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Research Article

# Prevalence and Risk Factors of Low Back Pain: A Case from the Higher Education Institutions in Pakistan

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## Abstract

Low Back Pain (LBP) is among the major causes of disability in the world, and it poses serious occupational health challenges to the working class, especially among less active workers, like faculty researchers in universities. The purpose of this study was to find the prevalence of LBP and identify the occupational, psychosocial, and lifestyle risk factors of LBP in faculty members in higher educational institutions. The cross-sectional analytic design was used, including 300 faculty researchers from five universities (60 researchers in each Higher Educational institution). A standardized questionnaire that included all the items of the Nordic Musculoskeletal Questionnaire (NMQ) as well as information about the demographics, work characteristics, physical activity, and psychosocial stress was gathered. Associations were analyzed using descriptive statistics, chi-square tests, and multivariate logistic regression. LBP prevalence in the past 12 months was 57.3% (n= 172). Significant risk factors in the multivariate analysis included prolonged sitting (>6 hours/day) (OR = 2.34, 95% CI 1.45–3.78, $p < .001$), lack of regular physical activity (OR = 1.92, 95% CI 1.18–3.13, $p = .009$), high perceived work stress (OR = 1.76, 95% CI 1.08–2.88, $p = .023$), and poor ergonomic workstation setup (OR = 2.01, 95% CI 1.24–3.25, $p = .004$). We concluded that LBP is prevalent among the faculty members of higher education institutions and is correlated with adaptable work and lifestyle situations. Factors, including ergonomics, physical activity promotion, and stress prevention interventions, are likely to avoid this burden.

**Keywords:** Prevalence, Risk Factors, Ergonomics, Low Back Pain, Higher Educational Institutions Faculty, Occupational Health

## 1. Introduction

Low back pain (LBP) is among the most widespread musculoskeletal syndromes worldwide (Diallo et al. 2019). It is one of the leading causes of years lived with disability, and is a significant socioeconomic burden in terms of absenteeism, healthcare costs and lack of productivity (Islam et al. 2020). A close relationship between LBP and sedentary work behavior, inadequate ergonomics, and predictive psychosocial strain has rendered it a matter of serious concern to the employees in knowledge-based careers (Abu-Gharbieh, Salam, and Khan 2018).

The professors of Higher Educational Institutions, especially those engaged in research-intensive roles, are a special occupational group exposed to several risk factors for LBP. Their activities tend to require long sitting time to write academic papers, analyze data, and also to collaborate with virtual teams, as well as repetitive use of a computer, long instruction time, and administrative duties associated with research (Chuadhry and Niazi 2017). There is an increased focus on research

**Table 1. Demographic and Occupational Characteristics of Participants (N = 300).**

| Variable | n (%) or Mean ± SD |
|---|---|
| **Age (years)** | 42.1 ± 9.6 |
| **Gender** | Male: 168 (56.0%), Female: 132 (44.0%) |
| **BMI (kg/m²)** | 26.0 ± 4.2 |
| **Academic Rank** | Assistant: 120 (40.0%), Associate: 105 (35.0%), Full: 75 (25.0%) |
| **Mean weekly working hours** | 47.6 ± 8.1 |
| **Daily sitting time** | ≤4 hrs: 45 (15.0%), 4–6 hrs: 95 (31.7%), >6 hrs: 160 (53.3%) |
| **Regular physical activity (≥150 min/wk)** | Yes: 112 (37.3%), No: 188 (62.7%) |
| **Reported poor ergonomic setup** | 128 (42.7%) |
| **High perceived work stress (PSS-4 ≥ median)** | 138 (46.0%) |

output, institutional rankings, and the acquisition of grants, which has intensified job demands and stress among members of the faculty. These work-related and psychosocial stressors can make professors more susceptible to musculoskeletal disorders, in particular, to LBP(Krishnan, Raju, and Shawkataly 2021).

Although LBP has been known to be a burden in the general workforce, there is scant literature that specifically focuses on its prevalence and risk factors among Higher Educational Institutions faculty researchers, especially in the low- and middle-income countries. This association is crucial to understand to develop specific interventions that can enhance the well-being of faculty members to promote academic productivity and decrease the healthcare expenses of an institution (Ibrahim 2025).

