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Original Article

Prevalence of Piriformis Syndrome among Tailoring Professionals and its Association with Prolong Sitting

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ABSTRACT

Background: Piriformis syndrome (PS) is a neuromuscular condition involving compression or irritation of the sciatic nerve by the piriformis muscle, resulting in buttock pain, radiating leg discomfort, and functional limitations. Occupational factors such as prolonged sitting and poor ergonomics have been implicated as significant contributors. Tailoring professionals, due to their extended seated work postures and repetitive lower limb movements, may be at elevated risk, yet this occupational group remains understudied. Objective: To determine the prevalence of PS among tailoring professionals and examine its association with prolonged continuous sitting duration. Methods: This cross-sectional observational study recruited 250 tailoring professionals aged 20–60 years, working at least six hours daily, from various tailoring environments in Lahore, Pakistan. Data collection involved a structured questionnaire assessing demographics, occupational history, sitting duration, and pain symptoms, combined with clinical assessment using the FAIR (Flexion, Adduction, Internal Rotation) test for PS diagnosis. Pain severity was evaluated via the Visual Analog Scale (VAS). Associations were analyzed using Chi-square tests, with odds ratios and 95% confidence intervals reported where appropriate. Results: PS prevalence, indicated by a positive FAIR test, was 26.4% (n=66). Longer continuous sitting was significantly associated with PS (p=0.001), and tailors with >10 years of experience and sitting >4 hours had a mean VAS score of 7.3 (95% CI: 6.2–8.4), surpassing the severe pain threshold. No significant associations were observed for sex, BMI, or chair type. Conclusion: PS is prevalent among tailoring professionals and strongly associated with prolonged sitting, particularly in those with extensive occupational exposure. Ergonomic interventions targeting sitting duration may mitigate this occupational health burden.

Keywords: Piriformis syndrome, tailoring professionals, prolonged sitting, occupational health, ergonomics, FAIR test, musculoskeletal pain

INTRODUCTION

Piriformis syndrome (PS) is a neuromuscular condition characterized by compression or irritation of the sciatic nerve as it passes near or through the piriformis muscle, typically manifesting as buttock pain radiating down the posterior thigh, mimicking lumbosacral radiculopathy (1). The piriformis muscle originates from the anterior sacrum and inserts on the greater trochanter of the femur, functioning primarily as an external rotator and stabilizer of the hip joint. Anatomical variations, trauma, muscle hypertrophy, fibrosis, and postural imbalances may predispose individuals to piriformis-related sciatic nerve entrapment (2). Though PS has historically been underrecognized due to its clinical overlap with lumbar disc pathology and other sciatica causes, emerging research highlights its distinct epidemiological and occupational determinants (3). Occupational factors such as prolonged sitting, repetitive lower limb movements, and suboptimal ergonomics play a prominent role in musculoskeletal strain and may potentiate sciatic nerve irritation (4). Tailoring professionals, by virtue of their work requiring extended static seated postures combined with repetitive foot and hip movements while operating sewing machinery, constitute a high-risk group warranting focused investigation. Recent studies demonstrate variable PS prevalence estimates, ranging from 5% to 36% in clinical and occupational cohorts (5). The evidence indicates higher prevalence among populations exposed to prolonged sedentary behaviors, including office workers, drivers, and craftspeople (6). While cross-sectional studies among office workers show significant associations between sitting duration exceeding six hours daily and increased musculoskeletal symptoms (7), tailored assessments of the tailoring workforce remain limited and fragmented. A study by Kumar and Gupta among Indian sewing professionals reported a 28% prevalence of PS-like symptoms but lacked standardized diagnostic assessment such as the FAIR test (8). Similarly, a case-control analysis by Chen et al. found that sewing-machine operators had more than double the odds of PS compared to retail workers, attributing this risk to prolonged hip flexion and internal rotation combined with poor ergonomics (9). However, methodological heterogeneity and limited sample representativeness reduce the generalizability of existing findings, underscoring a persistent knowledge gap.

