

Correlation between low back pain and disability among physical therapy students at Horus University, Egypt: A cross-sectional study

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ABSTRACT

Low back pain (LBP) is a leading cause of disability and has been associated with several factors, including postural habits, physical inactivity, and psychosocial factors among university students. The precise cause of LBP is often difficult to find, with activity imbalance and postural changes being common contributors. Students in healthcare-related fields are particularly susceptible to LBP. This study aimed to investigate the correlation between LBP and disability among physical therapy students at Horus University, Egypt. A total of 200 physical therapy students (59% females and 41% males), aged 20 to 25 years enrolled in the current study, at Horus University, Egypt.. To measure

pain and functional level, both Acute LBP Screening Questionnaire (ALBPSQ) and Oswestry Low Back Disability Questionnaire (ODI) were used. The current study revealed that there was a moderate correlation between ALBPSQ score and ODI score ($p < 0.05$). Also, there was a moderate correlation between pain intensity in terms of VAS (Visual Analog Scale) score and dysfunction level in terms of ODI ($p < 0.05$). The findings highlight the relationship between pain intensity and functional impairment in physical therapy students with LBP. Universities and healthcare institutions might consider implementing policies that promote better posture, regular physical activity, and ergonomic practices to reduce the incidence of LBP among students.

KEYWORDS

Low Back Pain; Disability; Pain Intensity; Psychosocial Factors; Physical Activity

1. INTRODUCTION

Low back pain (LBP) affects 50% to 80% of people at some point in their lives (Shekhar et al., 2023). Chronic LBP is one of the leading causes of disability, affecting people of all ages and genders and having a significant financial effect on the world economy (Wang et al., 2022). Even though LBP is quite common, in 85 to 90% of instances, it is difficult to find the precise cause of chronic LBP using clinical or radiological means. Activity imbalance and postural changes, which can arise from changes in the kinetic chain from the feet to the back, are the most common causes of LBP (Ali et al., 2024).

Between 2000 and 2005, the percentage of university students experiencing LBP increased from 14% to 67%. In 2021, 20.8% of medical students in Serbia said they had LBP. In 2023, the point, yearly, and lifetime prevalences of LBP in Tunisia were 37.8%, 80.4%, and 90.5%, respectively. While the point, yearly, and lifetime prevalences of LBP were 32%, 32%, 48%, and 59%, respectively, in another 2020 study of the adult population in India, male individuals had a lower incidence of LBP than female participants. Australia, the United States, Finland, Japan, China, Korea, Saudi Arabia, Türkiye, Serbia, Tunisia, and Malaysia are among the other developed countries where this study has been carried out (Ilic et al., 2021; Kesiena et al., 2021; Boussaid et al., 2023; Shekhar et al., 2023; Zulkifli et al., 2023).

Previous studies have identified numerous risk factors associated with LBP, including age, gender, length of study, sitting posture, history of LBP, past physical trauma, current part-time employment, elevated body mass index (BMI), positive history of over-exertional back trauma, neck

forward bending, heavy weight carrying, awkward posture, prolonged standing, lack of physical exercise, smoking more than 11 cigarettes per day, and self-reported mental pressure (Alnaami et al., 2021; Bayoumi et al., 2025).

Students in nursing, physical therapy, dentistry, and medical programs who take part in clinical research and patient care are susceptible to LBP (Shekhar et al., 2023). As far as we are aware, no such study has been conducted in Egypt; hence, the goal of this one is to find out how common LBP is among physical therapy students at Horus University in Egypt and how it relates to impairment.

2. METHODS

2.1. Study Design and Participants

This descriptive cross-sectional study involved faculty of physical therapy students at Horus University, Egypt. The survey was conducted only among physical therapy students. Biomedical Research Ethics Committee at Cairo University, Faculty of Physical Therapy, Research Ethics Committee, NO: (P.T.REC/012/004777).

A total of 200 male and female physical therapy students aged 20–25 years were selected based on their age and faculty to ensure that the sample was representative of the physical therapy student population at Horus University, Egypt.

