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ATHLETIC RUNNER'S QUALITY OF LIFE WITH GROIN STRAIN- A CROSS-SECTIONAL STUDY

Original Research

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ABSTRACT

Background: Groin pain is a common and debilitating issue among athletes, particularly those engaged in high-intensity sports involving kicking, sprinting, and rapid directional changes. It accounts for approximately 6% of all athletic injuries, with prevalence increasing to 13% in specific sports like soccer. The condition often leads to impaired mobility, reduced quality of life, and suboptimal athletic performance. Despite its impact, there is limited evidence regarding its prevalence and effects on athletic runners.

Objective: To evaluate the prevalence of hip pain and assess the quality of life in athletic runners with groin strain using validated measurement tools.

Methods: This cross-sectional study was conducted using non-probability convenience sampling. A total of 150 athletes aged 18-35 years with groin strain were recruited from various sports physiotherapy clinics. Participants were evaluated using the Visual Analog Scale (VAS), the Copenhagen Hip and Groin Outcome Score (HAGOS), and the Lower Extremity Functional Scale (LEFS) to assess hip pain and quality of life. Data were analyzed using SPSS version 24, and correlations were determined with a significance level of $p < 0.05$.

Results: Of the participants, 64.7% were male, and 35.3% were female, with a mean age of 25 ± 4.6 years. The prevalence of hip pain was 88%. Pain intensity levels included no pain (12%), mild pain (38.7%), moderate pain (31.3%), and severe pain (18%). Functional impairment was evident, with 38.1% scoring less than 40 on LEFS. A significant negative correlation ($p < 0.05$) was observed between hip pain and quality of life, indicating the adverse impact of groin strain on athletic performance.

Conclusion: Groin strain significantly impairs quality of life in athletic runners, reducing physical function, general well-being, and athletic performance. Early diagnosis and tailored rehabilitation protocols are essential to mitigate these effects.

Keywords: Athletes, groin strain, hip pain, physical performance, quality of life, sports injuries, Visual Analog Scale.

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INTRODUCTION

Groin injuries are a significant concern among athletes, particularly those engaged in high-intensity sports. These injuries are often grouped with those of the thigh and hip, making it challenging to isolate and document the incidence of injuries specifically affecting the proximal adductor tendon and associated muscle structures. Reports on soccer injuries reveal that the occurrence of injuries in this region is 12% in young players, 20% in professionals, and 27% in older participants, indicating an increasing risk with age. Similarly, groin injuries among hockey players vary from 8.8% to 53.7%, highlighting the vulnerability of athletes in sports requiring rapid directional changes and repetitive strain (1, 2). Athletes such as karate practitioners and track runners often experience compromised performance due to groin strains, which limit their functional abilities, including high kicks, sprints, and other dynamic movements. A groin strain is commonly associated with injuries to the hip adductors, though it may also involve the iliopsoas, rectus femoris, and sartorius muscle units (3). Groin pain accounts for approximately 6% of all sports-related injuries and is notably prevalent in soccer players, where it constitutes up to 13% of injuries in certain studies. The nature of soccer, with its repeated jumping, dribbling, and rapid directional changes, places significant strain on the pubic symphysis and the surrounding musculature (4, 5). Additional risk factors, such as male gender, preseason training, uneven playing surfaces, and biomechanical imbalances, further contribute to the development of groin pain (6).

The complex anatomy of the groin region and the overlap of symptoms from different organ systems pose a challenge in diagnosing and managing groin injuries. Many athletes with groin pain experience prolonged recovery periods, multiple treatment regimens, and varying diagnostic conclusions. Commonly reported groin injuries include those associated with adductor-related pathologies, which frequently involve the attachment of the adductor muscles to the pubic bone (7, 8). Adductor tendinopathy is a well-established cause of groin pain and accounts for approximately 23% of muscle injuries in professional soccer players, predominantly affecting individuals aged 22 to 30. Although physical therapy is beneficial for many, surgical intervention may be required for cases resistant to conservative management (9, 10, 12). Acute adductor-related groin injuries are characterized by a sudden onset of pain, swelling, and possible discoloration, whereas chronic conditions present as pain during high-intensity activities such as sprinting, kicking, or cutting movements (13). Notably, previous groin injuries are a significant risk factor for recurrent or even new injuries in other areas of the lower limb, emphasizing the importance of proper rehabilitation and injury prevention strategies (14, 15). Research indicates a harmful relationship between injuries in different muscle groups of the lower extremities, such as the adductors, hamstrings, quadriceps, and calves, with adductors being most commonly affected and exhibiting the highest recurrence rates (16, 18).

