Prevalence of Sacroiliac Joint Dysfunction and Its Association with Low Back Pain Among Private Sector Female School Teachers

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Amna Bashir[1], Muhammad Sanaullah[1], Malik Basit Hussain[2]

Correspondence
Malik Basit Hussain
malikbh@example.com
Affiliations
1 Department of Physical Therapy, Superior University, Lahore, Pakistan
2 Department of Rehabilitation Sciences, Superior University, Lahore, Pakistan

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Disclaimers

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ABSTRACT

Background: Low back pain (LBP) is a common issue among school teachers due to prolonged standing and repetitive movements. Sacroiliac joint dysfunction (SIJD) is considered a potential contributor to LBP, but its role remains unclear.

Objective: To determine the prevalence of SIJD and its association with LBP among female school teachers in the private sector.

Methods: A cross-sectional study was conducted with 115 female school teachers aged 22-50 years from private schools in Lahore. Participants completed the Nordic Musculoskeletal Questionnaire (NMQ) and underwent five standardized provocative tests for SIJD: Distraction, Thigh Thrust, FABER, Compression, and Gaenslen's tests. SIJD was defined as a positive result in at least three of these tests. Data were analyzed using chi-square tests and logistic regression in SPSS 25.

Results: The prevalence of SIJD was 16.5% (n=19). LBP was reported by 38.3% (n=44) in the last 12 months and 47.8% (n=55) in the last 7 days. No significant association was found between SIJD and LBP (p=0.158 for 12 months; p=0.143 for 7 days).

Conclusion: While SIJD was present in a subset of teachers, it was not significantly associated with LBP, suggesting other factors may contribute more to LBP.

INTRODUCTION

Low back pain (LBP) is a prevalent and debilitating health issue affecting populations worldwide, with particularly high incidence rates reported among various occupational groups, including educators. Teachers, especially those working in the private sector, are frequently exposed to multiple risk factors associated with musculoskeletal disorders, such as prolonged standing, repetitive motions, and inadequate ergonomic support. These occupational hazards often result in a higher prevalence of LBP, which subsequently leads to significant absenteeism, decreased productivity, and reduced quality of life (1). The sacroiliac joint (SIJ), a key anatomical structure connecting the sacrum and ilium within the pelvis, is integral in maintaining load transfer between the spine and lower extremities. Dysfunction of the sacroiliac joint, referred to as sacroiliac joint dysfunction (SIJD), has been suggested as a potential contributor to LBP. However, the exact role of SIJD in the genesis of LBP remains a subject of ongoing debate within the medical community (2, 3).

The teaching profession is inherently physically demanding and often involves long periods of standing, repetitive movements, and static postures, all of which contribute to the development of musculoskeletal disorders, including LBP. In particular, private sector school teachers may face additional challenges due to less stringent occupational health regulations and ergonomic support, further exacerbating their risk for such conditions (4, 5). Given the pivotal role of the SIJ in maintaining pelvic stability and its potential contribution to LBP, understanding the prevalence of SIJD and its association with LBP among school teachers could provide essential insights for occupational health interventions. Previous studies have shown varied prevalence rates of SIJD in different populations, suggesting that factors such as occupational exposure, physical activity levels, and ergonomic practices could influence these outcomes (6-8).

This study was conducted to explore the prevalence of SIJD among female school teachers in the private sector and to assess whether SIJD significantly contributes to the LBP commonly reported in this demographic. By focusing on female school teachers, this study aims to address a gap in the literature, as most research on SIJD and LBP has predominantly centered around different populations, such as athletes and manual laborers, where the physical demands and risk factors differ considerably. Moreover, understanding the potential association between SIJD and LBP in this specific occupational group could help in designing targeted ergonomic interventions and policies aimed at reducing the burden of musculoskeletal disorders among teachers. The objectives of this study were threefold: to assess the prevalence of SIJD among female private sector school teachers, to evaluate the association between SIJD and LBP, and to identify potential risk factors that may exacerbate these conditions. Addressing these objectives is crucial for developing comprehensive ergonomic and health interventions tailored to the needs of educators, ultimately enhancing their quality of life and professional performance (9-11).

