

PREVALENCE OF DE QUERVAIN’S TENOSYNOVITIS AND ITS
ASSOCIATION WITH DURATION OF SMARTPHONE USE AMONG DPT
STUDENTS AT DISTRICT SWAT

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Abstract

Background: Smartphone use has increased dramatically among young adults, leading to repetitive thumb and wrist movements that may contribute to musculoskeletal disorders such as De Quervain’s tenosynovitis (DQT).

Objective: To determine the prevalence of De Quervain’s tenosynovitis and its association with duration of smartphone use among DPT students at District Swat.

Methods: An analytical cross-sectional study was conducted among young adults DPT students aged 18–25 years recruited from educational institutions in Swat. De Quervain’s tenosynovitis was assessed using the Wrist Hyperflexion and Abduction of the Thumb (WHAT) test along with a self-administered questionnaire assessing smartphone usage patterns. Data were analyzed using SPSS, and associations were evaluated using chi-square tests.

Results: Out of 126 participants, 58.7% tested positive for De Quervain's tenosynovitis. Prolonged smartphone use for chatting, gaming, and scrolling showed a statistically significant association with positive WHAT test results ($p < .001$).

Conclusion: A high prevalence of probable De Quervain's tenosynovitis was observed among young adults DPT students, strongly associated with prolonged smartphone use. Preventive strategies and ergonomic awareness are recommended to reduce the risk of smartphone-related musculoskeletal disorders.

INTRODUCTION

The use of smartphones has become ubiquitous in modern society, with billions of individuals worldwide relying on these devices for communication, entertainment, and daily tasks. The rapid increase in smartphone adoption has coincided with a rise in musculoskeletal complaints, particularly among young adults who are among the most intensive users of mobile technology (Alnaqbi et al., 2023; Javed et al., 2024). Prolonged and repetitive thumb and wrist movements during activities such as texting, scrolling, and gaming have been implicated as risk factors for tendon strain and overuse injuries.

De Quervain's tenosynovitis (DQT) is an overuse tendinopathy affecting the first dorsal compartment of the wrist, involving the abductor pollicis longus and extensor pollicis brevis tendons. This condition is characterized by pain and tenderness at the radial aspect of the wrist, particularly during thumb movement, pinch, or grip activities (Alnaqbi et al., 2023). Traditionally associated with occupational repetitive strain, recent research suggests that smartphone-related activities may contribute significantly to its development, especially among younger populations engaged in high-frequency smartphone use.

Several studies have documented the prevalence of DQT in populations with high smartphone exposure. A recent cross-sectional study among undergraduate students in Islamabad reported a positive Finkelstein test, indicating DQT, in over 66% of participants who used smartphones extensively, highlighting the prevalence of this condition among students (Javed et al., 2024).

Similarly, a Chinese study involving college students found that more than half of the participants exhibited signs of DQT, with increased smartphone usage time and phone activities such as gaming and social media engagement significantly elevating the risk (Luo et al., 2023). These findings suggest a strong association between smartphone use and the development of symptoms consistent with DQT.

Research conducted in different cultural and geographic settings has echoed these observations. A study among teenagers in Saudi Arabia demonstrated that prolonged smartphone exposure was significantly associated with the presence of De Quervain's disease based on Finkelstein test results, with higher prevalence in participants using phones for longer hours each day (Mehdinasab & Alemohammad, 2024). Additionally, studies evaluating problematic smartphone use have reported that individuals with higher smartphone dependence are more likely to show positive signs of DQT symptomatology (Blanco et al., 2021). These patterns underline the potential impact of behavioral and usage factors in the etiology of smartphone-related musculoskeletal disorders.

Although much of the existing research has focused on specific subgroups, such as students or those with smartphone addiction, the broader young adult population remains a key demographic for investigation due to their intensive engagement with mobile devices. Young adults not only use smartphones for communication but also for social networking, entertainment, education, and work-related tasks, resulting in prolonged daily exposure. This increased usage may amplify repetitive strain on the thumb and wrist tendons, making DQT a relevant public health concern in this age group.

