

## Prevalence of Low Back Pain among Undergraduate Medical Students in AIIMS Jodhpur

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### Abstract:

**Introduction:** Low Back Pain (LBP) is one of the most common musculoskeletal problem. LBP is no longer the disease of adult and 39.8% of adolescent population is also found to suffer from LBP. Medical students are no exception to this health issue and study should be done in medical students to find out possible risk factors and their correlation to LBP.

**Method and Material:** A cross sectional observational study was conducted in 146 under graduate students for the prevalence and risk factors of LBP. A self-made questionnaire was administered to the volunteers including demographic, anthropometric, hours of study, physical activity, etc. In the subject who reported LBP in past 4 weeks, the modified Oswestry LBP disability questionnaire was administered for assessing the disability in day to day activities. SF8 questionnaire for assessment of quality of life was administered to all medical students. Rating of pain was done using Numeric Rating Scale (NRS).

**Results:** It was found that there was significantly higher LBP in underweight and overweight males as compared to normal BMI individuals. There is no statistically significant association in LBP and W/H ratio. Prevalence of LBP was higher in students whose self-study hours were higher. Students who were physically active had less prevalence of LBP. Prevalence of LBP had no changes as compared to duration of clinical posting. 83.6% had mild, dull aching pain and remaining 16.4% had moderate pain in severity. None had severe intensity of pain. LBP was cause of mild disability for 1.6% student, moderate disability for 85.24% and severe disability for 13.11% students.

**Discussion:** Prevalence of LBP in undergraduate medical students in AIIMS Jodhpur is 41% which is quite high. It was found that less physical activity, bad posture and altered BMI in males were possible risk factors for this high prevalence. These are modifiable risk factors and hence can be prevented. There is a need of back schools and promoting education regarding proper posture, increased physical activity, recreational activities, exercises and stress free environment.

**Keywords:** Low Back Pain (LBP), Students.

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### Introduction

Low back pain (LBP) is one of the most common musculoskeletal problems worldwide. LBP expected to affect up to 80% of the people at some point in their lives and 20-30% are suffering from LBP at any given time.[1] High rate of occurrence has been noted in adult population[12]. Surprisingly, 39.8% of the adolescent population is also found to suffer from LBP.[4] It is interesting that 37% of low back pain worldwide is attributable to occupational risk factors, which represent many potentially preventable sources of pain [3,4]. In the US, it has been reported as the major condition responsible for limiting peoples' activities in those aged below 45 years and is a common patient complaint in clinics and frequent reason for

hospitalization and surgery. [5] In India, approximately 35% of people suffer from chronic LBP, which significantly hampers their day-to-day routine. [6] LBP also affects people's mood leading to depression, anxiety, irritability, poor social interactions, and lower overall health status. [7] Lifestyle factors such as smoking behaviour, less physical activity including sedentary life-style and less sports, short sleep hours, decreased recreational tasks, increased levels of stress are also considered to be risk factors of LBP among the students. [13] A recent study by N Aggarwal et al done in one of medical institutes in India shows high prevalence of LBP among medical students and its association with poor study habits, lifestyle

habits, and psychological factors. The overall prevalence over one year was noted as 47.5% (n = 76) with a prevalence of 32.5% at the time of data collection. Prevalence among males and females was 45.3% and 50%, respectively. No association of LBP was seen for weight lifting, watching television/working on computers.

Nyland and Grimmer et al carried out a cross-sectional study to evaluate the prevalence of LBP among physiotherapy students. They found a 1 week LBP prevalence of 27%, 1 month of LBP prevalence 44%, 1 year of LBP prevalence 63% and lifetime of LBP prevalence 69%. [14] A study carried out by Asdrubal Falavigna et al [4] in medical and physiotherapy students showing 77.9% of the students had LBP at some point in their lives, 66.8% had LBP in the last year and 14.4% of them reported they were suffering from LBP at the moment of answering the questionnaire. Physiotherapy students reported a higher prevalence as compared to the medical students.

However, there was no inter-group difference regarding pain intensity and disability. A recent study by Majra et al. [11] of medical students in southern India revealed an increase in health risk behaviours and a decline in health promoting behaviours among students over the years of their medical schooling. Hence, the following study was done with the purpose of defining the magnitude of problem of LBP and its risk factors among the medical students at our institute.

## Methods and Materials

**1. Obtaining permission for the project from Institutional Ethics committee (IEC):** The study was carried out after obtaining permission from IEC.