Despite advancements in injury management, groin injuries remain a persistent issue due to their high recurrence rates and potential to become chronic. This highlights the need for a deeper understanding of the impact of groin strains on athletic performance and quality of life. The present study aims to evaluate the effects of groin strain on the performance and quality of life of athletic runners. By identifying the factors influencing recovery and performance, this research seeks to guide rehabilitation processes and minimize the risk of reinjury, ultimately improving the health and performance outcomes for athletes.

METHODS

A cross-sectional study was conducted at various sports physiotherapy clinics, including ULTH, PSRD, and Physio Rehab Lahore, to evaluate the impact of groin strain on athletic runners. The sample size comprised 150 participants, calculated using the Rao Soft Software to ensure adequate representation. The study was conducted over a period of six months following the approval of the synopsis. Ethical approval was obtained from the Institutional Review Board (IRB) of Superior University under reference number IRB/FAHS/DPTRS/2/24/MS/RS-3340. Participants were fully informed about the study and provided written consent in their preferred language, either Urdu or English. The study included male and female athletes aged 18–35 years who reported groin pain or had a history of groin injuries. Exclusion criteria were strictly defined to eliminate confounding factors, such as individuals with hip trauma, referred pain from the hip joint, groin pain due to urinary tract infections, or groin pain associated with lumbar disk disease. This ensured the sample represented a specific population of athletes with groin strain, enhancing the validity of the findings.

Demographic information for all participants was systematically collected. Assessment tools included the Copenhagen Hip and Groin Outcome Score (HAGOS), the Lower Extremity Functional Scale (LEFS), and the Visual Analogue Scale (VAS), each selected for its reliability in evaluating functional limitations and pain severity associated with groin injuries. These standardized instruments facilitated a comprehensive evaluation of participants' conditions and outcomes. Data were entered into and analyzed using the Statistical Package for the Social Sciences (SPSS), version 24. Results were presented in the form of frequencies, ensuring clarity in the interpretation of findings. Ethical considerations were strictly adhered to, with all participants informed of their rights, the voluntary nature of their participation, and their ability to withdraw from the study at any time without consequences.

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RESULTS

The study included 150 athletes, with 64.7% being male (n=97) and 35.3% female (n=53). The age distribution showed that 64% of participants were between 18 and 25 years, 20.7% were aged 26 to 30 years, and 15.3% were aged 31 to 38 years. Pain intensity levels varied among participants, with 12% reporting no pain, 38.7% experiencing mild pain (scores 1-3), 31.3% reporting moderate pain (scores 4-7), and 18% experiencing severe pain (scores 8-10). The Lower Extremity Functional Scale (LEFS) revealed a wide range of functionality among participants. A normal score (61-68) was observed in 34.7% of participants, while 20.7% scored between 31 and 40. Scores of 41-50 and 51-60 were recorded by 12% and 15.3%, respectively. Lower scores were less frequent, with 6% scoring between 21 and 30, 2.7% scoring 11-20, and 8.7% scoring 0-10, indicating significant functional impairment in these groups.

Table 1 Demographics with Pain Intensity and Lower Extremity Function Score

Variable	Construct	Frequency (%age)
Gender	Male	97 (64.7%)
	Female	53 (35.3%)
Age	18-25 Years	96 (64.0%)
	26-30 Years	31 (20.7%)
	31-38 Years	23 (15.3%)
Pain Intensity	No Pain	18 (12.0%)
	Mild Pain (1-3)	58 (38.7%)
	Moderate Pain (4-7)	47 (31.3%)
	Severe Pain (8-10)	27 (18.0%)
LEFS	0-10 Score	13 (8.7%)
	11-20 Score	4 (2.7%)
	21-30 Score	9 (6.0%)
	31-40 Score	31 (20.7%)
	41-50 Score	18 (12.0%)
	51-60 Score	23 (15.3%)
	61-68 Normal Score	52 (34.7%)

A strong negative correlation (Pearson correlation coefficient: -0.778, $p<0.01$) was observed between pain intensity and lower extremity functional scores, indicating that higher pain levels were significantly associated with lower functional capacity, thereby impacting the quality of life. Cross-tabulation of pain intensity with gender revealed variations in pain severity. Among males, 25.8% reported mild pain, 40.2% moderate pain, and 24.7% severe pain, while 9.3% reported no pain. For females, mild pain was the most common (62.3%), followed by no pain (17%), moderate pain (15.1%), and severe pain (5.7%).

