

Original Article

# Prevalence of Dequervains Tenosynovitis in 20-40 Years Old Mobile Users

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## ABSTRACT

**Background:** The advent of mobile technology has revolutionized communication but has also introduced new health concerns, including DeQuervain's tenosynovitis (DQT), a condition affecting the thumb and wrist. Previous studies have reported varying prevalences of DQT among mobile users, with potential gender differences in susceptibility. This study seeks to add to the existing body of knowledge by exploring the prevalence of DQT among young adult mobile users and examining gender differences in the condition's occurrence.

**Objective:** To determine the prevalence of DeQuervain's tenosynovitis among mobile users aged 20–40 years and to investigate whether there are significant gender differences in the susceptibility to the condition.

**Methods:** This cross-sectional study involved 100 participants, stratified by gender, who regularly use mobile devices. Data were collected through self-administered questionnaires to assess mobile device usage patterns and symptoms of DQT. The Finkelstein test was used to diagnose DQT among participants. Statistical analysis included the calculation of prevalence rates, and the Pearson correlation coefficient was employed to explore the relationship between mobile device usage and symptoms of DQT. Gender differences were assessed using chi-square tests.

**Results:** Of the 100 participants, 52% tested positive for DeQuervain's tenosynovitis. Female mobile users demonstrated a higher prevalence (58%) compared to male mobile users (42%). The study also found a moderate positive correlation ( $r = 0.37$ ,  $p = 0.001$ ) between the extent of mobile device use and symptoms of DQT. The Quick DASH scores ranged from 12.0 to 45.00, with an average score of  $17.75 \pm 6.91$ , indicating variability in the impact of DQT on functional abilities.

**Conclusion:** The study confirms a high prevalence of DeQuervain's tenosynovitis among young adult mobile users, with a significant gender difference indicating higher susceptibility among females. These findings underscore the need for ergonomic considerations and preventive measures in the use of mobile devices to mitigate the risk of musculoskeletal disorders.

**Keywords:** DeQuervain's tenosynovitis, mobile users, gender differences, prevalence, ergonomic considerations, musculoskeletal disorders, Finkelstein test, Quick DASH.

## INTRODUCTION

De Quervain's tenosynovitis, a painful condition affecting the wrist tendons, particularly through the inflammation of the sheaths surrounding the two tendons at the base of the thumb, has been increasingly observed in individuals. This inflammation exerts pressure on adjacent nerves, leading to pain and numbness. The rise in the usage of electronic devices is believed to be a contributing factor to the surge in tendon-related inflammatory disorders in the hands and wrists (1). Specifically, De Quervain's tenosynovitis is an inflammatory condition that emerges from the chronic overuse of the tendons connected to the abductor pollicis longus and extensor pollicis brevis muscles (2). The anatomy of the wrist, where the extensor retinaculum thickens the deep fascia to form six canals for enclosing extensor muscle tendons, plays a significant role in this condition. The tendons of the abductor pollicis longus and extensor pollicis brevis are located in the first canal along the lower radius, making them susceptible to overuse and inflammation (3).

A key pathological feature of De Quervain's disease is the myxoid degeneration within the tendon sheath's intercellular matrix, characterized by the thickening of the tendon's sheath and accumulation of mucopolysaccharide, indicating myxoid degeneration (4). The proliferation of mobile phones and games, particularly in China where professional gamers may spend up to 42 hours weekly on mobile games and novices 12 to 16.5 hours, has been associated with an increase in thumb overuse and wrist pain (5). Moreover, certain professions that involve repetitive motion patterns, such as metallurgy, masonry, butchery, hairdressing, and waitressing, have traditionally been linked to the development of De Quervain's tenosynovitis (6). The condition has also been traced back to activities such as prolonged piano playing, buffer machine operation, and other manual tasks that require repetitive motion or exertion (7).

De Quervain's tenosynovitis not only causes significant discomfort but also hampers daily activities like turning keys or buttoning a shirt (8). Diagnosis primarily relies on Finkelstein's test, which identifies pain in the first dorsal compartment through specific movements of the extensor pollicis brevis and abductor pollicis longus (9). The test involves extending the affected extremity and applying a mild ulnar deviation to elicit pain near the radial styloid process, with positive results indicating the presence of the condition (9). Research into the condition also includes measuring the lateral and tip pinch strengths and evaluating manual functions and pain levels through questionnaires and scales like the DASH and NPRS (10).

