

# Prevalence of De Quervain's tenosynovitis in housemaids using Finkelstein test

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## Abstract:

**Background-**De Quervain's tenosynovitis is a condition causing inflammation of the tendon of the wrist leading to pain at the base of the thumb. The main characteristics of this condition are pain and swelling over the radial styloid process. Finkelstein's test is a standard test used for the diagnosis of De Quervain's tenosynovitis. A positive test is the reproduction of pain over the radial styloid process. Housemaids are involved in various activities where major use of hand muscles will be seen leading to different musculoskeletal disorders of the upper limb. Activities like wringing clothes, squeezing, etc. repeatedly over years may lead to De Quervain's tenosynovitis.

**Methodology-**An observational study was carried out in which housemaids between the age group of 29 to 40 yrs., working for more than 5 years of age and more than 6 hours a day in and around the PCMC area were selected by convenient sampling as per inclusion criteria. The females who have any musculoskeletal condition, inflammatory disorders of the hand, history of fractures, carpal tunnel syndrome, tendon injury, or repair were excluded. Consent forms were taken from subjects and were informed about the study procedure, demographic data were taken and Finkelstein's test was performed, the data was collected and the results were tabulated.

**Results-** 173 subjects were assessed out of which 110 subjects had De Quervain's tenosynovitis positive while 63 subjects had test negative. 64% out of the total population assessed had test positive regardless of side and 36% had the results negative. Out of 110 positive results, 72 subjects had De Quervain's tenosynovitis of dominant hand while 38 subjects had it of both dominant as well as non-dominant hand i.e. 65% had De Quervain's of dominant hand while 35% had bilateral.

**Conclusion-** The results of the study showed that 64% prevalence of De Quervain's tenosynovitis is found in housemaids. It can be concluded that the dominant hand (65%) is affected more and less bilateral affection (35%)

**Keywords-** *De-Quervain's tenosynovitis, Finkelstein test, Housemaids, Musculoskeletal disorders.*

## INTRODUCTION:-

De Quervain's Tenosynovitis is a painful inflammation of tendons on the side of the wrist at the base of the thumb <sup>[1][2]</sup>. The tendons included are extensor pollicis brevis (EPB) and abductor pollicis longus (APL) [Figure 01]. These muscles are located on the dorsal side of the forearm and go to the lateral side of the thumb through a fibro-osseous tunnel located along the radial styloid at the distal wrist <sup>[1][2]</sup>. Fritz de Quervain, a Swiss surgeon was the first to describe De Quervain's tenosynovitis in 1895, and the condition was named after him <sup>[3][4]</sup>. The first dorsal compartment of the wrist is lined by a synovial sheath contains the abductor pollicis longus and extensor pollicis brevis tendons separating it from the five other dorsal wrist compartments. These tendons pass through an approximately 2 cm long fibrous tunnel that is passing over the radial styloid and under the transverse fibers of the extensor retinaculum risking them for entrapment, particularly due to acute trauma or repetitive motion <sup>[17]</sup>. The etiology of de Quervain's tenosynovitis is unclear, it has been described as myxoid degeneration along with fibrous tissue deposition and also there is increased vascularity rather than acute inflammation of the synovial lining. This fibrous tissue deposition results in thickening of the tendon sheath, which entraps the abductor pollicis longus and extensor pollicis brevis tendons leading to pain <sup>[17]</sup>. Pain and swelling over the radial styloid process are the main characteristics of the condition. Pain is mainly due to thumb movement and radial and ulnar deviation of the wrist <sup>[3][4]</sup>. Many musculoskeletal disorders are due to repetitive and forceful activities or any awkward position <sup>[4][5]</sup>. Repetitive strain injuries or cumulative trauma disorders create challenges in many day-to-day activities, to diagnose, treat and establish a relationship between activity and work-related disorders the study has been carried out <sup>[5]</sup>. Housemaids are involved in various task which include repetitive muscles use of upper limb leading to twisting, wringing, and pull-push activities which predispose them to common musculoskeletal high-risk factors in the upper limb <sup>[7][8][9]</sup>. Diagnosis is carried out of De Quervain's tenosynovitis by Finkelstein's test which is a standard finding. A positive Finkelstein test is the reproduction of pain at the radial styloid process <sup>[10]</sup>. Harry Finkelstein was an American surgeon (1865–1939) who described the Finkelstein's test or Finkelstein's sign in 1930. It is a test provocative for the diagnosis of De Quervain's disease and it can be easily performed in an office setting or bedside <sup>[11]</sup>. Finkelstein's test is positive when there is severe tenderness and pain on the radial aspect of the wrist when the thumb is flexed into the palm and the wrist is ulnar deviated <sup>[12]</sup>. Musculoskeletal disorders (MSDs) are injuries or dysfunctions which affect muscles, bones, nerves, tendons, ligaments, joints, cartilage, and spinal discs. It may include sprains, strains, tears, soreness, pain, carpal tunnel syndrome, hernias, connective tissue injuries, etc <sup>[16]</sup>. Often, cleaners participate in different physical activities that may change their normal body mechanics, which potentially leads them to develop musculoskeletal disorders over time <sup>[16]</sup>. A Positive test indicates that there is an indication of a Para tendonitis of over abductor pollicis longus and extensor Pollicis brevis tendons <sup>a1</sup>. Various repetitive hand movements like kneading dough, wringing clothes, lifting, and carrying, squeezing may lead to inflammation of abductor pollicis longus and extensor pollicis brevis which may lead to De Quervain's tenosynovitis hence traditionally it is also called "Washer Woman's sprain" the wrist joint <sup>[10]</sup>.

