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THE PREVALENCE OF PROLONGED SITTING POSTURE AND ITS RELATIONSHIP WITH LOW BACK PAIN AMONG TEACHERS AT KHAWAJA FAREED UNIVERSITY

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ABSTRACT

Background: Low back pain (LBP) is one of the most common musculoskeletal disorders worldwide and a major cause of disability among working populations. Teachers are particularly at risk due to prolonged sitting during lectures, computer work, research activities, and administrative tasks. Continuous sitting posture places stress on the lumbar spine, which may lead to discomfort and development of low back pain.

Objective: The objective of this study is to determine the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University.

Methods: A cross-sectional study design will be conducted among 100 teachers at Khawaja Fareed University. Data will be collected using a structured questionnaire that includes demographic information, duration of sitting posture, work habits, and the presence and severity of low back pain. Statistical analysis will be performed to evaluate the association between prolonged sitting posture and low back pain.

Results: The study is expected to identify the prevalence of prolonged sitting posture among university teachers and determine whether extended sitting duration is associated with an increased risk of low back pain.

Conclusion: The findings of this study will help highlight the importance of ergonomic awareness, proper sitting posture, and regular movement breaks to reduce the risk of low back pain among teachers and improve their occupational health and work performance.

INTRODUCTION

Pain is described as an unpleasant sensation in any part of the body resulting from illness or injury, serving as a warning to alert an individual to potential harm and to encourage protective behavior. Low back pain, also referred to as “lumbago” or lumbosacral pain, is specifically localized below the twelfth rib and above the gluteal folds. The high prevalence of low back pain significantly contributes to increased healthcare costs and work absences, highlighting its impact on both individual well-being and occupational productivity.(Kanakkarthodi et al., 2022). Low back pain (LBP) is a debilitating

condition that causes discomfort, functional limitations, and reduced quality of life. Teachers are particularly at risk of developing LBP due to the occupational demands of their profession, which include prolonged sitting during lectures, grading, and administrative tasks, as well as periods of standing while teaching. These prolonged static postures make teaching a profession highly susceptible to low back pain. Therefore, examining the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University is important for identifying occupational risk fa ctors and promoting preventive strategies.(Mushtaq et al., 2022). In many cases, the exact anatomical or pathological cause of low back pain cannot be identified, and it is therefore considered idiopathic. Its development is typically influenced by multiple factors, including sociodemographic variables such as age, sex, income, and education level; behavioral factors like smoking, alcohol consumption, poor diet, and sedentary lifestyle; daily activities involving strenuous tasks, poor posture, or repetitive movements; as well as obesity and psychological conditions. All of these factors can contribute to the onset and severity of low back pain symptoms(BOSZCZOWSKI, PINTO, & ARAÚJO, 2021). Low back pain, also known as "lumbago," is a common musculoskeletal disorder among working populations, including teachers. It can have a significant impact on teachers' quality of life, leading to frequent sick leave, functional limitations, absenteeism, and even early retirement. Teaching is considered a human service profession and involves activities that place educators at high risk for musculoskeletal disorders. Prolonged sitting during lectures, administrative tasks, and grading further increases the likelihood of developing low back pain among teachers(Behera & Koley, 2021).Low back pain (LBP) has become a major clinical and public health concern worldwide, with its prevalence increasing to alarming levels. It is estimated that nearly 90% of people experience low back pain at some point in their lives. According to the **World Health Organization (WHO)**, LBP is among the top occupational health problems, with a significant proportion of cases linked to workplace-related factors. Occupational exposures, particularly prolonged sitting and poor posture, contribute greatly to the global burden of low back pain. The prevalence of LBP in the general population ranges from approximately 30% to 80%, depending on the nature of daily activities and work demands. Professions that involve extended periods of sitting, such as teaching, may increase the risk of developing low back pain. Therefore, investigating the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University is important for understanding occupational risk factors and improving workplace health.(Tesfaye, Abere Mekonnen, Jara, & Aragaw, 2023).Low back pain is a common condition that often leads individuals to seek medical attention because it can significantly limit daily activities and reduce occupational performance. Among working populations, low back pain is one of the most frequently reported health problems. Research indicates that nearly 80% of individuals experience back pain at some point in their lives. Occupational factors such as prolonged sitting posture, especially in professions like teaching where long hours are spent sitting during lectures, meetings, and computer work, may increase the risk of developing low back pain. Therefore, assessing the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University is important to better understand its impact on occupational health(Almansour et al.,2024).

