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Prevalence and risk factors of low back pain among physiotherapy students and observational study

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Abstract
Background: Low back pain (LBP) is a leading cause of disability globally and is increasingly reported among young adults. Undergraduate physiotherapy students represent a vulnerable population due to prolonged academic hours, practical training, patient handling, and sustained static postures, despite formal education in ergonomics.
Aim: To determine the prevalence and determinants of low back pain among undergraduate physiotherapy students.
Methods: A cross-sectional observational study was conducted among 100 undergraduate physiotherapy students selected using simple random sampling. Data on demographic characteristics, academic and ergonomic factors, lifestyle habits, and LBP history over the past six months were collected. Disability due to LBP was assessed using MODI. Descriptive statistics, chi-square tests, and multivariate logistic regression were used for data analysis.
Results: The 6-month prevalence of LBP was 62%. Among affected students, 38.7% reported moderate disability, while 22.6% and 9.7% reported severe and crippling disability, respectively. Prolonged standing (>4 hours/day), improper lifting techniques, and poor sitting posture were significantly associated with LBP ($p < 0.05$). Logistic regression identified improper lifting technique (OR = 6.5), prolonged standing (OR = 4.8), and poor posture (OR = 3.2) as significant independent predictors.
Conclusion: Low back pain is highly prevalent among physiotherapy students and is strongly associated with modifiable ergonomic and academic factors. Early ergonomic education, posture correction, and preventive exercise programs should be integrated into physiotherapy curricula to reduce future musculoskeletal burden.

Keywords: Low back pain, physiotherapy students, modified oswestry disability index, ergonomics, musculoskeletal disorders

Introduction

Low back pain (LBP) is one of the most prevalent musculoskeletal complaints worldwide, affecting individuals across all ages and socioeconomic groups. It represents a major cause of functional disability and reduced quality of life, particularly when it becomes recurrent or chronic (Asad *et al*., 2024) [1]. Traditionally considered a disorder affecting middle-aged and older populations, emerging evidence indicates that LBP is increasingly common among young adults, including university students (Hoy *et al*., 2014; Taha *et al*., 2023). This trend poses substantial concerns, as the onset of LBP during formative academic years may predispose individuals to chronic pain and long-term disability if unaddressed.

Healthcare students—including those in physiotherapy programmes—appear especially vulnerable due to the combined physical demands of clinical training and prolonged academic activities. Physiotherapy curricula often require extended periods of standing, repetitive bending during practical sessions, patient handling, and sustained static postures during study or clinical observation. These demands can increase mechanical loading on the lumbar spine, even in students with formal training in body mechanics and ergonomics (Nyland & Grimmer, 2003; Karishma *et al*., 2021). Previous research has reported high prevalence rates of LBP among physiotherapy students, with some studies suggesting that exposure to physiotherapy training itself may function as a risk factor for musculoskeletal discomfort (Nyland & Grimmer, 2003; Silva *et al*., 2010).

Moreover, lifestyle factors such as prolonged sitting, inadequate physical activity, and poor posture have been implicated in the onset and exacerbation of low back pain among young adults. For example, prolonged sedentary behaviour and poor ergonomic habits have been associated with higher rates of spinal discomfort and musculoskeletal pain in student populations (Asad *et al*., 2024; Young People *et al*., 2022) [1]. Despite this, there remains a relative paucity of research examining the prevalence and multifactorial determinants of LBP within physiotherapy student cohorts, particularly in the Indian context. Insight into these factors is essential for developing targeted preventive strategies that can be integrated early in professional training.

Given the potential impact of LBP on students' functional capacity, academic performance, and future professional wellbeing, the current study aims to determine the six-month prevalence of LBP among undergraduate physiotherapy students and identify associated ergonomic and lifestyle-related risk factors using the Modified Oswestry Disability Index.

Materials and Method

Study Design

Cross-sectional observational study.

Sample Size and Sampling

A total of 100 undergraduate physiotherapy students were recruited using simple random sampling from the student enrollment list.

Inclusion Criteria

1. Undergraduate students enrolled in the Bachelor of Physiotherapy (BPT) program, including final-year students and interns, at the selected institution during the study period.
2. Students aged 18–25 years, representing the typical undergraduate physiotherapy population.
3. Students who were actively participating in academic, practical, and/or clinical training, ensuring exposure to ergonomic and academic risk factors.
4. Students who reported with or without a history of low back pain within the past six months, allowing estimation of prevalence.
5. Students who were willing to participate voluntarily and provided written informed consent prior to data collection.
6. Students who were able to comprehend and respond to the study questionnaire and the Modified Oswestry Disability Index independently.