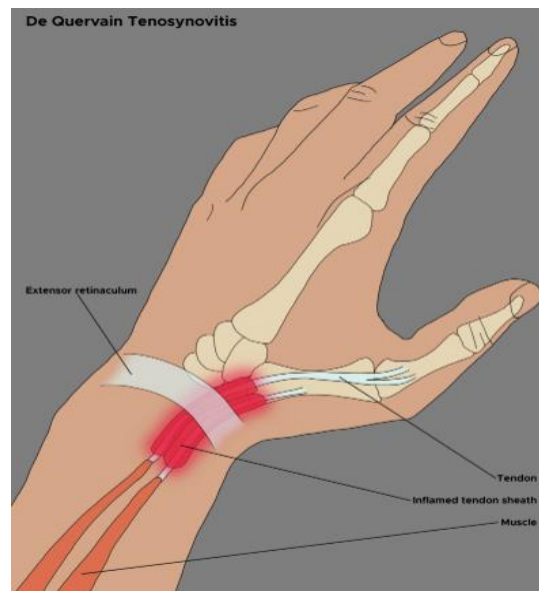


Figure 01-  
Illustration of De Quervain Tenosynovitis.

Extensor retinaculum, wrist tendon, inflamed tendon sheath, muscle<sup>[18]</sup>

#### Need of study-

In India, many women are involved as housemaids for several hours a day which involves various twisting, wringing, and turning activities that predispose them to the common risk of musculoskeletal disorders. There have been studies to prove that there are several musculoskeletal disorders affecting different areas of the body in housemaids. But there is a lack of evidence in the literature that has studied the prevalence of De-Quervain's Tenosynovitis in housemaids and hence this study has been carried out.

#### Aim-

To study the prevalence of de Quervain's tenosynovitis in housemaids.

#### Objective-

To determine the presence of De Quervain's tenosynovitis in housemaids using Finkelstein's test

#### Hypothesis-

##### Null hypothesis (H<sub>0</sub>):

There is no prevalence of de Quervain's tenosynovitis in housemaids

##### Alternative hypothesis (H<sub>1</sub>):

There is a prevalence of de Quervain's tenosynovitis in housemaids.

#### Research Question:

Is there a prevalence of De Quervain's tenosynovitis in housemaids?

#### Material and Methodology:

##### Methodology:

Type of Study: - Observational study

Sampling: - Convenient sampling

Study Set up: - PCMC, PUNE

Sample size: -173

Study duration: -6 months

##### Materials required: -

1. Pen
2. Paper
3. Chair
4. Table

##### Outcome measures: -

Finkelstein's test.

**Inclusion and Exclusion criteria:**

Inclusion criteria	Exclusion criteria
Females in the age group of 29-40 years.	Females who have any musculoskeletal condition or any other inflammatory disorder of hand or wrist.
Females who have been working for more than 5 years	Any history of wrist fracture, carpal tunnel syndrome, tendon injuries or repair.
Females who have been working for more than 6 hours per day.	
Females who are involved in cleaning and washing activities.	

