RESEARCH ARTICLE

©2023 The Academy of Environmental Biology, India

Journal of Ecophysiology and Occupational Health, *Vol 25(1), DOI: 10.18311/jeoh/2025/44387, 79-85, March 2025*

ISSN (Online) : 0972-4397
ISSN (Online) : 0974-0805

Prevalence of De Quervain's Tenosynovitis among Physical Therapists: A Cross-Sectional Study

Syeda Shaista Naz and Feba Roy*

Department of Health Sciences, Dayananda Sagar University, Ramanagara, Bengaluru – 562112, Karnataka, India; febaroy10@gmail.com

Abstract

Background: De quervain's Tenosynovitis (DQT) is a common condition characterised by the narrowing of the tendon sheaths in the wrist's first dorsal compartment. It affects approximately 1.3% of adult women and 0.5% of adult men in the general population[1]. This is often attributed to repetitive hand and wrist motions, which pose a significant challenge to physical therapists as it can impede their ability to deliver optimal patient care and compromise their well-being. Therefore, this study aims to conduct a prevalence study to determine the occurrence of DQT among physical therapists. **Material and Method:** this study was carried out among 84 physiotherapists in selected south Bangalore, India clinics. The participants were selected based on inclusion and exclusion criteria, after which Finkelstein's test was performed to rule out DQT. Patient Rated Wrist Evaluation questionnaire was used to evaluate wrist joint pain and difficulty using in daily activities. **Results:** Out of the 84 individuals sampled, 34 tested positive for Finkelstein's test, indicating a prevalence rate of 40.5%. It was observed that DQT is more commonly found in females compared to males and in individuals who work more than 6 hrs per day. **Conclusions:** This research offers valuable insights into the occurrence of DQT among physiotherapists and holds potential for developing preventative strategies and rehabilitation programs specifically tailored to the needs of physiotherapists.

Major Findings: This study highlights the high prevalence rate of De Quervain's tenosynovitis (DQT) among physiotherapists in South Bangalore, with 40.5% testing positive and a greater incidence among females and those working over 6 hours daily. Given the lower prevalence in the general population, these findings underscore the occupational risks physiotherapists face.

Keywords: De Quervain's Tenosynovitis, Pain, Physiotherapist, Wrist

Abbreviations: DQT - de Quervains Tenosynoitis**,** WRULD- Work-Related Upper Limb Disorder, APL - Abductor Pollicis, EPB - Extensor Pollicis Brevis, PT - Physical Therapy, CMC - Carpo Metacarpel

1. Introduction

De Quervain tenosynovitis is a condition defined by the entrapment of the first dorsal compartment of the wrist which includes the tendons of the APL and EPB muscles, which is the common cause of wrist and hand pain[2]. Common sites prone to tenosynovitis are the hand, wrist, and forearm[3]. The extensor tendons of the forearm muscles separate into six different compartments encased in a fibro-osseous sheath[4]. When subjected to shear stress and compressive forces, these result in the tendon sheath's thickening (due to myxoid degeneration) within the extensor retinaculum, thereby narrowing the tunnel space[4,5].

Clinical symptoms include localized soreness over the styloid process of the radius and a restricted range of motion in the thumb's carpometacarpal joint during the abduction. Irritation of the nerve spanning the tendon sheath causes the posterior part of the thumb and index finger to become numb[5]. Since women's wrists often angulated farther than men's, tendons in the first compartment are more vulnerable to stress. This is likely the reason why women are three times more susceptible than men to developing stenosing tenosynovitis near the radial styloid[6]. The clinical examination of choice for diagnosing DQT is the Finkelstein test. In this test, the patient is asked to actively take the wrist into ulnar deviation followed by which the examiner will passively

*Author for correspondence

Article Received on: 07.06.2024 Revised on: 23.08.2024 Accepted on: 30.08.2024

flex the thumb into the palm. The test is positive when it elicits pain which may radiate from the thumb[7].

Management of DQT emphasizes the importance of individualized treatment plans that incorporate patient-specific responses to therapy and pain levels, which encompasses both conservative and surgical approaches. Conservative management includes the use of non-steroidal anti-inflammatory drugs, corticosteroid injections, splinting, and physical therapy modalities and exercises[8].