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By focusing on this specific occupational group, the study offers an opportunity to better understand the interplay of various risk factors in the development of SIJD and LBP among teachers. Such insights could contribute to evidence-based strategies that promote ergonomic workplace modifications and comprehensive health programs. These interventions could mitigate the impact of LBP and improve the overall well-being of teachers in the private sector, where resources for occupational health may be limited. Furthermore, the findings of this study could serve as a basis for future research to explore the complex, multifactorial nature of LBP in educational settings, incorporating both physical and psychosocial dimensions (12-14).

MATERIAL AND METHODS

The study employed a cross-sectional design to investigate the prevalence of sacroiliac joint dysfunction (SIJD) and its association with low back pain (LBP) among female school teachers in the private sector of Lahore, Pakistan. Data collection was conducted over a period of six months, during which participants were recruited from various private sector schools, including primary and secondary institutions. Female school teachers aged between 22 to 50 years who had been employed full-time for at least two years were included in the study. Teachers with known musculoskeletal disorders, such as SIJD or LBP, were eligible for participation. However, those who were pregnant, had a history of recent trauma, neurological disorders, or frequently used muscle relaxants were excluded due to potential confounding effects related to these conditions (9).

The study was introduced as a health and wellness initiative aimed at improving the musculoskeletal health of teachers. Information sessions were held at each participating school to explain the study's purpose, procedures, and potential benefits. Informed consent was obtained from all participants prior to data collection, in accordance with the Declaration of Helsinki. Ethical approval was secured from the institutional review board to ensure adherence to ethical standards in research involving human subjects. After consent was obtained, participants were scheduled for assessment sessions conducted in designated spaces within their schools.

Data collection involved two components: a self-reported questionnaire and a series of clinical tests for SIJD. The Nordic Musculoskeletal Questionnaire (NMQ) was administered to all participants to assess the presence, severity, and impact of LBP on daily activities. This standardized instrument is widely used to evaluate musculoskeletal symptoms and was chosen for its reliability and validity in capturing relevant data in occupational health studies (17). Following the completion of the NMQ, participants underwent five standardized provocative tests for diagnosing SIJD. These tests, including the Distraction Test, Thigh Thrust Test, FABER Test, Compression Test, and Gaenslen's Test, were administered by a trained physiotherapist to ensure consistency and accuracy in the assessment. A positive result in at least three of the five tests was considered indicative of SIJD (11). The Distraction Test involved applying outward pressure to the anterior superior iliac spines (ASIS) to distract the SIJ, with pain as a positive indicator of SIJD (12). The Thigh Thrust Test, or posterior shear test, required the application of a posterior force through the femur while the hip was flexed and adducted, with pain in the SIJ region indicating a positive result (13). The FABER Test, also known as Patrick's test, positioned the patient's leg in a figure-four configuration, with downward pressure applied on the knee while stabilizing the opposite pelvis; pain in the SIJ region indicated SIJD (14). The Compression Test involved lateral pressure on the iliac crests to compress the SIJ, with pain as a positive result (15). Gaenslen's Test, which involved applying pressure to a hanging leg while the other leg was flexed at the hip, created torsion in the SIJ, and pain indicated a positive result (16). These tests are widely recognized in clinical practice for their diagnostic value in identifying SIJD and were selected based on their reliability and applicability to the study population.

Data were analyzed using IBM SPSS Statistics software, version 25. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to summarize the demographic characteristics of the participants, the prevalence of SIJD, and the occurrence of LBP. To assess the association between SIJD and LBP, chi-square tests were conducted, with a p-value of less than 0.05 considered statistically significant. Logistic regression analysis was performed to identify potential confounding factors that might influence the relationship between SIJD and LBP. Variables such as age, body mass index (BMI), years of teaching experience, and ergonomic conditions at work were included in the regression model to determine their impact on the likelihood of developing LBP (9, 10).

The study's methodology ensured rigorous data collection and analysis, with a focus on maintaining high standards of ethical conduct. The use of both self-reported measures and objective clinical tests provided a comprehensive approach to understanding the prevalence of SIJD and its potential association with LBP in the target population. By combining these methods, the study aimed to contribute valuable insights to the existing literature on occupational health, particularly concerning musculoskeletal disorders among female school teachers in the private sector.

