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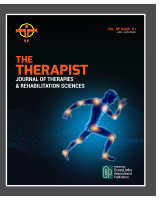

Original Article

Association of Low Back Pain with Sitting Patterns among Desk-Based Office Workers

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ABSTRACT

Low back pain (LBP) is one of the most frequently observed musculoskeletal complaints of office workers who sit at the desk for most of their working hours, chiefly as a result of sitting and poor sitting postures. Since the sedentary working conditions are on the increase, it is essential to know the connection between sitting patterns and LBP. **Objective:** To determine the association of LBP with sitting patterns among desk-based office workers. **Methods:** The cross-sectional study was conducted at the University of Lahore for four months. A sample of 72 faculty members aged 25–55 years was selected using convenience sampling. Data were collected using a self-structured questionnaire covering demographic details, sitting patterns and pain severity, which was measured using the Visual Analogue Scale (VAS), a 10-point scale where 0 indicates 'no pain' and 10 indicates 'worst possible pain'. Statistical analysis was conducted by SPSS version 25.0, and the chi-square test assessed the association between variables. **Results:** The results showed 91.7% of participants reported experiencing LBP in the past year. Most participants (52.8%). Seated position for more than six hours per day, and 70.8% rated their posture as average. A significant number (58.3%) only occasionally supported their back properly, and 63.9% had monitors not aligned at eye level. The association between poor sitting habits and increased LBP was statistically significant ($p<0.01$). **Conclusions:** The present study shows a close relationship between LBP and sitting habits in office workers who sit at their workstations.

INTRODUCTION

Low back pain (LBP) is pain felt between the lower ribs and buttocks, which may or may not spread to the legs and can vary in severity [1, 2]. Most cases have no clear cause, but about 5–10% are linked to conditions like infections, inflammation, degenerative or congenital issues, tumors, trauma, or psychological factors [3, 4]. When no specific cause is found, it is called non-specific LBP [5]. In contrast, specific LBP refers to serious conditions such as spinal stenosis or disc herniation that require targeted treatment [6]. Estimating the incidence of LBP among office workers is challenging due to recurring symptoms that are hard to track. Many people experience LBP by adulthood, making it difficult to measure new cases accurately [7, 8]. A review of twelve studies, categorized by bias risk as low, moderate, and high, showed that this variation could affect the findings. Some studies also included general back pain, not just lower back [9]. Sedentary behaviour, which involves long periods of sitting or inactivity, has been linked to several health issues, even in people who engage in regular exercise [10]. Recent studies suggest that how sedentary time is spent may be more important than how long it lasts. Currently, there are no standardized national guidelines specifically addressing sedentary behaviour, and existing recommendations are inconsistent and mainly based on expert opinion rather than solid scientific evidence [11]. LBP among office workers is influenced by factors such as

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age, poor ergonomics, and environmental elements like lighting, temperature, and humidity [12]. However, studies during the COVID-19 pandemic found no strong link between LBP and factors like gender, physical activity, or work hours in remote workers, suggesting other causes may be involved [13, 14]. Prolonged sitting, common in today's inactive lifestyle, is linked to obesity and various health issues. While earlier research mainly focused on work-related sitting, recent studies have taken a broader view by examining how both work and leisure-related sedentary activities contribute to back pain, aiming to better understand the link and assess the strength of existing evidence [15]. There is limited research on specific patterns and their direct impact.

This study aims to provide valuable insights into how different sitting behaviours affect LBP risk among desk-based office workers.

METHODS

The cross-sectional study was done at the University of Lahore for four months, from January 2024 to June 2024. A sample of 72 faculty members was selected using convenience sampling. Rao online software was used to ca;culate sample size, based on the prevalence from a previous study. Data were collected by means of a self-structured survey containing demographic details and sitting patterns, which included variables such as average daily sitting duration, posture alignment, frequency of postural breaks, use of back support, and monitor position. Pain severity was measured using the Visual Analogue Scale (VAS), a 10-point scale ranging from 0 (no pain) to 10 (worst possible pain). Statistical analysis was done by SPSS version 25.0, and a chi-square test assessed the association between variables. Ethical considerations were followed, and the study was approved under institutional guidelines. Sitting patterns and LBP were presented as mean ± SD. Gender, age and remaining variables were presented as frequency and percentage. The chi-square test compares LBP with sitting patterns.

RESULTS

The findings were that 2.8% of the 72 study participants fell with the 25 years' group category, 54.2% fell with the 26-35 years' group category, 16.7% fell with the 36-45 years' group category and 26.45% within the 46-55 years' group category(Table 1).

Table 1: Descriptive Statistics of Participants' Age

Age		Frequency (%)
Valid	25	2 (2.8)
	26-35	39 (54.2)
	36-45	12 (16.7)
	46-55	19 (26.4)
	Total	72 (100.0)

Out of 72 participants mean value of sitting patterns was 18.9, and the standard deviation was 1.7. The mean value of Low back pain was 10.3, and the standard deviation was 1.7. The association between LBP with sitting patterns was analyzed. As the p-value<0.01, which shows that the correlation was highly significant(Table 2).

Table 2: Total Score of Sitting Patterns and Low Back Pain

Variables	Total Score
Sitting Patterns	
Valid	72
Missing	0
Mean ± SD	18.9306 ± 1.73064
p-value	<0.01
Low Back Pain	
Valid	72
Missing	0
Mean ± SD	10.3889 ± 1.74061
Df	49

DISCUSSION

This study mainly focused on the relationship between low back pain with sitting patterns among desk-based office workers. Well-defined inclusion and exclusion criteria were used to ensure the homogeneity of the sample. Participants included male and female office workers aged 25–55. The primary obstacle to sitting reduction was that job-related tasks were given the top priority. Intervention designers must take into consideration individual choice, environmental considerations, judgmental culture, productivity issues and the knowledge of the staff [16]. Yuwono and Wahyuni, studied the association between sitting duration and LBP in office workers found a 3.5%. The result showed an association between sitting duration and LBP with a p value of 0.05, which makes the results statistically significant [17]. The correlation found in this study aligns with that of previous research, as both yielded statistically significant results suggesting common patterns in the studied population. Putsa *et al.*, study on factors associated with low back pain with sitting patterns in office workers, is 30% with a statistically significant p-value of <0.01. The result showed a relationship between LBP and sitting patterns.The correlation found in this study aligns with that of previous research, as both yielded statistically significant results suggesting common patterns in the studied population [18].Another study conducted by Silva *et al.*, on the association of sit-stand desks with low back pain among office workers, with a statistically significant p-value of <0.05.The correlation found in this study aligns with that of previous research, as both yielded statistically significant results, suggesting common patterns in the studied population [19]. Hendrika *et al.*, showed that the association of LBP with sitting

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patterns and duration among office employees shows that office workers are more prone to have low back pain, with a significant p-value <0.001.The study of these findings under earlier research, with both demonstrating statistically significant results that indicate recurrent population[20].

CONCLUSIONS

Based on these findings, it was concluded that low back pain is associated with sitting patterns among desk-based office workers. Factors such as prolonged sitting duration, inadequate back support, misaligned monitor position, and infrequent postural breaks contribute to increased prevalence of LBP promoting ergonomic awareness and encouraging regular postural breaks may help reduce the risk of LBP in sedentary work settings.

Authors Contribution

Conceptualization: SS
Methodology: LR, RI
Formal analysis: LR
Writing review and editing: AS, HS, FA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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