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Prevalence of De Quervain's Tenosynovitis in Recreational Badminton Players

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Abstract

Background: Recreational badminton involves repetitive wrist and thumb movements that may predispose players to overuse injuries such as De Quervain's Tenosynovitis. Despite its clinical relevance, limited data exist on the prevalence of this condition among recreational badminton players.

Method: A cross-sectional observational study was conducted on 100 recreational badminton players aged 18–40 years. Participants were assessed using the Finkelstein Test to identify De Quervain's Tenosynovitis. Pain intensity was recorded using the Numeric Pain Rating Scale (NPRS), and associations with gender, hand dominance, and grip type were analyzed.

Results: The prevalence of De Quervain's Tenosynovitis was found to be 17%. Affected players reported mild to moderate pain (mean NPRS ≈ 5). The condition was more common in females, universally present in right-hand dominant players, and most prevalent among those using a forehand grip.

Conclusion: De Quervain's Tenosynovitis is moderately prevalent among recreational badminton players and is strongly associated with repetitive wrist use and grip technique. Early screening, ergonomic grip correction, wrist strengthening, and preventive physiotherapy should be emphasized to reduce injury risk.

Keywords: De Quervain's Tenosynovitis, Badminton, Wrist Injury, Finkelstein Test, Recreational Players

1. Introduction

De Quervain's tenosynovitis is a painful condition characterized by inflammation of the tendons Abductor Pollicis Longus (APL) and Extensor Pollicis Brevis (EPB) located at the base of the thumb. It affects the synovial sheath that surrounds the tendons responsible for thumb movement, resulting in discomfort, swelling, and restricted motion.

Recreational badminton players are individuals who engage in badminton primarily for leisure, fitness, and social interaction rather than competitive or professional purposes. While recreational badminton may not involve the same intensity or frequency as professional play, it still requires considerable physical effort, including frequent and repetitive wrist movements. This repetitive motion can lead to various musculoskeletal issues, including De Quervain's tenosynovitis.

The condition arises from repetitive stress and strain on the wrist and thumb, which can occur in activities that involve frequent gripping, pinching, or wrist movements. In badminton, the repetitive nature of strokes such as serves, smashes, and defensive plays can put significant strain on the wrist and thumb, potentially leading to De Quervain's tenosynovitis.

Research on similar sports or activities with high wrist usage, such as tennis or racquetball, suggests that

players in these sports are at a higher risk for wrist and hand injuries, including De Quervain's tenosynovitis. This can provide some context for understanding the potential prevalence among badminton players.

The results of such tests are used to gain information that can be used to optimally train the athlete and to predict athletic performance. (4)

Understanding the biomechanics of wrist and thumb function is essential in sports involving racquet use, such as badminton. Grip force and pressure distribution play a crucial role in controlling racket motion, ensuring stroke precision, and minimizing the risk of overuse injuries like De Quervain's tenosynovitis. Variations in grip dynamics between male and female players can influence stroke mechanics, power generation, and overall performance efficiency. Therefore, analyzing grip force and pressure patterns during different forehand overhead strokes provides valuable insight into performance optimization and injury prevention.(9)

De Quervain's tenosynovitis is not only influenced by mechanical factors but also by anatomical and ergonomic considerations. Improper grip technique, inappropriate racket size or string tension, and poor wrist posture during play can exacerbate the load on the thumb tendons, increasing the likelihood of inflammation. Additionally, lack of adequate warm-up, overtraining, and insufficient rest periods can further predispose players to the condition. Preventive strategies, such as ergonomic modifications, targeted stretching, and strengthening exercises of the wrist extensors and thumb muscles, have been shown to reduce the incidence of this condition among athletes.

Moreover, understanding the epidemiological trends of De Quervain's tenosynovitis in badminton players is crucial for sports medicine professionals and coaches. Determining its prevalence among recreational players can help in the formulation of training guidelines, ergonomic recommendations, and early intervention protocols to prevent chronic tendon disorders. Early diagnosis using clinical tests such as Finkelstein's test and ultrasound imaging can aid in prompt management and prevent progression to more severe forms.

