

# Prevalence of DeQuervain's Tenosynovitis among Clinical Physical Therapists in Islamabad: A cross-sectional study

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## ABSTRACT

**Aims:** To determine the prevalence of De Quervain's tenosynovitis among clinical physical therapists in Islamabad.

**Study design:** A descriptive cross-sectional study

**Place and duration:** We conducted this study among clinical physical therapists working in hospitals and clinics of Rawalpindi and Islamabad from Feb 2022 to Aug 2022.

**Methods:** We included 288 clinical physical therapists that were selected through non-probability quota sampling. Both male and female clinical physical therapists with ages ranging from 25 to 50 yrs having thumb pain, with one year of clinical experience who worked for 4 to 8 hours per day at least 4 days a week were included in the study. The De Quervain tenosynovitis was diagnosed in participants having tenderness at the base of the thumb and a positive Finkelstein test. A positive Finkelstein sign indicates pain over the region of the abductor pollicis and extensor pollicis tendon. The data were collected and statistically analyzed using SPSS version 26. Results were shown in the form of frequency tables and graphs.

**Results:** Out of 288 participants, 77(26.73%) had tenderness at the base of the thumb and 77(26.74%) clinician physical therapists had positive Finkelstein test. This indicates that 26.73% had De Quervain's Tenosynovitis. Out of them, 31.94% of cases were males and 21.51% were females. Out of these 77 therapists, 4(5.2%) therapists suffered from mild pain, 61 (79.2%) physical therapists experienced moderate pain while 12(15.6%) therapists with positive cases had severe thumb pain.

**Conclusions:** The study concluded that there was a prevalence of De Quervain's tenosynovitis among clinical physiotherapists experiencing thumb pain.

**Key words:** De Quervain's tenosynovitis, Physical Therapists, Finkelstein's test, Thumb pain

## INTRODUCTION

The World Health Organization (WHO) defines a work-related musculoskeletal disorder (WRMSD) as a form of illness ranging from acute transitory disorders to irreversible injuries and disabilities that are caused or worsened by work or physical activities<sup>1</sup>. It impacts workers in a range of jobs and is a substantial source of lost time from work, disability, and higher health care expenses<sup>2</sup>. Work-related musculoskeletal disorders of the hand involve motions requiring forceful manual activity<sup>3</sup> and a persistent uncomfortable wrist position<sup>4</sup>. A study conducted to identify a relationship between exposure to occupational risk factors and response to elbow and hand disorders shows that wrist angular velocity is the most consistent factor for developing different disorders<sup>5</sup>.

Work-related musculoskeletal disorders of the hand are common in all occupations requiring repetitive movement and loading of small joints<sup>6</sup>. Due to the same reason, the physical therapist also experiences various work-related musculoskeletal injuries especially in the hand, as repetitive movement and loading of small joints is a major requirement of manual therapy intervention.

A study shows that the lifetime prevalence of work-related musculoskeletal disorders among physical therapists is 91%, with a higher prevalence in younger therapists<sup>7</sup>. Although work-related musculoskeletal disorders affected all body parts and lies fifth in rank to cause disability. Thumb pain was most prevalent among physical therapists and is second common tendinopathy of hand after trigger finger<sup>4</sup>. There are various contributory factors responsible for its occurrence. Out of all those factors, the use of manual intervention is considered a major contributor<sup>8</sup>.

A study conducted to investigate the prevalence, presentation and technique associated with aggravation of thumb

pain while performing spinal manipulation therapy showed that 83% of them complained of pain in the association of thumb pain with manual therapy intervention. The most common presentation of pain included mild pain (3.8/10) at the metacarpophalangeal joint, with multiple, short-lived episodes<sup>9</sup>. Other than conditions such as carpal tunnel syndrome and osteoarthritis, thumb pain is secondary to underlying disease, factors such as thumb joint hypermobility or an inability to stabilize the joints of the thumb whilst performing physiotherapy techniques and prolonged working may cause a change in underlying structures leading to thumb pain<sup>10</sup>.

