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PREVALENCE OF LOW BACK PAIN AND ITS ASSOCIATION WITH SEDENTARY LIFESTYLE AND SLEEP QUALITY AMONG FEMALE COLLEGIATE STUDENTS IN ZIRO

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ABSTRACT

Background: Low back pain (LBP) is one of the most common musculoskeletal disorders affecting collegiate students and is associated with various lifestyle-related factors such as prolonged sedentary behavior and poor sleep quality. Female students are considered more vulnerable due to reduced physical activity, prolonged sitting during academic activities, and lifestyle-related factors.

Objective: To determine the prevalence of low back pain and its association with sedentary lifestyle and sleep quality among female collegiate students in Ziro, Arunachal Pradesh

Methodology: A descriptive cross-sectional study was conducted among 286 female collegiate students from selected colleges in Ziro, Arunachal Pradesh. Participants were selected using stratified random sampling techniques. Data was collected using a self-administered questionnaire including the Nordic Musculoskeletal Questionnaire (NMQ) to assess low back pain prevalence during the past 7 days and past 12 months, Sedentary Behavior Questionnaire (SBQ) for sedentary lifestyle, and Pittsburgh Sleep Quality Index (PSQI) for sleep quality. Data analysis was performed using Microsoft Excel 2019, and Chi-square test was used to determine the association between variables.

Results: The prevalence of low back pain among female collegiate students was found to be 66.08%. High sedentary lifestyle was observed in 50.35% participants, while 81.82% of participants reported poor sleep quality. A statistically significant association was found between sedentary lifestyle and low back pain (χ^2 = 32.51, $p < .001$). Participants with high sedentary lifestyle had 17.57 times higher odds of reporting low back pain compared to those with low sedentary lifestyle. Similarly, a statistically significant association was observed between sleep quality and low back pain ($\chi^2 = 43.49$, $p < .001$). Participants with poor sleep quality had 8.05 times higher odds of reporting low back pain compared to those with good sleep quality.

Conclusion: The study concludes that low back pain is highly prevalent among female collegiate students in Ziro and is significantly associated with sedentary lifestyle and poor sleep quality. Promotion of regular physical activity, reduction of prolonged sitting, ergonomic awareness, and healthy sleep practices may help reduce the prevalence of low back pain among students.

Keywords: Low back pain, sedentary lifestyle, sleep quality, PSQI, female collegiate students, prevalence.

INTRODUCTION

LBP is a chronic, dull backache that runs from beyond the lower borders of the 12th ribs to the gluteal folds. The lifetime prevalence of LBP is estimated to be between 60 and 80% globally. According to certain research, the high point incidence of LBP among university students may have reached 41.2% at the time of the study.

LBP often affects university students who spend long hours sitting while studying or working on computers. [1]Low back pain (LBP) is a common musculoskeletal problem that most individuals experience at some point in their lives. In 2017, LBP was the largest cause of years lived with disability. Most instances can be classified as nonspecific LBP when a particular cause has not been found. [2] According to the Global Burden of Disease 2019 report, there were 223.5 million estimated cases of LBP worldwide, with 63.7 million LBP-related disability-adjusted life years. The incidence was lower in male individuals than in females. In an Indian study of adults, the lifetime, point, one-year, and age-standardized lifetime prevalence rates were 57%, 32%, 48%, and 59%, respectively [4] Sedentary activity is described as "any waking behavior characterized by an energy expenditure of ≤1.5 metabolic equivalents (MET) while in the sitting or reclining posture" As such, sedentary behavior encompasses a wide variety of activities such as watching television, using a computer, playing video games, and sitting at work. Recent research found that adults spend more than half of their waking hours in sedentary 3 activities. Longer periods of sedentary activity are associated with a variety of health issues. [1] A sedentary lifestyle considerably raised the risk of recurring LBP, whereas increased physical exercise significantly reduced the risk of chronic LBP. Prolonged sitting (sedentary behavior) may be connected with overload and stress in students throughout their lives According to one research in Saudi Arabia, 61.5% of students who sit for lengthy periods of time (more than 4 hours per day) frequently suffer lower back pain. [3] Students who spent a large amount of time sitting reported higher levels of discomfort and soreness in their backs, necks, and shoulders. During extended sitting, muscles in the legs and core are not engaged, which can contribute to a decline in muscle tone and strength. [4] Sleep is a physiological process that is necessary for humans to meet their basic needs and function normally. According to the American Heritage Medical Dictionary (2007), 4 sleep is "a natural periodic state of rest for the mind and body in which the eyes usually close and consciousness is completely or partially lost so that there is a decrease in bodily movement and responsiveness to external stimuli." Good sleep quality is defined as score <=5, while scores above 5 demonstrate poor quality.[5] The human body needs seven to nine hours of regular sleep in order to perform memory consolidation and integration.[6] Sleep issues and pain severity are inextricably related; 50-60% of individuals with sleep problems experienced LBP. It has also been noted that those with LBP who sleep poorly and have more acute pain are more likely to be hospitalized than those who sleep well. This data implies that poor sleep quality may contribute to the development of LBP. Patients with LBP had an estimated prevalence of sleep disruption of 58.7%.[4] Low back pain, the most usually reported MSKP, has been found to be strongly connected with the quality of sleep; yet a night of poor sleep quality has been observed to be followed by exacerbated MSKP intensity.[7] Physical inactivity is detrimental to physical health, particularly the musculoskeletal structures. It is related with more structural abnormalities in the spine and impairment than physically active persons, making it a risk factor for low back pain, long hours of studying in poor ergonomic postures, and the lack of physical activity[8] The severity of back discomfort cannot be overstated. For example, it has been stated that low back pain (LBP) is the second leading cause of disability in the United States, with over 80% of people having it at some time in their life. LBP was also discovered to be more frequent in females than in males.[9] The point, yearly, and lifetime prevalence rates of LBP in the Indian population are greater than in the global and other ethnic groups, affecting a considerable proportion of the population, particularly women, rural communities, and primary school personnel.[10]