Changes in modern education systems have increased the workload and responsibilities of teachers, exposing them to various occupational and ergonomic risks that may negatively affect their physical health. These demands often require teachers to spend prolonged periods sitting while performing tasks such as lecturing, preparing lessons, grading, and working on computers. Such prolonged sitting posture can contribute to the development of musculoskeletal disorders, particularly low back pain. Therefore, investigating the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University is important to understand the impact of these occupational factors on teachers' musculoskeletal health.(Baklouti et al., 2023).It is estimated that approximately 70% to 85% of the global population will experience low back pain (LBP) at some point in their lives. The prevalence of LBP is increasing worldwide, affecting an estimated 60% to 70% of people in developed countries. Additionally, the annual incidence of LBP is around 5%, with

yearly prevalence rates ranging from 15% to 45% in developed populations. Among teachers, prolonged sitting during lectures, grading, and administrative tasks may contribute significantly to the development and persistence of low back pain, highlighting the importance of examining its prevalence and occupational risk factors at Khawaja Fareed University.(Behera & Koley, 2021). Several risk factors have been reported to contribute to the development of low back pain (LBP), including increased physical stress on the spine, psychological stress, and overall poor health. In occupational settings, factors such as prolonged sitting, poor posture at work, and lack of physical activity have been identified as significant contributors to LBP. For teachers, extended periods of sitting during lectures, grading, and administrative tasks, combined with work-related stress, may increase the risk of developing low back pain. Therefore, examining the prevalence of prolonged sitting posture and its relationship with LBP among teachers at Khawaja Fareed University is essential to identify key occupational risk factors.(Alhadeethi, Elkhawaga, Khalil, Basheer, & Khalil Jr, 2024).Low back pain (LBP) is commonly classified according to the duration of symptoms into acute, subacute, and chronic types. Acute LBP refers to pain lasting less than 1 month, subacute LBP persists for 1 to 3 months, and chronic LBP continues for more than 3 months.(Behairy et al., 2025).For example, low back pain (LBP) affected approximately 619 million people worldwide (about one in every 13) in 2020, and this number is projected to rise to 843 million by 2050.The global point prevalence of LBP ranges from 12% to 33%, while the annual prevalence ranges from 22% to 65%, affecting populations in both low- and middle-income countries (LMICs) as well as high-income countries (HICs). In the context of teachers, prolonged sitting posture during lectures, grading, and administrative work may further contribute to the increasing burden of LBP. This highlights the importance of investigating the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University, particularly in regions where occupational health awareness may be limited.(Hakiranuye, Kiwanuka, Asiimwe, Posti, & Lule, 2024).Low back pain (LBP) often occurs when the muscles or ligaments that support the vertebrae—the bones forming the spinal column—become strained or weakened, causing a loss of spinal stability and resulting in pain. Since the spinal cord connects nerves to nearly every part of the body, problems in the lower back can lead to pain, discomfort, or weakness in various areas. In the teaching profession, LBP may develop from prolonged sitting during lectures, grading, and administrative tasks, as well as maintaining static postures for extended periods. Additional contributing factors can include bending over for classroom activities, lifting teaching materials, or stress, all of which can exacerbate lower back discomfort. Therefore, investigating the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University is important for understanding occupational risk factors.(Ahmed, Mafiz, Nasir, & Science, 2021). Low back pain is a common musculoskeletal problem among individuals who spend long periods in a sitting posture. Prolonged sitting has been identified as an important occupational risk factor that may lead to postural misalignment, muscle imbalance, and increased stress on the lumbar spine. Teachers are among the professional groups who often remain seated for extended periods during teaching, computer work, and academic activities. Therefore, prolonged sitting may contribute to the development of low back pain among teachers. The purpose of the present study is to investigate the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University. The findings of this research may help in understanding the impact of prolonged sitting on teachers' musculoskeletal health and may contribute to improving awareness and preventive strategies within the academic community(Bhatti et al., 2022). Low back pain is considered a multifactorial condition influenced by several physical, lifestyle, and psychosocial factors. Risk factors such as obesity, smoking, poor general health, sedentary lifestyle, and strenuous physical activities can contribute to the development of low back pain. Psychological factors including anxiety, depression, job dissatisfaction, and an unfavorable working environment may also increase the risk of musculoskeletal problems. From a biomechanical perspective, excessive trunk flexion, rotation, prolonged standing, lifting heavy loads, repetitive work, vibration, and high-speed trunk movements can place additional stress on spinal structures, leading to low back pain. Certain occupations that