**2. Study Design:** A cross sectional observational study was conducted in the institute for finding the prevalence and risk factors of Low Back Pain (LBP) in undergraduate medical students of All India Institute of Medical Sciences, Jodhpur. The study was carried out in year 2014 in AIIMS Jodhpur.

**3. Subject selection:** A convenient sample (150) was selected from medical undergraduate based on the following inclusion and exclusion criteria. The sample size was taken as 146 since it was the total number of students present in institute.

### Inclusion Criteria:

- The subject is student of our institute.
- He/She has been a part of undergraduate medical curriculum for minimum 10 months or more.

### Exclusion Criteria's:

- History of trauma to back or pelvis in past 1 year.
- Any subject on analgesic medication for reasons other than low back pain.
- If a subject is addicted to alcohol, opioids, or any other drug with analgesic effect.
- Subjects with any deformity of spine or lower limb.

### 4. Volunteers were included in the study after written informed consent

**5. Data obtained from all subjects:** A self-made questionnaire was administered to the volunteers including demographic, anthropometric, hours of study, physical activity etc. The subject/volunteer who reported low back pain in past 4 weeks, the following questionnaires were administered Modified Oswestry low back pain disability questionnaire for assessing the disability in day to day activities

SF8 questionnaire for assessment of quality of life was administered to all medical students.

### 6. Measurements:

- Measurement of weight was done using bathroom scale.
- Measurement of height was done using stadiometer.

**7. Calculation of BMI:** The BMI of subject was calculated by the following formula

$$\text{BMI} = \frac{\text{Weight in kg}}{[\text{Height in meter}]^2}$$

### 8. Calculation of W/H (waist hip ratio):

$$\text{W/H} = \frac{\text{Waist circumference in c.m.}}{\text{Hip circumference in c.m.}}$$

**9. Pain Assessment:** The rating of pain was done using Numeric Rating Scale (NRS). The subject was asked to rate the pain on a scale from 0-10 where 0 refers to the state of no pain or complete comfort & 10 refers to maximum pain which is unbearable for the subject. The pain was quantified according to range of pain: Mild: 1 to 3, Moderate: 4 to 7, Severe: 8 to 10

**10. Statistical Method:** Ratio and Proportion were calculated for descriptive analysis and Pearson's Chi square Test was used as a statistical analytical tool. For statistical analysis SPSS version 21 was used.

## Results

Out of total sample size of 150, 1 person sustained trauma prior to the study, 1 person expired prior to

administration of questionnaire (not related the condition being studied), 2 person dropped out. Out of 146 subjects who completed the study, there were 92(63.01%) males and 54 (36.99%) females. The age of the subjects ranged from 18 years to 24 years. The range of BMI of subjects was 15.3-34.4 and the range of W/H ratio was 0.75 to 0.95. 76.03% (111) had at least 1 episode of low back pain over past 2 years. 41.78% (Total: 61, male=35, female= 26) suffered from LBP during the survey in past 4 weeks from the date of study. Prevalence of LBP among females is higher (48.15%) as compared to males (38.04%).

Out of 146 students 28 were underweight, 75 had normal BMI, 39 were overweight and obese. The prevalence of LBP was 53.57% (n=15) in underweight category, 35.44% (n=28) in normal BMI, 47.37% (n=9) in overweight BMI & 45% (n=9) in obese BMI. It was found that there was significant relation with LBP in underweight and overweight and obese males as compared to normal BMI individuals with p value of 0.027. In females there was no such significant co relation.

Prevalence of low back pain in males with W/H ratio less than 0.9 is 33.33% and more than 0.9 is 45.71%. Among the females, W/H ratio with <0.85, 50% had LBP and W/H ratio >0.85, 37.5% had LBP. There is no statistical significance association in LBP and W/H ratio in both genders. It was observed that prevalence of LBP was higher in students whose self-study hour was higher. For <2 hours, prevalence of LBP was seen in 28.84 %

and for >2 hours, prevalence was 48.93%. There was a significant statistical correlation with p value of 0.018.

Students who were physically active (involved in active sport, walking, jogging etc) had less prevalence of LBP with increased duration of active sports. The percentage of LBP in students with physical activity<45 minutes was 47.89% whereas in > 45 minutes duration physical activity, the prevalence was 14.8%. It was found to be statistically significant with p value of 0.002.

