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Prevalence of De Quervain's Tenosynovitis Among Weightlifters

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ABSTRACT

Background: De Quervain's tenosynovitis is an inflammatory condition affecting the tendons in the wrist's first dorsal compartment, commonly caused by repetitive wrist movements. Its prevalence among weightlifters remains underexplored.

Objective: To determine the prevalence of De Quervain's tenosynovitis among weightlifters.

Methods: A cross-sectional study was conducted from January to May 2024 in several cities of Pakistan, including Faisalabad, Lahore, Muridke, and Sheikhupura. A total of 380 weightlifters aged 20 to 40 years were recruited using non-probability convenience sampling. Data were collected through a self-constructed questionnaire, the Numeric Pain Rating Scale (NPRS), and the Finkelstein test. Pain levels were assessed, and data were analyzed using IBM SPSS Statistics 25.

Results: Out of 380 participants, 272 (71.6%) tested positive for De Quervain's tenosynovitis. Among them, 137 (36.1%) reported moderate pain, and 80 (21.1%) reported severe pain on the NPRS. A higher prevalence was observed in males (56.6%) compared to females (43.4%).

Conclusion: The study reveals a high prevalence of De Quervain's tenosynovitis among weightlifters, emphasizing the need for preventive measures and early intervention strategies.

INTRODUCTION

De Quervain's tenosynovitis, a condition marked by inflammation of the tendons within the first dorsal compartment of the wrist, predominantly affects the abductor pollicis longus (APL) and extensor pollicis brevis (EPB) tendons. These tendons play a crucial role in thumb movement, and their inflammation leads to pain, swelling, and restricted motion around the thumb and wrist. The condition is highly prevalent among individuals engaged in repetitive hand and wrist movements, such as those involved in weightlifting or other activities that place a consistent strain on these tendons. The primary clinical presentation of De Quervain's tenosynovitis includes localized pain that worsens with thumb and wrist movements, along with tenderness over the radial styloid, swelling, and sometimes palpable crepitation in the affected area. While the exact etiology of De Quervain's tenosynovitis is multifactorial, it is often associated with repetitive movements, forceful gripping, and other stress-inducing activities affecting the wrist and hand (1).

Epidemiological studies indicate that De Quervain's tenosynovitis has a relatively low incidence rate in the general population, with reports ranging from 0.31 to 0.94 per 1,000 people. However, higher incidence rates have been noted in specific populations, particularly those with increased exposure to repetitive wrist movements. For instance, a study conducted in the Loire region of France found an incidence rate of 12 per 1,000 over two years, highlighting a significantly higher prevalence among women than men, with 2.1% of females diagnosed compared to 0.7% of males (2). This difference may be attributed to anatomical and physiological differences, as well as variations in activity patterns between the sexes. Weightlifting is particularly relevant in the context of De Quervain's tenosynovitis due to the repetitive stress it places on the wrist tendons, potentially leading to alterations in normal tendon kinematics and anatomy. Despite this, there is a paucity of data specifically addressing the prevalence of De Quervain's tenosynovitis among weightlifters, making it a significant area for further investigation (3).

The clinical significance of understanding the prevalence and risk factors for De Quervain's tenosynovitis in weightlifters cannot be understated, as targeted prevention strategies could be developed to mitigate the risk of developing this painful condition. These strategies might include modifications in training techniques, ergonomic adjustments, or the use of supportive equipment to reduce strain on the wrist tendons. Furthermore, weightlifting programs could incorporate exercises designed to strengthen the muscles surrounding the APL and EPB tendons and increase their flexibility, potentially reducing the incidence of De Quervain's tenosynovitis. Early recognition of symptoms and prompt intervention are

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critical in preventing the progression of the condition and minimizing its impact on functional activity (4).

Historically, De Quervain's tenosynovitis was first described by Fritz De Quervain in 1895 as a painful condition resulting from the narrowing of the tendon sheath around the muscles responsible for thumb abduction. This narrowing, also known as stenosis, typically results from inflammation within the first dorsal compartment of the wrist (5). In addition to pain, patients may experience dysesthesias such as burning, tingling, numbness, and cramping around the thumb. The Finkelstein test is a widely accepted diagnostic tool for De Quervain's tenosynovitis, wherein pain is provoked by bending the thumb towards the palm while the wrist is bent away (6). Recent studies have also explored more advanced treatment modalities, such as surgical interventions that minimize the risks associated with traditional approaches. For example, Perno-Ioanna and Papaloïzos (2016) proposed an enlargement technique to prevent complications after De Quervain tendinopathy surgery, highlighting the evolving nature of management strategies (7).