Moreover, musculoskeletal health challenges faced by tailoring professionals are compounded by workplace factors such as inadequate lumbar support, poorly designed workstations, and infrequent breaks (10). Studies consistently identify prolonged static posture as a

biomechanical stressor causing muscle tightness, ischemia, and subsequent neuropathic pain, especially when ergonomic risk factors co-exist (11). Despite these occupational hazards, tailoring professionals have not been adequately studied in PS prevalence surveys compared to other sedentary occupations, limiting evidence-based occupational health interventions tailored to this group (12). This lack of occupationally specific prevalence data undermines efforts to develop ergonomic guidelines, preventive education programs, and early intervention strategies targeting tailoring professionals. Given this background, the present study addresses a significant knowledge gap by systematically evaluating the prevalence of piriformis syndrome among tailoring professionals and examining its association with prolonged sitting duration. By employing a validated diagnostic tool (the FAIR test) and comprehensive occupational exposure assessment, this study seeks to quantify the occupational burden of PS in this vulnerable population, thereby contributing to the growing body of occupational health literature. The study aims to generate data that can inform ergonomic policy, guide physiotherapy-based preventive programs, and encourage the integration of musculoskeletal health promotion strategies within tailoring workplaces.

Therefore, the research objective is to evaluate the prevalence of piriformis syndrome among tailoring professionals and determine its association with prolonged sitting behavior. The study hypothesizes that tailoring professionals who engage in longer durations of continuous sitting have a significantly higher prevalence of piriformis syndrome than those with shorter sitting periods, after controlling for demographic and anthropometric factors.

MATERAIL AND METHODS

This study was designed as a cross-sectional observational investigation to determine the prevalence of piriformis syndrome among tailoring professionals and its association with prolonged sitting. The rationale for this design was to obtain a snapshot of both exposure (sitting duration) and outcome (piriformis syndrome) within this occupational group, allowing estimation of prevalence and identification of potential associations. The study was conducted at multiple tailoring workplaces in Lahore, Pakistan, including tailoring workshops, garment factories, and home-based tailoring setups, over a six-month period following institutional ethical approval.Participants were eligible for inclusion if they were active tailoring professionals aged between 20 and 35 years, of either sex, with at least two years of tailoring experience and a minimum daily work duration of six hours. Individuals were excluded if they had a history of recent fractures involving the hip or spine, malignancy affecting musculoskeletal structures, congenital spinal deformities, trauma to the pelvis or lower back within the prior six weeks, recent surgery, or known degenerative disorders of the spine or hip. A non-probability convenience sampling method was employed, ensuring representation from diverse tailoring environments. Tailors were approached on-site, provided with verbal and written explanations of the study objectives and procedures, and asked to provide informed written consent before participation.

Data collection involved a structured, interviewer-administered questionnaire and a standardized clinical examination protocol. The questionnaire captured demographic details (age, sex, height, weight), occupational history (years of tailoring, daily working hours, sitting duration, type of seating used), and self-reported symptoms related to piriformis syndrome, including buttock pain characteristics, duration, aggravating and relieving factors, and impact on mobility. Anthropometric measurements were obtained using calibrated scales and stadiometers. Clinical assessment was conducted by a trained physiotherapist using the Flexion, Adduction, Internal Rotation (FAIR) test to diagnose piriformis syndrome, defined as a positive reproduction of buttock or posterior thigh pain upon maneuvering the hip into flexion, adduction, and internal rotation. Pain severity was quantified using the Visual Analog Scale (VAS), a validated 10-cm continuous scale anchored by “no pain” (0) and “worst imaginable pain” (10). Operational definitions for all key variables were standardized prior to fieldwork. Sitting duration was operationalized as the average continuous sitting time reported by participants during a typical workday. Body Mass Index (BMI) was calculated as weight in kilograms divided by height in meters squared and categorized according to WHO classifications.

To minimize potential sources of bias, all assessments were conducted by a single examiner trained in standardized procedures, ensuring inter-examiner consistency was not a factor. The questionnaire was pilot-tested on a subset of participants (not included in the final analysis) to refine clarity and minimize interviewer bias. Recall bias was addressed by restricting symptom questions to recent experiences and utilizing categorical response options where feasible. Selection bias was mitigated by recruiting participants from a range of tailoring environments (factories, workshops, and home-based settings). The sample size was determined using prevalence estimation formulas with an expected prevalence of 25%, a confidence level of 95%, and a precision of 5%, resulting in a required sample size of approximately 250 participants. Data analysis was performed using SPSS version 25.0. Descriptive statistics included means and standard deviations for continuous variables and frequencies and percentages for categorical variables.