It was observed that 134 individuals were involved in jogging for less than 30 minutes, out of which 58(43.28%) had LBP. Remaining 12 individuals were involved in > 30 Minutes of jogging everyday with LBP in 3(25%). There was no statistical significance between the two groups.

It was observed that the prevalence of LBP had no change as compared to duration of clinical posting. The Prevalence in <2 hours is 39.02% and in >2hours is 42.85%. But it was found that students with laboratory posting of <1 hour in a day had prevalence of 25% as compared to 47.27% in students with > 1 hour postings.

The severity of pain was quantified in 3 categories: Mild (1-3 score on NRS), moderate (NRS 4-7) and severe (NRS 8-10). Out of 61 students with LBP, 51(83.6%) had mild, dull aching pain and the remaining 10(16.39%) had moderate pain in severity. None had severe intensity of pain. (Table 1)

**Table 1: Severity of pain**

NRS Grade	No. Of LBP
Mild (1-3)	51
Moderate (4-7)	10
Severe (8-10)	0

The disability due to LBP was rated using Modified Oswestry Low Back Pain Disability Questionnaire. It was found that LBP was cause of Mild disability for 1 (1.6%) student, moderate disability for 52 (85.24%) and severe disability for 8(13.11%) students. (Table 2)

**Table 2: Disability with LBP**

MODQ Score	No. of LBP
0-20 (Mild Disability)	1
21-40 (Moderate Disability)	52
41-60 (Severe Disability)	8
61-80 (Crippled)	0
81-100 (Bed-Bound)	0

The quality of life was also assessed for all the enrolled students and it was observed that out of 146, 60(41%) had poor quality of life for physical components and 97(66%) poor quality of life for mental component. Out of 41% for physical components, 51.6% had LBP which was found to be statistically significant with p-value of 0.043. Out of 66% for mental component, 41% had LBP which was not statistically significant. (Table 3 and Table 4)

**Table 3: LBP with Physical component of LBP**

SF 8 Score	LBP	Non LBP
<50	31	29
>50	30	56

**Table 4: LBP with Mental component of LBP**

SF 8 Score	LBP	Non LBP
<50	40	57
>50	21	28

### Discussion

The cross sectional study revealed high prevalence for low back ache among medical students of All India Institute of Medical Sciences, Jodhpur (AIIMS Jodhpur). The prevalence of at least 1 episode of Low Back Pain in last 2 years was 76.03% and 41.78% for past 4 weeks during the administration of study. These results are comparable to the studies done in past in India, by Agarwal et al (2) which was 33% in 4 weeks duration. Also the study conducted in U.S by Kennedy et al [16] suggested comparable figures 43% and in Austrian medical students studied by Moroder et al [15] showed figures of 53%.

In the study, there was no statistical significance between LBP and BMI of all students; however gender analysis suggests significant correlation between normal and underweight, overweight and obese males with LBP. As compared to prior studies, this is significant co relation; as such correlation is not seen in prior studies.

We found statistically significant inverse relationship between the duration of physical activity and LBP. It was seen that students involved in > 45 mts of Physical activity in the form of active sports had less prevalence of LBP as compared to students with < 45 minutes of Physical activity. This is in concurrence with prior studies done by Agarwal et al [2] and Moroder et al [15]. It can be attributed to the fact that these students had hectic study curriculum and busy schedule and hence, were involved in less physical activity. It was further observed that students who studied for > 2 hours had increased prevalence of LBP which was statistically significant.

The finding is same as seen in prior studies done [2,15]. The increased prevalence was observed in students with longer duration of laboratory postings. The posture during laboratory posting is of forward bending while sitting. The poor posture could be responsible for this increased prevalence which is also seen in previous studies showing statistical significance.

Majority of the students (83.6%) had mild intensity of pain with dull aching type of pain. This mild intensity was bothersome and was a factor in causing moderate disability in performing activities of day to day life. The higher prevalence of poor quality of life was observed more for mental component, which can be contributed to the fact that these students are under stressful routine and also pressure of performance with long curriculum. It was found that less physical activity, prolonged

study hours, bad posture, altered BMI in males were possible risk factors for this high prevalence. These are modifiable risk factors and hence, can be prevented.

There is a need of back schools and promoting education regarding proper posture, increased physical activity, recreational activities, exercises, stress-free environment. This can decrease the disability index and improve quality of life of medical students which can help in creating healthier, physically and mentally fit future clinicians.

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