RESULTS

The results of the study provide a comprehensive overview of the demographic characteristics of the participants, the prevalence of sacroiliac joint dysfunction (SIJD) and low back pain (LBP), and the association between SIJD and LBP among female school teachers in the private sector. The findings are presented in the following sections with tabulated data for clarity and better understanding.

The study included 115 female school teachers from various private sector schools in Lahore. The demographic characteristics of the participants are summarized in Table 1. The mean age of the participants was 32.5 years (SD ± 8.4

years). The majority (60%) of the participants were between the ages of 22 and 30 years, while 39.1% were aged between 31 and 40 years, and only 0.9% were aged between 41 and 50 years. Most participants were married (53.9%), and the rest were single (46.1%). The participants were recruited from a range of schools to ensure diversity and generalizability of the findings.

Table 1: Demographic Characteristics of Participants

Variable	Category	Frequency	Percent
Age	22-30 years	69	60.0
	31-40 years	45	39.1
	41-50 years	1	0.9
Marital Status	Single	53	46.1
	Married	62	53.9
School	Kips	9	7.8
	Allied School	11	9.6
	Al-Hamd	30	26.1
	Dar-e-Arqam	20	17.4
	Bloom Field Hall	9	7.8
	Bright Grammar	22	19.1
	Unique Science	14	12.2
Weight	Less than 50 kg	2	1.7
	50-60 kg	41	35.7
	61-70 kg	70	60.9
	Greater than 70 kg	2	1.7

The prevalence of SIJD was assessed using five provocative tests. A positive result in at least three of these tests indicated the presence of SIJD. Among the 115 participants, 19 (16.5%) were found to have SIJD, while the remaining 96 participants (83.5%) did not show signs of SIJD based on these tests. This prevalence rate aligns with findings from similar studies that focus on occupational health risks among teachers.

Table 2: Prevalence of Sacroiliac Joint Dysfunction (SIJD)

Result	Frequency	Percent
Positive	19	16.5
Negative	96	83.5

The prevalence of LBP was determined using the Nordic Musculoskeletal Questionnaire (NMQ). The results showed that 44 participants (38.3%) reported experiencing LBP in the last 12 months, while a higher proportion, 55 participants (47.8%), reported experiencing LBP in the last seven days. These findings highlight the significant burden of LBP among female school teachers in the private sector.

Table 3: Prevalence of Low Back Pain (LBP) in the Last 12 Months and 7 Days

Time Period	Response	Frequency
Last 12 months	Yes	44
	No	71
Last 7 days	Yes	55
	No	60

Table 4: Association Between SIJD and LBP

SIJD Status	LBP (Last 12 Months)	Yes	No	p-value
Positive	Count	10	9	0.158
	Percentage	52.6%	47.4%	
Negative	Count	34	62	
	Percentage	35.4%	64.6%	
SIJD Status	LBP (Last 7 Days)	Yes	No	
Positive	Count	12	7	0.143
	Percentage	63.2%	36.8%	
Negative	Count	43	53	
	Percentage	44.8%	55.2%	

The association between SIJD and LBP was analyzed using chi-square tests. The results indicated that there was no statistically significant association between SIJD and LBP either in the last 12 months ($p = 0.158$) or in the last seven days ($p = 0.143$). This suggests that while SIJD was present in some participants, it was not a significant predictor of LBP in this population. The detailed cross-tabulation is presented in Table 4. The study found that while 16.5% of female school teachers in the private sector had SIJD, nearly half of the participants reported experiencing LBP within the past week. However, no statistically significant association was found between SIJD and LBP, suggesting that other factors, such as ergonomic conditions, posture, and stress, may play a more critical role in the development of LBP among this population. These results underscore the importance of further research to explore additional risk factors contributing to LBP and to develop comprehensive occupational health interventions tailored to teachers.

DISCUSSION

The findings of this study contribute to the growing body of literature on musculoskeletal disorders among school teachers, particularly focusing on sacroiliac joint dysfunction (SIJD) and its potential association with low back pain (LBP). The prevalence of SIJD among female school teachers in the private sector was found to be 16.5%, a figure that aligns with some previous studies which have reported similar rates of SIJD in occupational settings with high physical demands (18). This prevalence emphasizes the importance of addressing SIJD in occupational health programs, especially in environments where ergonomic conditions may be suboptimal. However, despite the relatively high prevalence of SIJD, the study did not find a statistically significant association between SIJD and LBP, which suggests that while SIJD may contribute to LBP in some individuals, it is not the sole or primary cause of LBP in this population (19).