It has been proven from previous studies, that due to the physically demanding and constant hands-on nature of the job, PTs are more likely to acquire WRULDs[9]. Due to the repetitive wrist movements involved in delivering myofascial release techniques, ultrasound therapy, manipulation techniques, and other treatments, physical therapists are at a high risk of developing DQT. Therefore, this research is designed to investigate the prevalence of DQT among physical therapists.

2. Materials and Methods

This cross-sectional study was conducted in Bangalore, India, and involved 84 participants, consisting of 57 females and 27 males which included Physical Therapy Interns, Master's students in Physiotherapy, and Practicing Clinicians.

2.1 Inclusion and Exclusion

The study included individuals who were physical therapy postgrad students, junior therapists, and senior therapists, and who practised techniques such as manipulations, trigger release, and manual therapy. Participants needed to be between 20 and 40 years old and work at least 2 hrs daily, but no more than 15 hrs weekly. Exclusion criteria comprised therapists with recent surgeries, motor vehicle injuries, sports-related injuries, upper extremity trauma or fractures, individuals with arthritis, pregnant women in the post-partum stage, and those with hypermobility.

2.2 Procedure

Before commencing the study, ethical clearance was obtained from the college for conducting the research. The data collection process included administering an informed consent form, a screening tool, and the Patient Rated Wrist Evaluation Questionnaire. First, the participant had to fill out the screening tool followed by which the examiner performed a special test known as Finkelstein's test to confirm DQT. Participants who tested positive for the test were asked to fill out the Patient Rated Wrist Evaluation Questionnaire. A descriptive analysis was performed using SPSS software (SPSS Inc.; Chicago, IL), version 26.0. Descriptive analyses were computed as means and standard deviations for continuous variables and frequency with percentages for nominal variables. The chi-square test compared categorical variables. Mann-Whitney and Spearman Ratio were also used.

3. Results

The study involved a statistical analysis with a sample size of 84 individuals who met the inclusion criteria. After administering Finkelstein's test, 34 participants tested

Table 1. Descriptive statistics of age and working hours

(n = 84)	Range	Mean	S.D.
Age (Years)	21 to 32	23.7	1.7
Working hours	2 to 12	7.2	2.2

Table 2. Demographic data

(n = 84)		Frequency	%
Age	20-24	63	75
	25-29	19	22.6
	30-34	2	2.4
Gender	Male	27	32.1
	Female	57	67.9
Educational status	BPT+ Practicing	58	69
	MPT+ Practicing	23	27.4
	Teaching + Practicing	2	2.4
	Clinician	1	1.2
Any recent surgeries or trauma to upper extremities?	No	84	100
Do you have arthritis?	Yes	1	1.2
	No	83	98.8
Are you pregnant or in the post-partum stage?	No	84	100
Finkelstein test	Positive	34	40.5
	Negative	50	59.5

Table 3. Comparison of age, educational status, arthritis, and Finkelstein test according to gender

		Gender				Chi-square/likelihood ratio#	p-value
		Male		Female			
		n	%	n	%		
Age	20-24	17	63.0	46	80.7	2.96#	0.227
	25-29	9	33.3	10	17.5		
	30-34	1	3.7	1	1.8		
Educational status	BPT + Practicing	16	59.3	42	73.7	2.91#	0.407
	MPT + Practicing	10	37.0	13	22.8		
	Teaching + Practicing	1	3.7	1	1.8		
	Clinician	0	0	1	1.8		
Do you have arthritis?	Yes	0	0	1	1.8	0.78	0.377
	No	27	100	56	98.2		
Finkelstein test	Positive	13	48.1	21	36.8	0.97	0.324
	Negative	14	51.9	36	63.2		

Table 4. Comparison of pain according to gender

Pain	Male		Female		"Z"	p-value
	Median	IQR	Median	IQR		
Pain at rest	0	0 to 0	0.5	0 to 2	-1.78	0.075
Pain, when doing a task with repeat wrist movement	1	0 to 4	3	1.3 to 4	-1.33	0.184
Pain, when lifting a heavy object	2	0 to 4	3	1.3 to 5	-1.72	0.086
Pain, when it is at its worst	4	1.5 to 6	4	2 to 6	-0.06	0.955
How often do you have pain?	2	1 to 3	3	2 to 4	-1.50	0.134

("Z" = Mann Whitney U test; IQR = Inter Quartile Range)