Despite the growing concern regarding low back pain among university students, limited studies have examined its association with sedentary lifestyle and sleep quality among female collegiate students in Arunachal Pradesh. Therefore, the present study was undertaken to determine the prevalence of low back pain and to investigate its association with sedentary lifestyle and sleep quality among female collegiate students in Ziro, Arunachal Pradesh.

AIM AND OBJECTIVE OF THE STUDY

Aim of the study is to measure the low back pain and assess its association with sedentary lifestyle and sleep quality among female collegiate student of Ziro.

OBJECTIVE OF THE STUDY

1. To assess the prevalence of low back pain in female collegiate students in Ziro
2. To assess sedentary lifestyle using Sedentary Behavior Questionnaire (SBQ) and to analyze its association with low back pain.
3. To assess sleep quality using Pittsburgh Sleep Quality Index (PSQI) and to examine its association with low back pain among female collegiate students.

METHODOLOGY

1) Study Design: Cross - sectional Analytic study.
2) Study Setting: The study was conducted in selected Colleges in Ziro ,Arunachal Pradesh
3) Study Duration: 1 year
4) Study Population: Female students studying in 5 colleges of Ziro, Arunachal Pradesh (N=1111)
5) Sample Size: 286 participants
6) Sample Technique: Stratified Random Sampling was used.
7) Method Of Data Collection:

- Questionnaire form used for data collection

8) Selection Criteria:

- Inclusion Criteria:
  - Female students aged 18-31years.
  - Students Willing to participate and provide informed consent.
  - Students are able to understand and respond to the questionnaires.
  - Students who were present when the data was being collected.
- Exclusion Criteria:
  - Recent history of spinal surgery.
  - History of traumatic injury or fracture in past 1 year.
  - Any congenital spinal abnormalities.
  - Male students.
  - Pregnant women.
  - Non- consenting participants.

9) MATERIALS/EQUIPMENTS REQUIRED:

- Printed questionnaire.
- Writing pen.
- Pencil.
- Paper.

10. Measuring Tools

- LOW BACK PAIN QUESTIONNAIRE(SELF REPORTED YES/NO)[11]
- SEDENTARY LIFESTYLE:SBQ[12]
- SLEEP QUALITY :PSQI[13]

11. **Statistical Tools:**

1. Data analysis was done using Microsoft excel,2019
2. Chi-square was used to check association of variables.

Data collection procedure

The Ethical Review Committee (ERC) of Indira Gandhi Technological and Medical Sciences University, Ziro, Arunachal Pradesh, granted ethical approval following the submission of a written study proposal to the Department of Physiotherapy.

The study was conducted with careful adherence to all ethical guidelines. Since this study was only a cross-sectional survey, there were no interventions or treatment methods used, which reduced ethical issues.

The administrators of the five chosen colleges in Ziro, where the study was carried out, granted prior authorization for data gathering. The goal and methodology of the study were explained to the participants in detail. They were told that they could leave the study at any time without penalty.

All participants gave their informed consent before any data was gathered, and the study's anonymity was upheld at all times.