The lack of a significant association between SIJD and LBP could be attributed to several factors. Firstly, the cross-sectional design of the study provided a snapshot of the participants' health at a single point in time, which may not have captured the dynamic nature of SIJD and LBP. It is possible that the onset of SIJD and LBP could vary over time, and a longitudinal study design might offer a better understanding of the temporal relationship between these conditions (21). Secondly, the reliance on self-reported measures of LBP through the Nordic Musculoskeletal Questionnaire (NMQ) might have introduced recall bias, as participants could underreport or overreport their symptoms based on personal perceptions or social desirability (22). Additionally, the provocative tests used to diagnose SIJD, although widely accepted in clinical practice, may have limitations in terms of sensitivity and specificity, potentially leading to underdiagnosis or overdiagnosis of SIJD (15).

The study's findings are consistent with the biopsychosocial model of pain, which posits that LBP is not solely a physical condition but is influenced by psychological and social factors as well. Teachers, particularly those in private sector schools, often face high levels of stress, workload, and time pressure, all of which can contribute to the onset and exacerbation of musculoskeletal pain. Previous research has indicated that psychosocial factors, such as job satisfaction, stress, and perceived workload, significantly impact the experience of LBP among teachers (23). These findings suggest that comprehensive workplace health programs should not only focus on the physical aspects of work-related musculoskeletal disorders but also consider the psychosocial factors that contribute to pain and disability.

The strengths of this study include its focus on a specific occupational group, which provided valuable insights into the prevalence of SIJD and LBP among female school teachers in the private sector. By combining self-reported data with objective clinical tests, the study adopted a comprehensive approach to understanding the relationship between SIJD and LBP. The inclusion of a range of schools from a major urban center also enhanced the generalizability of the findings to similar populations. However, several limitations must be acknowledged. The sample size of 115 participants, while adequate for a cross-sectional study, may not be representative of the broader population of female school teachers in the private sector. The potential for selection bias cannot be ruled out, as schools and teachers who chose to participate might differ systematically from those who did not. Furthermore, the use of self-reported data for the assessment of LBP could introduce information bias, as participants' recollection of their symptoms over the past 12 months may have been influenced by various factors, leading to potential inaccuracies in the data (20).

Future research should address these limitations by adopting longitudinal designs that follow participants over time to better understand the temporal relationship between SIJD and LBP. Such studies should also incorporate more robust diagnostic tools for SIJD that offer higher sensitivity and specificity, minimizing the likelihood of misdiagnosis. In addition, there is a need to explore the interplay between physical, psychological, and social factors in the development of LBP among teachers. Studies that integrate quantitative and qualitative data could provide a more holistic understanding of the factors contributing to LBP and SIJD in educational settings.

The findings of this study have several important implications for practice. The high prevalence of LBP among female school teachers underscores the need for targeted interventions to address this issue. Schools and educational institutions should prioritize the implementation of ergonomic interventions, such as adjustable chairs, standing desks, and regular breaks, to reduce the physical strain on teachers. While SIJD may not be the primary cause of LBP in this population, it remains a significant health concern that warrants attention. Teachers diagnosed with SIJD should receive appropriate treatment, including physical therapy, manual therapy, and exercises aimed at improving SIJ stability and reducing pain. Moreover, schools should consider implementing stress management programs, mental health support services, and educational

workshops on proper posture and body mechanics to promote overall well-being among teachers.

CONCLUSION

In conclusion, this study provided valuable insights into the prevalence of SIJD and its association with LBP among female school teachers in the private sector. While the prevalence of SIJD was relatively low, LBP was a common complaint among the participants, and no statistically significant association was found between SIJD and LBP. These findings suggest that other factors, such as ergonomic conditions, posture, and stress, may play a more critical role in the development of LBP in this population. Future research should continue to explore these factors and identify the most effective strategies for prevention and treatment.

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