One such condition is DeQuervain tenosynovitis. It is a rheumatic disease caused by stenosis or entrapment of the first dorsal compartment of the wrist<sup>11</sup>. The abductor pollicis longus and extensor pollicis brevis tendons are located in the first dorsal wrist compartment, which is separated from the other five compartments by a synovial sheath. These tendons are vulnerable to entrapment because they pass via a 2 cm long fibrous tunnel that passes over the radial styloid and under the transverse fibres of the extensor retinaculum<sup>12</sup>, particularly in the setting of acute trauma or repetitive motion<sup>13</sup>. Patients with De-Quervain's tenosynovitis frequently report sharp/dull pain and swelling near the wrist or base of the thumb.

Along with pain on the radial side of the wrist, spasms, tenderness, an occasional burning feeling in the hand, swelling over the thumb side of the wrist<sup>14</sup> and difficulties grasping with the affected hand<sup>15</sup>. The onset is often slow. Movement of the thumb and wrist exacerbates the pain, which may spread to the thumb or forearm<sup>16</sup>. Precipitating factors of De Quervain as reported by studies are related to overuse and repetitive activity of the affected thumb. Also Working with a sore thumb in the same position for long periods may aggravate the disease<sup>17</sup>. The diagnosis of de Quervain is based on clinical assessment. This includes pain in the lateral side of the thumb, tenderness at the base of the thumb and pain at the base of the thumb with ulnar deviation of a fist with the thumb directed inward. i.e. Finkelstein test<sup>18</sup>.

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The treatment of De Quervain tenosynovitis is usually based on pain management and immobilization at the thumb joint. By using thumb Spica 24 hours a day for 4 to 6 weeks<sup>19</sup>. Non-steroid anti-inflammatory drugs usually. Ibuprofen (Advil, Motrin) and naproxen are two examples used for pain relief. In severe cases, oral Steroids or local anaesthetic injections into the tendon sheath are quite effectively used<sup>20</sup>. Previous studies have identified the prevalence of De Quervain's tenosynovitis among different occupations and its association with thumb pain. However, there are limited researches regarding De Quervain's among clinical physical therapists, also uneven gender distribution in the study does not identify significant gender-based prevalence<sup>21,22</sup>. In this study, equal distribution of gender is used to counter this problem.

This study is designed to find the prevalence of De Quervain's tenosynovitis among clinician physical therapists.

## MATERIAL AND METHOD

A descriptive cross-sectional study was conducted among clinical physical therapists of different hospitals and clinics in Rawalpindi and Islamabad, Pakistan from Feb 2022 to Aug 2022. The Permission was taken from the Head of Department, Institute of Physical Therapy, University of Lahore, Islamabad campus. The study was approved by the Institutional Review Committee (IRC) /Ethical Review Board (ERB) of the University of Lahore, Islamabad Campus. Written informed consent was taken from each participant. The sample size was measured to be n=306 based on slovin's formula. These participants were recruited through non-probability quota sampling. Out of the measurement sample, 288 qualified for the study based on inclusion criteria. Both male and female therapists either working in government or private clinical and hospital set-ups with at least last one year of clinical experience, currently having thumb pain, the willingness of respondents, aged between 25-50 years, clinician physical therapists working for at least four days a week for a minimum of 4-8 hours per day, A minimum of 30 minutes of manual handling per day by physical therapists was considered for inclusion criteria. Those Physical therapists who are suffering from any thumb injury, trauma, fracture in the last 3 months, carpal tunnel syndrome, arthritis, ganglion cyst, pregnant female physical therapists, and therapists who previously had undergone any kind of thumb surgery were excluded from the study. The participants were asked to fill out a semi-structured questionnaire. That contained questions regarding demographics, inclusion and exclusion criteria. The prevalence of De Quervain was calculated based on diagnostic criteria of De Quervain, which include; the presence of pain on the lateral side of the thumb, positive Finkel stein test and tenderness over the base of the thumb. The pain was measured by a numeric pain rating scale. The tenderness was palpated over the base of the thumb and the Finkel stein test was performed by asking the patient to make and fist with the thumb inward and then perform ulnar deviation. A positive test is when there is pain in the base of the thumb during ulnar deviation. The data were analyzed by SPSS (Software Statistical Package for Social Science) version 26.0. The frequency and percentage were calculated and shown in tables and graphs.