Table 2 Correlation of Pain and LEFS with QOL

		Lower Extremity Function Score out of 68	Pain
Lower Extremity Function Score out of 68	Pearson Correlation	1	-.778**
	Sig. (2-tailed)		.000
	N	150	150

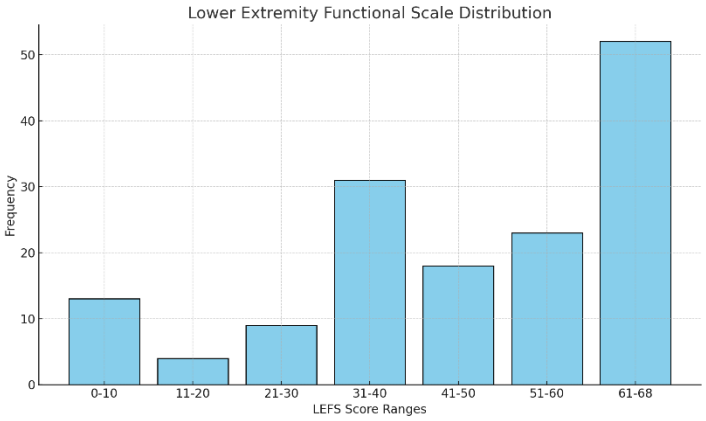
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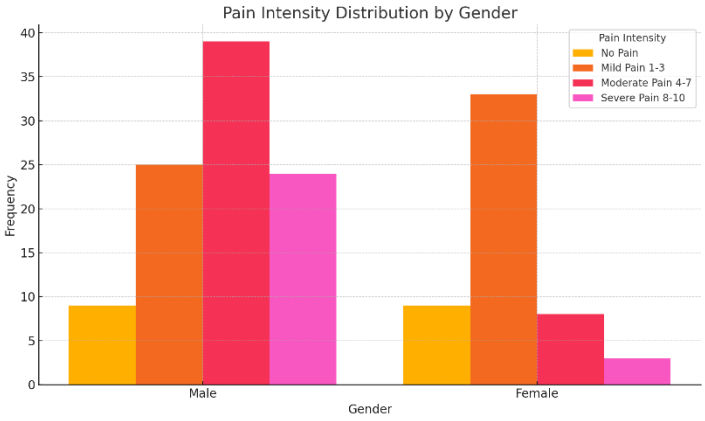
		Lower Extremity Function Score out of 68	Pain
Pain	Pearson Correlation	-.778**	1
	Sig. (2-tailed)	.000	
	N	150	150

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3 Cross Tabulations of Pain Intensity with Gender

		Pain Intensity Ranges				Total
		0 No Pain	Mild Pain 1-3	Moderate Pain 4-7	Severe Pain 8-10	
Gender	Male	9	25	39	24	97
	Female	9	33	8	3	53
Total		18	58	47	27	150





DISCUSSION

The findings of this study align with existing literature, emphasizing the prevalence and impact of hip and groin pain among athletes. A study conducted on a similar population revealed that more than one-third of athletes reported hip or groin pain, with nearly half experiencing moderate to intense discomfort and mobility issues. In comparison, this study found that 49.3% of participants experienced moderate to severe hip pain, while 38.1% scored less than 40 on the Lower Extremity Functional Scale, indicating significant mobility challenges and their effect on quality of life. Strong evidence was observed for a negative correlation between pain intensity and quality of life ($p<0.05$), reinforcing the detrimental impact of pain on functional outcomes (23). Another investigation highlighted that males were less commonly affected than females in terms of hip and groin discomfort. In contrast, this study observed that males experienced higher rates of pain than females, with 88 males reporting discomfort compared to 44 females. This disparity could be attributed to differences in physical activity levels, biomechanical factors, or population-specific characteristics, emphasizing the need for localized data to inform management strategies (24).