In Pakistan, limited studies have examined the relationship between smartphone use and DQT in the general young population, with most research focusing on specific student groups. For example, a study in Gujranwala reported a positive association between frequent texting and thumb pain consistent with DQT, reinforcing the link between mobile messaging behaviors and tendon overload (Ali et al., 2014). However, comprehensive data on the prevalence and activity-specific associations of DQT among young adults across a broader context is still lacking. This gap is particularly relevant

given the increasing penetration of smartphones in Pakistani society and the growing trend of mobile usage among youths.

Understanding the prevalence of De Quervain's tenosynovitis and its relationship with specific smartphone use behaviors among young adults DPT students is crucial in order to develop preventive strategies and ergonomic recommendations. By identifying the patterns of smartphone use that are most strongly associated with DQT, stakeholders can design targeted educational interventions and user guidelines to reduce the risk of musculoskeletal injuries. Therefore, the current study examines the prevalence of DQT and investigates its association with the duration and type of smartphone use among DPT students at District Swat.

MATERIALS AND METHODS

Study Design and Setting

An analytical cross-sectional study was conducted over a period of six months in Swat, Khyber Pakhtunkhwa, Pakistan. Participants were recruited from various educational institutions in the region.

Study Population

Young DPT students aged 18–25 years who owned and regularly used smartphones were included in the study. Individuals with a history of wrist trauma, inflammatory joint disease, cervical radiculopathy, or previous wrist surgery were excluded.

Sample Size and Sampling Technique

A convenience sampling technique was used. Initially, 129 participants were recruited; however, 3 were excluded based on exclusion criteria, resulting in a final sample of 126 participants.

Data Collection Tools

WHAT Test: The Wrist Hyperflexion and Abduction of the Thumb (WHAT) test was used to assess De Quervain's tenosynovitis due to its high reported sensitivity (Goubau et al., 2014).

Questionnaire: A structured, self-administered questionnaire was used to collect demographic information and details regarding smartphone usage, including hours spent chatting, gaming, and scrolling.

Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics were used to summarize demographic variables. Chi-square tests were applied to assess the association between smartphone usage duration and the presence of DQT. A p-value of less than .05 was considered statistically significant.

RESULTS

Demographic Characteristics of Participants

A total of 126 young DPT students participated in the study after exclusion of three participants based on predefined criteria. Among the participants, 64 (50.8%) were males and 62 (49.2%) were females. The age of participants ranged from 18 to 25 years, with a mean age of 19.43 ± 1.08 years. All participants were regular smartphone users (Table 1).

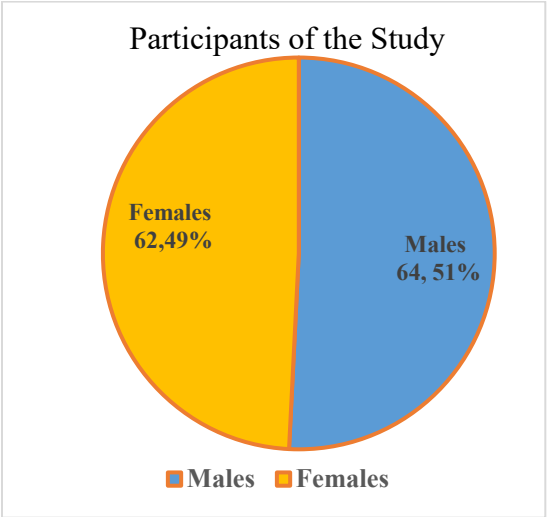


Figure 1. Participants of the Study

Table 1. Demographic Characteristics of Participants

Variable	Frequency (n)	Percentage (%)
Male	64	50.8
Female	62	49.2
Total	126	100

Prevalence of De Quervain’s Tenosynovitis

Assessment using the Wrist Hyperflexion and Abduction of the Thumb (WHAT) test revealed that 74 participants (58.7%) tested positive for probable De Quervain’s tenosynovitis, while 52 participants (41.3%) tested negative. This indicates a high prevalence of DQT among the young DPT students population included in the study (Table 2).