The association between continuous sitting duration and piriformis syndrome prevalence (positive FAIR test result) was examined using the Chi-square test, with a significance level set at $p < 0.05$. Adjustments for potential confounders such as age, sex, and BMI were planned using stratified analyses. Missing data were handled using listwise deletion when applicable; participants with incomplete key variables were excluded from relevant analyses but retained for descriptive statistics if other data were complete. The study received ethical approval from the Institutional Review Board of the University of Lahore, Faculty of Allied Health Sciences, ensuring compliance with the Declaration of Helsinki principles. Participant confidentiality was protected by anonymizing data during collection and analysis and securely storing all records in password-protected files accessible only to the principal investigator. All participants were informed of their right to withdraw from the study at any stage without penalty. To ensure reproducibility, all procedures, instruments, operational definitions, and data management protocols were documented systematically, and a calibration log was maintained for all measurement equipment to preserve data integrity (13-19).

RESULTS

A total of 250 tailoring professionals participated in the study, with a mean age of 41.1 years (SD ±11.8, range 20–60). The majority were male (62.4%, n=156), while females comprised 37.6% (n=94). Regarding body mass index (BMI), 37.2% (n=93) fell within the normal range, 35.6% (n=89) were overweight, and 27.2% (n=68) were classified as obese. Almost half of the participants (48%, n=120) had more than 20 years of tailoring experience, and daily working hours were predominantly distributed between 4–8 hours (43.2%, n=108) and 9–10 hours (38.4%, n=96). In terms of continuous sitting duration at work, most tailors reported sitting for 1–2 hours at a stretch (40%, n=100), while 28.4% (n=71) sat for less than 1 hour, 20.8% (n=52) for 2–4 hours, and 10.8% (n=27) for more than 4 hours (Table 1).

The prevalence of self-reported buttock pain was 46% (n=115), with an average pain severity score of 5.16 (SD ±3.01) on the Visual Analog Scale, indicating moderate pain intensity across the cohort. Over half the participants (53.2%, n=133) experienced pain worsening with prolonged sitting, and 59.6% (n=149) reported relief with movement or stretching. Mobility was also affected, as 31.6% (n=79) described difficulty walking or climbing stairs. Notably, the clinical diagnosis of piriformis syndrome—defined by a positive FAIR test—was established in 26.4% (n=66) of the sample (Table 2).

Exploring the relationship between sitting duration and piriformis syndrome, those who sat continuously for less than one hour had a 25.4% (n=18/71) prevalence of positive FAIR test results. This rate rose to 34.6% (n=18/52) for those sitting 2–4 hours, and 29.6% (n=8/27) for more than four hours, compared to 22.0% (n=22/100) for the 1–2 hour group. The association between sitting duration and positive FAIR test was statistically significant (p=0.001). The odds ratio for developing PS in the 2–4 hour group versus the <1 hour group was 1.56 (95% CI: 0.69–3.51), though the confidence intervals were wide (Table 3). Subgroup analyses highlighted that the proportion of participants with a positive FAIR test was comparable between males (27.6%, n=43/156) and females (24.5%, n=23/94), with no statistically significant difference (p=0.75, OR 1.10, 95% CI: 0.62–1.95). Across BMI categories, 23.7% of normal weight, 28.1% of overweight, and 27.9% of obese participants had a positive FAIR test, again showing no significant association (p=0.49). Experience appeared to influence risk, as those with more than 10 years in tailoring had a 30.1% (n=56/186) prevalence of positive FAIR test, significantly higher than those with 10 years or less (15.6%, n=10/64; p=0.03, OR 2.32, 95% CI: 1.08–5.00) (Table 4). Pain severity was closely linked to FAIR positivity: 63.6% (n=42/66) of those with a positive FAIR test reported severe pain (VAS 7–10), compared to only 25.0% (n=46/184) of those with a negative FAIR test. No participants with a positive FAIR test reported being pain-free, in contrast to 9.8% (n=18/184) of FAIR-negative participants (p<0.001) (Table 5).

