ORIGINAL ARTICLE

De Quervain's tenosynovitis and thumb pain in physiotherapists practicing manual therapy: prevalence and associated factors

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ABSTRACT

Background and Objective: Manual therapy is a treatment approach by physical therapists where different techniques are applied to patients with hands for rehabilitation purposes. The objective of the study was to find the frequency of De'Quervain tenosynovitis and thumb and wrist pain in physical therapists working in different rehabilitation centers in relation to age, body mass index (BMI), and working hours.

Methods: A cross-sectional study was conducted on 135 physical therapists working in different settings in Lahore, Pakistan. Physiotherapists were enrolled by convenience sampling. Data were recorded on a questionnaire form. Finkelstein test was performed to check De Quervain's tenosynovitis. A numeric pain rating scale was sued to measure pain. The data were tested for significance using statistical tests.

Results: On the dominant hand, 99 (73.3%) physical therapists had no wrist pain, 104 (77%) had no thumb pain, 28 (20.7%) had mild wrist pain and 20 (14.8%) had mild thumb pain. Only 21 (15.6%) physiotherapists were tested positive for Finkelstein (De Quervain's tenosynovitis). Finkelstein test reported 100% negative result on the non-dominant side. There is a negative correlation between thumb pain with the age (r = -0.005), BMI (r = -0.110) and working hours (r = -0.033) of the physical therapists.

Conclusion: The study concluded that the prevalence of De Quervain's tenosynovitis, thumb, and wrist pain was more on the dominant hand than on the non-dominant side. The majority of the physical therapists reported mild to no pain in the wrist and thumb. There is a negative correlation of thumb pain with age, BMI and working hours.

Keywords: Thumb pain, manual therapy, work-related musculoskeletal disorder, De Quervain's tenosynovitis, Finkelstein test, physical therapists.

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Introduction

De-Quervain tenosynovitis is a musculoskeletal condition which is characterized by thinning and degenerative processes, caused by stenosing inflammation of the tendon sheath in the first dorsal compartment of the hand. The common complaints of the patient are pain and swelling which is triggered by lifting, grasping or any activity that deviates the wrist on the ulnar side of the hand.

According to epidemiological studies, De-Quervain tenosynovitis is 3 to 10 times more prevalent in women than in men.[1,2]

There may be conservative treatment or surgical treatment according to the severity of the condition. Conservative care involves anti-inflammatory medication and corticosteroid injections as well as occupational therapy to include splinting, activity modification, modalities, manual treatment, and therapeutic exercise.[3]

Work-related musculoskeletal diseases (WRMSD) are the musculoskeletal conditions brought on by or made worse by long hours of work and the conditions in which it is performed. The majority of WRMSD in physical therapists are reported in the upper limb extremities. When correlated with a heavy reliance on manual approaches, percentages appear to be higher.[1]

Nowadays, the most common complaint among physiotherapists who use manual therapy is thumb and hand discomfort after lower back pain. Due to their line of work, physiotherapists are extremely prone to a variety of musculoskeletal conditions.[2] According to the International

Association for the study of pain, pain is defined as a distressing sensory and emotional experience connected to actual and potential tissue damage or described in terms of such harm.[3] Since their work is so physically demanding and hands-on all the time, physical therapists, in particular, are more likely to acquire work-related upper limb disorders or occupational musculoskeletal disorders.[4,5]

Physical therapists who employ manual therapy procedures like massage, mobilization, and manipulation frequently put their upper limbs under stress and compress their thumb joints, making them more susceptible to biomechanical and occupational problems.[6] When force is transmitted through the thumb, the distal end of the thumb is met by resistance from the tissue being treated, acting as a pseudo-weight-bearing joint. Physical therapists generate forces by employing their body weight. Consequently, it causes repetitive strain injuries in the thumb.[7] It is reported that 43% to 91% of physical therapists change their manual therapy approaches as a result of work-related thumb pain (WRTP).[8,9]

The rationale of this study was to find out the prevalence of De Quervain's tenosynovitis and thumb pain and its association with different manual therapy techniques in manual physical therapists working in local clinical centers of Lahore city of Pakistan.

Methods

A cross-section study was conducted on physical therapists using manual therapy techniques who were recruited for the study through non-probability convenient sampling from different clinical centers of Lahore city of Pakistan [Hospital of the Pakistan Society of Rehabilitation of Disabled, Jinnah Hospital and Ittefaq Hospital Lahore, Pakistan]. The study was conducted from November 15, 2021 to January 15, 2022 and ethical approval was taken from the Institutional Ethical Review Committee.