RESULT

Among the total 286 participants, the majority belong to the age group of 18–21 years, accounting for 197 (68.88%) participants. Participants in the age group of 22–25 years accounted for 86 (30.07%) participants, while only 3 (1.05%) participants belonged to the age group of 26-31 years.

Table 1: Distribution of age range

Age Range (Years)	Frequency (n=286)	Percentage (%)
18-21	197	68.88
22-25	86	30.07
26 and above	3	1.05

Table 2: Distribution of frequency of physical activity

Physical Activity	Frequency (n=286)	Percentage (%)
Always (≥30 minutes/day, daily)	34	11.89
Often (≥30 minutes/day, ≥3 times/week)	67	23.43
Rarely (≥30 minutes/day, 1-3 times/ month)	149	52.10
Never	36	12.59

In terms of physical activity, more than half of the participants (52.10%) reported rarely engaging in it. About 23.43% were active often, while 12.59% stated they never participated in physical activity. Only 11.89% of participants said they always engaged in physical activity for at least 30 minutes daily.

Table 3: Distribution of presence of low back pain using NMQ

Low Back Pain	Frequency (n=286)	Percentage (%)
Yes	189	66.08
No	97	33.92

According to the Self-reported LPB Questionnaire from the Nordic Musculoskeletal Questionnaire (NMQ), 66.08% of participants reported experiencing low back pain, while 33.92% reported no such pain.

Table 4: Distribution of sedentary lifestyle using SLQ

Sedentary lifestyle	Frequency (n=286)	Percentage (%)
High	144	50.35
Moderate	106	37.06
Low	36	12.59

The assessment of sedentary lifestyle using the Sedentary Behavior Questionnaire (SBQ) showed that over half of the participants (50.35%) had a high sedentary lifestyle. Only 12.59% of participants had a low sedentary lifestyle, whereas 37.06% had a moderate sedentary lifestyle.

Table 5: Distribution of sleep quality using PSQI

Sleep Quality	Frequency (n=286)	Percentage (%)
Good	52	18.18
Poor	234	81.82

The assessment of sleep quality using the Pittsburgh Sleep Quality Index (PSQI) revealed that poor sleep quality was widespread among the participants. Only 18.18% of respondents said they had decent sleep, compared to 81.82% who said they had terrible sleep.

Table 6: Association between sedentary lifestyle and low back pain

Sedentary Life	LBP Present	LBP Absent	Total	% with LBP	OR	95% CI
Low	9	27	36	25.0%	1.00	Reference
Moderate	57	49	106	53.8%	3.49	1.50, 8.13
High	123	21	144	85.4%	17.57	7.25, 42.57
Column Total	189	97	286	66.1%	---	--

Note. $\chi^2(2, N = 286) = 32.51$, $p < .001$, Cramer's $V = .34$.

The study also showed a significant link between sedentary lifestyle and low back pain ($\chi2 = 32.51$, $p < .001$). The incidence of low back pain increased with higher levels of sedentary lifestyle. It was 25.0% among those with a low sedentary lifestyle, 53.8% among those with a moderate sedentary lifestyle, and 85.4% among those with a high sedentary lifestyle. Participants with a moderate sedentary lifestyle were 3.49 times more likely to report low back pain, while those with a high sedentary lifestyle were 17.57 times more likely compared to those with a low sedentary lifestyle

A similar significant association was found between sleep quality and low back pain ($\chi2 = 43.49$, $p < .001$). Participants with poor sleep quality had a much higher incidence of low back pain (74.8%) than those with good sleep quality (26.9%). Additionally, participants with poor sleep quality had 8.05 times higher odds of reporting low back pain compared to those with good sleep quality.

Table 7: Association between sleep quality and low back pain

Sleep Quality	LBP Present, n (%)	LBP Absent, n (%)	Total
Good	14 (26.9%)	38 (73.1%)	52
Poor	175 (74.8%)	59 (25.2%)	234
Total	189 (66.1%)	97 (33.9%)	286

Note. $\chi^2(1, N = 286) = 43.49$, $p < .001$, Phi = .39, OR = 8.05, 95% CI = [3.95, 16.41].

A total of 240 participants were included with a mean age of 34 years. The gender distribution showed a female predominance (163 females and 77 males) Most of the subjects were between (25-29 years).33% of the population are technicians,35.8% are nursing officers,19.8 % are doctors,5%pharmacist,3.32 % are dentist and a small percentage of 2.49% are physiotherapist. The participants work in various departments of TRIHMS with a mean working hour of 48 hours weekly.