Table 5. Comparison of functional-specific activities according to gender

Functional specific activities	Male		Female		"Z"	p-value
	Median	IQR	Median	IQR		
Turn the door knob using my affected hand	0	0 to 2	2	0.3 to 3	-2.29	0.022*
Cut meat using a knife in my affected hand	0	0 to 2	2	0 to 3	-1.61	0.107
Fasten buttons on my shirt	0	0 to 2.5	0.5	0 to 3	-1.30	0.194
Use my affected hand to push up from a chair	0	0 to 2	2	1 to 3	-2.14	0.033*
Carry a 10 lb object in my affected hand	0	0 to 2	3	2 to 3.8	-3.16	0.002*
Use bathroom tissue with my affected hand	0	0 to 2	0.5	0 to 2	-0.35	0.730

("Z" = Mann Whitney U test; IQR = Inter Quartile Range; * Significant)

positive, resulting in an overall prevalence rate of 40.5% (Table 2).

The statistical analysis collected shows out of 84 samples 34 tested positive, resulting in a prevalence of 40.5%.

Table 3 shows that the Chi-square or Likelihood ratio test was used to compare age, educational status, arthritis, and the Finkelstein test according to gender. There was no difference ($p>0.05$) in age, educational status, arthritis, and Finkelstein test according to gender.

Table 4 shows that the Mann-Whitney U test was used to compare pain according to gender. There was no difference ($p>0.05$) in pain according to gender.

Table 5 shows that the Mann-Whitney U test was used to compare functional-specific activities according to gender. There was a difference ($p<0.05$) in functional-

Table 6. Relation between the various sub-scales of pain

Pain		Pain at rest	Pain, when doing a task with repeat wrist movement	Pain, when lifting a heavy object	Pain, when it is at its worst	How often do you have pain?
Pain at rest	Spearman's ratio	1	0.362	0.394	-0.226	0.334
	p-value	--	0.039*	0.023*	0.205	0.057
Pain, when doing a task with repeat wrist movement	Spearman's ratio		1	0.433	0.304	0.585
	p-value		--	0.012*	0.085	< 0.001*
Pain, when lifting a heavy object	Spearman's ratio			1	0.283	0.466
	p-value			--	0.110	0.006*
Pain, when it is at its worst	Spearman's ratio				1	0.518
	p-value				--	0.002*
How often do you have pain?	Spearman's ratio					1
	p-value					--

(* Significant)

Table 7. Relation between age, working hours, and pain

Pain		Age (Years)	Working hours
Pain at rest	Spearman's ratio	0.056	0.293
	p-value	0.758	0.098
Pain, when doing a task with repeat wrist movement	Spearman's ratio	0.055	0.197
	p-value	0.759	0.272
Pain, when lifting a heavy object	Spearman's ratio	0.208	0.382
	p-value	0.244	0.028*
Pain, when it is at its worst	Spearman's ratio	-0.050	0.241
	p-value	0.781	0.177
How often do you have pain?	Spearman's ratio	0.273	0.245
	p-value	0.125	0.169

(* Significant)

Table 8. Relation between the age, working hours, and functional usual activities

Functional usual activities		Age (years)	Working hours
Personal care activities (dressing, washing)	Spearman's ratio	0.188	0.280
	p-value	0.296	0.115
Household work (cleaning)	Spearman's ratio	0.220	0.398
	p-value	0.219	0.022*
Work (your job or everyday work)	Spearman's ratio	-0.144	0.394
	p-value	0.423	0.023*
Recreational activities	Spearman's ratio	0.029	0.566
	p-value	0.871	0.001*

(* Significant)

specific activities: "Turn door knob using my affected hand", "Use my affected hand to push up from a chair" as well as "Carry a 10-lb object in my affected hand" between males and females.

Table 6 shows that the Spearman's ratio was used to find the relation between the various sub-scales of pain. "Pain at rest" was positively correlated ($p<0.05$) with "Pain, when doing a task with repeat wrist movement" as well as "Pain, when lifting a heavy object". The "Pain, when doing a task with repeat wrist movement" was positively correlated ($p<0.05$) with "Pain, when lifting heavy objects" as well as "How often do you have pain?" Also, "How often do you have pain?" was a positively correlated ($p<0.05$) between with "Pain, when lifting a heavy object" as well as "Pain, when it is at its worst".

Table 7 shows that the Spearman's ratio was used to find the relation between age, working hours, and pain. Working hours were positively correlated ($p<0.05$) with "Pain when lifting a heavy object".