Therefore, this research is aimed at establishing the prevalence of LBP among faculty researchers across five universities, as well as to find out demographic, occupational, ergonomic, psychosocial, and lifestyle factors linked to LBP. The results are likely to shed light on the occupational health interventions and policy changes to overcome musculoskeletal health challenges (Diallo et al. 2019). Our specific objectives include finding the 12-month prevalence of LBP among Higher Educational Institutions, determining demographic, occupational, ergonomic, psychosocial, and lifestyle factors associated with LBP in Higher Educational Institutions faculty, and identifying the factors that remain significant predictors after adjusting for confounders.

## 2. Methodology

A cross-sectional analytic study was conducted between November 2024 to March 2025 among full-time faculty researchers employed at Bahauddin Zakariya University, (BZU), Islamia University Bahawalpur (IUB), Government College University Faisalabad (GCUF), and University of Sargodha (UOS). Ethical approval was obtained from the Institutional Review Board (IRB) of the Aqua Clinic, Islamabad.

A total of 300 participants (75 from each Higher Educational Institution) were selected using stratified random sampling to ensure representation across academic ranks (Assistant, Associate, and full Professors (Otzen and Manterola 2017). Faculty members aged 25–70 years, employed at the participating universities for at least six months, and involved in research-related work were included. Faculty on long-term medical leave, those with spinal surgery within the past year, and pregnant faculty members were excluded (Ahmed 2024).

Data was collected through a detailed, structured questionnaire containing demographic information such as age, gender, body mass index (BMI), and academic rank,

**Table 2. The 12-Month Prevalence of LBP by Higher Educational Institutions.**

| Higher Educational Institutions | (Sample)(n) | LBP Cases | Prevalence (%) |
|---|---|---|---|
| **BZU Multan** | 75 | 45 | 60.0 |
| **IUB Bahawalpur** | 75 | 47 | 63.3 |
| **GCUF Faisalabad** | 75 | 43 | 56.7 |
| **UOS Sargodha** | 75 | 39 | 51.7 |
| **Total** | **300** | **172** | **57.3** |

work-related factors such as working hours, teaching load, daily sitting time, and administrative responsibilities, ergonomics such as self-reported workstation quality, monitor height, and use of lumbar support, physical activity measured using the International Physical Activity Questionnaire Short Form (IPAQ-SF), psychosocial variables such as those assessed with the Perceived Stress Scale (PSS-4) and job satisfaction items, and outcome variable (LBP prevalence and severity) using the Nordic Musculoskeletal Questionnaire (NMQ).

Pilot testing and data quality of the tool were pre-tested among 20 faculty members at a non-participating Higher Educational institution to refine the validity of the tool, which was verified while involving the experts in the same field (Narayan, Sinha, and Singh 2023).

## 3. Results

Table 1 provides demographic and occupational data of the respondents in the four universities. The average age was 42.1± 9.6 years, with 56 percent of the participants being male and 44 percent female. More than half of the participants (53.3%) reported sitting for more than six hours daily, and nearly 63% reported no regular physical activity.

Table 2 pointed out that the 12-month prevalence of LBP was 57.3% (n = 172), with the 7-day prevalence at 29.7% (n = 89). The highest prevalence was at IUB Bahawalpur (63.3%), followed by BZU Multan (60.0%), GCUF Faisalabad (56.7%), and UOS Sargodha (51.7%).

LBP was significantly associated with daily sitting time > 6 hours ($p < .001$), poor ergonomic setup ($p = .002$), lack of physical activity ($p = .004$), and high perceived work stress ($p = .012$) (Table 3). However, age, gender, and BMI showed no significant association with LBP prevalence. The adjusted analysis also showed that prolonged sitting, poor ergonomics, physical inactivity, and high work stress remained independent predictors of LBP after adjusting for confounders (Table 3).

## 4. Discussion

The findings of this investigation reveal a high burden of LBP (57.3%) among Higher Educational Institutions faculty members, exceeding previous studies that reported prevalence rates ranging from 20% to 60% among sedentary workers (Russo et al. 2021). This high rate of prevalence can be explained by the prolonged sitting time, excessive school workload, and lack of proper ergonomic support, as discussed by Smith and Leggat (Mahdavi et al. 2021).