- *Inclusion criteria:*

1. Undergraduate physical therapy students enrolled at Horus University, Egypt.
2. Aged between 20 and 25 years.
3. Willing to participate and provide informed consent.

- *Exclusion criteria:*

1. History of spinal cord injury or damage.
2. Previous spinal or musculoskeletal surgery.
3. Diagnosed intervertebral disc herniation (slipped disc) or scoliosis.
4. Pregnancy.
5. Current use of psychiatric medications.

2.2. Instruments and Procedures

Each participant filled out a survey that assessed the correlation between LBP and the disability they suffer from. Google Forms was used to distribute the questionnaires and administer

them to participants online. For evaluation, pain intensity was assessed using visual analog scale (VAS). Participants determined their level of pain at that time on a 10-cm VAS, where zero shows no pain and 10 shows the worst pain imaginable (Atisook et al., 2021) and two questionnaires were used. The first one is the questionnaire for acute LBP assessment from the New Zealand acute LBP guide, incorporating the guide to assessing psychosocial yellow flags in acute LBP. The Acute LBP Screening Questionnaire (ALBPSQ) (Linton, 1996) was designed in English and serves as a diagnostic tool for acute LBP assessment in the form of 24 questions. Participants were informed about scoring instructions and the interpretation of scores.

The second one is the Oswestry Low Back Disability Questionnaire, used to evaluate functional performance level. The scale consists of ten questions, which include pain intensity, personal care (e.g., washing, dressing), lifting, walking, sitting, standing, sleeping, social life, traveling, and employment/homemaking. (Fairbank et al., 1980)

The ALBPSQ questionnaire had questions and statements for assessing aches or pains, such as back, shoulder, or neck pain, and physical activities that increase pain, and a list of five activities that best describe the current ability to take part in each of these activities. Questionnaire scores greater than 105 show that the patient is at risk.

Oswestry Low Back Disability Questionnaire: for each question, there are a possible 5 points; 0 for the first answer, 1 for the second answer, etc. Add up the total for the 10 questions and rate them on the scale at right. Scoring disability level occurs as follows: 0-4 No disability, 5-14 Mild disability, 15-24 Moderate disability, 25-34 Severe disability, 35-50 Completely disabled.

All participants signed an informed consent form showing their approval to take part in the study and to share the survey results for publication.

2.3. Statistical Analyses

Descriptive statistics were used in presenting the participant demographic and pain characteristics. Pearson correlation coefficient was conducted to investigate the correlation between the total score of ALBPSQ, VAS, and ODI. Multiple linear regression was used to find the variables that had a significant association with ODI results. The level of significance for statistical tests was established at $p < 0.05$. All statistical analyses were conducted using SPSS software, version 25.

3. RESULTS

A total of 200 physical therapy students at Horus University, Egypt, with LBP, took part in this study. Table 1 shows the general characteristics of study participants and the duration of their current pain.

Table 1. Demographic characteristics, anthropometric measurements, and duration of the current pain problem among participants

	Mean ± SD	Minimum	Maximum
Age (years)	24.07 ± 1.28	21	26
Weight (kg)	74.08 ± 12.18	55	100
Height (cm)	168.20 ± 7.70	152	184
BMI (kg/m²)	26.10 ± 3.29	20.20	32.77
	N	%	
Sex			
Females	118	59	
Males	82	41	
Duration of the current pain problem			
1–2 days	63	31.5	
3–7 days	23	11.5	
8–14 days	18	9.0	
15–30 days	10	5.0	
1 month	18	9.0	
2 months	10	5.0	
3–6 months	16	8.0	
6–12 months	15	7.5	
Over 1 year	27	13.5	

Note. SD: Standard deviation

Their mean age was 24.07 ± 1.28 years, with a minimum of 21 years and a maximum of 26 years. The mean weight, height, and BMI were 74.08 ± 12.18 kg, 168.20 ± 7.70 cm (about 3.03 in), and 26.10 ± 3.29 kg/m². About sex distribution, 59% of participants were females and 41% were males. (Table 1).