Previous research has shown that individuals with hip or groin pain tend to report lower scores on functional scales such as the HAGOS, which is consistent with this study's findings. Here, 88% of participants experienced hip pain, and a significant proportion of these

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individuals reported impaired functionality, further demonstrating the substantial impact of groin injuries on athletic performance and quality of life (25). Studies examining pain severity have indicated that a majority of athletes experience mild pain, while only a smaller fraction report severe pain. This study showed comparable results, with 38.7% experiencing mild pain and 18% reporting severe pain. However, differences in pain perception and reporting across populations may explain these variations (26). A study on soccer players previously reported that male athletes were more likely to experience groin discomfort than females, with a higher prevalence among younger individuals. Similarly, this study found that male participants not only outnumbered females but also exhibited a higher frequency of hip discomfort. The mean age of participants was 25 years, comparable to previous research focusing on young athletic populations. These findings highlight the vulnerability of younger athletes to groin injuries, likely due to their high engagement in strenuous activities (27).

The study contributes valuable insights into the relationship between groin injuries, functional impairment, and quality of life. However, its findings are limited by its geographic scope, as data were collected exclusively from Lahore. Cultural, environmental, and socio-economic factors that vary across regions may influence the incidence and perception of groin injuries, limiting the generalizability of the results. Furthermore, the cross-sectional design restricted the ability to assess the long-term recovery trajectory of injured athletes. The study also did not investigate the effectiveness of rehabilitation protocols, leaving a gap in understanding optimal management strategies for this population. Future research should aim to recruit a broader and more diverse sample from various geographic locations to enhance generalizability. Longitudinal studies could provide insights into the progression and outcomes of groin injury rehabilitation. Additionally, exploring preventive measures and early identification strategies tailored to specific athletic populations could support better injury management and overall health outcomes. Strengths of this study include its use of validated tools such as the HAGOS, LEFS, and VAS for comprehensive assessment and its inclusion of both male and female participants, providing a balanced perspective on the prevalence and impact of groin injuries.

The findings underscore the need for targeted interventions to address the high prevalence of groin pain and its significant impact on athletic performance and quality of life. By focusing on prevention, early identification, and individualized rehabilitation strategies, sports organizations can enhance the well-being and performance of athletes in similar settings.

CONCLUSION

This study highlighted that groin discomfort is a prevalent and challenging issue for athletes involved in sports requiring dynamic movements such as kicking, rapid accelerations, and sudden directional changes. Common conditions such as adductor strains, osteitis pubis, and sports hernias significantly impact athletes' performance and quality of life. The findings emphasize the importance of adopting a tailored and systematic approach to the assessment and management of groin injuries, considering the unique needs and circumstances of each athlete. By focusing on personalized rehabilitation and prevention strategies, this research contributes to enhancing injury management protocols and promoting better outcomes for athletic populations.

Author Contribution

Author	Contribution
Muhammad Tariq*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Muhammad Sharif Waqas	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Hafiz Muhammad Abu Bakar Rashid	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Aleena Jafar	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Javeria Nadeem	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Imtiaz Ahmad	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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REFERENCES

1. Watson A, Mjaanes JM. Soccer injuries in children and adolescents. Pediatrics. 2019;144.

2. Estwanik JJ, Sloane B, Rosenberg MA. Groin strain and other possible causes of groin pain. The Physician and Sportsmedicine. 1990;18(2):54-65.

3. Roy S, Irvin R. Sports medicine: prevention, evaluation, management, and rehabilitation: Prentice Hall; 1983.

4. Dut R, Akgül S, Dönmez G, Ulkar B, Kanbur N, Derman O. Adolescent male soccer players have higher growth rates and risk of injury associated with biological maturity. Turk J Pediatr. 2023;65(6):990–1001.

5. Werner J, Hägglund M, Waldén M, Ekstrand J. UEFA injury study: a prospective study of hip and groin injuries in professional football over seven consecutive seasons. British journal of sports medicine. 2009;43(13):1036-40.

6. Quintana-Cepedal M, López-Aguado I, Fernández-Somoano A, Rodríguez MA, del Valle M, Olmedillas H. Injury incidence and characteristics in adolescent female football players: A systematic review with meta-analysis of prospective studies. Biol Sport. 2024;41:137–51.

