



## FREQUENCY OF PIRIFORMIS TIGHTNESS IN SCIATIC PATIENTS

Ansa Zulfiqar<sup>1</sup>, Sarfraz Ahmad<sup>2</sup>, Shabah Surriya<sup>1</sup>, Emma Chohan<sup>1</sup>, Aroosha Abrar<sup>1</sup>, Maria Ajmal<sup>1</sup>, Javeria Ajmal<sup>3</sup>, Syeda Rahat<sup>1</sup>

<sup>1</sup> Department of Physical Medicine and Rehabilitation, The Children's Hospital and University of Child Health Sciences, Lahore, Pakistan

<sup>2</sup> MBBS, FCPS, Associate Professor, Chairman & Head of Department, Physical Medicine and Rehabilitation, The Children's Hospital and University of Child Health Sciences, Lahore, Pakistan

<sup>3</sup> Physiotherapy Department, Ghurki Trust Teaching Hospital, Lahore, Pakistan

### ARTICLE INFO:

#### Keywords:

sciatica, piriformis stretch test, stretching

#### Corresponding Author:

**Sarfraz Ahmad**

MBBS, FCPS Associate Professor

Chairman & Head of Department PM&R, The Children's Hospital and University of Child Health Sciences, Lahore, Pakistan

[dr.sarfraz.ahmad@chich.edu.pk](mailto:dr.sarfraz.ahmad@chich.edu.pk)

#### Article History:

Published on 25 July 2025

### ABSTRACT

**Background:** Piriformis syndrome results from compression of sciatic nerve due to tightness of piriformis muscle.

**Objective:** To determine the frequency of piriformis muscle tightness in sciatic patients

**Methods:** This cross-sectional study was conducted at Physical Medicine & Rehabilitation Centre, Model Town Lahore on sciatic patients with piriformis tightness from October 2023 to May 2024 and included 77 patients diagnosed with sciatica. Piriformis stretch test was used to identify piriformis tightness in sciatic patients. The data was collected using a self-designed questionnaire and analyzed using IBM SPSS V-23. Chi-square Test was used to find the association between gender and piriformis stretch test.

**Results:** Out of 77 sciatic patients, 41 were male and 36 were female. Associated pain aggravating factors such as prolonged sitting 70 (90.9%) patients, sitting on hard surfaces 61(79.2%) and pain-relieving interventions like stretching 71 (92.2%) cases, massage on affected area 60 (77.9%) patients, use of hot packs to relieve pain 73(94.8%) cases were seen. Almost 57(74.0%) patients tested positive for Piriformis stretch test. A significant association was found between piriformis stretch test and gender (p-value = 0.015)

**Conclusion:** The proportion of men to women with piriformis tightness showed slight male predominance. The majority affected were those patients who spent more time on prolonged sitting on hard surface; therefore, they were less knowledgeable about the value of physical activity. Early diagnosis and physiotherapy management with risk factor modification can help achieve better results in managing the condition.

## INTRODUCTION

Piriformis is a deep, pyramidal-shaped gluteal muscle that arises from the sacrum and inserts into the greater trochanter of the femur (1). The Piriformis muscle provides postural stability and function as an external rotator and abductor at hip joint(2) The larger sciatic foramen allows the sciatic nerve to pass through the pelvis below the belly of this muscle and descend the posterior thigh. (3,4) Piriformis syndrome may result from the piriformis muscle being stretched and shortened due to altered biomechanics of the lower leg resulting in sciatic nerve entrapment. (5) It is characterized by pain, numbness, tingling and discomfort that is restricted to the larger sciatic notch, sacroiliac joint, and piriformis muscle, which may radiate along the length of the sciatic nerve and causes difficulty in walking. (6) In a general population study, 12.2-27% of respondents reported having PS at some point in their lives. (7) Athletes as well as the general public may experience discomfort and impairment due to the piriformis syndrome. (8) The characteristics features of piriformis tightness may include positive Lasegue sign, tenderness at the sciatic notch, pain worsens with certain actions, such as bending forward, lifting objects, sprinting or leaping (9) Risk factors associated with piriformis tightness include faulty posture, long sitting hours on hard surfaces, poor ergonomic furniture, obesity, female gender, pregnancy, congenital anomalies (2) and piriformis muscle dysfunction. (10,11). In the past few years, entrapment neuropathies like PS have been extensively evaluated using high-resolution ultrasound of piriformis muscle (13) It is not associated with any particular radiographic findings(12) However, surgery is considered for persistent patients, an MRI of the pelvis is recommended to rule out a mass effect within the sciatic notch or an intrapelvic lesion (14,15) stretch tests which are used most commonly are Freiberg test,