Table 8 shows that the Spearman's ratio was used to find the relation between age, working hours, and functional usual activities. Working hours were positively correlated ($p<0.05$) with functional usual activities: "Household work (Cleaning)", "Work (Your job or everyday work)", and "Recreational activities".

4. Discussion

Physiotherapists frequently perform tasks such as administering manual therapy techniques, myofascial release methods, transferring patients, carrying out repetitive wrist movements, and maintaining prolonged postures during daily practice. These activities increase their susceptibility to musculoskeletal and occupational injuries[10]. Consequently, assessing the prevalence of DQT among physiotherapists in clinical settings becomes crucial. The age range of the participants was between 21 and 32 (Table 1), with the majority (75%) falling between the ages of 21 and 24 (Table 2). Of the total participants in the study, 57 were females, and 27 were males. The findings of this study align with prior research conducted by Chaya, Saadat and Taufiq *et al.* confirming that DQT is more commonly observed in females (67.9%) than in males (32.1%)[2,11,12]. There was no difference found ($p>0.05$) in pain according to gender (Table 4). There was a difference in pain ($p<0.05$) in functional usual activities concerning gender (Table 5). "Pain at rest" was positively correlated ($p<0.05$) with "Pain, when doing a task with repeat wrist movement" (Table 6) which is in line with a study conducted by Obembe *et al.* that showed a 6.1% prevalence of job risk activities caused by repeated wrist movements and by performing manual therapy techniques (20.9%)[13]. The entire sub-scales of functional-usual activities were positively correlated ($p<0.05$) with each other. Working hours were positively correlated ($p<0.05$) with "Pain when lifting a heavy object" and with functional-specific as well as functional-usual activities. This is in line with a study conducted by Obembe *et al.* in which there is mention of transferring patients that corresponds to lifting heavy objects in the current study[13]. Based on the findings of the present study, it was observed that DQT is more commonly found among individuals in the age group of 20-24, with a prevalence rate of 70.6%. This contradicts the results of several previous studies, including those conducted by Reada *et al.*, Pillay and Adachi *et al.* which typically reported a higher prevalence of DQT in individuals over the age of 30[3,5,14]. The analysis of the raw data from this study revealed a stronger association between DQT prevalence and working hours ranging from 8 to 9. This finding is consistent with a similar cross-sectional study conducted by Ramdan *et al.* which reported a higher prevalence of DQT among motorcycle repair mechanics working more than 8 hrs[15]. Additionally, an observational cross-sectional study by Reada *et al.* also demonstrated a correlation between a positive Finkelstein's sign and the duration of phone use, specifically in the range of 6-8 hrs[3,16].

Research conducted by Waller *et al.* has highlighted that physiotherapists are at an increased risk of developing WRULDs due to the physically demanding and hands-on nature of their work[3]. Among various studies, WRULDs were most commonly associated with thumb disorders, followed by wrist and hand disorders[3]. These WRULDs were primarily linked to factors such as treating a large number of patients daily and frequent use of manual therapy techniques, which resulted in injuries to the wrist and hand. Additionally, younger therapists tended to have a higher prevalence of WMSDs across various body regions, and the use of mobilization and manipulation methods was correlated with an increased occurrence of thumb-related symptoms. Therefore, understanding the

prevalence of DQT among physical therapists is essential for several reasons. Firstly, it provides valuable insights into the occupational health risks associated with this profession, facilitating the implementation of targeted preventive measures to mitigate injury occurrence. Additionally, knowledge of the prevalence rates can guide healthcare policies aimed at improving workplace ergonomics and promoting strategies for injury prevention and management among physical therapy practitioners.

5. Conclusion

In summary, this study has highlighted that DQT is more prevalent among female physiotherapists and those who work for extended periods, typically between 6 to 9 hrs per day. This increased prevalence is associated with repetitive wrist movements and the lifting of heavy objects, particularly when transferring patients. The condition is often linked to the chronic overuse of the APL and EPB tendons, which can lead to myxoid degeneration and subsequent entrapment within the first dorsal compartment of the wrist. To mitigate the risk of WMSDs in physiotherapists, it is essential to incorporate newer approaches into practice. For instance, adopting methods such as Instrument-Assisted Soft Tissue Mobilization (IASTM) tools and shock wave therapy can help reduce the likelihood of these occupational health issues among physiotherapists.

6. Acknowledgement

The authors thank all the participants without whom this study would not have been possible.