require prolonged postures, either standing or sitting for long durations, are often associated with an increased risk of developing low back pain. Teaching is one of the professions reported to have a high prevalence of low back pain due to prolonged sitting, repetitive tasks, and occupational workload. Therefore, investigating the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University is important to understand occupational risk factors and promote better musculoskeletal health among educators(Kashif et al., 2016).Psychosocial factors have also been reported to be associated with the risk of developing low back pain. Increased job demands, prolonged working hours, and work-related stress can negatively affect the psychological well-being of employees. In academic professions, teachers often face heavy workloads, long working hours, and various academic responsibilities such as teaching, research, and administrative tasks. These factors may contribute to psychological stress, anxiety, and reduced job satisfaction. Additionally, poor work relationships and increased workload may further increase the risk of developing low back pain. Therefore, psychosocial and occupational factors should also be considered when investigating the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University(Abeer et al., 2021). Health (NIOSH) as pain that occurs in the lumbosacral region and may extend to the buttocks or upper leg. It can be acute or chronic in nature depending on the duration and severity of the symptoms. LBP is recognized as one of the most common musculoskeletal disorders affecting populations in both developed and developing countries. It can affect individuals of all age groups, from young adults to older populations, and is a frequent reason for medical consultation. Management of low back pain commonly includes the use of analgesic medications to reduce pain and inflammation. In addition, non-pharmacological approaches such as physical therapy, rehabilitation exercises, and spinal manipulation are also widely used as alternative or supportive treatments for managing low back pain. Considering the high prevalence of LBP among working populations, particularly among teachers who often maintain prolonged sitting postures during teaching and administrative activities, it is important to investigate the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University(Qareeballa et al., 2018). In developing countries, occupational factors play an important role in the occurrence of low back pain due to limited ergonomic facilities and inadequate workplace design. Several studies have reported that workers who perform their duties for long hours without proper equipment or ergonomic support are at greater risk of developing musculoskeletal disorders, including low back pain. In educational institutions, teachers often spend prolonged periods sitting while preparing lectures, grading assignments, conducting research, and performing administrative tasks. Such working conditions may increase the risk of developing low back pain. Therefore, it is important to identify occupational risk factors associated with low back pain among teachers. Understanding these factors can help in developing preventive strategies and improving workplace ergonomics. To contribute to the existing knowledge on low back pain, the present study was conducted using a cross-sectional design to determine the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University.(Sanjoy, Ahsan, Nabi, Joy, & Hossain, 2017). In the workplace, interaction between individuals, work tools, and the working environment is unavoidable and often requires continuous use of physical and mental effort. Certain occupations involve repetitive movements and prolonged static postures, which may lead to musculoskeletal disorders (MSDs) due to sustained muscle tension and strain on the body. Workers who spend long hours sitting, particularly those using computers for administrative or academic tasks, are more likely to develop musculoskeletal discomfort. Such conditions are commonly observed among professionals who maintain prolonged sitting postures during their work. Among these disorders, low back pain is one of the most prevalent musculoskeletal conditions worldwide and is associated with an increased risk of disability. Teachers, who frequently engage in prolonged sitting while preparing lectures, grading assignments, and performing computer-based tasks, may also be at risk of developing low back pain. Therefore, it is important to investigate the prevalence of prolonged sitting posture and its relationship with low back pain(Mustafah, Hasbiah, Rahmaniar, & Research, 2023).

MATERIAL AND METHODS

It was a cross-sectional analytical study conducted at Khawaja Fareed University of Engineering and Information Technology (KFUEIT), Rahim Yar Khan. The duration of the study was four months (April to July 2026). The sample size was 100 teachers, selected using a convenient sampling technique.

Inclusion criteria included teachers currently working at the university who were involved in teaching, administrative, or computer-based tasks and willing to participate in the study. Exclusion criteria included teachers with a history of spinal surgery, diagnosed musculoskeletal disorders unrelated to occupational posture, or those undergoing treatment for severe medical conditions.

Data Analysis

Data was analyzed with statistical procedures. Data was collected according to the data collection sheet. Data was analyzed using SPSS version 27. Frequencies and percentages was calculated for qualitative/quantitative variables. Mean ± SD ratio was calculated for qualitative variables. Histogram and pie-chart was constructed. T-test is run between obese and non- obese ureteric stones.