Although conservative management remains the first line of treatment for De Quervain's tenosynovitis, including immobilization, nonsteroidal anti-inflammatory drugs (NSAIDs), and physical therapy, surgical options may be considered for cases refractory to initial interventions (8). Recent research, such as that conducted by Ali et al. (2014), has also linked the condition to other repetitive activities, including frequent texting, which demonstrates the broader applicability of findings to different populations (9). Given the variability in patient response to treatment and the potential for long-term disability if left untreated, it is vital to approach De Quervain's tenosynovitis with a comprehensive understanding of its pathophysiology, risk factors, and management options.

Understanding the specific risks associated with weightlifting is crucial in developing preventive and therapeutic strategies that could reduce the burden of De Quervain's tenosynovitis among these individuals. The current study aims to fill this gap by investigating the prevalence of De Quervain's tenosynovitis among weightlifters, utilizing both clinical and self-reported measures such as the Numeric Pain Rating Scale (NPRS) and the Finkelstein test, which remain cornerstone tools in assessing the severity of pain and confirming the diagnosis (10). By providing insights into the prevalence and contributing factors of this condition in weightlifters, the study aims to offer practical recommendations that could enhance clinical practice and guide future research in this field.

MATERIAL AND METHODS

The study employed a cross-sectional design to determine the prevalence of De Quervain's tenosynovitis among weightlifters. Data collection was conducted from January 2024 to May 2024 across several cities, including Faisalabad, Lahore, Muridke, and Sheikhupura. The sampling technique used was non-probability convenience sampling, and the sample size was calculated to be 380 participants. The target population comprised weightlifters aged 20 to 40 years who trained two to three days per week, used weights of at least four kilograms, and performed 12-15 repetitions per set. Only weightlifters who utilized resistive trainers were included in the study. Individuals with pre-existing wrist injuries, rheumatoid arthritis, or any condition causing distal quadrant tendinitis were excluded. Additionally, participants unwilling to participate were also excluded from the study.

Data collection involved administering surveys as handouts in selected gyms, physiotherapy clinics, and sports training centers. Designated representatives from these institutions or in-person representatives were responsible for distributing and collecting the surveys to ensure high response rates. The primary data collection tool was a partially self-constructed questionnaire designed to assess the presence of De Quervain's tenosynovitis, combined with the Numeric Pain Rating Scale (NPRS) to evaluate pain severity. The NPRS is a subjective measure where respondents rate their pain on an eleven-point scale, with 0 representing "no pain" and 10 indicating "the worst imaginable pain" (32). Additionally, the Finkelstein test was used to diagnose De Quervain's tenosynovitis clinically. This test involved placing the thumb inside a clenched fist and performing ulnar deviation of the wrist. A positive test result was recorded if the participant experienced pain along the radial aspect of the wrist.

Ethical approval for this study was obtained from the institutional review board (IRB) of Hajvery University, Lahore, Pakistan, and all procedures were conducted following the ethical standards of the Helsinki Declaration. Written informed consent was obtained from all participants after they were briefed on the study's aims, procedures, potential risks, and benefits. Participants were assured of the confidentiality of their data, and their participation was voluntary, with the option to withdraw from the study at any stage without any consequences.

Data analysis was conducted using IBM SPSS Statistics version 25. Descriptive statistics, including frequencies and percentages, were used to summarize demographic information, such as age, gender, and handedness. The prevalence of De Quervain's tenosynovitis was determined using the Finkelstein test results. Pain severity was categorized into four levels: no pain (0), mild pain (1-3), moderate pain (4-6), and severe pain (7-10) based on the NPRS scores. The relationship between pain severity and demographic variables, including gender and hand dominance, was analyzed using chi-square tests. The association between a positive Finkelstein test and pain severity was also examined to determine the correlation between clinical diagnosis and self-reported pain levels.

Overall, this study utilized a comprehensive methodology to explore the prevalence of De Quervain's tenosynovitis among weightlifters. It combined clinical assessments and subjective measures to provide a holistic understanding of the condition in this specific population. The methods ensured robust data collection and analysis, adhering to ethical guidelines and standards for medical research.