Consistent with prior research, prolonged sitting emerged as the most significant predictor of LBP (Russo et al. 2021). Faculty members reporting over 6 hours of daily sitting had more than

**Table 3. Multivariate Logistic Regression, Predictors of LBP (N = 300)**

| Predictor | Adjusted OR | 95% CI | p-value |
|---|---|---|---|
| Daily sitting >6 hrs (ref ≤6 hrs) | 2.34 | 1.45–3.78 | < .001 |
| Poor ergonomic setup (yes vs no) | 2.01 | 1.24–3.25 | .004 |
| Physical inactivity (no vs yes) | 1.92 | 1.18–3.13 | .009 |
| High work stress (yes vs no) | 1.76 | 1.08–2.88 | .023 |
| Age (per year) | 1.01 | 0.99–1.03 | .340 |
| Female vs Male | 1.12 | 0.72–1.74 | .610 |

Model fit: Hosmer-Lemeshow p = .45; Nagelkerke $R^2$ = 0.28

double the odds of experiencing LBP compared to those sitting ≤6 hours. Ergonomic workstation factors, including inadequate chair support and monitor height, also played a critical role, supporting evidence that ergonomic interventions reduce musculoskeletal strain (World Health 2025).

Physical inactivity was another strong predictor, aligning with studies indicating that regular exercise enhances spinal flexibility and muscle strength, thereby mitigating LBP risk (Awan et al. 2022; World Health 2025). Moreover, high perceived work stress was a risk factor of LBP on its own, which is also in line with psychosocial mechanisms that postulate that stress and muscle tension worsen the perception of pain. Surprisingly, the demographic factors of age and gender did not have significant relationships with the LBP in this study, possibly because the age distribution of faculty working in the universities was relatively constant, and the gender aspect of these employees had comparable physical workloads (Nieminen, Pyysalo, and Kankaanpää 2021).

The relevant literature review shows that LBP is common among faculty researchers in Pakistani universities, with over 50 percent of them being affected every year. In this study, we found that the causes may include a lack of awareness of back health and ergonomics among the faculty members. Modifiable risks, such as long sitting, bad ergonomics, lack of physical activity, and stress, are also considered to contribute to the LBP. The faculty may be working under stress, as lecturing and research in academia is fast becoming a stressful job in Pakistan (Chuadhry and Niazi 2017). By sorting out these issues, the LBP can be reduced among faculty working in the higher educational Institutions of Pakistan. This will not only enhance faculty well-being but also academic productivity and decrease healthcare expenditures related to musculoskeletal diseases.

## 5. Conclusions & Recommendations

We conclude that LBP is prevalent among faculty members in Pakistan's higher education institutions. We recommend that ergonomic interventions, such as the provision of ergonomically designed chairs and adjustable desks, training faculty on correct posture and workstation setup, and periodic ergonomic audits of office spaces, can help. Enhancing physical activity by the introduction of on-campus wellness programs (e.g., yoga, stretching sessions). Encouragement of micro-breaks and standing meetings to reduce sedentary time is likely to reduce LBP. We also recommend that stress management strategies such as implementation of counseling services and stress management workshops should be introduced. Workload adjustments should be

adopted to prevent burnout among academic staff. Policy-level initiatives, such as the development of occupational health policies integrating LBP prevention strategies should be implemented. We also propose further research, especially longitudinal studies to assess causal relationships and inclusion of intervention trials to evaluate the effectiveness of ergonomic and stress-reduction programs.

**Conflict of Interest**

The authors declare that they have no conflicts of interest to disclose.

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**Study Approval**

This study was approved by the Institutional Research Committee (IRC) Aqua Clinic, Islamabad, Pakistan.

**Consent Forms**

Every participant signed a consent form before participating in the research.

**Authors Contributions**

Conceptualization and experimental work by Sadia Batool and Kiran Ishaq; Statistical analysis and interpretation by Syed Mehran Gillani, Original Draft by Sadia Batool and Syed Nazir Abbas, Review & Editing by Muhammad Kashif Khan and Syed Nazir Abbas

**Data Availability**

The authors have all the data.

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