Original Article

PREVALENCE OF SACROILIAC JOINT DYSFUNCTION AMONG IT STUDENTS: A CROSS-SECTIONAL STUDY

Aena Umar[1], Sabia Allah Rakha[2], Rehana Hayat[3], Sumbal Salik[4]

Abstract:

Background: Sacroiliac joint dysfunction (SIJD) is one of the most frequent causes of musculoskeletal pain that IT students are primarily exposed to due to bounded sitting postures which lead to tension, dysfunction and pain in the sacroiliac joint. The objective of this study is to establish the prevalence of SIJD among the IT students and to analyse its association between gender.

Material and Methods: A cross-sectional survey was conducted among 85 IT students of UET and ILM College who reported falling at least once in the past year or seeking musculoskeletal treatment. NPRS, DSIJQ, FABER, thigh thrust, and distraction tests were utilized in the overall assessment. SPSS 25 was used for performing the statistical analysis.

Results: The overall prevalence of SIJD among IT students was 43.8%; of them 68.2% had positive FABER test, 25.9% thigh thrust test, and 17.6% distraction test. Women were slightly more at risk than men due to conditions such as movement disorders, sitting for long hours, and poor ergonomic. In addition, a strong positive correlation with > 45 working hours/week and SIJ pain and lifting weights made it worse.

Conclusion: The current research revealed that 43.8% of the IT students were found to have SIJD related to the risk factors including improper postures while sitting, sitting for long duration and working for long duration. Other areas that need intervention for the prevention of the SIJD include ergonomic problems proportion and position problems.

Keywords: Sacroiliac joint dysfunction, Denver SIJ Dysfunction Questionnaire, IT students

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INTRODUCTION

Sacroiliac joint dysfunction (SIJD) is defined as a pathologic variation in the amounts of movement that produce painful in the sacroiliac joint, whether due to hypermobility or hypomobility.[1] Also known as SI joint dysfunction, strain, or inflammation, SIJD can result from arthritis, joint instability, joint stiffness, or ligament laxity.[2] This is the pathos-mechanical dysfunction characterized by the abnormal biomechanics of the joint rather than the pathological processes.[3] It has features of both synovial and amphiarthrotic joints: it contains synovial fluid and articular cartilage and lacks a synovial cavity.[4] It is involved in 15 to 30% of low back pain incidences but poorly diagnosed and treated.[5] Higher incidence is reported in females mainly due to pregnancy, lack of physical activity or after lumbar fusion surgeries, whereby SIJ degeneration occurs in 75% of patients within five years.[6] Some of the