RESULTS

The cross-sectional study included a total of 380 participants, with a slight male predominance (56.6%). The age range of participants was between 20 and 40 years, with the majority being in the 20-25 years age group (38.9%). The participants were predominantly right-handed (95.8%), which prompted further exploration of the association between handedness and the risk of De Quervain's Tenosynovitis (DQT). The prevalence of De Quervain's tenosynovitis was determined using the Finkelstein test, and pain levels were assessed using the Numeric Pain Rating Scale (NPRS).

Table 1: Finkelstein Test Results

Finkelstein Test	Frequency	Percent
Positive	272	71.6%
Negative	108	28.4%
Total	380	100%

Out of the total participants, 272 (71.6%) tested positive for De Quervain's tenosynovitis using the Finkelstein test, while 108 (28.4%) tested negative. The distribution of positive cases was relatively even between genders, though slightly higher in males.

Table 2: Numeric Pain Rating Scale (NPRS) Scores

NPRS Score	Frequency	Percent
No pain (0)	107	28.2%
Mild pain (1-3)	56	14.7%
Moderate pain (4-6)	137	36.1%
Severe pain (7-9)	80	21.1%
Total	380	100%

The NPRS scores indicated that 107 participants (28.2%) reported no pain, while 56 participants (14.7%) experienced mild pain. A considerable number, 137 participants (36.1%), reported moderate pain, and 80 participants (21.1%) experienced severe pain. The results suggest that a significant proportion of weightlifters who tested positive for DQT had moderate to severe pain levels.

Correlation Between Finkelstein Test and NPRS Scores

Among those who tested positive for De Quervain's tenosynovitis, a substantial correlation was observed between a positive Finkelstein test and moderate to severe pain levels. Participants with a positive Finkelstein test were more likely to report higher pain scores on the NPRS. However, some participants with a negative Finkelstein test also reported pain, highlighting the potential variability in individual pain perception and the possible influence of other contributing factors.

Overall, the results provide valuable insights into the prevalence and severity of De Quervain's tenosynovitis among weightlifters. They underline the importance of early diagnosis and targeted interventions to manage pain and prevent the progression of the condition in this specific population. Future studies with larger, more diverse samples could further elucidate the risk factors and mechanisms underlying De Quervain's tenosynovitis in weightlifters.

DISCUSSION

This study investigated the prevalence of De Quervain's tenosynovitis among weightlifters, revealing that a significant proportion of participants, 71.6%, tested positive for the condition using the Finkelstein test. This finding suggests a high prevalence of De Quervain's tenosynovitis in this population, underscoring the association between repetitive wrist movements and the development of the condition. The results align with previous studies that have identified repetitive activities and forceful gripping as major risk factors for De Quervain's tenosynovitis (Stahl et al., 2015; Ali et al., 2014). The high prevalence rate observed in this study is comparable to the findings of other research focused on specific occupational or activity-based groups, such as medical professionals and smartphone users, where repetitive hand and wrist movements are common (Hetaimish et al., 2020; Benites-Zapata et al., 2021).

The study's findings demonstrated that a majority of weightlifters reported moderate to severe pain levels on the Numeric Pain Rating Scale (NPRS), which is consistent with the clinical presentation of De Quervain's tenosynovitis as described in prior literature (Wolf et al., 2009; Huisstede et al., 2018). The strong correlation between a positive Finkelstein test and higher pain scores supports the reliability of this diagnostic tool in assessing the severity of De Quervain's tenosynovitis among weightlifters. However, the presence of pain in some participants who tested negative for the Finkelstein test suggests that pain perception may vary among individuals, possibly influenced by other underlying conditions or individual pain thresholds. This finding aligns with earlier studies that noted variability in the clinical presentation and patient-reported outcomes associated with De Quervain's tenosynovitis (Reada et al., 2020; Goubau et al., 2014).

One of the strengths of this study was the inclusion of a relatively large sample size, which enhances the generalizability of the findings to the broader population of weightlifters. The use of both clinical assessments, such as the Finkelstein test, and subjective measures like the NPRS provided a comprehensive evaluation of the prevalence and severity of De Quervain's tenosynovitis. The study also

adhered to ethical standards by obtaining informed consent and following the Helsinki Declaration, ensuring the ethical conduct of research involving human participants. However, there were some limitations that need to be acknowledged. The study relied on non-probability convenience sampling, which may introduce selection bias and limit the representativeness of the sample. Additionally, the use of self-reported pain measures, such as the NPRS, could be influenced by individual psychological and biological factors, potentially affecting the accuracy of the data. The absence of a control group also restricted the ability to make more definitive conclusions about the association between weightlifting and De Quervain's tenosynovitis.