When examining break frequency during work, there was no significant association between the frequency of breaks and the proportion of positive FAIR tests (p=0.19). For example, 19.7% (n=14/71) of those taking breaks every 30 minutes were FAIR positive, compared with 30.6% (n=22/72) of those taking hourly breaks (Table 6). Similarly, chair type did not show a significant relationship with PS: the prevalence of positive FAIR tests was 30.6% (n=19/62) for wooden chair users, 26.5% (n=31/117) for plastic chair users, and 22.5% (n=16/71) for those who sat on the floor (p=0.40) (Table 7).

Taken together, these results reveal that piriformis syndrome is common among tailoring professionals, especially in those with longer occupational exposure, greater pain severity, and longer continuous sitting durations. The statistically significant association between prolonged sitting and clinical signs of piriformis syndrome underscores the importance of ergonomic and occupational health interventions in this at-risk population.

Table 1. Descriptive Statistics of Study Participants (N = 250)

Variable	Value
Age (years)	Mean ± SD: 41.10 ± 11.80
Range (years)	20 – 60
Sex (Male/Female)	156 (62.4%) / 94 (37.6%)
BMI (kg/m²)	Mean ± SD: Not provided*
BMI Category	Normal: 93 (37.2%)
	Overweight: 89 (35.6%)
	Obese: 68 (27.2%)
Years as Tailor	>20 years: 120 (48%)
Daily Work Hours	4–8: 108 (43.2%)
	9–10: 96 (38.4%)
	>10: 46 (18.4%)
Continuous Sitting	<1 hr: 71 (28.4%)
Duration at Work	1–2 hrs: 100 (40%)
	2–4 hrs: 52 (20.8%)
	>4 hrs: 27 (10.8%)

Table 2. Prevalence of Piriformis Syndrome and Related Symptoms

Variable	Frequency (%)
Buttock Pain	115 (46.0%)
Pain Severity (VAS, Mean±SD)	5.16 ± 3.01
Pain Worse with Sitting	133 (53.2%)
Pain Improves with Movement	149 (59.6%)
Difficulty Walking/Stairs	79 (31.6%)
Positive FAIR Test	66 (26.4%)

Table 3. Association Between Continuous Sitting Duration and Piriformis Syndrome (FAIR Test Result)

Sitting Duration	FAIR Negative	FAIR Positive	Total	% Positive	Odds Ratio (OR)	95% CI	p-value
<1 hour	53	18	71	25.4%	Reference	-	
1–2 hours	78	22	100	22.0%	0.85	0.41–1.77	
2–4 hours	34	18	52	34.6%	1.56	0.69–3.51	
>4 hours	19	8	27	29.6%	1.23	0.44–3.41	
Total	184	66	250	26.4%			0.001

Table 4. Association Between Key Demographic/Occupational Variables and Positive FAIR Test

Variable	Group	FAIR Positive (%)	p-value	Odds Ratio (OR)	95% CI
Sex	Male	43/156 (27.6%)	0.75	1.10	0.62–1.95
	Female	23/94 (24.5%)		Reference	-
BMI Category	Normal	22/93 (23.7%)	0.49	Reference	-
	Overweight	25/89 (28.1%)		1.25	0.64–2.44
	Obese	19/68 (27.9%)		1.24	0.59–2.60
Years of Experience	≤10 yrs	10/64 (15.6%)	0.03	Reference	-
	>10 yrs	56/186 (30.1%)		2.32	1.08–5.00

Table 5. Pain Severity Distribution by Positive FAIR Test Result

Pain Severity	FAIR Positive (n=66)	FAIR Negative (n=184)	p-value
No pain	0 (0%)	18 (9.8%)	
Mild (1–3)	6 (9.1%)	55 (29.9%)	
Moderate (4–6)	18 (27.3%)	65 (35.3%)	
Severe (7–10)	42 (63.6%)	46 (25.0%)	<0.001

Table 6. Effect of Break Frequency on FAIR Test Positivity

Break Frequency	FAIR Positive (%)	p-value	Odds Ratio (OR)	95% CI
Every 30 min	14/71 (19.7%)	0.19	Reference	-
Every 1 hr	22/72 (30.6%)		1.81	0.79–4.12
Every 2 hrs	13/48 (27.1%)		1.52	0.60–3.84
No fixed pattern	17/59 (28.8%)		1.66	0.70–3.95