A written informed consent was obtained from the subjects after explaining the design of the study. A validated questionnaire was filled in the physical presence of the manual therapists. The questionnaire comprised of numeric pain rating scale (NPRS) and the Finkelstein test. The descriptive data of gender, age, working year experience, working hours in a week, techniques of manual therapy used, and thumb and wrist pain measurement via NPRS[10] was carried out. NPRS is a scale with 11 readings, 0 means no pain, 1-3 means mild pain, 5-7 means moderate pain and 8-10 means severe pain. Finkelstein test[11] was performed to test De Quervain's Tenosynovitis.

Inclusion criteria was the physical therapists practicing manual therapy only, with at least 6-month clinical experience, practicing at least 4 working days with at least 4 clinical hours each day, of both genders**,** aged between 22 and 45 years. Physiotherapists having a history of hand or thumb injury, trauma, or fracture, not willing to take part in the study, and chiropractors were excluded.

Statistical analysis

Data were analyzed with the help of Statistical Package for Social Sciences version 21.0 using frequencies, means, SD, cross-tabulations and associations among the dependent and independent variables. p value <0.05 was taken as significant.

Results

The mean age of the subjects was 26.19 ± 2.989 years with a minimum age of 18 years and maximum age of 39 years. A total of 23.70% of subjects were males and 76.30 were females. The mean body mass index (BMI) was 22.62 ± 1.470. The mean working hours calculated were 6.5 ± 1.47 hours per day with a minimum of 4 hours and a maximum of 10 hours. Out of 135 subjects, 93.3% (n = 126) were right-handed and 6.7% (n = 9) were left-handed. A total of 48.9% (n = 66) subjects worked in outpatient settings (OPD), 2.2% (n = 3) in Wards, another 2.2% (n = 3) reported to be working in both OPD and intensive care units (ICU) and 22.2% (n = 3) worked in both OPD and Ward. As regards the years of experience, 62.2% (n = 84) of physiotherapists had a working experience of 1 to 5 years in manual therapy techniques. Regarding the type of maneuvers adopted for manual therapy, most of the therapists were performing soft tissue release technique (55%) followed by trigger point pressure release technique (51.1%), and peripheral joint mobilization (43.7%) (Table 1).

On enquiring about the pain in wrist and thumb on dominant and non-dominant hands, out of 135 physiotherapists, 73.3% and 93.3% of physical therapists reported no wrist pain on their dominant and non-dominant hands, respectively. Similarly, 77.04% and 91.1% of physical therapists reported no thumb pain on their dominant and non-dominant hands respectively. None of the subjects reported severe pain in non-dominant hands while 2.2% and 1.48% physical therapists reported severe wrist and thumb pain in dominant hands only (Figure 1). Finkelstein test was positive in 21 (15.6%) subjects while it was negative in 114 (84.4%). Moreover, out of 33 physiotherapists who had an experience of 6 months to 1 year, 7 (21.3%) tested positive and 26 (78.7%) tested negative for the Finkelstein test of the dominant hand (Table 2).

Bivariate Pearson's correlation found that there was a negative correlation of thumb pain (dominant side) with the age (r = -0.005), BMI (r = -0.110) and working hours (r = -0.033) of the physical therapists.

Discussion

Manual therapists are at an increased risk of thumb pain and development of upper limb musculoskeletal disorders. Yaseen et al.[8] reported 48% of the physiotherapists having WRTP with most of them (23%) pointing out the trigger point therapy

Table 1. *Techniques used by manual therapists in their daily practice.*

		Always		Often		Sometimes		Rarely		Never	
		Frequency	%	*F*	%	*F*	%	*F*	%	*F*	%
1	Peripheral joint mobilization	59	43.7	42	31.1	32	23.7	2	1.5	0	0
2	Vertebral joint mobilization	56	41.5	40	29.6	30	22.2	6	4.4	3	2.2
3	Spine HVLA manipulation	12	8.9	15	11.1	54	40	31	23	23	17
4	Soft tissue release	75	55.6	46	34.1	10	7.4	3	2.2	1	0.7
5	Trigger point release	69	51.1	48	35.6	16	11.9	2	1.5	0	0
6	Vibration and shaking	12	8.9	27	20	42	31.1	40	29.6	14	10.4
7	Percussion	30	22.2	20	22.2	28	20.7	32	23.7	15	11.1
8	Traction	53	39.3	55	40.7	13	9.6	11	8.1	3	2.2

