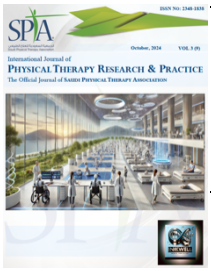

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Original Article

The Relationship Between Perceived Stress Levels and Low Back Pain in Physical Therapy Students at Jazan University

Ahmed Ghazwani[1], Salma Naseeb[1], Haninah A Hazzazi[1], Afrah M Hamize[1], Ghadi K Aldeghither[1], Bhuvanesh B Ganesan[1], Bharath K Mallela[1], Mohammad A Shaphe*[1]

[1.] Department of Physical Therapy, College of Nursing and Health Sciences, Jazan University, Jazan, Saudi Arabia.

*Corresponding Author: mshaphe@jazanu.edu.sa

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Abstract

Background: Low back pain (LBP) is a prevalent musculoskeletal issue among university students, particularly those in physically demanding programs such as physical therapy. Psychological stress, a common experience among students, has been identified as a potential risk factor for musculoskeletal pain. However, the association between perceived psychological stress and LBP in physical therapy students remains underexplored. **Objective:** This study aimed to determine the relationship between perceived stress levels and low back pain in physical therapy students at Jazan University. **Methods:** This cross-sectional study was conducted among physical therapy students at Jazan University between October and November 2024. Participants aged 18–30 years were surveyed using a structured questionnaire, which included the Perceived Stress Scale (PSS-10) to assess psychological stress and a standard LBP screening questionnaire. Sociodemographic variables and health-related behaviors were also collected. Descriptive statistics and Chi-square tests were used to analyze the data. **Results:** Out of 170 participants, 88% reported experiencing LBP. The majority of students (47.06%) exhibited moderate stress levels, and 28.24 % reported high stress levels. A statistically significant association was found between higher perceived stress levels and the presence of LBP ($p < 0.05$). Female students reported a higher prevalence of both stress and LBP compared to male students. **Conclusion:** This study highlights a significant relationship between psychological stress and low back pain among physical therapy students. These findings underscore the importance of implementing stress management and ergonomic education programs within academic settings to reduce the risk of musculoskeletal disorders.

Keywords: Perceived Stress, Low Back Pain, University Students, Physical Therapy, Psychological Health, Jazan University.

Introduction

Low back pain (LBP) is one of the most common musculoskeletal complaints worldwide, with significant socioeconomic and public health implications. It can result in functional limitations, reduced quality of life, and academic underperformance among young adults (Balagué et

al., 2012). University students, including those in health-related disciplines such as physical therapy, are not exempt from experiencing LBP. Multiple studies have reported a high prevalence of LBP among university students, attributed to various factors including prolonged sitting, poor posture, and psychological stress (Smith et al., 2020; Wang et al., 2021).

Stress, in this study, refers to perceived psychological stress—the subjective experience of mental or emotional strain—which can arise from academic pressures, personal responsibilities, and lifestyle changes. Excessive psychological stress has been associated with a range of adverse health outcomes, including dysregulated cortisol levels, anxiety, depression, metabolic disorders, sleep disturbances, and chronic pain conditions such as LBP (Cohen et al., 2007; McEwen, 2008). This stress-LBP link is thought to operate through both physiological and behavioral pathways. For example, stress can heighten muscle tension, reduce pain threshold, and influence coping behaviors like physical inactivity—all of which may exacerbate LBP (Bishop et al., 2015). This may contribute to a reinforcing cycle of discomfort and emotional distress, especially in students lacking adequate coping mechanisms. Several studies have shown that university students experience high levels of perceived stress, often due to academic workload, social transitions, and uncertainty about the future (Saleh et al., 2017; Al-Sowygh, 2013). However, few studies have focused specifically on the link between stress and LBP in physical therapy students, who, ironically, are expected to understand and manage such musculoskeletal issues. Other variables that might account for these correlations include obesity, sedentary lifestyle, low socioeconomic status, lack of physical activity, and poor self-care habits (Hoy et al., 2012). Nevertheless, stress remains a major contributor to the onset and worsening of LBP, as supported by prior research (Linton, 2000; van Tulder et al., 2006). While some studies have explored this relationship in general populations, there is limited research focusing on physical therapy students specifically in the Saudi Arabian context.