RESULTS AND STATISTICAL ANALYSIS

A total of 100 teachers participated in this study from Khawaja Fareed University. The collected data were analyzed to determine the prevalence of prolonged sitting posture and its relationship with low back pain among teachers. The results are presented in the form of tables with frequencies and percentages.

Bar chart for age:

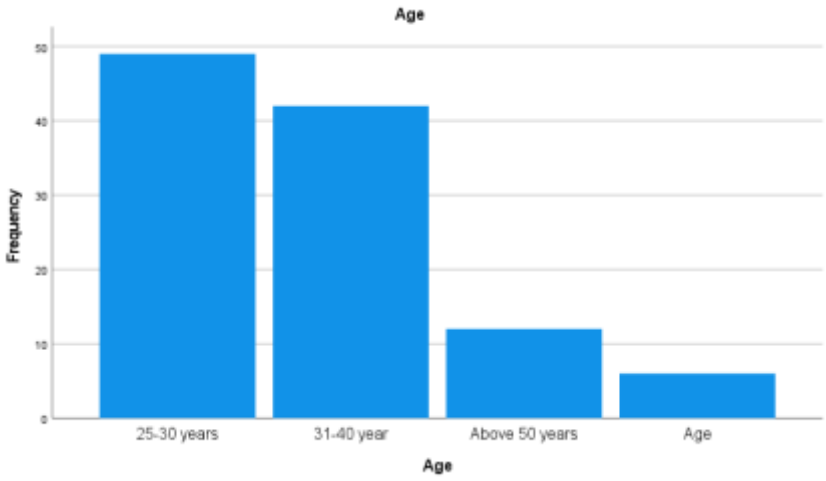

Figure 4.1: Age Distribution of Participants

The above pie chart illustrates the age distribution of the teachers who participated in the study. The largest proportion of participants belongs to the 25–30 years age group, indicating that the majority of respondents were young faculty members. The second largest group falls within the 31–40 years age category. A smaller percentage of participants were above 50 years of age. This distribution shows that most of the study participants were relatively young teachers working at Khawaja Fareed University.

Bar chart for Gender:

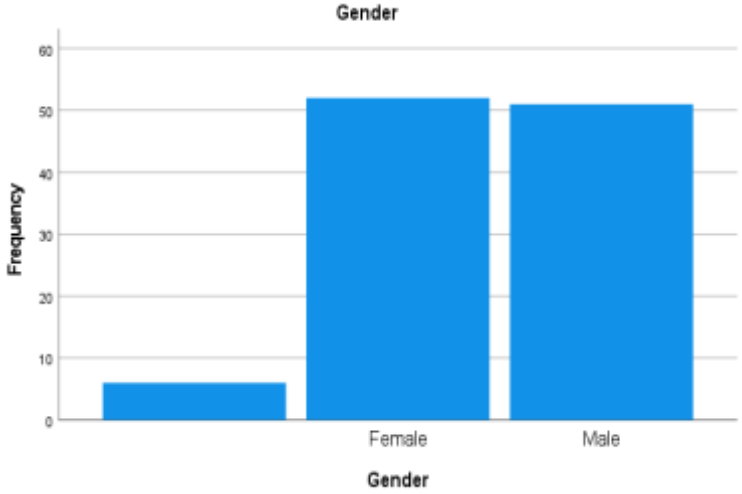

Figure 4.2: Gender Distribution of Participants

The above bar chart presents the gender distribution of the participants included in the study. The chart shows that a total of **109 teachers** participated in the research. Among them, **52 participants were female** and **51 were male**, indicating almost equal representation of both genders. A very small number of responses fall into another category. Overall, the chart demonstrates that both male and female teachers from Khawaja Fareed University were almost equally involved in the study.

Table 4.4: Chi-Square Test for Association

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	94.209[a]	8	.000
Likelihood Ratio	42.738	8	.000
N of Valid Cases	109		

The Chi-square test was conducted to determine the association between the study variables. The results show that the Pearson Chi-Square value is **94.209** with **8 degrees of freedom (df)** and a significance value (**p = .000**). Since the p-value is less than the standard significance level of **0.05**, the result indicates that there is a **statistically significant association between the variables**.
Additionally, the likelihood ratio value is **42.738** with **8 degrees of freedom**, which also shows a significance value of **p = .000**, further confirming the presence of a statistically significant relationship. The analysis was conducted on a total sample size of **109 participants**. These results suggest that the variables examined in this study are significantly associated with each other.