Most participants reported experiencing pain for a short duration, with 31.5% having pain for 1–2 days, followed by 11.5% for 3–7 days. A smaller proportion reported chronic pain, with 13.5% experiencing symptoms for over 1 year and 8.0% for 3–6 months. Most participants reported minimal work absence due to pain in the past 18 months (about 1 and a half years), with 33.5% missing no days and 28.0% missing only 1–2 days. Additionally, 17.0% missed 3-7 days (Table 1).

Table 2 presents the descriptive statistics of pain intensity, disability, and psychosocial risk factors among participants with LBP.

Table 2. Descriptive statistics of VAS, ODI, and ALBPSQ in participants with LBP

	Mean ± SD	Minimum	Maximum
VAS	4.36 ± 2.09	1	9
ODI	31.67 ± 7.47	14	47
Total score of ALBPSQ	93.10 ± 19.17	42	148

Note. SD: Standard deviation

The mean VAS of participants with LBP was 4.36 ± 2.09, ranging from 1 to 9. The mean ODI was 31.67 ± 7.47, ranging from 14 to 47. The mean ALBPSQ of participants with LBP was 93.10 ± 19.17, ranging from 42 to 148. Table 3 presents the descriptive statistics of pain-related characteristics among individuals with LBP.

Table 3. Characteristics of pain in participants with LBP

	Mean ± SD	Min	Max
How would you rate the pain that you have had during the past week?	4.06 ± 2.09	1	9
In the past 3 months, on average, how bad was your pain?	4.20 ± 1.98	1	9
How often would you say that you have experienced pain episodes, on average, during the past 3 months?	4.42 ± 2.37	1	10
Based on all the things you do to cope with or deal with your pain on an average day; how much are you able to decrease it?	5.38 ± 2.28	0	10
How tense or anxious have you felt in the past week?	4.79 ± 2.34	1	10
How much have you been bothered by feeling depressed in the past week?	4.67 ± 2.48	1	10
In your view, how large is the risk that your current pain may become persistent?	4.53 ± 2.14	1	10
Physical activities make my pain worse	4.59 ± 2.67	1	10
An increase in pain is an indication that I should stop what I am doing until the pain decreases	5.10 ± 2.99	1	10
I should not do my normal work with my present pain	4.22 ± 2.23	1	10
I can do light work for an hour	3.82 ± 2.90	0	9
I can walk for an hour.	3.93 ± 3.16	0	10
I can do ordinary household chores	4.39 ± 2.62	0	9
I can go shopping	4.12 ± 2.89	0	10
I can sleep at night	4.11 ± 3.19	0	10

Note. SD: Standard deviation

Based on table 3 above, the mean pain intensity reported during the past week was 4.06 ± 2.09 , and the average pain over the past three months was slightly higher at 4.20 ± 1.98 . Participants reported experiencing pain episodes often in the past three months (mean = 4.42 ± 2.37). On average, participants felt moderately able to reduce their pain through coping strategies (5.38 ± 2.28). Levels of anxiety (4.79 ± 2.34) and depression (4.67 ± 2.48) were moderate. The perceived risk of pain persistence was also moderate (4.53 ± 2.14). Many participants agreed that physical activity worsened pain (4.59 ± 2.67), and pain increases were seen as signals to stop activity (5.10 ± 2.99). Functional abilities such as walking, working, household tasks, and sleeping showed moderate limitations, with scores ranging between 3.82 and 4.39.

Table 4 and figure 1 show the correlations between psychosocial risk factors (ALBPSQ), pain intensity (VAS), and disability (ODI) among participants with LBP.

Table 4. Correlation between total score of ALBPSQ, VAS, and ODI in participants with LBP

	VAS		ODI	
	R-value	p value	R-value	p value
Total score of ALBPSQ	0.595	0.001	0.485	0.001
VAS			0.912	0.001