[1,2] Physiotherapist Institute of Leadership & Management, Lahore
[3] Student of MS Rehab Science Institute of Leadership & Management, Lahore, Lahore
[4] Consultant Physiotherapist Institute of Leadership & Management, Lahore, Lahore
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risk factors include abnormal walking patterns, unequal leg length, scoliosis and strain on the structures involved in the activity.[7] Sedentary lifestyle and kyphotic posturing results in added stress on the sacrum and SIJ joint therefore increasing the development of pain.[8] It is manifested by low back pain that may be unilateral or bilateral, pain in both buttocks and hips, and instability. Postural changes such as sitting, standing, climbing steps, and bending make the symptoms worse and women are affected more especially during menstruation.[9] Diagnostic strategies include pain assessment, provocative testing, and, in some cases, local anesthetic SI joint injections.[10] Sacroiliac joint testing may also be used to diagnose SI joint problems. Some of the tests included in provocation tests were Gansler's Test, Faber's Test, Thigh Thrust Test, SI Compression Test and Sacroiliac Joint Distraction Test. The sacroiliac joint was engaged when pain was experienced in three or more tests.[7] Lower quarters tests used were Gillet's test for sacroiliac joint dysfunction.[11] Conservative treatment possibilities include NSAIDs, corticosteroid injections, manual therapy and core muscle strengthening exercises. In some special circumstances, the following surgical procedures may be applied, such as sacroiliac joint fusion.[12,13] Because the general effects of SIJD are severe, early detection and appropriate treatment are crucial. Yan et al. (2024) pointed out that pain reduction and functional improvement can be obtained from the combined treatment that includes mobilization and mediations.[14] Moreover, Naveed et al., (2024) established that LBP and SIJD were prevailing among gynecologists due to poor posture caused by sitting and prolonged stooping at work.[11] In a similar way, Bashir et al. (2024) observed fewer school teachers with SIJD and concluded that there could be various causes other than SIJD, which leads to LBP among school teachers.[15] Siva Kumar et al. (2021) concluded regarding the impacts of SIJD that 61% of medical students experienced LBP due to SIJD because of the adverse consequences of prolonged sitting.[7] On the other hand, Arslan et al., (2021) established a 46.71% prevalence SIJD among women in Lahore significantly higher among married ladies, due to hormonal changes during childbirth and sedentary life styles.[16] Ramirez et al. (2015) found that SIJD was responsible for 15-30% of patients with idiopathic LBP. In provocation tests, around 40% people had SIJD and FABER and Sacral Thrust tests were more valid.[17] On the contrary, Kiil et al. (2022) distinguished abnormal SIJ structures involving females only through the use of CT and MRI and, thereby, pointed towards the effects of morphological changes on the incidence rates of SIJD.[18] Similarly, Krishnamoorthy et al. (2019) have correlated changes in SIJD with poor prognosis in FAIS thus emphasizing the role of imaging.[19] However, Eno et al. (2015) noted that SIJD degeneration is 30.5% prevalent among asymptomatic normal individuals that is further linked with advancing age.[20] Several researchers have explored the prevalence of SIJD in different working groups with a focus on health-wise professional and peripatetic students, pregnant women, cyclists, and rowers whereas not much research has been conducted on IT students. IT students are at higher risks of experiencing low back pain which is an indication of SIJD since they spend most of their time in front of computers with bad postural manners. The purpose of this research was to assess the incidence of this type of SIJD among IT students, discuss the measures of improving posture, the methods of recognizing the first signs of the problem, and encouraging the practice of physical activities. They focused on physiotherapy, as well as offering pain relief through medication and massage, and reducing a worker's risk of developing SIJD and enhancing their quality of life through supporting ergonomic practices, exercise, and maintaining an appropriate work schedule.

MATERIAL AND METHODS

The current cross-sectional study was conducted after seeking the ethical approval from the Ethical Committee of the Institute of

Leadership and Management. Sample size of 85 participants was calculated with RAO software in order to collect the data, non-purposive convenient sampling was applied from the institutions such as University of Engineering and Technology (UET), Institute of Leadership and Management (ILM), National College of Business Administration & Economics (NCB&E), Institute of Professional and Learning (IPL), GTECH sources etc. The data collection took six months. Based on criteria for sample selection, participants included college students, 17 to 27 years of age, who did not suffer a fall recently were taking medications that are related to musculoskeletal health issues, without structural abnormalities or congenital diseases.[7] The exclusion criteria also prevented the participation of patients with previous fractures, pregnancy, previous trauma, disc-related issues, cancer, and spondyloarthropathies.

The sample included only participants who met the study requirements.[7] Each participant provided an informed consent to ensure the study's authenticity. The participants were clearly informed on the study's aim and the use of the questionnaires that they were to complete. Participants completed a self-administered questionnaire, which provided information about demographic characteristics, and two standardized instruments; the Denver Sacroiliac Joint Questionnaire (DSIJQ) and the Numeric Pain Rating Scale (NPRS).[21] The DSIJQ is a reliable and valid scale to measure sacroiliac joint disability as found by ICC, 0.87 Cronbach alpha 0.842, content validity (<30% of floor/ceiling effects), r =0.89.Significant correlations were obtained with the Timed Up and-Go with correlation coefficient of 0.53, P = 0.008 and the 5 Minute walk with a correlation coefficient of - 0.52, P = 0.009 (22).