piriformis stretch test (FAIR) test, Pace test, and Beatty test (6) Physiotherapy treatment included hot packs to reduce muscle tightness and improve circulation (16) stretching exercises to improve ROM (17), myofascial therapy to release trigger points, deep friction massage to reduce pain and discomfort (9) nerve mobilization, electrical stimulation (18)for pain-relief and dry needling. The surgical management involves sciatic nerve decompression or release of piriformis muscle. (19)

After a thorough literature review, it was found that information regarding the frequency of piriformis tightness in sciatic patients is very scarce in our country. The lack of knowledge and association of pain aggravating and relieving factors such as prolonged sitting, lifting objects or sitting on hard surface with piriformis tightness were not known previously leading to referral at later stages, compromising the prognosis. Therefore, a thorough understanding and study of associated factors was the choice of interest to cure this at earlier phase and raise awareness.

The objective of this study is to determine the frequency of piriformis tightness in sciatic patients.

## METHODS

This cross-sectional study was conducted in Physical Medicine & Rehabilitation Centre, Model Town Lahore on sciatic patients with piriformis tightness. The participant of this study included 77 patients diagnosed with sciatica. All sciatic patients between the ages of 30-60 years and both genders were included. Patients with piriformis tightness due to orthopedic problems, and post-surgery or due to any other neurological problem were also excluded. Using the sample size formula:

$$n = \left[ \frac{Z_{\alpha/2}}{d} \right]^2 P(1-P)$$

$Z_{\alpha/2}$  = Confidence level = 1.96

$d$  = degree of error = 10%=0.1

P = prevalence = 0.721

n = sample size = 77 (10)

A self-designed questionnaire was utilized to obtain data for this study in order to extract information. The questionnaire was constructed using items from pre-existing literature. (1) (3) (10) Eight out of nine questions were simple yes or no questions. The questionnaire included variables like age, gender, changes in intensity of pain or discomfort with prolonged sitting or lifting object from ground or sitting on hard surfaces, use stairs in daily routine, ability to perform ADLs without restrictions, pain relief with stretching or massage on affected area or by using hot packs and the proportion who tested positive or negative for Piriformis stretch (FAIR) test. The test was performed with patient lying supine. The leg that needed to be tested was flexed at the knee joint and the other leg remained straight. The hip joint was flexed at 60 degrees. The piriformis muscle was stretched by bringing the knee into adduction. Patients tested positive for the test if they reported any uncomfortable sensation at the greater trochanter during the performance of the test. This test has a high sensitivity (0.881) and specificity (0.832) in detecting piriformis syndrome or sciatic nerve entrapment (20)

After approval and written consent from professionals, this questionnaire was used. Ethical clearance was obtained from ethical committee of Physical Medicine & Rehabilitation Center, Lahore (No. 132/EC; Dated 21/09/2023). The data were entered and analyzed using IBM SPSS version 23.0. Categorical variables were expressed in form of frequency and percentages. Chi-square Test was used to find the association between gender and piriformis stretch test. A p-value of less than 0.05 was taken as statistically significant.

## RESULTS

This cross-sectional study was conducted at Children Hospital and University of Child Health Sciences, Lahore. Data were collected from Physical Medicine&Rehabilitation Centre, Model Town Lahore on sciatic patients with piriformis tightness. A self-created questionnaire was utilized to obtain data. Frequency distribution and percentage of demographics are given below:

*Table 1: Table showing percentage distribution of Demographics of patients*

Demographics	Variable	Frequency(n)	Percent%
Gender	Male	41	53.2
	Female	36	46.8
Age	30-40	50	64.9
	40-50	20	26.0
	50-60	7	9.1

The descriptive data showed that out of 77 patients, approximately 56 (72.7%) patients used stairs in daily routine while 21(27.3%) did not used. About 27(35.1%) patients performed ADLs without restrictions whereas 50(64.9%) cases were not able to perform. Different physiotherapy interventions were applied in the form of stretching, massage and hot packs or cold packs. with variable treatment outcomes. The statistics are depicted in table. Out of the total, 57(74.0%) patients tested positive for Piriformis stretch test while 20(26.0%) tested negative. Association between Piriformis stretch test and gender showed p-value of 0.015 ( $p < 0.05$ ) so that results are significant.