Table 4.5: Average Working Hours per Day

Average working hours per day					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	6.4	6.4	6.4
	4–6 hours	45	41.3	41.3	47.7
	6–8 hours	36	33.0	33.0	80.7
	8–10 hours	18	16.5	16.5	97.2
	More than 10 hours	3	2.8	2.8	100.0
	Total	109	100.0	100.0	

The above table presents the distribution of participants according to their average working hours per day. The results indicate that the majority of teachers (41.3%) reported working **4–6 hours per day**, followed by **33.0%** who reported working **6–8 hours daily**. Additionally, **16.5%** of the participants worked **8–10 hours per day**, while a small proportion (**2.8%**) reported working **more than 10 hours daily**. A very small percentage (**6.4%**) did not specify a particular category. Overall, the findings suggest that most teachers at Khawaja Fareed University work between **4 to 8 hours per day**, indicating moderate daily working hours among the participants.

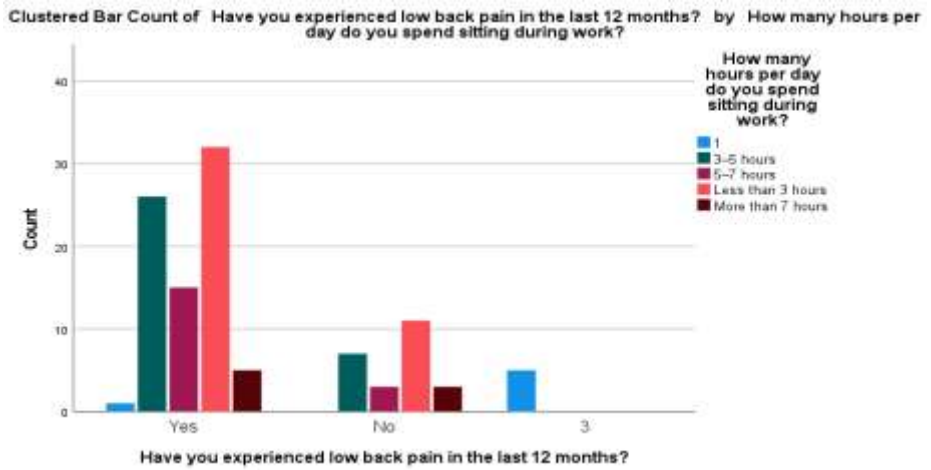

Figure 4.6: Relationship between Sitting Duration and Low Back Pain

The above clustered bar chart illustrates the relationship between the duration of sitting during work and the experience of low back pain in the last 12 months among teachers. The chart shows that a large number of participants who reported experiencing low back pain also spend several hours sitting during their work, particularly in the categories of **3–5 hours** and **less than 3 hours** per day. In comparison, fewer participants who reported no low back pain fall within these sitting duration categories. A smaller number of participants reported sitting **more than 7 hours per day**. Overall, the chart suggests that prolonged sitting during work may be associated with the occurrence of low back pain among teachers.

DISCUSSION

The present study aimed to determine the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University. The findings highlight that low back pain is a common musculoskeletal complaint among teachers and may be strongly associated with occupational factors such as prolonged sitting, static postures, and inadequate ergonomic conditions.Low back pain is recognized as one of the most common musculoskeletal disorders worldwide and is a leading cause of disability among working populations. Previous studies have indicated that a significant proportion of adult's experience low back pain at some point in their lives, particularly those involved in occupations requiring prolonged static postures. Teaching is considered a profession that involves multiple physical demands including prolonged sitting while preparing lectures, marking assignments, and using computers, as well as prolonged standing during lectures. These occupational activities can place continuous mechanical stress on the spine and surrounding muscles, increasing the risk of musculoskeletal discomfort.The findings of the present study are consistent with previous research that has reported a high prevalence of low back pain among teachers. Several studies conducted in different countries have highlighted that teachers frequently experience musculoskeletal symptoms due to occupational activities such as prolonged sitting, standing, bending, and repetitive movements. These postural demands can lead to muscle fatigue, ligament strain, and increased pressure on the intervertebral discs, ultimately contributing to the development of low back pain.Prolonged sitting posture has been identified as a significant risk factor for the development of