Each participant was informed about the study's objectives and the purpose of the questionnaires. The results were analyzed using the Statistical Package for Social Science (SPSS) to guarantee a precise statistical estimation in mean and frequency (%) were described. Further, cross tabulation and chi square analysis between two variables were also performed.

RESULTS

Table 1 shows the mean age of the participants to be 21.88 ± 2.73 years; the age varied from 17 to 27 years. In regards to gender the subjects were rather balanced with 43 females, representing 50.6% of the sample, and 42 males, 49.4%. The most commonly positive diagnostic tests are FABER, and of the 85 students taking the tests, 58 (68.2%) yielded positive results while 22 (25.9%) were positive for Thigh Thrust and 15 (17.6%) for Distraction. NPRS scale for pain intensity yielded that 40 students (47.1%) had mild pain, 28 (32.9%) had moderate pain and 17 (20.0%) students had severe pain. From the above DSIJQ analysis it can be noted that while 29 of the students (34.1%) used cushions or pads for elongated sitting, 44 students 51.8% complained of experiencing pain when standing from a chair after work.

Table 1: Frequency Distribution of Outcome Variables

Variable		Frequency (n)	Percentage (%)
Gender			
Female		43	50.6%
Male		42	49.4%
Diagnostic Test			
Faber's Test	Positive	58	68.2%
	Negative	27	31.8%
Thigh Thrust Test	Positive	22	25.9%
	Negative	63	74.1%
Distraction Test	Positive	15	17.6%
	Negative	70	82.4%
Numeric Pain Rating Scale			
(0-3) Mild pain		40	47.1%
(4-6) Moderate pain		28	32.9%
(7-10) sever pain		17	20%

Data presented in Table 2 shows that 34 students (40.0%) denied any form of pain while walking on any surface of the building, 39 students (45/9%) denied any form of pain while climbing stairs. Further, 48 (56.5%) had no car transfer pain/comfort and, 46 (54.1%) slight pain for car bending, kneeling, and squatting. Students complained of pain when lifting objects to be 38 (44.7%) whereas 33 of them complained of sleep disturbances due to pain. Importantly, 38 students (44.7%) demonstrated a normal degree of stability of the sacroiliac joint. The results concerning the gender and diagnostic tests were shown in the Table 3. There were no correlations between gender and the results of FABER's test, Thigh Trust test, and Distraction test as the p-values of 1.00, 0.805, and 0.407 respectively suggest.

Table 2: Denver Sacroiliac Joint Questionnaire Frequency of participants

Question	Frequency (n)	Percentage (%)
Affect your daily life		
I can always sit in any chair for longer periods of time.	22	25.9%
I can always sit for longer period of time on a chair with a pad or cushion.	29	34.1%
I can sit for long periods of time but I have to change positions frequently	25	29.4%
I cannot sit for more than an hour due to pain in sacroiliac joint.	9	10.6%
Standing up		
There is no pain in the sacroiliac joint area	24	28.2%
I have some pain in the sacroiliac joint area, but I can stand up from chair normally.	44	51.8%
I have severe pain in the sacroiliac joint area, so I have to get up from chair very slowly.	15	17.6%
I can't get up a chair without help because of the pain in my sacroiliac joint.	2	2.4%
Walking		
Can walk long distances on any surfaces.	34	40%
I have pain in my sacroiliac joint, so I try to walk on flat surfaces.	25	29.4%
Due to pain in the sacroiliac joint ,I am unable to walk more than 1.5 kilometers.	17	20%
I cannot walk more than 100 m due to pain my sacroiliac joint.	9	10.6%
Getting up and down stairs		
There is no pain in the sacroiliac joint area and I can go up and down stairs.	30	35.3%
I have pain in the sacroiliac joint area, but I can go up and down stairs.	39	45.9%
Because of pain in the sacroiliac joint, I have to go up and down slowly.	10	11.8%
Handrails are required due to pain in the sacroiliac joint.	6	7.1%
Getting in and out from the car		
There is no pain in the sacroiliac joint area and I can get in and out from car normally.	48	56.5%
I have some pain in my sacroiliac joint but I can get in and out of the car normally.	28	32.9%
I have severe pain in the sacroiliac joint area but I can get in and out of the car normally.	8	9.4%
I have quite severe pain in the sacroiliac joint area, but with assistance I am able to get in and out of car.	1	1.2%
Bending, Kneeling and squatting		
I can bend kneel and squat without pain in the sacroiliac joint area.	24	28.2%