7. Tyler TF, Silvers HJ, Gerhardt MB, Nicholas SJ. Groin injuries in sports medicine. Sports health. 2010;2(3):231-6.

8. Harris N, Murray R. Lesions of the symphysis in athletes. Br Med J. 1974;4(5938):211-

9. Wik EH. Growth, maturation and injuries in high-level youth football (soccer): A mini-review. Front Sports Act Living. 2022;4.

10. Lysens R, Steverlynck A, van den Auweele Y, Lefevre J, Renson L, Claessens A, et al. The predictability of sports injuries. Sports Medicine. 1984;1(1):6-10.

11. Ekstrand J, Hägglund M, Waldén M. Epidemiology of muscle injuries in professional football (soccer). The American journal of sports medicine. 2011;39(6):1226-32.

12. Dupré T, Potthast W. Are sprint accelerations related to groin injuries? A biomechanical analysis of adolescent soccer players. Sports Biomech. 2022.

13. Renström P. Tendon and muscle injuries in the groin area. Clinics in sports medicine. 1992;11(4):815-31.

14. Prieto-González P, Martínez-Castillo JL, Fernández-Galván LM, Casado A, Soporki S, Sánchez-Infante J. Epidemiology of sports-related injuries and associated risk factors in adolescent athletes. Int J Environ Res Public Health. 2021;18.

15. Finch CF, Cook J, Kunstler BE, Akram M, Orchard J. Subsequent injuries are more professional Australian football. The American journal of sports medicine. 2017;45(8):1921-7.

16. Drew MK, Lovell G, Palsson TS, Chiarelli PE, Osmotherly PG. Australian football players experiencing groin pain exhibit reduced subscale scores of Activities of Daily Living and Sport and Recreation on the HAGOS questionnaire: a case-control study. Physical Therapy in Sport. 2017;26:7-12.

17. Verrall GM, Esterman A, Hewett TE. Analysis of the three most prevalent injuries in Australian football demonstrates a season to season association between groin/hip/osteitis pubis injuries with ACL knee injuries. Asian journal of sports medicine. 2014;5(3).

18. Hägglund M, Waldén M, Ekstrand J. Risk factors for lower extremity muscle injury in professional soccer: the UEFA Injury Study. The American journal of sports medicine. 2013;41(2):327-35.

19. Morrissey D, Graham J, Screen H, Sinha A, Small C, Twycross-Lewis R, et al. Coronal plane hip muscle activation in football code athletes with chronic adductor groin strain injury during standing hip flexion. Manual therapy. 2012;17(2):145-9.

20. Hölmich P. Groin injuries in athletes—development of clinical entities, treatment, and prevention. Dan Med J. 2015;62(12):B5184.

21. Coleman SH, Mayer SW, Tyson JJ, Pollack KM, Curriero F. The epidemiology of hip and groin injuries in professional baseball players. Am J Orthop. 2016;45(3):168-75.

22. Langhout R, Tak I, Van Beijsterveldt A-M, Ricken M, Weir A, Barendrecht M, et al. Risk factors for groin injury and symptoms in elite-level soccer players: a cohort study in the Dutch professional leagues. Journal of orthopedic & sports physical therapy. 2018;48(9):704-12.

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23. Gill TJ, Wall AJ, Gwathmey FW, Whalen J, Makani A, Zarins B, et al. Surgical release of the adductor longus with or without sports hernia repair is a useful treatment for recalcitrant groin strains in elite athletes. Orthopaedic Journal of Sports Medicine. 2019;8(1):2325967119896104.

24. Falavigna A, Teles AR, Mazzocchin T, de Braga GL, Kleber FD, Barreto F, et al. Increased prevalence of low back pain among physiotherapy students compared to medical students. European Spine Journal. 2011;20(3):500-5.

25. Crichton N. Visual analogue scale (VAS). J Clin Nurs. 2001;10(5):706-6.

26. Thorborg K, Branci S, Stensbirk F, Jensen J, Hölmich P. Copenhagen hip and groin outcome score (HAGOS) in male soccer: reference values for hip and groin injury-free players. British journal of sports medicine. 2014;48(7):557-9.

27. Naal FD, Impellizzeri FM, Torka S, Wellauer V, Leunig M, von Eisenhart-Rothe R. The German Lower Extremity Functional Scale (LEFS) is reliable, valid and responsive in hip or knee replacement patients. Quality of Life Research. 2015;24(2):405-10.

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