Table 2. Prevalence of De Quervain’s Tenosynovitis

WHAT Test Result	Frequency (n)	Percentage (%)
Positive	74	58.7
Negative	52	41.3

Based on symptom scoring and clinical screening, participants were further categorized into three groups:

Unlikely DQT (score 0–3): 39 participants (31.0%)

Probable DQT (score 4–7): 42 participants (33.3%)

Almost certain DQT (score 8–11): 4 participants (3.2%)

These findings suggest that a considerable proportion of young DPT students experience symptoms suggestive of DQT, ranging from mild to severe.

Gender-wise Distribution of De Quervain’s Tenosynovitis

Among the participants who tested positive for DQT, 40 (31.7% of the total sample) were males and 34 (27.0% of the total sample) were females. Although both genders showed a high prevalence of DQT, males demonstrated a slightly higher frequency of positive WHAT test results. However, the difference between genders was not statistically analyzed as the primary focus of the study was smartphone usage duration.

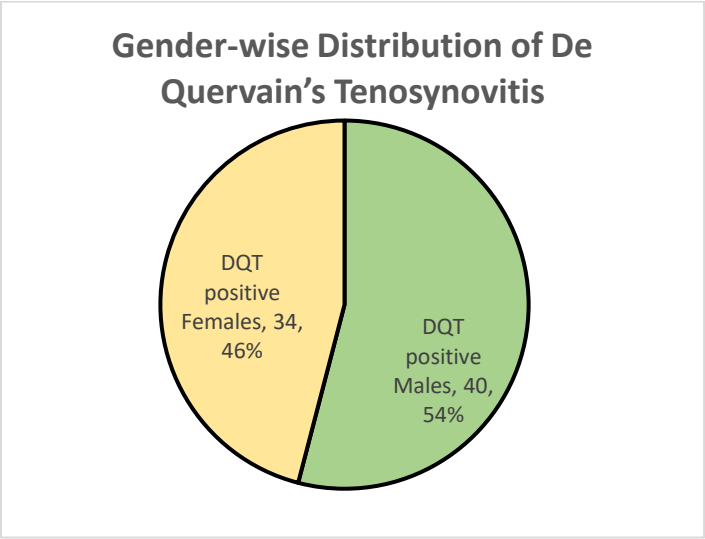


Figure 2. Gender-wise Distribution of De Quervain's Tenosynovitis

Association Between Smartphone Use Duration and De Quervain's Tenosynovitis
Chatting Duration

A statistically significant association was observed between hours spent chatting on smartphones and positive WHAT test results ($\chi^2 = 90.506$, $df = 7$, $p < .001$). Participants who reported spending three or more hours per day chatting showed a markedly higher proportion of positive DQT screening compared to those with lower chatting durations.

Gaming Duration

Analysis revealed a strong and statistically significant association between smartphone gaming duration and DQT ($\chi^2 = 56.279$, $df = 4$, $p < .001$). Participants engaging in prolonged gaming sessions were more likely to test positive for De Quervain's tenosynovitis than those who reported little or no gaming activity.

Scrolling and Browsing Duration

Time spent scrolling and browsing social media or online content was also significantly associated with DQT ($\chi^2 = 46.312$, $df = 4$, $p < .001$). Participants who reported extended daily scrolling exhibited a higher prevalence of positive WHAT test results, indicating increased risk with repetitive thumb movements.

Overall Smartphone Use Pattern

Overall, participants with prolonged smartphone use across multiple activities (chatting, gaming, and scrolling) demonstrated a higher likelihood of developing symptoms consistent with De Quervain’s tenosynovitis. The results collectively indicate that increased duration of repetitive smartphone-related thumb activities is strongly associated with the presence of DQT among young DPT students (Table 3).

Table 3. Association Between Smartphone Use and DQT

Smartphone Activity	Chi-square (χ^2)	p-value
Chatting	90.506	<0.001
Gaming	56.279	<0.001
Scrolling	46.312	<0.001

DISCUSSION

Previous studies have reported that excessive smartphone use among young adults is associated with an increased prevalence of musculoskeletal disorders, particularly involving the wrist and thumb. Kim et al. (2021) observed that young adults who used smartphones for prolonged durations were more likely to report hand and wrist discomfort due to repetitive thumb movements. Similarly, Osailan et al. (2021) highlighted that sustained smartphone use exceeding three hours per day significantly increased the risk of upper limb musculoskeletal symptoms. The findings of the present study are consistent with these reports, as a high prevalence of probable De Quervain's tenosynovitis was observed among young DPT students who reported prolonged daily smartphone use.