## RESULTS

A total of 288 participants with an equal ratio of both genders were recruited to avoid biases in gender influence on prevalence. Out of 288 participants, 144 (50 %) clinician physical therapists were male and 144 (50 %) were female (fig.1). Among all, 237 (82.3%) clinician physical therapists were between age of 25-30 years followed by 40 (13.8%) were between age of 31-35 years (fig.2). Out of 288 participants, 77 (26.7%) participants had tenderness at base of thumb and positive Finkel stein test (tab.1).

Our result showed that out of 288 participants having pain at lateral side of thumb, 77 (26.3%) had tenderness at base of thumb and Finkel stein test positive. Hence, prevalence of de quervain

tenosynovitis is in 77 out of 288 participants (26.3%) (Table 1). Among population having De quervain tenosynovitis, 60 (77.9%) were between age group of 25-30, making it the most prevalent age group. Regarding gender, it is seen that out of 77 participants having De Quervain's Tenosynovitis, 46 (59.7%) are male. Hence it was prevalent among male clinician Physical therapist population. In addition, left-hand dominant participants showed slightly more prevalence than right-hand dominance. Regarding intensity of pain with prevalence of De quervain tenosynovitis, it is seen that 61 (79.2%) had moderate pain (Table 2).

Fig. 1 Frequency of gender

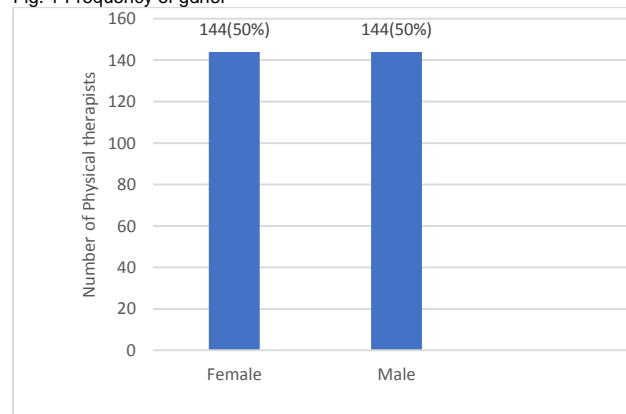


Figure 2: Bar charts shows frequency of age category

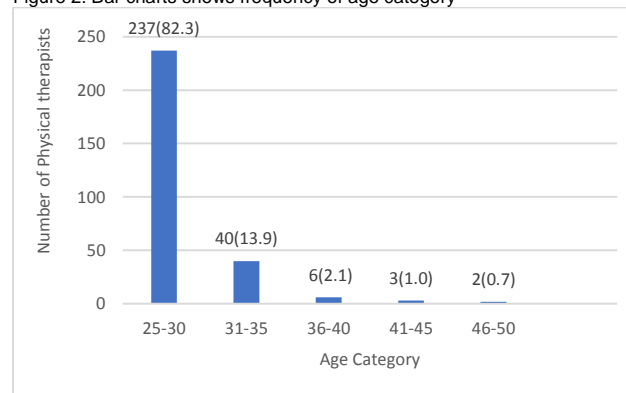


Table 1: Prevalence of De Quervain Tenosynovitis

Finkelstein Test	Tenderness	
	Positive = 77	Negative= 211
Negative	0(0.0%)	211(100%)
Positive	77(100%)	0(0.0%)

Table 2: De Quervain tenosynovitis in age, gender, dominant hand and pain intensity