7. References

1. Stahl S, Vida D, Meisner C, Lotter O, Rothenberger J, Schaller HE, *et al*. Systematic review and meta-analysis on the work-related cause of De Quervain tenosynovitis: A critical appraisal of its recognition as an occupational disease. Plast Reconstr Surg. 2013; 132(6):1479-91. https://doi.org/10.1097/01.prs.0000434409.32594.1b
2. Chaya B, Bakhach E, Bakhach J. The De Quervain tenosynovitis: Literature review. Biomed J Sci Tech Res. 2018;8 (4):001691. https://doi.org/10.26717/BJSTR.2018.08.001691
3. Reada B, Alshaebi N, Almaghrabi K, Alshuaibi A, Abulnaja A, Alzahrani K. Prevalence and awareness evaluation of De Quervain's tenosynovitis among students in the Kingdom of Saudi Arabia. Int J Pharm Res Allied Sci. 2020; 9(4):151-7.
4. Allbrook V. The side of my wrist hurts: De Quervain's tenosynovitis. Aust J Gen Pract. 2019; 48(11):753-6. https://doi.org/10.31128/AJGP-07-19-5018
5. Pillay P. A study to determine the prevalence of signs and symptoms of carpal tunnel syndrome and De Quervain's tenosynovitis in garment workers in the eThekwini district of KwaZulu-Natal (Doctoral dissertation); 2012.
6. Lipcomb P. Stenosing tenosynovitis at the radial styloid process; (De Quervain's disease). Ann Surg. 1951; 134(1):110-5. https://doi.org/10.1097/00000658-195107000-00013
7. Wu F, Rajpura A, Sandher D. Finkelstein's test is superior to Eichhoff's Test in the investigation of De Quervain's disease. J Hand Microsurg. 2018; 10(2):116-8. https://doi.org/10.1055/s-0038-1626690
8. Challoumas D, Ramasubbu R, Rooney E, Seymour-Jackson E, Putti A, Millar NL. Management of De Quervain tenosynovitis: A systematic review and network meta-analysis. JAMA Netw Open. 2023; 6(10):e2337001. https://doi.org/10.1001/jamanetworkopen.2023.37001
9. Waller E, Bowens A, Washmuth N. Prevalence of and prevention for work-related upper limb disorders among physical therapists: A systematic review. BMC Musculoskelet Disord. 2022; 23(1):453. https://doi.org/10.1186/s12891-022-05412-8
10. Obembe A, Onigbinde A, Johnson O, Emechete A, Oyinlola M. Occupational injuries among physical therapists in South-West, Nigeria. Niger J Clin Med. 2009; 25-30. https://doi.org/10.34058/njmr.v13i1.2.38
11. Saadat M. Frequency of De Quervain's tenosynovitis in carpenters of Lahore. Healer J Physiother Rehabil Sci. 2021;1(2):68-75. https://doi.org/10.55735/thjprs.v1i2.39
12. Taufiq F, Batool T, Bashir S. Prevalence of De-Quervain's tenosynovitis among medical students of Allama Iqbal Medical College. J Riphah Coll Rehabil Sci. 2015; 3(2):95-8.
13. Obembe A, Onigbinde A, Johnson O, Emechete A, Oyinlola M. Occupational injuries among physical therapists in South-West, Nigeria. Niger J Med Rehabil. 2009; 13(1.2):25-30. https://doi.org/10.34058/njmr.v13i1.2.38
14. Adachi S, Yamamoto A, Kobayashi T, Tajika T, Kaneko T, Shibusawa K, Takagishi K. Prevalence of de Quervain's

disease in the general population and risk factors. Kitakanto Med J. 2011; 61:479-82. https://doi.org/10.2974/kmj.61.479
15. Ramdan IM, Nur A, Sultan M, Adrianto R, Baharudin I. De Quervain's disease among motorcycle repair mechanics and related factors. Indian J Public Health Res Dev. 2022; 13(1):156-63. https://doi.org/10.37506/ijphrd.v13i1.17340
16. Cromie JE, Robertson VJ, Best MO. Work-related musculoskeletal disorders in physical therapists: Prevalence, severity, risks, and responses. Phys Ther Rehabil J. 2000; 80(4):336-51. https://doi.org/10.1093/ptj/80.4.336

Access this journal online	
Website: www.informaticsjournals.co.in/index.php/JEOH/index	**Quick Response Code**