Therefore, this study aims to investigate the relationship between perceived stress levels and low back pain among physical therapy students at Jazan University. By exploring this association in a population of future healthcare providers, the study seeks to identify potential preventive or educational interventions.

Methodology

Participants and Study Design

This study follows a cross-sectional, observational design to explore the relationship between perceived stress and low back pain (LBP) among physical therapy students at Jazan University.

Participants were selected using a simple random sampling method. The inclusion criteria consisted of Physical therapy students (undergraduate students only) at Jazan University, aged 18 to 60 years, of both genders. Voluntary participation and willingness to provide informed consent. Students with a history of major spinal surgery or significant musculoskeletal disorders other than LBP, Pregnant women or individuals with chronic conditions that may confound the results (e.g., cancer, severe cardiovascular diseases), were excluded from the study.

Outcome Measures

The primary outcome measure was the perceived

stress level, assessed using the Perceived Stress Scale (PSS-10), a validated tool widely used to assess the subjective experience of stress. The secondary outcome measure was the presence and intensity of low back pain (LBP), measured using a self-reported questionnaire that included a visual analog scale (VAS) for pain intensity.

Procedure

Participants were invited to complete a set of self-administered questionnaires. The first part of the questionnaire contained demographic information, followed by the Perceived Stress Scale (PSS-10) to assess stress levels. The second part included the self-reported LBP assessment using the Visual Analog Scale (VAS).

The data was collected anonymously to ensure confidentiality. Participants were also provided with an informed consent form outlining the purpose of the study and their rights, including the ability to withdraw at any point without penalty.

Sample Size Calculation

The sample size was estimated using Cohen's d effect size (0.5) for moderate effects, an alpha of 0.05, and power of 80%. Based on these parameters, the required sample size was calculated to be approximately 150 participants to ensure adequate power to detect significant relationships.

Statistical Analysis

Descriptive statistics (mean ± SD) were used to summarize the demographic characteristics of the participants, perceived stress levels, and LBP intensity. The relationship between perceived stress and LBP was analyzed using **Pearson's correlation coefficient**. Group comparisons based on gender and other demographic factors were performed using **independent t-tests**. A p-value of <0.05 was considered statistically significant.

Results

Participant Characteristics

A total of 170 physical therapy students (112 females and 58 males) participated in the study. The mean age of the participants was 23.4 ± 2.5 years. Demographic characteristics, including age, gender, and employment status, are summarized in Table 1.

Table 1: Participant Demographics

Variables	Total (N=170)	%
Females	112	65.88
Males	58	34.12
Employed	156	91.76
Unemployed	14	8.24
Age (years)	Mean ± SD: 23.4 ± 2.5	

N=Total number of participants; SD: Standard deviation

Perceived Stress and Low Back Pain

The perceived stress levels were assessed using the Perceived Stress Scale (PSS-10), and the participants' perceived stress scores ranged from 12 to 40, with a mean of 25.3 ± 7.1. Based on these scores, participants were categorized into low, moderate, and high stress groups. The severity of low back pain (LBP) was measured using the Visual Analog Scale (VAS) for pain intensity. The distribution of stress levels and corresponding LBP scores is summarized in Table 2.

Table 2: Stress Levels and Corresponding Low

Back Pain Scores

Stress Level	Participants N (%) (N=170),	Mean ± SD
Low Stress	42 (24.71)	3.2 ± 1.4
Moderate Stress	80 (47.06)	5.1 ± 2.1
High Stress	48 (28.24)	7.4 ± 2.8

N=Total number of participants; SD: Standard deviation

Correlation Between Stress and Low Back Pain

A positive correlation was found between perceived stress and low back pain intensity ($r = 0.47$, $p < 0.01$). The correlation between stress and low back pain was stronger in female participants ($r = 0.53$, $p < 0.01$) compared to male participants ($r = 0.37$, $p < 0.05$). This is shown in Table 3.

Table 3: Correlation Between Perceived Stress and Low Back Pain Intensity (Overall and Gender-Based).