Note. R value: Pearson correlation coefficient; p value: Probability value

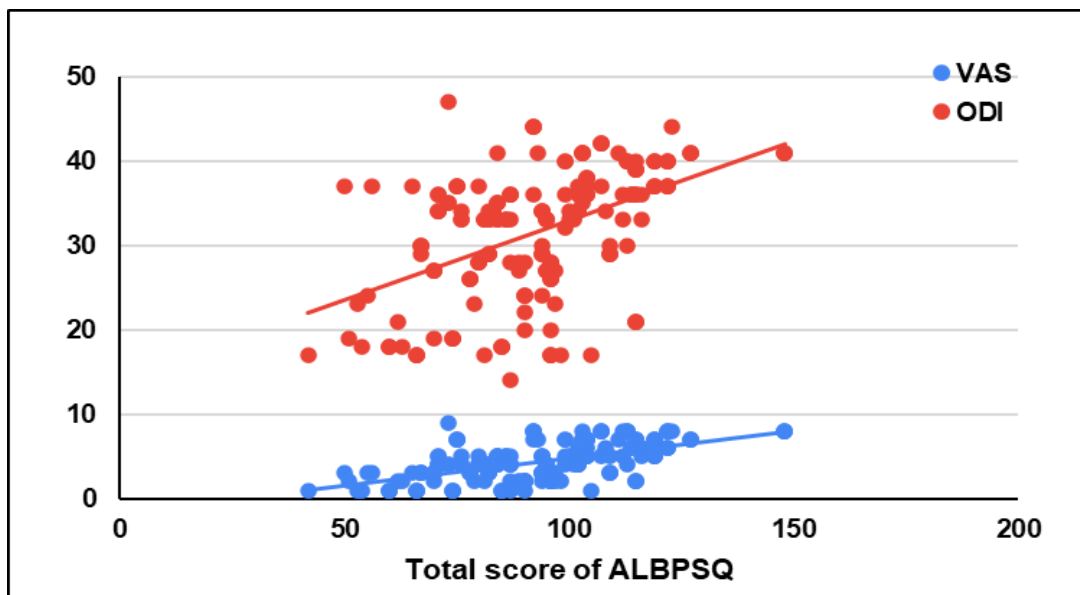


Figure 1. Correlation between the total score of the ALBPSQ, VAS, and ODI in participants with LBP

Based on table 4 above, the correlation of ODI was a moderate positive correlation with the total score of ALBPSQ ($r = 0.595$, $p = 0.001$) and was a strong positive correlation with VAS ($r = 0.912$, $p = 0.001$). Table 5 presents the results of a multiple linear regression analysis examining whether ALBPSQ scores and VAS scores predict ODI scores among participants with low back pain.

Table 5. Prediction of ODI from total score of ALBPSQ and VAS

Model	B	t	p value	95% CI	
				Lower Bound	Upper Bound
Total score of ODI	19.90	18.27	0.001	17.76	22.05
Total score of ALBPSQ	0.19	7.81	0.001	0.14	0.24
VAS	3.43	26.89	0.001	3.18	3.68

Note. B: Regression coefficient; value: p-value, probability value

Multiple linear regression analysis revealed that the overall model explained 92% of the variance of the ODI score. Total scores of ALBPSQ and VAS were significant predictors of ODI score ($p < 0.01$).

4. DISCUSSION

LBP is a common musculoskeletal disorder among physical therapy students who need medical advice within certain limits. It is the most frequent type of musculoskeletal dysfunction, which has a remarkably high prevalence among medical students. LBP harms students' social, psychological, and productivity levels (Hashim et al., 2021; Kesiena et al., 2021; Boussaid et al., 2023).

Many factors might contribute to causing LBP among PT students, such as repetitive or prolonged awkward posture, assuming certain positions for extended periods, repetitive bending forward, or carrying heavy objects from the floor. Also, sitting for prolonged periods at home to study and exam stress and anxiety might be strong inducing factors for chronic LBP (Parreira et al., 2016; Alnaami et al., 2019).

Statistical results of the current study revealed that there was a moderate correlation between ALBPSQ score and ODI score, which showed that all students who were expected to have psychosocial dysfunction and LBP suffer from lumbar spine dysfunction. Also, there was a moderate correlation between pain intensity in terms of VAS score and dysfunction level in terms of ODI, which shows that students who suffer from more intense LBP experience back dysfunction.

