4%, and 18.6% respectively. No significant association between LBP and psychological stress was found. Further, more studies on large scale should be done to evaluate the association between LBP and stress levels among medical students.

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