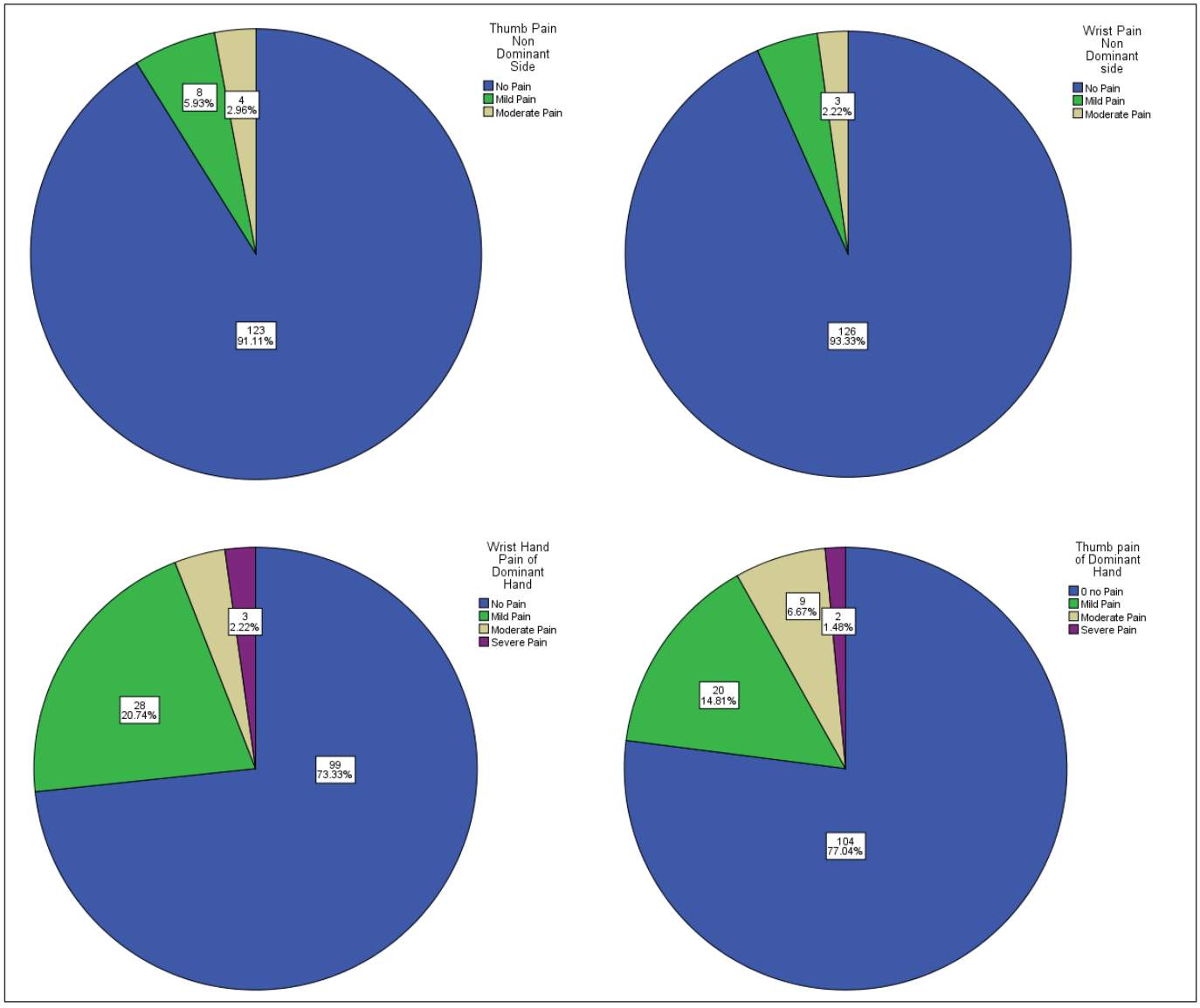

Figure 1. *Frequency of thumb and wrist pain on dominant and non-dominant sides.*