**Procedure:**

Subjects were selected considering the inclusion and exclusion criteria. Written consent was taken from the subjects. The subjects were informed about the study procedure. The subject was asked to sit on a chair with the forearm in mid-prone position supported on the table. The therapist sitting on the lateral side of the subject. The subject was asked to make a fist with the thumb inside the fist. The examiner stabilizes the forearm and deviates the wrist towards ulnar side. A positive test is indicated by pain over the abductor pollicis longus and extensor pollicis brevis tendons at the wrist joint. The data was collected and results were tabulated.

**Results:**

Finkelstein test	Positive	Negative
173	110	63

Table 01

A total of 173 subjects assessed 110 subjects had De-Quervain's tenosynovitis test positive, while 63 subjects had test results negative as shown in Table 01

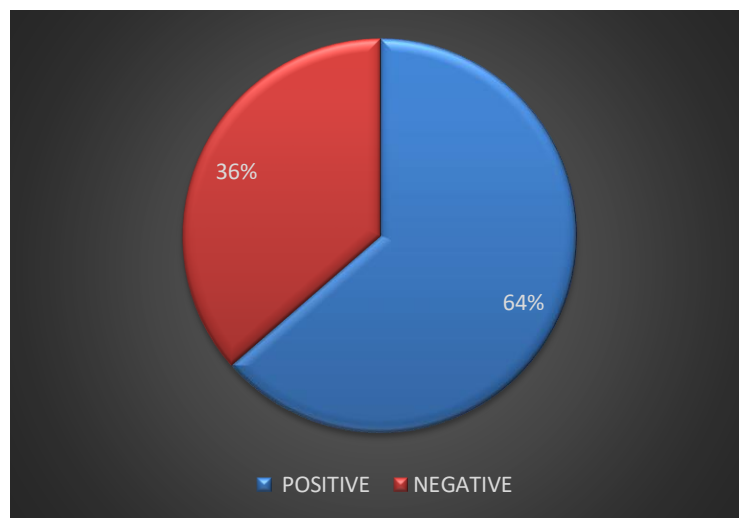


Figure 02

The percentages of population with the positive and negative results are shown in Figure 02. Out of total population assessed 64% had De-Quervain's tenosynovitis test positive regardless of side and 36% had test negative.

Hand dominance	Dominant	Dominant and Non-dominant
110	72	38

Table 02

Out of positive results 72 subjects had De-Quervain's tenosynovitis of dominant hand while 38 subjects' hand De-Quervain's tenosynovitis of both dominant and non-dominant hand (Table 02).

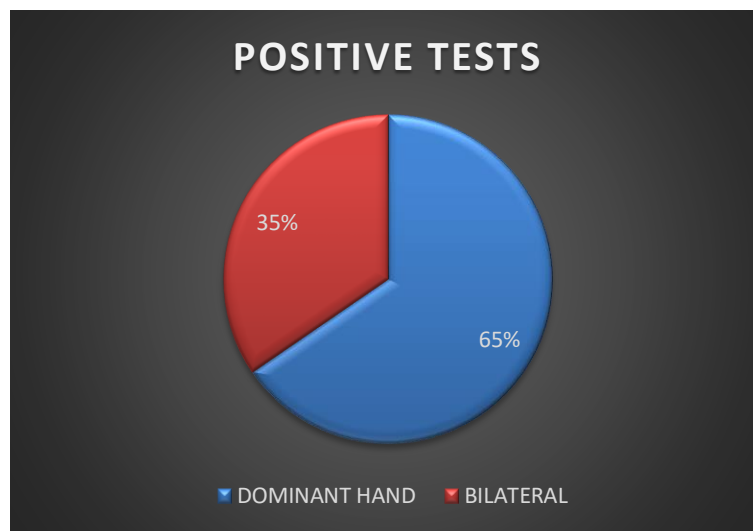


Figure 03

When assessed the results of both hand 65% had De-Quervain's tenosynovitis in dominant hand and 35% had De-Quervain's tenosynovitis in bilateral hands (Figure 03).

#### Discussion:

The study was conducted to determine the prevalence of De-Quervain's Tenosynovitis in 173 housemaids in the age group of 29-40. The population was selected according to the inclusion criteria, years of work as a housemaid, and the number of working hours. The prevalence of De-Quervain's was studied using the Finkelstein test. It is an active test commonly used to detect the presence of De-Quervain's Tenosynovitis.