I have slight pain in the sacroiliac joint but I can bend, kneel and squat.	46	54.1%
I have some pain in the sacroiliac joint but I can bend, kneel and squat.	8	9.4%
I have severe pain in the sacroiliac joint but I can bend, kneel and squat.	7	8.2%
Lifting		
No pain in the sacroiliac joint area and able to lift heavy objects.	17	20%
Pain in the sacroiliac joint area but able to lift heavy objects.	38	44.7%
I have pain in the sacroiliac joint, but I can lift them from waist height such as on a table.	17	20%
I have pain in the sacroiliac joint area and only lift very light objects.	12	14.1%
I cannot lift or carry anything because of pain in sacroiliac joint area.	1	1.2%
Work, Social work		
I can go to work, do house work	12	14.1%
slight pain in the sacroiliac joint area, but I can do still work,	37	43.5%
some pain in the sacroiliac joint area during work.	26	30.6%
severe pain in the sacroiliac joint area during work.	10	11.8%
Sleep		
I don't wake up because of pain in the sacroiliac joint.	30	35.3%
Sometimes, wake up because of pain in sacroiliac joint.	33	38.8%
I wake up because of pain in my sacroiliac joint, but I can sleep about 8 hours a night.	8	9.4%
I can't sleep more than 6 hours due to pain in my sacroiliac joint	10	11.8%
I can't sleep more than 4 hours due to pain in my sacroiliac joint.	4	4.7%
SIJ Stability		
Sacroiliac joint doesn't fell unstable	38	44.7%
I get overworked, I feel discomfort in the sacroiliac joint.	31	36.5%
I bend or twist my body, I feel like the sacroiliac joint is loose or out of place.	11	12.9%
I walk or stand, I feel as if my sacroiliac joint is loosening or popping out.	5	5.9%

Table 3: Association of Gender distribution with Diagnostic Tests

Diagnostic Test	Gender		Total 85	*p*-value
	Male 42	Female 43		
Faber Test				
Positive	29	29	58	1.00
Negative	13	14	27	
TTT				
Positive	10	12	22	0.805
Negative	32	31	42	
Distraction Test				
Positive	9	6	15	0.407
Negative	33	37	70	

DISCUSSION:

Sacroiliac Joint Dysfunction (SIJD) has emerged as a significant concern among IT students, primarily due to prolonged sitting in static postures. This research investigated the prevalence of SIJD in this population using the Denver Sacroiliac Joint Questionnaire (DSIJQ) and the Numeric Pain Rating Scale (NPRS), involving both male and female participants. Findings indicated that females were slightly more prone to SIJD than males, potentially due to anatomical differences, such as a shallower pelvis, hormonal fluctuations, and flexible ligaments. This observation aligns with Sivakumar et al. (2021), who reported a