The study of De Quervain's tenosynovitis in badminton thus holds significance not only in understanding the mechanisms of overuse injuries but also in developing evidence-based preventive and rehabilitative strategies tailored to racquet sport athletes. By integrating biomechanical analysis, clinical evaluation, and sports-specific training approaches, it becomes possible to enhance performance while minimizing the risk of injury in recreational badminton players.

2. Methods

2.1 Research design

This observational study aimed to find out the prevalence of De Quervain's tenosynovitis in recreational badminton players. This study was conducted within a time period of 6 months.

2.2 Participants

The samples were selected according to the inclusion and exclusion criteria. Participants were explained about the aim and objectives of the study. The consent forms were filled by the participants and the study and procedure was explained to the participants. The athletes fitting in the inclusion criteria were evaluated by the outcome measures of Finkelstein Test. The study was conducted with 100 recreational badminton players, both male and female, aged 18-40 years.

2.3 Research tool

The Finkelstein test: Performed by a trained medical professional to assess pain on the radial aspect of

the wrist, particularly in suspected cases of De Quervain's tenosynovitis. The patient is positioned comfortably in a seated posture with the forearm supported and the hand resting on an examination table. The patient is asked to place the thumb across the palm and then close the fingers over the thumb to form a fist. While stabilizing the forearm, the examiner gently deviates the wrist in the ulnar direction. This maneuver stretches the abductor pollicis longus and extensor pollicis brevis tendons within the first dorsal compartment. The test is considered positive if this movement reproduces sharp pain or marked discomfort over the radial side of the wrist, which may radiate toward the thumb or along the volar aspect of the wrist, indicating De Quervain's tenosynovitis.

The prevalence is calculated and determined.

2.4 Ethics, consent and permissions

Participants in this study were given a consent form which introduced the research project by including the title of the study, the aims of the study and reassuring confidentiality of participant information as well as their responses. Consent was taken from each participant.

2.5 Data collection

The permission to obtain data was taken from the ethical committee of the college. The data collection sheet contained sections on personal as well as work demographics with test reading.

RESULT

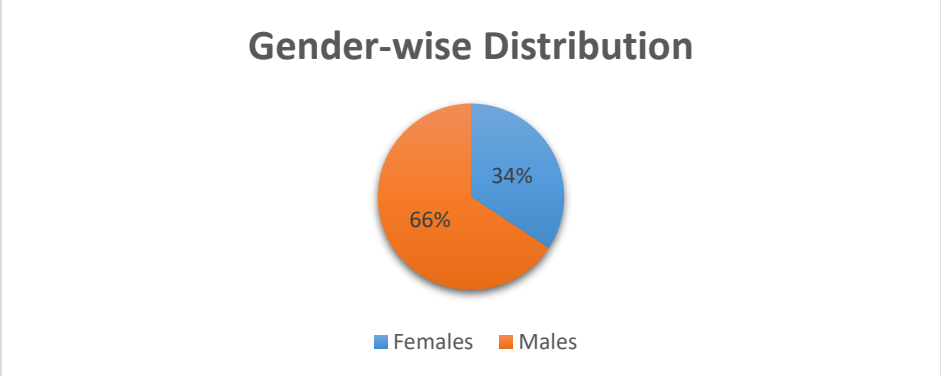
Table 1: Descriptive Statistics of Age

	Descriptive statistics (in years)
Mean	25.44
SD	4.46
Median	24.5
Mode	22
Minimum	18
Maximum	37