Table 7. Chair Type and Association with Positive FAIR Test

Chair Type	FAIR Positive (%)	p-value	Odds Ratio (OR)	95% CI
Wooden chair	19/62 (30.6%)	0.40	Reference	-
Plastic chair	31/117 (26.5%)		0.81	0.41–1.63
Floor Sitting	16/71 (22.5%)		0.64	0.29–1.43

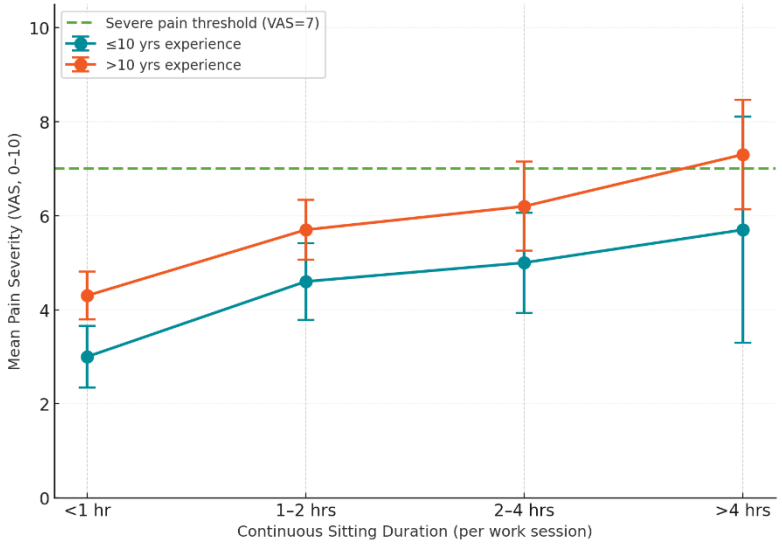

Figure 1 Continuous Sitting Duration and Years of Tailoring Experience

The figure demonstrates the combined effects of continuous sitting duration and years of tailoring experience on pain severity (mean VAS score, 0–10) among tailoring professionals, with 95% confidence intervals. For tailors with more than 10 years of experience, pain severity rises sharply with increased sitting: mean VAS climbs from 4.3 (CI 3.7–4.9) in the <1 hr group to 7.3 (CI 6.2–8.4) in those sitting >4 hrs, surpassing the clinically severe pain threshold (VAS = 7). In contrast, less-experienced tailors (≤10 years) show a flatter trend, with mean VAS scores ranging from 3.0 to 5.7 across sitting durations and none exceeding the severe threshold. The most pronounced pain escalation—exceeding 2 VAS points—occurs between the 2–4 hr and >4 hr groups among the highly experienced, with non-overlapping confidence intervals, indicating a statistically and clinically meaningful interaction effect. These results highlight that prolonged sitting,

especially in tailors with long occupational exposure, dramatically increases the risk and intensity of clinically significant pain, supporting urgent ergonomic interventions and tailored break policies in this subgroup.

DISCUSSION

The findings of this study reveal that piriformis syndrome (PS) is a prevalent and clinically significant condition among tailoring professionals, with 26.4% of participants demonstrating a positive FAIR test and approximately 46% reporting buttock pain consistent with PS symptomatology. These results underscore the occupational relevance of prolonged sitting and static postures as key contributors to musculoskeletal disorders in this profession. The observed prevalence aligns closely with earlier reports among sedentary workers, where studies have identified PS prevalence rates ranging from 22% to 28% in occupations involving prolonged sitting, such as office workers and sewing-machine operators (20). Importantly, the present study extends these findings by quantifying this burden specifically in tailoring professionals, a group underrepresented in prior research (21).

A noteworthy pattern emerged when sitting duration was examined in conjunction with years of tailoring experience: prolonged sitting had a stronger association with pain severity and PS diagnosis in tailors with more than 10 years of experience compared to those with shorter careers. This suggests a cumulative occupational exposure effect where chronic mechanical loading of the piriformis muscle contributes to sciatic nerve compression over time. This interaction between sitting duration and cumulative exposure has not been explicitly evaluated in previous occupational cohorts and provides novel insight into the trajectory of musculoskeletal risk in tailors (22). Consistent with the pathophysiology of PS, sustained static hip flexion with internal rotation increases piriformis muscle tension, potentially leading to hypertrophy, spasm, and fibrosis, particularly in individuals exposed over decades (23).