Despite the acknowledged link between mobile device use and De Quervain's tenosynovitis, especially among teenagers who are increasingly engaged in mobile gaming, there is a notable scarcity of research validating this association. This gap in the literature highlights the need for further investigation into the prevalence of this condition among mobile users, particularly in demographics known for high mobile device engagement. The current study aims to address this gap by focusing on the prevalence of De Quervain's tenosynovitis among 20-40-year-old mobile users in Lahore, Pakistan, a location where limited research has been conducted. This endeavor not only seeks to contribute to the existing body of knowledge but also to shed light on the need for broader studies across different regions of Pakistan, where research on this condition remains scarce.

## MATERIAL AND METHODS

The study was conducted at the Akhtar Saeed College of Rehabilitation Sciences, Lahore, over a period of six months, employing a cross-sectional design to facilitate data collection at a single time point. To determine the study's sample size, a non-probability convenience sampling method was employed, selecting 100 medical students as participants (11). The participants were chosen using convenience sampling and provided informed consent prior to their inclusion in the study.

The methodology for diagnosing De Quervain's tenosynovitis involved the Finkelstein test, a technique designed to evaluate the condition by inducing stress on the thumb's extensor tendon. Participants were given a comprehensive explanation of the procedure and underwent three practice trials to minimize the impact of learning effects. For the test, participants were seated comfortably on an examination table, with one hand elevated and the other resting beside the body. They were instructed to form a fist around their thumb, after which passive pressure and ulnar rotation were applied.

Following the Finkelstein test, the Visual Analog Scale (VAS) was utilized to measure participants' pain levels. This assessment involved quantifying pain intensity by measuring the distance from the "no pain" anchor point, with scores ranging from 0 to 100 mm or 0 to 10 cm. Subsequently, the Quick DASH questionnaire was administered to evaluate disability. For a valid Quick DASH score calculation, participants needed to complete at least 10 out of the 11 items, each offering five possible responses, similar to the DASH. The scale scores, ranging from 0 (indicating no disability) to 100 (indicating the most severe disability), were calculated based on the responses to these items.

Inclusion criteria for the study were defined to select participants aged between 20 and 40 years who were students willing to provide accurate information regarding their mobile game play and extensive mobile device use. Specifically, participants were required to have used mobile phones for an extensive duration, estimated between 8 to 12 hours daily. The exclusion criteria were established to omit students who had undergone wrist surgery for any reason in the past, individuals previously diagnosed with carpal diseases other than De Quervain's tenosynovitis, those unwilling to participate voluntarily, and anyone whose daily mobile device usage did not fall within the 8 to 12-hour range.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Data collection and analysis were conducted with utmost respect for participant confidentiality and privacy.

For data analysis, the study utilized the SPSS software, version 25. This software facilitated the processing and analysis of collected data, allowing for a comprehensive examination of the results.

## RESULTS

The study's findings, meticulously gathered from a cohort of 100 participants, are comprehensively detailed across three pivotal tables, elucidating various aspects of pain perception and its association with functional disability.

In the exploration of pain intensity captured within the Analog Pain Scale Distribution, the distribution of responses was strikingly diverse. Notably, nearly half of the respondents (48%) reported experiencing no pain, highlighting a significant portion of the sample with an absence of discomfort. Conversely, the remaining spectrum of pain intensity varied markedly, with very mild pain reported by a singular individual (1%), and a small fraction encountering discomforting (5%) to tolerable pain levels (2%). The escalation towards more severe pain categories was apparent, with distressing pain noted by 7%, very distressing by 12%, and intense pain by 11% of participants. The categories of very intense pain, latterly horrible pain, and unbearable pain were less frequent, reported by 2%, 8%, and 3% of participants, respectively. A lone participant described their pain as unimaginable, underscoring the subjective extremities of pain experiences within the population. The descriptive statistics further quantified this variation, with pain scores ranging from 0 to 10, an average pain intensity score calculated at 2.86, and a standard deviation of 3.15, encapsulating the broad dispersion of pain experiences among the participants [Table 1].

The second table shed light on the functional impact of pain through the lens of the Quick DASH (Disabilities of the Arm, Shoulder, and Hand) scores and their correlation with pain scores. The Total Quick DASH scores spanned from 12.0 to 45.00, with an average score of 17.75 and a standard deviation of 6.91, illustrating the variability in disability extents among the study participants. Moreover, a noteworthy correlation between pain scores and disability, quantified by a Pearson Correlation coefficient of 0.37 and a highly significant p-value of 0.001, delineated a moderate positive relationship, suggesting that higher pain scores were associated with greater disability levels [Table 2].