Variables	Frequency(%)
<b>Age (yrs)</b>	
25-30	60(77.9%)
31-35	15(19.55)
36-40	1(1.3%)
41-45	0(0.0%)
46-50	1(1.3%)
<b>Gender</b>	
Female	31(40.3%)
Male	46(59.7%)
<b>Dominant hand</b>	
Right (n=262)	68(25.9%)
Left (n= 26)	9(34.6%)
<b>Pain intensity</b>	
1-3 Mild	4(5.2%)
4-6 Moderate	61(79.2%)
7-10 Severe	12(15.6%)

## DISCUSSION

Prevalence of de quervain tenosynovitis varies in different population based on frequency of movement and load applied through the thumb joint<sup>7</sup>. This study showed a 26.73% prevalence of De-Quervain's among Clinician physical therapists. This is due to use of thumb in manual therapy and repetitive motion of small joints. A meta-analysis of all controlled cohort studies was performed to verify the classification of de Quervain tenosynovitis on the list of occupational diseases to evaluate the strength of the association between de Quervain tenosynovitis and repetitive, forceful, or ergonomically stressful manual work suggested an odds ratio of 2.89 (95% CI, 1.4 to 5.97;  $p = 0.004$ ) indicating its likelihood to be associated to all three factors<sup>19</sup>.

De Quervaintenosynovitis considered second most common hand tendinopathy after carpal tunnel syndrome<sup>23</sup>. Literature shows peak prevalence age of de quervain as 30-45 years with a peak incidence at the age of 40–59 years<sup>24</sup>. This finding is supported by various studies, a similar study conducted by Iwan Muhamad Ramadanto identify prevalence of de quervain among motorcyclist stated that average age of 76.7% motorcyclist having de quervain is 40yrs<sup>21</sup>. However, peak prevalence age of de quervain among clinical physiotherapist as identified by our study is 25-35, that accounts for more than 90% of participants. Similar results were observed in a research publication by Mehwish Mubeen et al, regarding analysis of thumb pain in terms of age-wise distribution showed that 95.8% of physiotherapists about experiencing thumb pain were between the age of 25-31 years while 0.46% of physical therapists having thumb pain were between the age range of 32-38 years<sup>25</sup>.

Since This age is visibly skills developing phase and lack of manual handling experience and abnormal thumb and wrist posture among novice practitioners make them susceptible to developing de quervain tenosynovitis. Although literature show de quervain tenosynovitis to be more prevalent among females as A study conducted by Israr Ahmad et al found De Quervain to occur at a ratio of 8:1 in females and males respectively. The study reported that housewives and females who perform manual work are more prone to develop this musculoskeletal condition<sup>26</sup> the results are opposing in results of our study, as males were found to suffer more from De Quervain than females i.e. 59.7% and 40.3% respectively. This was because male physical therapists tend to apply manual techniques for more time and with greater force as compared to female physical therapists. In current study, majority of participants (79.2%) with de quervain tenosynovitis had moderate intensity of thumb pain. This finding was supported by another study conducted by mairae et al to determine prevalence of de quervain among carpenters reported that majority of participants with de quervain tenosynovitis experienced moderate thumb pain (average of 6.93 on Numeric pain rating scale)<sup>27</sup>.

There are several limitations of this study, One limitation is that it was based on self-reported information provided by clinician physiotherapists. It was unfeasible to evaluate risk factors for development of De-Quervain's tenosynovitis. With a small sample size and sample setting it was not convenient to generalize the study. Future researches on De-Quervain's tenosynovitis among clinician physical therapists are recommended to include: evaluating risk factors contributing to De-Quervain's tenosynovitis.

## CONCLUSION

There was 26.74% prevalence of De-Quervain's tenosynovitis among clinician physical therapist. There was prevalence of 31.94% among males and 21.51% among females respectively. This showed that male clinician physical therapists were more exposed to De-Quervain's tenosynovitis as compared to female.

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revising it critically for important intellectual content, UA: Final approval of the version to be published

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**Ethical Approval:** This study was approved by the Institutional Review Committee (IRC) /Ethical Review Board (ERB) of the University of Lahore, Islamabad Campus. A written informed consent was taken from each participant.

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