Exclusion Criteria

1. Students with a history of spinal surgery, vertebral fracture, or major traumatic injury involving the spine within the past one year.
2. Students with diagnosed neurological disorders (e.g., radiculopathy, spinal cord injury) or inflammatory spinal conditions (e.g., ankylosing spondylitis).
3. Students with congenital spinal deformities such as scoliosis or spondylolisthesis that could independently influence low back pain.
4. Students with systemic musculoskeletal disorders (e.g., rheumatoid arthritis) or chronic medical conditions affecting mobility or pain perception.
5. Students who were pregnant, due to pregnancy-related biomechanical and hormonal changes affecting the lumbar spine.
6. Students who were currently undergoing treatment for severe low back pain, including physiotherapy or pharmacological management, which could bias pain severity reporting.
7. Students who were unwilling to participate or did not provide informed consent.
8. Incomplete or improperly filled questionnaires, which were excluded from final analysis.

Outcome Measures: Modified Oswestry Disability Index

Procedure

The study was conducted following approval from the Institutional Ethics Committee. Prior to data collection, permission was obtained from the Head of the Physiotherapy Department. The study procedure was explained to all eligible participants, and written informed consent was obtained in accordance with ethical guidelines.

A list of all undergraduate physiotherapy students, including interns, was obtained from the academic office. Participants were selected using simple random sampling with the help of computer-generated random numbers to minimize selection bias. Students who met the inclusion criteria were approached during academic hours and invited to participate in the study.

Data collection was carried out in a classroom or clinical teaching area to ensure a quiet and comfortable environment. Participants were first asked to complete a demographic and ergonomic questionnaire, which included information on age, gender, academic year, internship status, and exposure to potential risk factors such as prolonged standing, sitting posture, lifting techniques, and physical activity levels. The recall period for low back pain was defined as the preceding six months.

Following the demographic assessment, participants completed the Modified Oswestry Disability Index (MODI) to assess the severity of disability associated with low back pain. Standardized instructions were provided prior to questionnaire administration to ensure uniform understanding. Participants were instructed to answer each item based on their typical functional status during episodes of low back pain within the recall period. Clarifications were provided when required, without influencing responses.

Upon completion of data collection, all questionnaires were reviewed for completeness. Incomplete or improperly filled forms were excluded from the final analysis. Data were then coded and entered into a password-protected database to maintain confidentiality. Participant identity was anonymized using unique identification numbers.

Statistical analysis was performed using appropriate statistical software. Descriptive statistics were used to summarize demographic characteristics, prevalence of low back pain, and MODI severity categories. The association between low back pain and ergonomic risk factors was analyzed using the Chi-square test. Factors showing significant associations were further evaluated using multivariate logistic regression analysis to identify independent predictors of low back pain. A p-value of less than 0.05 was considered statistically significant

Results

Out of 100 participants, 62 students reported experiencing low back pain within the past six months, yielding a prevalence of 62%. Female students constituted 64.5% of those affected, while interns represented 45.1% of the LBP group, indicating higher vulnerability during intensive clinical exposure.

MODI assessment revealed that moderate disability was most common (38.7%), followed by minimal disability (29.0%). Severe and crippling disability were reported by 22.6% and 9.7% of students, respectively. The mean MODI score was 31.4 ± 12.2, suggesting an overall moderate level of functional impairment.

Chi-square analysis demonstrated statistically significant associations between low back pain and prolonged standing, improper lifting techniques, and poor sitting posture ($p < 0.05$). Logistic regression analysis identified improper lifting technique as the strongest predictor of LBP (OR = 6.5), followed by prolonged standing (OR = 4.8) and poor posture (OR = 3.2). Physical inactivity showed increased odds but was not statistically significant.

Statistical Analysis : Out of 100 undergraduate physiothera py students, the 6-month prevalence of low back pain was 62%, indicating a high burden of musculoskeletal complaints. Female students showed a higher prevalence of LBP (64.5%) compared to male students (35.5%). Nearly half of the affected students were interns (45.1%), suggesting increased risk during clinical training. MODI analysis revealed moderate disability as the most common severity level (38.7%), with a mean score of 31.4 ± 12.2. A substantial proportion (32.3%) of students exhibited severe

to crippling disability, indicating notable functional limitation. Prolonged standing (>4 hours/day) showed a highly significant association with LBP ($\chi^2 = 18.72$, $p = 0.00001$). Improper lifting technique demonstrated an even stronger association with LBP ($\chi^2 = 29.4$, $p < 0.00001$). Logistic regression identified improper lifting (OR = 6.5) and prolonged standing (OR = 4.8) as independent significant predictors of low back pain.

Results

A total of 100 undergraduate physiotherapy students participated in the study. The 6-month prevalence of low back pain (LBP) was found to be 62%, indicating that nearly two-thirds of the participants experienced LBP during the recall period.

Among the students reporting LBP, female students constituted 64.5% (40 out of 62), while interns accounted for 45.1% (28 out of 62) of the affected population. This suggests a higher burden of LBP among female students and those undergoing intensive clinical training.