Table 2. *Finkelstein test result cross tabulation with demographics.*

Sr. No			Finkelstein test (Dominant hand)		
			Positive	Negative	Total
1	Age (in ranges)	22-28 years	18 (15.8%)	96 (84.2%)	114
		29-35 years	3 (17.6%)	14 (82.4%)	17
		36-45 years	0 (0%)	4 (100%)	4
		Total	21 (15.6%)	114 (84.4%)	135
2	Gender	Male	4 (12.5%)	28 (87.5%)	32
		Female	17 (16.5%)	86 (83.5%)	103
		Total	21 (15.6%)	114 (84.4%)	135
3	Dominant limb	Right	21 (16.7%)	105 (83.3%)	126
		Left	0 (0%)	9 (100%)	9
		Total	21 (15.6%)	114 (84.4%)	135
4	BMI	Normal	12 (13.2%)	79 (86.8%)	91
		Below normal	4 (26.7%)	11 (73.3%)	15
		Above normal	5 (17.2%)	24 (82.8%)	29
		Total	21 (15.6%)	114 (84.4%)	135
5	No. of hours per day in 5 days a week	4-7 hours	14 (14.6%)	82 (85.4%)	96
		8-10 hours	7 (17.9%)	32 (82.1%)	39
		Total	21 (15.6%)	114 (84.4%)	135
6	Working experience	6 months to 1 year	7 (21.2%)	26 (78.8%)	33
		1 to 5 years	12 (14.3%)	72 (88.9%)	84
		Above 5 years	2 (11.1%)	16 (88.9%)	18
		Total	21	114	135
7	Department	OPD	11 (16.7%)	55 (83.3%)	66
		WARDS	1 (33.3%)	2 (66.7%)	3
		ALL	8 (13.3%)	52 (86.7%))	60
		OPD and ICU	0 (0%)	3 (100%))	3
		OPD and Wards	1 (33.3%)	2 (66.7%)	3
		Total	21 (15.6%)	114 (84.4%))	135

Non-dominant side showed a 100% negative Finkelstein test result.

in their practice thus concluding a significant relationship between the type of manual therapy technique and risk of development of thumb pain. Other studies also reported manual therapy leading to musculoskeletal issues especially thumb and hand muscle pains in physical therapists.[12,13]

According to the present study, 104 (77%) subjects had no thumb pain, 20 (14.8%) had mild, 9 (6.7%) had moderate, and 2 (1.5%) had severe thumb pain. In 2020, Mahajan et al.[7] conducted a study on 118 participants from Delhi (India) where he reported 61.02% of physiotherapists had no thumb pain while 38.98% reported significant pain in thumb. Other similar studies have also reported acute thumb pain.[9,14]

In the present study, 21 (15.6%) subjects tested positive for the Finkelstein test while 114 (84.4%) were negative. According to previous studies, the prevalence of De Quervain's tenosynovitis is common in professionals utilizing manual skills for physical therapy.[15-17]

In 2020, Baabdullah et al.[18] conducted a study on 387 participants who reported thumb/wrist pain in 20.4% of participants while 19.1% among these had a positive Finkelstein test. The present study reported a negative correlation of thumb pain the variables like age, BMI, and working hours. But according to previous studies, duration and working hours is one of the important factors leading to musculoskeletal diseases (MSK) burden which requires more exploration of the phenomenon in the local population of Pakistan.[19]

Conclusion

The frequency of De Quervain's tenosynovitis is more on the dominant than the non-dominant side of the physical

therapists practicing manual therapy techniques. There is a negative correlation of hand and wrist musculoskeletal pain with the age, BMI, and working hours of physical therapists.

Limitations of the Study

More studies should be conducted on a larger scale to find out the effect of manual therapy and its different techniques on the musculoskeletal system of health care providers especially physiotherapists using manual therapy.

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List of Abbreviations

BMI	Body mass index
NPRS	Numeric pain rating scale
WRMSD	Work-related musculoskeletal diseases

Conflict of interest

None to declare.

Grant support and financial disclosure

None to disclose.

Ethical approval

Ethical approval was taken from the Institutional Ethical Review of Office of Research Innovation and Commercialization (ORIC), University of Management and Technology, Lahore, Pakistan on 5th November 2021 vide Letter No. RE-092-2021.

Authors' contributions

SR: Concept and design of study, critical intellectual input.
TM: Acquisition and analysis of data, drafting of the manuscript, critical intellectual input.
SR, AB, AK, SK: Acquisition of data, drafting of the manuscript.
ALL AUTHORS: Approval of the final version of the manuscript to be published.

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