**Table 2:** Frequency distribution of factors which cause piriformis tightness in patients

Factors	Variables	Frequency (n)	Percentage %
Pain intensity with prolonged sitting	No	7	9.1
	Yes	70	90.9
Discomfort at hip region while lifting	No	16	20.8
	Yes	61	79.2
Discomfort while sitting on hard surface	No	14	18.2
	Yes	63	81.8
Pain relieved with stretching	No	6	7.8
	Yes	71	92.2
Pain relieved by massage	No	17	22.1
	Yes	60	77.9
Pack used to relieve pain	Cold pack	4	5.2
	Hot pack	73	94.8

**Table 3:** Frequency of Piriformis stretch test and gender

Piriformis stretch test	Gender	
	Male	female
Positive	35	22
Negative	6	14

## DISCUSSION

Piriformis syndrome (PS) occurs when sciatic nerve or its branches become functionally entrapped under the piriformis muscle. (20) .PS frequently causes sciatica (21) and

females are six times more affected than males (22) It is identified by buttock or gluteal pain, piriformis tenderness upon palpation and increased piriformis muscle tension during the active tests (23) The primary objective of treatment is to reduce inflammation, related pain, and spasm, stretching and strengthening exercises of piriformis muscle and manual therapy.(24)

With this descriptive study, we have shown that sciatic pain with piriformis syndrome is the major cause of referral to the physiotherapy department with a slight male predominance with age group 30-40 years affected commonly. Majority of the patients experienced increased pain with prolonged sitting and discomfort at hip area when lifting objects. Almost three-quarters of the total were not able to perform ADLs without restrictions. More than half patients used stairs in daily routine. The treatment showed significant improvement in symptoms.

In a study conducted by Gulzar k, the prevalence of piriformis tightness in sciatic patients was determined and results of association with piriformis stretch test and gender was statistically significant with p-value of 0.026 with slight male predominance. Majority had discomfort at hip area while sitting on hard surface or lifting objects from floor, and were not able to perform ADLs or exercise daily without restrictions. Of the 251 patients in the sample, 181 (72.1%) tested positive for the piriformis stretch test (10) which supports the results as 57(74.0%) of the 77 participants who had been diagnosed with sciatica had tightness in their piriformis muscles in our current study.

In a prior study conducted by Mondal M, a total of 200 sedentary, healthy people were examined, and 159 of them were found to have piriformis muscle tightness (11) . Males are affected more than females in the third decade which agrees with our results. The results showed that the prevalence of piriformis muscle tightness in male and

female was statistically insignificant which contradicts this study.

A cross-sectional study done by Desai VS, approximately 135 out of 260 participants experienced piriformis muscle tension, with a prevalence of 51.92% among bankers (25). Out of 135 bank employees present with pain due to piriformis tightness, 93 subject were females and 42 were males. Association between gender and pain due to piriformis tightness was calculated by the Chi-square test with the p-value of 0.023 which is significant and closely ranges with the study results.

Our study is supported by another study that was done by Mughal S. Of the 190 subjects, 125 participants (65.4%) tested positive for the piriformis stretch test, meaning they had tight piriformis muscles. (2). Mostly affected belong to age group 30-40 years with long sitting hours which closely correlates with the study.