Several researchers have specifically examined the relationship between smartphone texting and De Quervain's tenosynovitis. Sarfraz et al. (2022) reported a significant association between mobile texting duration and DQT among university students, suggesting that repetitive thumb flexion and extension during texting increases tendon strain. In agreement with these findings, the present study demonstrated a statistically significant association between hours spent chatting on smartphones and positive WHAT test results, indicating that texting-related repetitive movements play a substantial role in the development of DQT.

Gaming-related smartphone use has also been investigated in previous literature. Ayaz et al. (2022) found a higher prevalence of De Quervain's tenosynovitis among individuals who engaged in prolonged smartphone gaming, attributing this to sustained gripping and repetitive thumb motions. The present study supports these observations, as a strong association was identified between increased gaming duration and positive screening for DQT. This similarity reinforces the notion that high-intensity smartphone activities impose excessive mechanical load on the first dorsal compartment tendons.

Scrolling and browsing activities, though often perceived as low-effort tasks, have been linked to musculoskeletal complaints in earlier studies. Woo et al. (2021) reported that prolonged scrolling on social media platforms contributed to thumb fatigue and wrist discomfort due to continuous micro-movements. The present study aligns with these findings, showing a significant association

between extended scrolling duration and De Quervain's tenosynovitis, suggesting that even seemingly passive smartphone behaviors can result in cumulative tendon stress.

Previous epidemiological studies have reported varying prevalence rates of De Quervain's tenosynovitis among young populations. Sarfraz et al. (2022) reported a prevalence of approximately 45%, while Ayaz et al. (2022) reported prevalence exceeding 50% in certain subgroups. The prevalence observed in the present study (58.7%) is comparatively higher, which may be attributed to differences in diagnostic tools, population characteristics, and smartphone usage patterns. The use of the WHAT test in the present study, which has been reported to have higher sensitivity than traditional tests, may have contributed to increased detection of probable cases.

Gender-based differences in De Quervain's tenosynovitis have been inconsistently reported in the literature. Some studies have suggested a higher prevalence among females due to anatomical and hormonal factors (Ilyas et al., 2007), whereas others have reported male predominance, particularly in populations with higher gaming exposure (Ayaz et al., 2022). The present study observed a slightly higher prevalence among males, which may be related to increased engagement in gaming and prolonged smartphone use rather than biological sex differences alone.

Certain studies have failed to demonstrate a strong association between total smartphone usage duration and De Quervain's tenosynovitis when exposure was measured broadly without activity-specific categorization (Woo et al., 2021). In contrast, the present study categorized smartphone use into chatting, gaming, and scrolling activities, revealing strong associations with each activity. This difference suggests that the type and repetitive nature of smartphone activity may be more relevant than total usage time alone.

Biomechanical explanations proposed in earlier studies indicate that repetitive thumb abduction, sustained wrist deviation, and forceful gripping contribute to increased friction within the first dorsal compartment (Ilyas et al., 2007). The findings of the present study support these mechanisms, as participants engaging in repetitive smartphone activities were more likely to exhibit positive WHAT test results, reflecting tendon irritation and functional impairment.

Previous public health studies have emphasized the need for early preventive strategies to address smartphone-related musculoskeletal disorders among young populations (Osailan et al., 2021). The present study further strengthens this recommendation by demonstrating a high prevalence of probable De Quervain's tenosynovitis among young DPT students, highlighting the urgency of ergonomic education and behavioral modification.

CONCLUSION

This study concludes that De Quervain's tenosynovitis is highly prevalent among young DPT students in Swat and is significantly associated with prolonged smartphone use. Awareness programs and preventive strategies targeting smartphone ergonomics may help reduce the burden of this condition in the young population.

RECOMMENDATIONS

- Promote ergonomic smartphone usage practices among young adults DPT students.
- Encourage regular breaks during prolonged smartphone use.
- Conduct longitudinal studies with objective smartphone usage tracking.

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