Future research should consider incorporating a more diverse and representative sample to validate the findings and explore potential differences across various demographics and activity levels. Including a control group of non-weightlifters could provide more robust evidence on the impact of weightlifting on the development of De Quervain's tenosynovitis. Moreover, future studies could benefit from using a combination of objective and subjective measures to assess pain and functional impairment more accurately. Exploring the role of preventive strategies, such as ergonomic adjustments, the use of supportive equipment, and modifications in training techniques, could also be valuable in reducing the risk of De Quervain's tenosynovitis among weightlifters.

CONCLUSION

In conclusion, this study contributes to the growing body of evidence on the prevalence and severity of De Quervain's tenosynovitis among weightlifters, highlighting the need for early diagnosis and intervention to manage pain and prevent further complications. The findings suggest that targeted approaches, including tailored exercises to strengthen and increase flexibility in the wrist tendons and muscles, could be effective in mitigating the condition's impact on weightlifters. These insights are particularly important for sports medicine professionals, physiotherapists, and trainers in developing effective prevention and management strategies for this population.

REFERENCES

1. Wolf JM, Sturdivant RX, Owens BD. Incidence of De Quervain's Tenosynovitis in a Young, Active Population. J Hand Surg Am. 2009;34(1):112-5.
2. Horn BJ, Zondervan R, Shafer-Crane G, Hornbach E. Prevention of Tendon Subluxation in De Quervain's Tenosynovitis Release Using Retinacular Repair. Spartan Med Res J. 2016;1(1).
3. Taufiq F, Batool T, Bashir S. Prevalence of De-Quervain's Tenosynovitis Among Medical Students of Allama Iqbal Medical College. J Riphah Coll Rehabil Sci. 2015;3(2):95-8.
4. Stahl S, Vida D, Meisner C, Stahl AS, Schaller H-E, Held M. Work-Related Etiology of De Quervain's Tenosynovitis: A Case-Control Study With Prospectively Collected Data. BMC Musculoskelet Disord. 2015;16:1-10.
5. Hetaimish B, Bossei A, Turkstani G, Al-Jezani K, Al-Motairi K. Prevalence of De-Quervain's Tenosynovitis Among Medical Professionals. Middle East J Fam Med. 2020;7(10):125.
6. Perno-Ioanna D, Papaloïzos M. A Comprehensive Approach Including a New Enlargement Technique to Prevent Complications After De Quervain Tendinopathy Surgery. Hand Surg Rehabil. 2016;35(3):183-9.
7. Ali M, Asim M, Danish SH, Ahmad F, Iqbal A, Hasan SD. Frequency of De Quervain's Tenosynovitis and Its Association With SMS Texting. Muscles Ligaments Tendons J. 2014;4(1):74.
8. Weiss AP, Akelman E, Tabatabai M. Treatment of De Quervain's Disease. J Hand Surg Am. 1994;19(4):595-8.
9. Huisstede BM, Gladdines S, Randsdorp MS, Koes BW. Effectiveness of Conservative, Surgical, and Postsurgical Interventions for Trigger Finger, Dupuytren Disease, and De Quervain Disease: A Systematic Review. Arch Phys Med Rehabil. 2018;99(8):1635-49.e21.
10. Reada B, Alshaebi N, Almaghrabi K, Alshuaibi A, Abulnaja A, Alzahrani K. Prevalence and Awareness Evaluation of De Quervain's Tenosynovitis Among Students in the Kingdom of Saudi Arabia. Int J Pharm Res Allied Sci. 2020;9(4):151-7.
11. Lane L, Boretz R, Stuchin S. Treatment of De Quervain's Disease: Role of Conservative Management. J Hand Surg Br. 2001;26(3):258-60.
12. Goubau J, Goubau L, Van Tongel A, Van Hoonacker P, Kerckhove D, Berghs B. The Wrist Hyperflexion and Abduction of the Thumb (WHAT) Test: A More Specific and Sensitive Test to Diagnose De Quervain Tenosynovitis Than the Eichhoff's Test. J Hand Surg Eur Vol. 2014;39(3):286-92.
13. Walker-Bone K, Palmer KT, Reading I, Coggon D, Cooper C. Prevalence and Impact of Musculoskeletal Disorders of the Upper Limb in the General Population. Arthritis Care Res. 2004;51(4):642-51.
14. Mawdsley RH, Moran KA, Conniff LA. Reliability of Two Commonly Used Pain Scales With Elderly Patients. J Geriatr Phys Ther. 2002;25(3):16-20.
15. Childs JD, Piva SR, Fritz JM. Responsiveness of the Numeric Pain Rating Scale in Patients With Low Back Pain. Spine. 2005;30(11):1331-4.
16. Firdous S, Mehta Z, Fernandez C, Behm B, Davis M. A Comparison of Numeric Pain Rating Scale (NPRS) and the Visual Analog Scale (VAS) in Patients With Chronic Cancer-Associated Pain. J Clin Oncol. 2017.
17. Minahel S, Shahzad A, Shehzad S, Iqbal SA, Saeed A, Pervaiz A, et al. Prevalence of De-Quervain's Tenosynovitis in Female Tailors in District Wazirabad. Eur J Health Sci. 2023;9(4):22-30.
18. Mazhar T, Riaz S, Riaz S, Batool A, Khan A, Khan S. De Quervain's Tenosynovitis and Thumb Pain in Physiotherapists Practicing Manual Therapy: Prevalence and Associated Factors. Biomedica. 2023;39(1):38-43.