low back pain. Extended periods of sitting can cause continuous loading on the lumbar spine, which may alter the natural curvature of the spine and increase intra-discal pressure. When teachers remain seated for long durations while preparing lectures, grading assignments, or working on computers, the static posture can place additional strain on the lower back muscles and ligaments. Over time, these stresses may lead to discomfort, fatigue, and chronic low back pain. In addition to prolonged sitting, improper ergonomic conditions in the workplace may further contribute to the development of musculoskeletal problems. In many educational institutions, teachers often work in environments that may not fully comply with ergonomic standards. Inadequate seating arrangements, poorly designed desks, and lack of ergonomic awareness may result in awkward or uncomfortable postures during work activities. These unfavorable conditions can increase the risk of musculoskeletal symptoms and negatively affect the overall health and productivity of teachers.Technological advancements have also changed the working patterns of teachers. Increased use of computers, laptops, and smartphones for academic and administrative tasks has resulted in longer periods of sedentary behavior. Research has shown that excessive use of digital devices is associated with spinal disorders and musculoskeletal complaints. Teachers who spend long hours working on computers without proper posture or ergonomic support may be more vulnerable to developing low back pain.Another important factor associated with low back pain is lack of physical activity. Sedentary lifestyles and reduced levels of physical exercise may weaken the core muscles that support the spine. Weak musculature combined with prolonged sitting can lead to poor posture and increased stress on the lumbar region. Regular physical activity and stretching exercises are important for maintaining spinal health and reducing the risk of musculoskeletal disorders.Psychosocial and demographic factors may also influence the occurrence of low back pain among teachers. Age, body weight, occupational stress, and duration of teaching experience have been reported as potential contributors to musculoskeletal symptoms. Studies have shown that individuals over the age of forty are more likely to experience low back pain due to degenerative changes in the spine and reduced flexibility of muscles and ligaments. Similarly, increased workload and stress levels may lead to muscle tension and discomfort in the back region.Despite the significant occupational demands placed on teachers, musculoskeletal health in the teaching profession has not received adequate attention in the literature. Research focusing specifically on the relationship between prolonged sitting posture and low back pain among university teachers remains limited, particularly in developing countries. Therefore, the present study contributes valuable information regarding the prevalence of low back pain and its association with prolonged sitting among teachers at Khawaja Fareed University.The findings of this study emphasize the importance of implementing preventive strategies to reduce the risk of low back pain among teachers. Educational institutions should promote ergonomic awareness and ensure that workstations are designed according to ergonomic principles. Providing adjustable chairs, proper desk heights, and supportive backrests may help teachers maintain proper posture during prolonged sitting. In addition, encouraging regular breaks, stretching exercises, and physical activity can help reduce muscle fatigue and improve overall musculoskeletal health. In conclusion, prolonged sitting posture appears to be an important occupational factor associated with low back pain among teachers. The results of this study highlight the need for increased awareness regarding proper posture, ergonomic workplace design, and healthy lifestyle practices among university teachers. Addressing these factors may help reduce the prevalence of low back pain and improve the overall well-being and work productivity of teachers.

CONCLUSION

This study was conducted to determine the prevalence of prolonged sitting posture and its relationship with low back pain among teachers at Khawaja Fareed University. The findings of the study indicate that low back pain is a common musculoskeletal complaint among teachers and may be associated with prolonged sitting during occupational activities. Teachers often spend long hours sitting while preparing lectures, grading assignments, and working on computers, which can place continuous mechanical stress on the lumbar spine and surrounding muscles.The results highlight that prolonged

sitting posture, combined with inadequate ergonomic conditions and limited physical activity, may contribute significantly to the development of low back pain among university teachers. Static postures maintained for extended periods can lead to muscle fatigue, ligament strain, and increased pressure on intervertebral discs, ultimately affecting spinal health and work performance. Furthermore, the study emphasizes the importance of promoting ergonomic awareness and healthy work practices within academic institutions. Proper workstation design, regular posture changes, and incorporation of short breaks during work hours may help reduce the risk of musculoskeletal discomfort. Encouraging physical activity and educating teachers about correct sitting posture can also play an important role in preventing low back pain. In conclusion, addressing prolonged sitting posture and improving ergonomic working conditions are essential steps in reducing the prevalence of low back pain among teachers. Implementing preventive strategies can enhance the musculoskeletal health, well-being, and productivity of university teachers.

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