DISCUSSION

The present study was conducted to determine the prevalence of low back pain and its association with sedentary lifestyle and sleep quality among female collegiate students in Ziro, Arunachal Pradesh. A total of 286 female collegiate students participated in the study. The findings of the present study revealed that the prevalence of low back pain among female collegiate students was 66.08%. This indicates that low back pain is highly prevalent among collegiate students and may represent an important musculoskeletal health concern in this population. The high prevalence observed in the present study may be attributed to prolonged sitting during academic activities, reduced physical activity, poor posture, increased screen time, and unhealthy lifestyle behaviors among students. The results of this study are in line with those of a study by Awad et al. (2025),[1] which found that low back pain affected around 64.8% of college students, with female students being more often impacted. In a similar vein, Alshehri et al. (2023)[5] found that sedentary lifestyle choices were a significant contributing factor to low back pain, which affected roughly 67% of college students.

In the present study, more than half of the participants (50.35%) demonstrated a high sedentary lifestyle, while only a small proportion had low sedentary behavior. The increase in sedentary behavior among students may be due to prolonged sitting during studying, online learning, use of electronic devices, and reduced participation in physical activity. The current study showed a statistically significant correlation ($\chi^2 = 32.51$, $p < .001$) between sedentary lifestyle and low back discomfort.</mark> Participants with high degrees of sedentary lifestyles had the highest prevalence of low back pain, which rose gradually with increasing levels of sedentary living. These results imply that long-term inactivity may be a major factor in the prevalence of low back pain among female college students. Alzahrani et al. (2022)[2], who found a strong positive correlation between sedentary behavior and low back pain in their systematic review and meta-analysis, corroborate the results of this study. Similarly, Alshehri et al. (2023)[5] discovered that low back discomfort was much more common and severe among students who were sedentary for extended periods of time. According to Cepkova et al. (2023)[14], university students' sedentary lifestyles had a negative impact on their lumbar spine, especially for female students.

According to the Pittsburgh Sleep Quality Index (PSQI), 81.82% of participants in the current research reported having poor sleep quality. Academic stress, excessive screen time, inconsistent sleep cycles, and bad lifestyle choices may all contribute to poor sleep quality among students. Low back pain and sleep quality were shown to be statistically significantly correlated ($\chi^2 = 43.49$, $p < .001$).</mark> Those with poor sleep quality were much more likely to experience low back discomfort than those with high sleep quality. These findings indicate that poor sleep quality may influence pain perception, muscle recovery, and musculoskeletal health, thereby increasing the likelihood of low back pain. The results are in line with research by Awad et al. (2025)[1] which found that students with low back pain had far worse sleep quality than students without the condition. Additionally, Goel et al. (2023)[18] discovered that undergraduate medical students who used smartphones excessively had much shorter sleep durations and worse sleep quality.

In order to lessen the burden of low back pain among college students, the results highlight the need of encouraging physical exercise, decreasing extended sitting behavior, improving sleep patterns, and raising knowledge regarding musculoskeletal health.

CONCLUSION

The present study was conducted among 286 female collegiate students in Ziro to determine the prevalence of low back pain (LBP) and its association with sedentary lifestyle and sleep quality.

The findings revealed that 66.08% of the participants reported low back pain, 50.35% had a high sedentary lifestyle, and 81.82% had poor sleep quality. A statistically significant association was found between sedentary lifestyle and LBP, with the prevalence of LBP increasing from 25.0% in students with low sedentary behaviour to 85.4% in those with high sedentary behaviour. Similarly, poor sleep quality was significantly associated with a higher prevalence of LBP (74.8%) compared to good sleep quality (26.9%).

The study concludes that low back pain is highly prevalent among female collegiate students and is significantly associated with both sedentary lifestyle and poor sleep quality. Promoting physical activity, reducing prolonged sitting, and improving sleep habits may help reduce the burden of low back pain in this population.

LIMITATIONS:

1. The present study was conducted only among female collegiate students in Ziro, Arunachal Pradesh; therefore, the findings cannot be generalized to the general population or students from other regions.
2. The study utilized self-reported questionnaires for data collection, which may have resulted in recall bias and inaccurate responses from the participants.
3. Due to the cross-sectional design of the study, causal relationships between low back pain, sedentary lifestyle, and sleep quality could not be established.
4. Other factors associated with low back pain, such as psychological stress, body mass index, ergonomic factors, menstrual factors, and academic workload, were not assessed in the present study.
5. The study was limited to a specific sample size and selected colleges in Ziro, which may limit the generalizability of the findings.