Table 2: Gender wise Distribution

	Frequency	**Percentage**
Females	35	66%
Males	67	34%

Graph 1: Gender wise Distribution

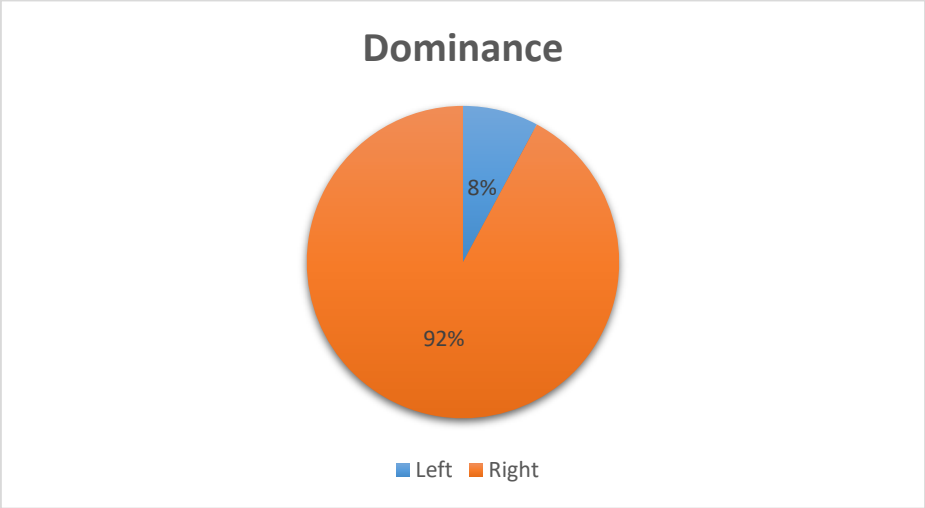


Interpretation: 66% participants of the study were male and the remaining 34% were female.

Table 3: Dominance–wise Distribution

	Frequency	Percentage
Right	94	92%
Left	8	8%

Graph 2: Dominance–wise Distribution

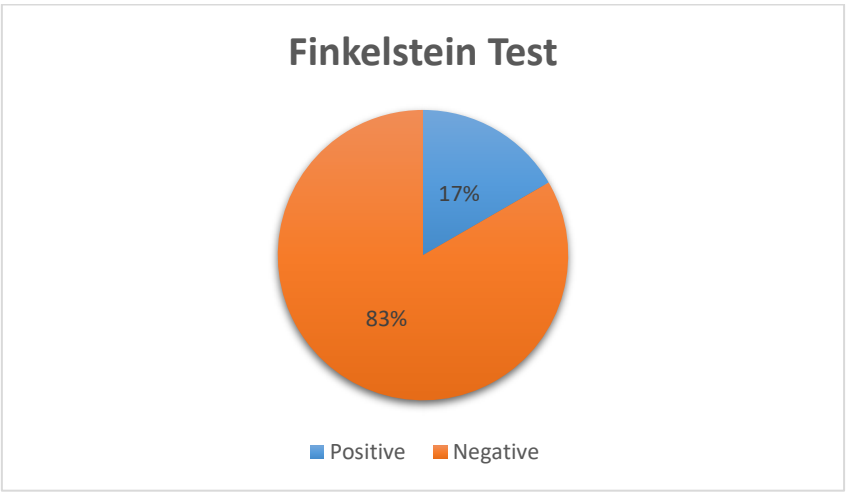


Interpretation:A large majority of players were right-hand dominant (92%), with only 8% left-hand dominant.