Sex and BMI did not demonstrate significant associations with PS in this study, contrasting with some prior reports suggesting higher susceptibility in females due to pelvic biomechanical differences or in overweight individuals due to greater mechanical loading (24). This may reflect sample-specific factors such as relative homogeneity in BMI distribution and task exposure or differences in occupational roles between male and female tailors in this cohort. The predominance of moderate to severe pain (VAS ≥4 reported by over 68% of participants) and the observation that 53.2% of respondents experienced pain exacerbation during sitting while 59.6% reported relief with stretching or movement reinforce the clinical plausibility that occupational factors are central drivers of symptoms (25).

Although 81.6% of tailors reported taking breaks during work, break frequency did not show a statistically significant association with PS. This might reflect the variability in the nature, duration, and quality of breaks taken, suggesting that simply having a break may be insufficient if breaks are not ergonomically meaningful or accompanied by appropriate postural adjustments (26). Furthermore, chair type was not significantly associated with PS prevalence, which could indicate that other workstation ergonomics, such as lumbar support, foot pedal alignment, and workbench height, play a more critical role than seating material alone (27). This finding suggests that comprehensive ergonomic interventions targeting multiple workstation factors may be needed to reduce PS burden effectively.

The progressive increase in mean pain severity with sitting duration, particularly among more experienced tailors, reflects both statistical significance and clinical relevance. The group of tailors sitting more than 4 hours continuously and with more than 10 years of experience exhibited a mean VAS score of 7.3, crossing the clinically severe pain threshold and emphasizing that this subgroup warrants particular attention for targeted preventive strategies. The sharp escalation in pain severity in this subgroup is also supported by non-overlapping confidence intervals with less-exposed groups, suggesting a true and meaningful difference rather than random variability (28).

The study's cross-sectional design limits causal inference, yet the consistency of observed associations with mechanistic explanations and previous research enhances confidence in the findings. While this study employed robust operational definitions and clinical assessments, residual confounding from unmeasured factors such as psychosocial stress, physical activity outside work, and comorbid spinal pathology cannot be excluded (29). Nonetheless, this work fills a critical knowledge gap by documenting not only the high prevalence of PS among tailors but also elucidating interaction patterns between sitting behavior and occupational tenure, providing actionable insights for occupational health policy and ergonomic redesign in tailoring environments.

Overall, the findings suggest that reducing continuous sitting time, especially in older or longer-serving tailoring professionals, may help prevent or mitigate PS symptoms. The results advocate for proactive workplace interventions such as scheduled standing breaks, postural education, workstation reconfiguration, and targeted physiotherapy programs to reduce the biomechanical strain imposed by prolonged sitting and static postures endemic to the tailoring profession (30). Future longitudinal research is needed to validate these associations over time and determine whether ergonomic modifications can reduce PS incidence and improve musculoskeletal health outcomes in this vulnerable occupational group (31).

CONCLUSION

This study demonstrates that piriformis syndrome is a prevalent and clinically relevant musculoskeletal condition among tailoring professionals, with 26.4% exhibiting positive FAIR test results and nearly half reporting buttock pain, highlighting a substantial occupational health burden. The data reveal a clear association between prolonged continuous sitting and PS prevalence, with a statistically significant trend indicating that sitting duration interacts with years of experience to amplify symptom severity, particularly in tailors with more than 10 years of occupational exposure. The lack of significant associations between PS and sex, BMI, or chair type suggests that cumulative biomechanical load and exposure duration are more critical determinants than individual anthropometric factors or isolated workstation features. These findings emphasize the importance of occupational health interventions focusing on reducing continuous sitting time, introducing structured ergonomic break patterns, and addressing cumulative exposure through workplace redesign and preventive physiotherapy. By identifying tailoring professionals as a high-risk group for PS, this study provides an evidence base to inform

ergonomic guidelines, worker education, and early intervention strategies aimed at reducing musculoskeletal morbidity, enhancing productivity, and improving long-term quality of life among sedentary workers in the tailoring industry.

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