Assessment of disability using the Modified Oswestry Disability Index (MODI) revealed that moderate disability was the most common severity level, observed in 38.7% of students with LBP. Minimal disability was seen in 29.0%, while severe disability and crippling disability were reported by 22.6% and 9.7% of students, respectively. The mean MODI score among affected students was 31.4 ± 12.2, reflecting a moderate level of functional limitation.

Inferential analysis demonstrated a statistically significant association between prolonged standing and LBP. Students who stood for more than 4 hours per day during practical or clinical sessions showed a significantly higher prevalence of LBP compared to those with shorter standing durations ($\chi^2 = 18.72$, $p = 0.00001$).

Similarly, a strong and highly significant association was observed between improper lifting technique and LBP. Students who lifted or handled patients without proper knee flexion were more likely to report LBP compared to those who followed correct lifting mechanics ($\chi^2 = 29.4$, $p < 0.00001$).

Multivariate analysis using logistic regression identified improper lifting technique as the strongest independent predictor of LBP (OR = 6.5, 95% CI: 2.8–14.7, $p = 0.00001$), followed by prolonged standing (OR = 4.8, 95% CI: 2.1–10.9, $p = 0.0002$) and poor sitting posture (OR = 3.2, 95% CI: 1.4–7.3, $p = 0.004$). Although physical inactivity showed increased odds of LBP (OR = 2.1), the association was not statistically significant ($p = 0.07$).

Discussion

The present study identified a high six-month prevalence of low back pain (62%) among undergraduate physiotherapy students, indicating that musculoskeletal disorders are common even during the early stages of professional training. This finding is consistent with earlier studies conducted among physiotherapy and healthcare students, which report prevalence rates ranging from 50% to 70%, suggesting that academic and clinical training itself may act as a significant risk factor for low back pain (Nyland & Grimmer, 2003; Karishma *et al*., 2021; Kemall *et al*., 2024) [3].

A higher proportion of low back pain was observed among female students (64.5%) compared to male students (35.5%). Similar gender-related differences have been reported in previous literature, where female students demonstrated increased susceptibility to musculoskeletal pain. Possible explanations include differences in muscle strength, biomechanical loading, hormonal influences, and pain perception, as well as greater exposure to sustained postures during academic and clinical activities (Silva *et al*., 2010; Taha *et al*., 2023).

Severity analysis using the Modified Oswestry Disability Index revealed that moderate disability was the most prevalent category, followed by minimal disability. However, it is noteworthy that more than one-third of affected students reported severe to crippling disability. This indicates that low back pain in this population is not merely episodic discomfort but is associated with meaningful functional limitation. Similar patterns of moderate disability have been documented in studies among physiotherapy students, emphasizing the potential progression of symptoms if early intervention is not implemented (Karishma *et al*., 2021; Sultan *et al*., 2025) [2].

Among the ergonomic and lifestyle factors examined, improper lifting technique emerged as the most frequently reported risk factor and the strongest independent predictor of low back pain. This finding aligns with previous research highlighting patient handling and incorrect lifting mechanics as primary contributors to spinal loading and injury in physiotherapy trainees (Nyland & Grimmer, 2003; Thakkar & Jhala, 2024) [9]. The presence of this risk factor among physiotherapy students is particularly concerning, as it suggests a gap between theoretical knowledge of body mechanics and its consistent application during clinical practice.

Prolonged standing for more than four hours per day was another prominent risk factor associated with low back pain. Sustained static postures are known to increase compressive forces on spinal structures and contribute to muscular fatigue, which may explain the higher prevalence of symptoms among students engaged in extended practical and clinical sessions (Asad *et al*., 2024; Daher *et al*., 2025) [1, 5]. Poor sitting posture during academic study was also common, reflecting prolonged sedentary behavior in non-ergonomic environments, a factor previously associated with spinal discomfort in student populations (Young People *et al*., 2022).

Although physical inactivity was reported by a considerable number of students, it did not show a statistically significant association with low back pain in this study. This finding may be attributed to the generally active nature of physiotherapy training, which includes regular practical sessions. Nevertheless, previous studies have suggested that inadequate structured physical conditioning and reduced core stability may still contribute indirectly to musculoskeletal vulnerability (Hoy *et al*., 2014; Zhou *et al*., 2024) [6].

Overall, the findings of this study reinforce the concept that low back pain among physiotherapy students is largely associated with modifiable ergonomic and academic factors rather than unavoidable occupational exposure. Early identification of these risk factors provides an opportunity to implement preventive strategies such as ergonomic reinforcement sessions, supervised patient-handling training, posture correction programs, and core-stability exercises within the academic curriculum. Addressing these factors during training may reduce the risk of chronic low back pain and enhance long-term professional wellbeing.

Conclusion

Low back pain is highly prevalent among undergraduate physiotherapy students and is significantly associated with modifiable ergonomic and academic factors. Improper lifting, prolonged standing, and poor sitting posture are key contributors to disability. Early preventive strategies, including ergonomic education and structured exercise programs, are essential to protect the musculoskeletal health of future physiotherapists.

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