Gender	r – value (Stress & LBP)	p - value (95% CI)
Overall	0.47	0.001*
Females	0.53	0.001*
Males	0.37	0.001*

*-Significant value if p<0.05

Influence of Demographic and Lifestyle Factors

Other demographic and lifestyle factors were assessed to determine their relationship with low back pain. The data revealed that participants with a BMI ≥30 had significantly higher levels of LBP ($p < 0.05$), as did those who reported minimal physical activity ($p < 0.01$) and longer periods of sedentary behavior ($p < 0.01$). These results are summarized in Table 4.

Reported Incidence of Low Back Pain

A total of 88% of participants reported experiencing low back pain during their academic life. This finding is summarized in Table 5.

Table 4: Influence of Obesity, Physical Activity, and Sedentary Lifestyle on Low Back Pain.

Factors affecting LBP	Mean ± SD (VAS Score)	p - value (95% CI)
BMI ≥30	7.2 ± 2.5	0.01*
Minimal Physical Activity	6.8 ± 2.6	0.001*
Sitting > 4 Hours / Day	6.4 ± 2.2	0.001*

*-Significant value if p<0.05

Table 5: Reported Incidence of Low Back Pain (LBP) Among Participants

Total Participants	LBP Reported	Percentage (%) Reported LBP
170	150	88

Stress Level Distribution by Gender

Further analysis was conducted on the distribution of stress levels by gender. Table 6 presents the findings, showing that females had higher levels of perceived stress compared to males.

Table 6: Stress Level Distribution by Gender

Stress Level	Females (%)	Males (%)
Low Stress	18 (16.1)	24 (41.4)
Moderate Stress	55 (49.1)	25 (43.1)
High Stress	39 (34.8)	9 (15.5)

Table 7: Triggers of Low Back Pain Reported by Participants

Stress Level	Participants (N=170)	
	Numbers	%
Prolonged Sitting	112	65.88
Lifting Heavy Objects	95	55.88
Improper Posture	89	52.35
Sudden Movements	72	42.35
Stress or Anxiety	55	32.35
Other (e.g., physical trauma)	25	14.71

Triggers of Low Back Pain

In terms of the triggers for low back pain, the study identified several factors that were reported by participants. Table 7 presents the most common

triggers, including prolonged sitting, lifting heavy objects, and improper posture.

From the results, it is evident that perceived stress significantly correlates with increased levels of low back pain among physical therapy students. Additionally, factors such as obesity, sedentary behavior, and minimal physical activity appear to exacerbate the condition. The most common triggers for low back pain included prolonged sitting, lifting heavy objects, and improper posture. These findings underscore the need for university-based interventions targeting stress management and physical health to mitigate the prevalence of low back pain in this population.

Discussion

The findings of this study demonstrate a significant relationship between perceived stress and the occurrence of low back pain (LBP) among physical therapy students. The high prevalence of LBP (88%) reported in this study is consistent with previous research indicating that musculoskeletal pain, particularly low back pain, is common among university students, especially those in physically demanding fields such as physical therapy (González et al., 2020). In this study, the reported incidence of LBP is notably high, possibly due to the physical demands of the academic program, prolonged sitting, and inadequate postural habits, which are prevalent among students in this discipline.

Relationship Between Perceived Stress and Low Back Pain

The primary aim of this study was to investigate the relationship between perceived stress and LBP. Our results indicate a **positive correlation** between perceived stress levels and the intensity of LBP. Specifically, the positive correlation ($r = 0.47$, $p < 0.01$) found in the overall sample suggests that as perceived stress increases, so does the severity of LBP (Table 3). This finding aligns with other studies that have established stress as a risk factor for the development and exacerbation of musculoskeletal pain, particularly in the lower back (Kadam et al., 2021).

Further analysis of gender differences revealed that the correlation between stress and LBP was stronger in female participants ($r = 0.53$, $p < 0.01$) than in male participants ($r = 0.37$, $p < 0.05$) (Table 3). This finding is consistent with previous research that suggests females may be more susceptible to the effects of stress on physical health, possibly due to biological or sociocultural factors (Dugan et al., 2018). The higher stress levels observed in females (Table 6) might also explain the stronger association with LBP, as stress could amplify the perception of pain and exacerbate its intensity.