Table 4: Finkelstein's Test: Prevalence of De-Quervain's Tenosynovitis

	Frequency	Percentage
Positive	17	17%
Negative	85	83%

Graph 3: Finkelstein's Test: Prevalence of De-Quervain's Tenosynovitis

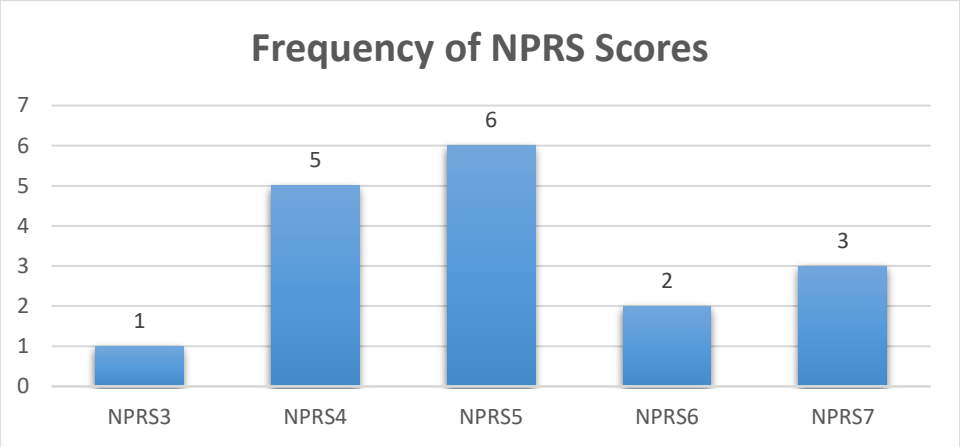


Interpretation: 17 (17%) tested positive on Finkelstein's Test, indicating clinical signs of De Quervain's Tenosynovitis, while 85 (83%) tested negative.

Table 5: NPRS scores:

	Descriptive statistics of NPRS
Mean	5.05
SD	1.19
Median	5
Mode	5
Minimum	3
Maximum	7

Graph 4: Frequency of NPRS Scores

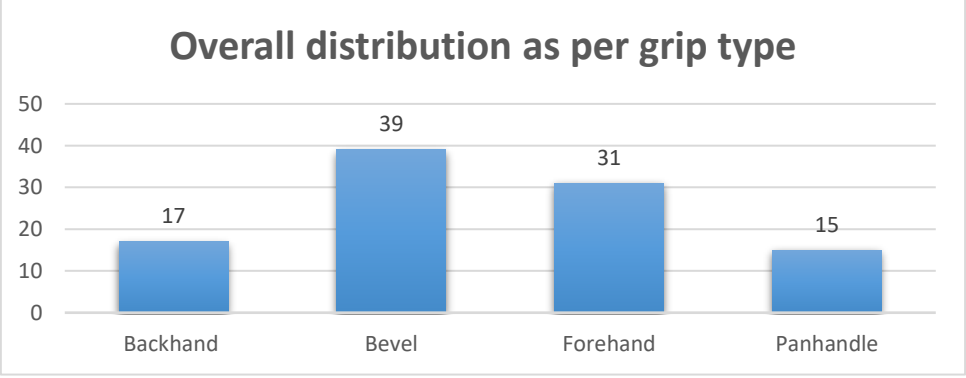


Interpretation: Among those who tested positive for De Quervain's Tenosynovitis, the mean NPRS score was 5.05 ± 1.19, with both the median and mode at 5, indicating moderate pain intensity.

Table 6: Distribution on the basis of grip type

	Frequency	Percentage
Backhand	17	17%
Bevel	39	38%
Forehand	31	30%
Panhandle	15	15%

Graph 5: Distribution on the basis of grip type

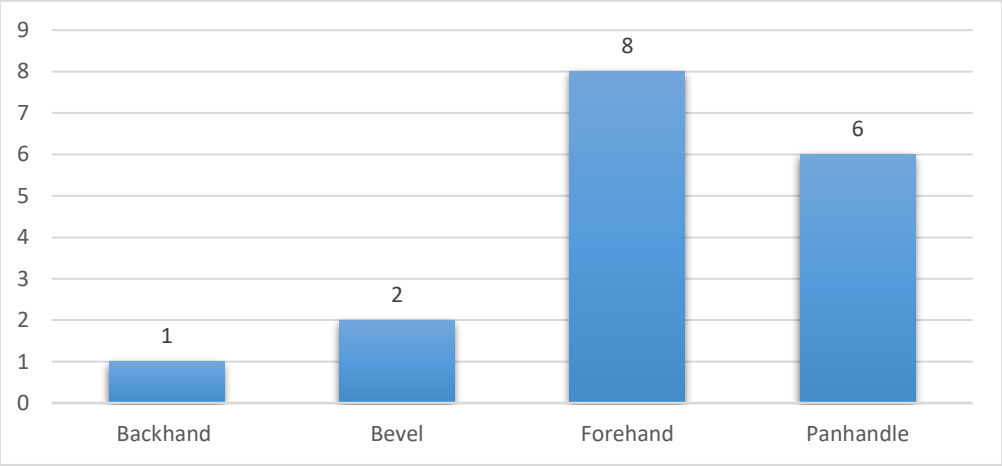


Interpretation: The most common type of grip observed is bevel and forehand type.