The results of the current study match the results of the study conducted by Naqiah et al. (2022). In their study, Naqiah and his college studied the association between LBP and quality of life (QOL) among health science students. They enrolled 96 students in their study and concluded that there was a significant negative correlation between QOL and LBP which means that the more intense LBP they suffer the worse QOL they are experiencing. Naqiah stated that LBP has a significant effect on participants' quality of life.

The episode of LBP and back dysfunction could have a biopsychosocial effect on these students and their mental well-being as well. The results of the study performed by Pavlova and her colleagues support this relationship. They conducted research among students in Ukraine and concluded that physical inactivity and back pain harm their mental health and QOL (Pavlova et al., 2017).

On the same vein, Shekhar et al. (2023) conducted a study to examine the relationship between LBP and the risk of long-term disability among medical students. They enrolled 30 participants in their cross-sectional study and concluded that among medical students, 15 % of them have an LBP associated with a chance of long-term disability, and they recommended that these participants need early intervention to avoid long-term disability. Also, they proposed that risk factors to cause LBP are stooping posture, weak hip and lower back muscles, Family history of LBP, and psychological stress (Shekhar et al., 2023).

The results of the current study agree with the results of Alnaami et al. (2019). They conducted their study over 12 months, and they enrolled 740 participants. And they assessed the prevalence and factors associated with LBP among health care workers in Saudi Arabia. Their results revealed that there was a positive association between the level of health care practice and LBP, and they concluded that there are multiple factors that could be risk to develop LBP as improper posture and bad ergonomics style at work, lack of regular physical exercise, stressful working conditions and high workload (Alnaami et al., 2019; Ali et al., 2024).

As a benefit from this study to the participants, the authors provided them tips to improve their ergonomics and posture and minimize stress to their back, and in turn decrease episodes of their LBP. Regular leg and lower stretches and daily walking for 10-15 minutes are helpful and keep proper posture during study hours and taking breaks. Every hour is vital to distribute the load equally to the lower back and lower extremities and minimize stress to back muscles.

If they are experiencing episodes of LBP, we urge them to seek physical therapy advice to strengthen their core muscle stabilizers, which are key to supporting their back. On the same vein, we asked them to visit the PT office once a week to receive manual therapy to help restore proper biomechanics of the spine and to practice regular exercise to secure long-term effects on their LBP.

5. LIMITATIONS

This study has some limitations that should be considered when interpreting the findings. First, due to its cross-sectional design, causal relationships between low back pain (LBP) and disability could not be established. In addition, several potentially relevant variables were not assessed, including study hours, levels of physical inactivity, and study-related postural habits. Second, all data were collected through self-reported measures, which may have introduced recall bias and social desirability bias. Finally, the study was conducted among physical therapy students from a single university, which may limit the generalizability of the findings. Future research should include larger and more diverse samples from different academic disciplines and institutions to improve the external validity and generalizability of the results.

6. CONCLUSIONS

The present study demonstrated a moderate correlation between ALBPSQ scores and ODI scores, indicating that higher levels of psychosocial risk factors associated with low back pain are related to greater disability among physical therapy students. In addition, a moderate correlation was observed between VAS scores and ODI scores, suggesting that increased pain intensity is associated with higher levels of functional disability. These findings highlight the relationship between psychosocial factors, pain intensity, and disability in physical therapy students with low back pain.

The implications of the current findings were the following:

- **Awareness and Prevention:** Highlighting the moderate correlation between pain intensity and functional impairment can raise awareness among physical therapy students and educators about the importance of early intervention and preventive measures for LBP.
- **Curriculum Development:** The results can inform curriculum developers to incorporate more ergonomic education and preventive strategies into the physical therapy program to help students manage and prevent LBP.

- Policy and Practice: Universities and healthcare institutions might consider implementing policies that promote better posture, regular physical activity, and ergonomic practices to reduce the incidence of LBP among students.
- Further Research: Our study provides a foundation for further research into the specific factors contributing to LBP in healthcare students and the effectiveness of various interventions.
- Clinical Implications: Understanding the relationship between LBP and disability can help clinicians develop more targeted treatment plans for students suffering from LBP, potentially improving their quality of life and academic performance.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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