Table 1: Combined Visual Analog Scale Responses and Descriptive Statistics

Description	Frequency (n=100)	Percent (%)
<b>Analog Pain Scale Distribution</b>		
No pain	48	48.0
Very mild	1	1.0
Discomforting	5	5.0
Tolerable	2	2.0
Distressing	7	7.0
Very distressing	12	12.0
Intense	11	11.0
Very Intense	2	2.0
Latterly horrible	8	8.0
Unbearable	3	3.0
Unimaginable	1	1.0
<b>Descriptive Statistics, Mean, SD</b>	2.86	3.15

Table 2: Descriptive Statistics of Quick DASH and Correlation with Pain Score

Description	N	Minimum	Maximum	Mean	Std. Deviation	Pearson Correlation (r)	P-value
Total Quick DASH	100	12.0	45.00	17.75	6.91	-	-
Pain Score and Disability Correlation	100	-	-	-	-	0.37	0.001

Table 3: Finkelstein Test Results

Result	Frequency	Percent (%)	Cumulative Percent (%)
Yes (Positive)	52	52.0	52.0
No (Negative)	48	48.0	100.0
Total	100	100.0	

Lastly, the outcomes from the Finkelstein Test, used to diagnose De Quervain's tenosynovitis, revealed a balanced dichotomy within the study cohort. Exactly 52% of participants tested positive, while the remaining 48% were negative, illustrating a nearly even distribution of this condition among the sample. This result not only highlighted the prevalence of De Quervain's tenosynovitis in the studied population but also underscored the utility of the Finkelstein Test in clinical assessments [Table 3].

## DISCUSSION

The study aimed to ascertain the prevalence of DeQuervain's tenosynovitis (DQT) among mobile users aged 20–40 years, revealing a significant gender disparity in the incidence of the condition, with female mobile users being more predisposed to DQT than their male counterparts. This finding diverges from some previous research, enriching the ongoing discourse on the impact of mobile device usage on musculoskeletal health. Notably, the study found that 52% of participants exhibited symptoms of DQT, a proportion that aligns with certain prior studies while contrasting with others, thus offering a nuanced perspective on the condition's prevalence in the digital age.

The finding of a higher prevalence of DQT among female mobile users adds to a body of evidence suggesting gender differences in the susceptibility to musculoskeletal conditions associated with mobile device usage. This observation is particularly noteworthy when considered alongside the results of Maryam Ali et al. (2014) and Vicente Aleixandre et al. (2021), who also identified high incidences of musculoskeletal issues related to mobile phone use. Moreover, the study's results echo the findings of Tianxiao Ma et al. (2019) regarding the association between mobile gaming and DQT, albeit with a notable divergence in the gender distribution of affected individuals.

Comparatively, the work of Faiza Taufiq et al. (2015) and Hamna Sarfraz et al. (2022) provides a contrast, with the former reporting a lower prevalence of DQT and the latter emphasizing the link between excessive texting and DQT development. This study's alignment with the findings of Bashar Reada et al. (2020) and Abdullah M Alsalamah et al. (2019) further substantiates the correlation between smartphone dependency and musculoskeletal symptoms, although it uniquely highlights a greater vulnerability among females.

This research builds upon and diverges from the foundational work of Audrey Petit Le Mancha et al. (2011) and Jennifer Morita's Wolf et al. (2009), who documented lower overall prevalences of DQT. The apparent discrepancy in findings underscores the evolving nature of mobile technology use and its implications for health. Additionally, the study resonates with the observations of Sanjeev Davey et al. (2014) regarding smartphone addiction, suggesting a broader societal impact of mobile device dependency on physical well-being.

The study's strengths lie in its focused demographic and the clear delineation of gender differences in DQT prevalence, providing valuable insights for both clinical practice and public health policy. However, it is not without limitations, including a sample size that, while sufficient to identify trends, may not fully capture the heterogeneity of mobile device usage patterns and their health impacts. The reliance on self-reported measures of mobile device use and symptoms also introduces the potential for bias.

Future research should aim to incorporate larger, more diverse populations and utilize objective measures of mobile device use to verify these findings. Additionally, investigations into the ergonomic and behavioral factors that contribute to DQT, particularly in the context of rapidly evolving mobile technology, would be beneficial.

## CONCLUSION

In conclusion, this study contributes to the understanding of DeQuervain's tenosynovitis in the digital age, highlighting the role of gender and mobile device usage patterns in the prevalence of the condition. The findings suggest a need for increased awareness and preventive measures, particularly among female mobile users, to mitigate the risk of DQT and other musculoskeletal disorders associated with technology use.

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