Table 7: Grip type in participants who had positive Finkelstein's test

	Frequency	Percentage
Backhand	1	6%
Bevel	2	12%
Forehand	8	47%
Panhandle	6	35%

Graph 6: Grip type in participants who had positive Finkelstein's test



Interpretation: The forehand type grip was most prevalent among those who had a positive finkelstein test.

DISCUSSION

The present study aimed to determine the prevalence of De Quervain's Tenosynovitis among recreational badminton players and to examine its correlation with gender and grip type. A total of 102 participants aged between 18–37 years were assessed using the Finkelstein Test. The prevalence was found to be 17%, indicating that nearly one in six recreational badminton players exhibit symptoms of De Quervain's Tenosynovitis.

The results highlight that the condition is not limited to elite or professional athletes but is also prevalent among recreational players. The repetitive wrist and thumb movements inherent in badminton—especially during forehand and backhand strokes—place substantial stress on the Abductor Pollicis Longus (APL) and Extensor Pollicis Brevis (EPB) tendons, leading to inflammation within their synovial sheath.

A higher prevalence was observed in players using forehand and panhandle grips, which require sustained thumb abduction and ulnar deviation—motions that are known to exacerbate tendon loading in the first dorsal compartment. The correlation between the forehand grip and positive Finkelstein's test suggests that improper grip technique or excessive racquet tension may increase strain on the wrist.

Gender distribution revealed a slightly higher incidence among female players, which may be attributed to anatomical and hormonal differences, such as narrower tendon sheaths and increased ligamentous laxity, predisposing them to overuse injuries. Similar gender differences have been reported in prior research on occupational and smartphone-related De Quervain's syndrome.

The average NPRS score of 5.05 ± 1.19 among affected participants reflects moderate pain levels, consistent with early or mid-stage tendon sheath inflammation rather than chronic fibrotic cases. The right-

hand dominance (92%) further supports the notion that repetitive racquet motion in the dominant hand contributes significantly to symptom development.

Overall, the findings align with existing literature demonstrating that repetitive thumb and wrist movements are a primary risk factor for developing De Quervain's Tenosynovitis. Preventive strategies such as grip correction, strengthening of wrist extensors and thumb abductors, and regular physiotherapy screening may help in early identification and management.

In addition to identifying prevalence and associated risk factors, it is important to understand the underlying biomechanical mechanisms that contribute to tendon overload in badminton players. Studies analyzing grip force and pressure distribution during various forehand overhead strokes have shown that differences in hand positioning, grip tension, and stroke execution significantly influence the load transmitted to the wrist and thumb tendons. Excessive localized pressure along the racket handle, particularly during powerful strokes, can lead to increased friction and strain within the first dorsal compartment, predisposing players to De Quervain's tenosynovitis. Furthermore, gender-based variations in grip dynamics and muscle activation patterns may further explain the higher susceptibility observed among female athletes. Therefore, integrating grip pressure assessment and ergonomic training into injury prevention programs could enhance performance while reducing the risk of overuse injuries in recreational badminton players.

LIMITATIONS:

The study was limited by its small sample size (n = 102) and inclusion of only recreational badminton players, which may restrict the generalizability of findings to professional athletes. The cross-sectional design prevents establishing a causal relationship between playing habits and the development of De Quervain's Tenosynovitis. Data were based on a single clinical test (Finkelstein's) without imaging confirmation, which may have led to diagnostic bias. Factors such as duration of play, training intensity, and prior wrist injuries were not analyzed, which could further influence the observed prevalence.

CONCLUSION:

The study found a 17% prevalence of De Quervain's Tenosynovitis among recreational badminton players, with higher occurrence in those using a forehand grip. Pain levels were mild to moderate, slightly more common in females, and all affected players were right-hand dominant. Repetitive and improper wrist movements appear to be the main cause, highlighting the importance of early screening with the Finkelstein test, proper grip technique, wrist strengthening, and preventive physiotherapy.

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