According to a recent study conducted by Singh on 182 cases, determined the prevalence of piriformis syndrome in patients with complain of low back pain/buttock pain with sciatica which was 6.25%. All the patients had reported increased pain on sitting with 2.2% having paresthesia/numbness. In this study, there were 94 cases showing positive piriformis sign, which was 51.64%. Lasegue sign was present in all cases of piriformis syndrome in this study

This study had several limitations. The sample size was relatively small, which restricts the generalizability of the findings. The use of non-probability convenience sampling may have introduced selection bias, affecting the representativeness of the sample. Additionally, data collection relied on a self-designed questionnaire, which may be prone to response bias or inaccuracies, particularly in reporting pain-related behaviors and interventions. Another limitation was the absence of diagnostic imaging, such as MRI or ultrasound, to confirm piriformis syndrome,

as the diagnosis was based solely on clinical tests. Lastly, the cross-sectional design limits the ability to establish causal relationships between risk factors and piriformis muscle tightness. Future research should include a larger and more diverse sample using probability sampling methods to improve generalizability and reduce selection bias. Longitudinal studies are recommended to evaluate the long-term effectiveness of physiotherapy interventions and establish causal relationships. Incorporating diagnostic imaging techniques can enhance the accuracy of piriformis syndrome diagnosis. Public health initiatives should also focus on educating individuals—especially those with prolonged sitting habits—about ergonomics, physical activity, and the importance of early physiotherapy. Lastly, future studies should employ standardized and validated assessment tools to ensure data reliability and validity

#### **CONCLUSIONS:**

This study was conducted to determine frequency of piriformis syndrome in sciatic patients. The majority of those affected by the tightness were employees and housewives with prolonged sitting on hard surfaces or lifting objects with male predominance. Piriformis stretch test was statistically significant and resulted positive in most of the cases. Appropriate diagnosis and early rehabilitation plan along with risk factor modification are prerequisite to achieve better results.

#### **REFERENCES**

1. Astarini NMWT, Wahyuni N, Wibawa A, Indrayani AW, Widyadharma IPE. Prevalence and risk factor of piriformis syndrome among online motorcycle taxis in Denpasar, Bali. *Bali Anatomy Journal*. 2020 Jun 1;3(1):24–7.
2. Mughal S. PREVALENCE OF PIRIFORMIS TIGHTNESS DUE TO LONG HOURS SITTING AMONG BANKERS OF FAISALABAD CITY. *independent journal of allied health sciences*. 2020 Jul 15;55–9.