On performing this test, it was found that 64% of the total population had an overall positive result i.e., 64% of the total population had a positive test regardless of side. Within this positive result, 65% had De-Quervain's Tenosynovitis in the dominant hand and 35% had it in both dominant as well as non-dominant hands. Thus, the conclusion was that there is a significant prevalence of De-Quervain's Tenosynovitis in housemaids.

Housemaids are involved in various challenging activities which include repetitive tasks, especially for the upper limb. There are various twisting, wringing, and pull-push activities which predispose them to a common musculoskeletal overuse injury of the upper limb. The wringing of clothes requires forearm supination, wrist flexion and ulnar deviation, fingers flexion, thumb flexion and abduction of one hand while forearm pronation, wrist extension, and radial deviation, thumb distal interphalangeal flexion, MCP flexion, and abduction of other hands.

These movements require forceful and strong contraction of forearm supinator pronators, wrist flexors, and extensors like Palmaris Longus (PL), Flexor Carpi Ulnaris (FCU), Flexor Digitorum Superficialis (FDS), Flexor <sup>[15]</sup> Digitorum Profundus (FDP) Extensor carpi radialis longus (ECRL), Extensor carpi radialis brevis (ECRB), Extensor digitorum (ED), Extensor digiti minimi (EDM), Extensor carpi ulnaris (ECU), Extensor indicis (EI) and thumb extensors, flexors and abductors such as Flexor Pollicis Longus (FPL), Abductor Pollicis Brevis, Extensor Pollicis Brevis.

Chronic forceful repetitive and strong contraction of these muscles causes trauma to the tendon which results in inflammation and swelling of extensor pollicis brevis and abductor pollicis longus over the radial styloid process. Pain is mainly due to thumb movement and radial and ulnar deviation of the wrist. Rope-like structures attaching muscles to bone are known as tendons. Gripping, grasping, clenching, pinching, or wringing anything with your hands, two tendons located in your wrist and lower thumb glide smoothly through the small tunnel that connects them to the base of the thumb <sup>[15]</sup>.

Repeating a particular motion day after day may irritate the sheath around the two tendons, causing thickening which leads to pain and may lead to functional disability. One of the studies, which was conducted by Piyali Mukherjee, Anindita Singha Roy, Amit Bandyopadhyay, and Somnath Gangopadhyay on 29 May 2020, Assessment of Work-Related Musculoskeletal Disorders among House Maids of Kolkata, India, states that Work-related musculoskeletal disorders (WMSDs) are common problems among the workers engaged in the unorganized sector. Working as a housemaid is a very old profession. WMSDs and pain experienced by housemaids were due to constrained and awkward working postures for a longer duration <sup>[13]</sup>.

Another study that supports my study has been conducted by Victoria Allbrook in November 2008; 'The side of my wrist hurts': De Quervain's tenosynovitis states that Radial-sided wrist pain is a common patient complaint that can have a dramatic effect on the patient's productivity at work, sporting or artistic pursuits and activities of daily living <sup>[14]</sup>. Another randomized control trial was carried out by Ippolito JA, Hauser S, Patel J, Vosbikian M, Ahmed I, and Nonsurgical Treatment of De-Quervain's tenosynovitis: A Prospective Randomized Trial. Hand (New York, N.Y.). 2018 Jul 30 states that De-Quervain's tenosynovitis is

commonly seen in patients who perform repetitive wrist ulnar deviation with thumb abduction and extension <sup>[4]</sup>. Hence from our study, it was found that there is the occurrence of De-Quervain's tenosynovitis in housemaids due to the nature of work performed on regular basis. The alternate hypothesis was proved by 64% overall positive results.

#### Conclusion:

The results of the study showed that 64% prevalence of De-Quervain's tenosynovitis is found in housemaids. It can be concluded that the dominant hand (65%) is affected more and less bilateral affection (35%).

#### Limitations of study:

Observational study.  
Study limited to only PCMC area.

#### Clinical implications and further scope:

Occupational hazards awareness and prevention strategies can be taught to housemaids. Ergonomic advice such as increased frequency of breaks, posture correction, muscle stretching will help in preventing pain. Intrinsic muscles strengthening, muscle imbalance exercises to be taught to prevent musculoskeletal disorders.

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