higher susceptibility in women (59%) compared to men (41%), linked to prolonged sitting and faulty postures.[7] Similarly, Naveed et al. (2024) highlighted an increased risk of SIJD among female gynecologists aged 35–40.[11] whereas Petrie et al. (2023) suggested an equal prevalence across genders, diverging from the current study's findings that females, irrespective of age, exhibited greater vulnerability.[23] The study demonstrated that the FABER's test and Thigh Thrust test were particularly effective in diagnosing SIJD, with 68.2% of participants testing positive on FABER's and 25.9% on Thigh Thrust. These findings echo Ramirez et al. (2015), who identified FABER's and Sacral Thrust tests as the most reliable diagnostic tools, with a significant proportion of individuals testing positive for SIJD using these methods.[17] Mikhail et al. (2021) emphasized the predictive value of three or more positive provocation tests in diagnosing SIJD, a conclusion partially supported by the current study as FABER test produce more authentic results in diagnosing SIJD.[3] However, Buchanan et al. (2021) advocated for the SI Compression and Thigh Thrust tests as more reliable, presenting a contrast in diagnostic emphasis. Moreover, distraction tests yielded lower sensitivity (60%) but higher specificity (81%), [6] consistent with Sivakumar et al. (2021), who integrated this test into their diagnostic protocol.[7] In contrast to current study, Fatima et al. (2021) found no significant association between NPRS scores and distraction test results.[24] The repetitive activities associated with IT student lifestyles, including prolonged sitting, bending, lifting, and twisting, contribute to SIJD-related discomfort. These faulty postures compress musculoskeletal structures, resulting in pain and dysfunction. The DSIJQ results revealed that 34.1% of students experienced difficulty sitting, 45.9% reported pain while climbing stairs, and 44.7% faced discomfort while lifting objects. Notably, 38.8% of participants experienced sleep disturbances due to pain, while the SI joint was stable in 44.7%. These findings align with Patel et al. (2023) and Sayed et al. (2024), who validated the DSIJQ as an effective tool for assessing SIJD and its impact on daily activities.[22,25] In contrast, Sivakumar et al. (2021) employed the Nordic Musculoskeletal Questionnaire alongside a demographic survey, offering an alternative assessment approach.[7] Provocation tests were evaluated for their diagnostic reliability, with FABER's test showing moderate sensitivity (71%) and specificity (75%), as supported by Telli et al. (2020) (26). The Thigh Thrust test, also referred to as the posterior shear test, demonstrated sensitivity of 88% and specificity of 69%, consistent with Mekhail (2021).[3] However, Gartenberg et al. (2021) critiqued the Thigh Thrust test for its limited diagnostic precision. The distraction test was less clinically robust but provided value when used within test clusters[1] Research by Bashir et al. (2024) corroborated these findings, indicating prolonged sitting as a critical factor for SIJD in other sedentary professions, while Fatima et al. (2024) found no significant correlation between NPRS scores and distraction test outcomes.[15,24] The study highlighted a 43.8% overall prevalence of SIJD among participants, aligning with Sivakumar et al. (2021), who estimated SIJ dysfunction as a contributor to 15–30% of low back pain cases.[7] While this research underscores the role of SIJD as a prevalent musculoskeletal concern, it also calls for further investigations integrating diverse diagnostic methods and extended observation periods to enhance understanding and management strategies. Despite these, the present study contains some limitations that may affect the generalization and scope of the findings. A particularly important point is that the information about the duration of the sitting and work history of the students were not obtained. Such a limitation poses a challenge in determining the progressive nature of sacroiliac joint dysfunction in patients or the changes that occur when such a condition is subjected to an extended period of sitting. More than that, the study did not

discover risk factors that may be linked with raised possibility of growing of SIJD among IT students. To overcome such limitations in future research, it is suggested to include a better examination of sitting duration and work patterns among the IT students who rely on laptops or computers. This approach would increase the knowledge of the progression of SIJD as well as increase the externality of the study. In addition, future research should seek to establish more vital risk indicators associated with the development of SIJD and compare them with the onset of pain experienced by this population. Such improvements would generate better data to prevent and control SIJD among IT students.

CONCLUSION

The study concluded that Sacroiliac joint dysfunction is 43.8% prevalent among IT students that is highly independent of the gender difference.

CONFLICT OF INTEREST

No conflict of interest is declared by authors**.**

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None

AUTHOR'S CONTRIBUTIONS

AU: Concept, Article Writing
SAR: Concept and Data Collection
RH: Technical Support, Critical approval
SS: Data Analysis, Critical approval

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