3. Islam F, Mansha H, Gulzar K, Raza A, Raffique A, Haider S. Prevalence Of Piriformis Muscle Syndrome Among Individuals with Low Back Pain. *Pakistan Journal of Health Sciences*. 2022 Sep 30;48–52.
4. Zade R, Arora SP, Phansopkar P, Deshmukh M. A comparative study based on two different stretching protocol of 30 second vs 10 second for piriformis tightness. *Journal of Medical Pharmaceutical and Allied Sciences*. 2022 Jul 1;11(4):5096–101.
5. Chapman C, Bakkum BW. Chiropractic management of a US Army veteran with low back pain and piriformis syndrome complicated by an anatomical anomaly of the piriformis muscle: a case study. *J Chiropr Med* [Internet]. 2012;11(1):24–9. Available from: <https://www.sciencedirect.com/science/article/pii/S1556370711001660>
6. Fishman LM, Dombi GW, Michaelsen C, Ringel S, Rozbruch J, Rosner B, et al. Piriformis syndrome: Diagnosis, treatment, and outcome - A 10-year study. *Arch Phys Med Rehabil*. 2002;83(3):295–301.
7. Warner S, Munawar A, Ahmad A, Fatima M, Waqas M. Prevalence of piriformis syndrome among university of Lahore male students. *Rawal Medical Journal*. 2018;43(2).
8. Singh US, Meena RK, Singh CAK, Singh AKJ, Singh AM, Langshong R. Prevalence of piriformis syndrome among the cases of low back/buttock pain with sciatica: A prospective study. *Journal of Medical Society* [Internet]. 2013;27(2). Available from: [https://journals.lww.com/jmso/fulltext/2013/27020/prevalence\\_of\\_piriformis\\_syndrome\\_among\\_the\\_cases.3.aspx](https://journals.lww.com/jmso/fulltext/2013/27020/prevalence_of_piriformis_syndrome_among_the_cases.3.aspx)
9. Ahmad Siraj S, Dadgal R. Physiotherapy for Piriformis Syndrome Using Sciatic Nerve Mobilization and Piriformis Release. *Cureus*. 2022 Dec 26;
  10. Gulzar K, Islam F, Raza Thakur A, Shaheen M, Shaharyar Ashar M, Shahzab S. Prevalence of Piriformis Tightness in Sciatic Patients. *Pakistan BioMedical Journal*. 2022 Apr 30;
  11. Mondal M, Sarkar B, Alam S, Das S, Malik K, Kumar P, et al. Prevalence of Piriformis Tightness in Healthy Sedentary Individuals: A Cross-Sectional Study. *International Journal of Health Sciences & Research* ([www.ijhsr.org](http://www.ijhsr.org)) [Internet]. 2017;7:134. Available from: [www.ijhsr.org](http://www.ijhsr.org)
  12. Byrd JWT. Piriformis syndrome. *Oper Tech Sports Med* [Internet]. 2005 Jan;13(1):71–9. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S106018720400067X>
  13. Siahaan YMT, Tiffani P, Tanasia A. Ultrasound-Guided Measurement of Piriformis Muscle Thickness to Diagnose Piriformis Syndrome. *Front Neurol* [Internet]. 2021;Volume 12-2021. Available from: <https://www.frontiersin.org/journals/neurology/articles/10.3389/fneur.2021.721966>
  14. Singh U, Meena R, Singh CA, Singh AKJ, Singh Am, Langshong R. Prevalence of piriformis syndrome among the cases of low back/buttock pain with sciatica: A prospective study. *Journal of Medical Society*. 2013;27(2):94.
  15. Ro TH, Edmonds L. Diagnosis and management of piriformis syndrome: A rare anatomic variant analyzed by magnetic resonance imaging. *J Clin Imaging Sci*. 2018 Jan 1;8(1).
  16. Zade R, Arora SP, Phansopkar P, Deshmukh M. A comparative study based on two different stretching protocol of 30 second vs 10 second for piriformis tightness. *Journal of Medical Pharmaceutical and Allied Sciences*. 2022 Jul 1;11(4):5096–101.
  17. Awan W, Babur MN, UI J, A S. The Effectiveness of Electrotherapy with Manual Therapy in Piriformis Syndrome. *International Journal of Rehabilitation sciences (IJRS)*. 2012 Nov;01:16–9.
  18. Kearns G, Gilbert KK, Allen B, Sizer PS, Brismée JM, Pendergrass T, et al. Accuracy and safety of dry needle placement

- in the piriformis muscle in cadavers. *Journal of Manual and Manipulative Therapy*. 2018 Mar 15;26(2):89–96.
19. Saeed Q, Nawaz Malik A, Ghulam S. Outcome of Specific Piriformis Stretching Technique in Females with Piriformis Syndrome [Internet]. Available from: [www.jpmsonline.com](http://www.jpmsonline.com)
  20. Fishman LM, Polesin A, Sampson S. Piriformis syndrome. In: *Therapeutic Uses of Botulinum Toxin*. Humana Press; 2007. p. 61–74.
  21. Han SK, Kim YS, Kim TH, Kang SH. Surgical Treatment of Piriformis Syndrome. *cios* [Internet]. 2017 May 8;9(2):136–44. Available from: <http://dx.doi.org/10.4055/cios.2017.9.2.136>
  22. Siahaan YMT, Ketaren RJ, Hartoyo V, Tiffani P. THE PREDISPOSING FACTORS OF PIRIFORMIS SYNDROME: STUDY IN A REFERRAL HOSPITAL. *MNJ (Malang Neurology Journal)*. 2019 Jul 1;5(2):76–9.
  23. Othman IK, Mohamad N, Sidek S, Bhaskar RN, Siew Kuan C. Risk factors associated with piriformis syndrome: A systematic review. *Research Article Science, Engineering and Health Studies*. 2020(3):215–33.
  24. Keskula DR, Tamburello M. Conservative Management of Piriformis Syndrome.
  25. Desai VS, Anand S. Prevalence of Piriformis Tightness with Relevance of Sitting Duration in Bankers. *Indian Journal of Forensic Medicine & Toxicology* [Internet]. 2020 Jul 30 [cited 2023 Nov 29];14(3):749–54. Available from: <https://medicopublication.com/index.php/ijfmt/article/view/10458>