RECOMMENDATIONS:

1. Colleges should promote regular physical activity and encourage students to reduce prolonged sitting time to minimize sedentary behaviour and its impact on low back pain.
2. Awareness programs should be conducted to educate students about the prevention of low back pain and the importance of maintaining an active lifestyle.
3. Students should be encouraged to adopt healthy sleep habits and practice good sleep hygiene to improve sleep quality and reduce the risk of low back pain.
4. Ergonomic education regarding proper sitting posture and study habits should be provided to help prevent low back pain among students.
5. Regular screening and early identification of low back pain among collegiate students are recommended to facilitate timely management and prevention of further complications.
6. Future studies should include larger and more diverse populations and use longitudinal designs to further examine the relationship between low back pain, sedentary lifestyle, and sleep quality.

REFERENCES:

1. Awad MYH, Warasna HJM, Awad BYH, Shaaban ME, Ibrahim T, Awad IYH, et al. Prevalence of lower back pain and its associations with lifestyle behaviours among university students in the West Bank, Palestine: a cross-sectional study. Ann Med. 2025. doi:10.1080/07853890.2025.2522974

2. Alzahrani H, Alshehri MA, Alzhrani M, Alshehri YS, Al Attar WSA. 2022. The association between sedentary behaviour and low back pain in adults: a systematic review and meta-analysis of longitudinal studies. PeerJ 10:e13127 https://doi.org/10.7717/peerj.13127

3. Shekhar S, Rao R, Nirala SK, Naik BN, Singh C, Pandey S. Prevalence of acute low back pain with risk of long-term disability and its correlates among medical students: a cross-sectional study. J Educ Health Promot. 2023;12:179. doi:10.4103/jehp.jehp_1460_22.

4. Alshehri MM, Alqhtani AM, Gharawi SH. Prevalence of lower back pain and its associations with lifestyle behaviours among college students in Saudi Arabia. BMC Musculoskeletal Disorder. 2023;24:646. doi:10.1186/s12891-023-06683-5

5. Doty TA, Knox LE, Krause AX, Berzenski SR, Hinkel-Lipsker JW, Drew SA. Keep it brief: videoconferencing frequency and duration as predictors of visual and body discomfort. International Journal of Human-Computer Interaction. 2024;40(5):1150-1161. doi:10.1080/10447318.2022.2132358.

6. Nair RK, Ahmed M. A study to assess the quality of sleep among medical students of Mysuru, Karnataka, India. Int J Community Med Public Health. 2023;10(5):1817-1821

7. Lawson HJ, Wellens-Mensah JT, Attah Nantogma S. Evaluation of sleep patterns and self-reported academic performance among medical students at the University of Ghana School of Medicine and Dentistry. Sleep Disorders. 2019;2019

8. Eloi DR, Quemelo PR, Sousa MN. Influence of physical activity and time in the sitting position on the condition of low back pain among university students.Coluna/Columna.2022;21(1):e253794.doi:10.1590/S1808185120222101 253794.

9. Hanna F, Daas RN, Al-Shareif TJ, Al-Marridi HH, Al-Rojoub ZM, Adegboye OA. The relationship between sedentary behaviour, back pain, and psychosocial 58 correlates among university employees. Front Public Health. 2019 Apr 9;7:80. doi:10.3389/fpubh.2019.00080.

10. Shetty GM, Jain S, Thakur H, Khanna K. Prevalence of low back pain in India: a systematic review and meta-analysis. Work .2022;73(2):429–452. doi:10.3233/WOR-205300.

11. Alrabai, Hamza M.; Aladhayani, Mohammed H.[1]; Alshahrani, Salem M.[1]; Alwethenani, Zaid K.[1]; Alsahil, Mohammed J.[1]; Algarni, Abdulrahman D.. Low Back Pain Prevalence and Associated Risk Factors among Medical Students at Four Major Medical Colleges in Saudi Arabia. Journal of Nature and Science of Medicine 4(3):p 296-302, Jul–Sep 2021. | DOI: 10.4103/jnsm.jnsm_132_20

12. Norman GJ, Wagner N, Patrick K, Calfas KJ, Sallis J. Reliability and validity of the Sedentary Behavior Questionnaire for adults. J Phys Act Health. 2010;7:697-705. https://doi.org/10.1123/jpah.7.6.697

13. Buysse DJ, Reynolds CF III, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. Psychiatry Res. 1989;28(2):193-213. doi:10.1016/0165-1781(89)90047-4

14. Liem S .Physical activity, sedentary behaviour ,and fitness: a cross-sectional study.Maj ilm fisioter indones 2025;13;504-511.doi:10.24843/mifi.000000363