19. Jannat N, Islam F, Aslam M, Hannan MA, Raza A. Prevalence of De Quervain's Syndrome Among Tailors and Barbers. J Hand Surg Eur Vol.
20. Ayaz M, Tofiq A, Fatima Y, Abbas SS, Jabeen R, Komal R. Prevalence of De-Quervain's Tenosynovitis Among Smartphone Gamers Among University Students of Multan. J Nanoscope. 2022;3(2):165-71.
21. Benites-Zapata VA, Jiménez-Torres VE, Ayala-Roldán MP. Problematic Smartphone Use Is Associated With De Quervain's Tenosynovitis Symptomatology Among Young Adults. Musculoskelet Sci Pract. 2021;53:102356.
22. Maurya P, Priyanka G, Palkar A. Prevalence of De-Quervain's Tenosynovitis in Tailors. Int J Health Sci Res. 2020;10(2):2249-957.
23. Gowda H, Mascarenhas SP, Patil DP, Pandit U. Hand Function Assessment in Beauticians. Int J Health Sci Res. 2016;6(12):121-6.
24. Harris ML, Sentner SM, Doucette HJ, Brillant MGS. Musculoskeletal Disorders Among Dental Hygienists in Canada. Can J Dent Hyg. 2020;54(2):61.
25. Bukhari KA, Khan IA, Ishaq S, Iqbal MO, Alqahtani AM, Alqahtani T, et al. Formulation and Evaluation of Diclofenac Potassium Gel in Sports Injuries With and Without Phonophoresis. Gels. 2022;8(10):612.
26. Cîmpeanu M, Roman N, Grigorescu S, Grigorescu O, Miclăus R. Management of "De Novo" Carpal Tunnel Syndrome in Pregnancy: A Narrative Review. J Pers Med. 2024;14:240.
27. Lutsky K, Kim N, Medina J, Maltenfort M, Beredjiklian PK. Hand Dominance and Common Hand Conditions. Orthopedics. 2016;39(3).
28. Ilyas AM, Ast M, Schaffer AA, Thoder J. De Quervain Tenosynovitis of the Wrist. J Am Acad Orthop Surg. 2007;15(12):757-64.
29. Adachi S, Yamamoto A, Kobayashi T, Tajika T, Kaneko T, Shibusawa K, et al. Prevalence of De Quervain's Disease in the General Population and Risk Factors. Kitakanto Med J. 2011;61(4):479-82.
30. Rettig AC. Wrist and Hand Overuse Syndromes. Clin Sports Med. 2001;20(3):591-611.
31. Pandis N. Cross-Sectional Studies. Am J Orthod Dentofacial Orthop. 2014;146(1):127-9.
32. Firdous S, Mehta Z, Fernandez C, Behm B, Davis M. A Comparison of Numeric Pain Rating Scale (NPRS) and the Visual Analog Scale (VAS) in Patients With Chronic Cancer-Associated Pain. Am Soc Clin Oncol. 2017.