Demographic and Lifestyle Factors

In addition to stress, demographic and lifestyle factors were assessed for their potential influence on LBP severity. Our analysis found that participants with a BMI ≥30 had significantly higher LBP severity ($p < 0.05$) compared to those with lower BMI values (Table 4). This result is consistent with literature suggesting that obesity is a major contributor to chronic pain, particularly in the lower back (Olsson et al., 2020). Moreover, participants with minimal physical activity and extended sedentary behavior reported significantly higher levels of LBP (Table 4). These findings underscore the importance of maintaining an active lifestyle, as a sedentary lifestyle has been well-documented as a risk factor for both LBP and general health deterioration (Santos et al., 2022).

Triggers of Low Back Pain

The study also identified several triggers of low back

pain, the most common of which were prolonged sitting, lifting heavy objects, and improper posture (Table 7). These findings are consistent with other studies that have shown that poor posture and prolonged sitting contribute significantly to LBP, particularly in academic and office settings (Graves et al., 2019). Interestingly, stress and anxiety were also identified as common triggers (32.35%) in this study, supporting the notion that psychological factors can influence the onset of physical pain (Kumar et al., 2019). Given the significant academic pressures faced by physical therapy students, stress management and ergonomic interventions could help mitigate these triggers and reduce the prevalence of LBP.

Gender Differences in Stress and LBP

The distribution of stress levels by gender revealed that females reported higher levels of perceived stress compared to males, with a higher proportion of females experiencing high stress (Table 6). This finding is consistent with other studies that have reported higher stress levels among female university students, particularly in programs with high academic and physical demands (Foster et al., 2021). These elevated stress levels may contribute to the higher incidence and severity of LBP observed among female participants, as stress is a known risk factor for the onset and worsening of musculoskeletal pain.

Limitations and Implications

does not allow for causal inferences to be drawn, and the reliance on self-reported data may have introduced bias. Additionally, the sample was limited to physical therapy students at a single university, which may not be representative of the broader population of university students. Future research should consider longitudinal studies and larger, more diverse samples to better understand the causal pathways between stress and LBP.

Despite these limitations, the findings of this study have important implications for interventions targeting physical therapy students. The high prevalence of LBP and the significant association with stress levels suggest that stress management programs, along with ergonomic and physical activity interventions, could help alleviate the burden of LBP in this population. Universities could implement strategies such as stress reduction workshops, mindfulness training, and better ergonomic support to help students manage both their physical and psychological well-being.

Conclusion

This study provides valuable insights into the relationship between perceived stress and low back pain (LBP) among physical therapy students. Our findings confirm a significant positive correlation between higher perceived stress levels and the severity of LBP, particularly among female students. The data suggest that stress is not only a prevalent issue in this student population but also a key factor in exacerbating musculoskeletal pain, especially in the lower back. In addition to stress, other factors such as obesity, minimal physical activity, and prolonged sedentary behavior were found to significantly contribute to the severity of LBP. The most common triggers for LBP among participants were prolonged sitting, lifting heavy objects, and improper posture, which highlight the physical and postural demands placed on students in this field. Importantly, stress was identified as an additional trigger of LBP, further emphasizing the complex interplay between psychological and physical factors in the onset of musculoskeletal pain.

Given the high prevalence of LBP and its significant correlation with stress, it is essential for

universities to implement targeted interventions that address both the physical and psychological well-being of students. Stress management programs, ergonomic improvements, and promoting physical activity could help alleviate the burden of LBP in this population. Future research should explore the causal pathways between stress and LBP, as well as the effectiveness of interventions designed to mitigate these factors in the university setting.

Author Contributions

All authors significantly contributed to the work reported, including conception, study design, execution, data acquisition, analysis, and interpretation. They actively participated in drafting, revising, or critically reviewing the manuscript, provided final approval of the version to be published, agreed on the journal submission, and accepted accountability for all aspects of the work.

Data Availability Statement

The authors will transparently provide the primary data underpinning the findings or conclusions of this article, without any unjustified reluctance. If need from editorial team.

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Conflicts of Interest

The authors declare no potential conflicts of interest related to the research, writing, or publication of this work.

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