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Original Article

Prevalence of Work-Related Thumb Pain among Clinical Physical Therapists of Rawalpindi & Islamabad

Hafsah Arshad[1]*, Hafsah Gul Khattak[2], Kinza Anwar[3], Maham Noreen[4], Taila Nazir Malik[5], Mahnoor Tariq Minhas[6], Sulman Amjad[7], Zoha Furrukh[8]

[1]Assistant Professor, Ibadat International University Islamabad, Pakistan.
[2]Senior Lecturer, Ibadat International University Islamabad, Pakistan.
[3]Senior Lecturer, Department Of Rehabilitation And Allied Health Sciences, Riphah International University Islamabad, Pakistan.
[4]Clinical Physiotherapist, Emaan Hospital Ghouri Town Islamabad, Pakistan.
[5]Clinical Physiotherapist, Khatiba International Hospital Police Foundation Islamabad, Pakistan.
[6]Clinical Physiotherapist, Pakistan Institute of Medical Sciences Islamabad, Pakistan.
[7]Clinical Physiotherapist, Khalid Hospital Gujar Khan-Gujar Khan, Pakistan.
[8]Clinical Physiotherapist, Pakistan Ordnance Factories Hospital Wah Cantt, Pakistan.
Corresponding Author: Hafsah Arshad, Assistant Professor; Email: hafsah.arshad@uipt.iiui.edu.pk

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ABSTRACT

Background: Work-related musculoskeletal disorders (WRMSDs) are prevalent among healthcare professionals, significantly affecting physical therapists due to their hands-on treatment techniques. These disorders, particularly involving the thumb, result from repetitive stress and poor ergonomics, leading to chronic pain and functional impairment. Despite extensive research on WRMSDs in other body regions, the specific prevalence of thumb pain among physical therapists in Pakistan remains underexplored. This study aims to investigate the prevalence and contributing factors of work-related thumb pain among clinical physical therapists in Rawalpindi and Islamabad, addressing a critical gap in the current understanding of occupational health challenges faced by these professionals.

Objective: The study was conducted to find out prevalence of work-related thumb pain among clinical physiotherapists of Rawalpindi & Islamabad.

Methods: A descriptive cross-sectional study was conducted from September 2022 to February 2023 in Rawalpindi and Islamabad. Data was collected from 270 physiotherapists using self-structured questionnaire. Sample size was calculated using Slovin's formula with confidence interval 95% and keeping margin of error 0.05%. Non-probability convenient sampling technique was used for collection of data. Data was analyzed by using SPSS version 26.

Results: Out of 270 participants, 130 complained of thumb pain whereas 140 had no pain. The overall mean age of sample was 28.15±5.39. Among males 52(43.3%) had thumb pain and 68(56.7%) had no thumb pain. Females 78(52.0%) had thumb pain and 72(48.0%) had no thumb pain. 218(80.7%) participants were working from 1-5 years, 62(23%) worked for less than 15 hours per week, 84(31.1%) worked for 5 hours per day, 108(40%) treated up to 5 patients per day. Moderate intensity pain was present in 82(30.4%) participants. Mostly 67(24.8) were affected with MP joint pain site.

Conclusion: Thumb pain was prevalent among clinical physiotherapists. Females were having more thumb pain as compared to male participants. The intensity of pain prevalent was moderate on NPRS. This thumb pain is due to their professional techniques including manual therapy, ischemic pressure release and massage. Most of the participants reported thumb pain due to mobilization and manipulation techniques.

Keywords: Musculoskeletal pain, thumb pain, clinical physiotherapist.

INTRODUCTION

According to World Health Organization (WHO), a work-related musculoskeletal disorder (WRMSD) is any condition that is brought on by or made worse by physical activity or job, ranging from acute transient disorders to irreversible injuries and impairments. It has been discovered that work related musculoskeletal disorders causes chronic pain and physical impairment in workers and results in considerable loss of contemporary work force (1). Musculoskeletal disorders is a broad term usually used for deterioration of body

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systems like muscle, tendon, ligament, joints, circulatory system, nerves, spinal discs and cartilage as result of single event micro trauma or occur due to continuous injury over the time resulting in tissue inflammation. Such disorders are exacerbated by over activity, decreased physical activity and decline in healthy behaviors (2). Research on low back pain due to work related musculoskeletal disorders has been of greater focus in health care professionals. Work related musculoskeletal disorders of upper limb are given importance in the recent years. In this regard, special attention is given to those professions who perform repetitive tasks with precise hand and wrist movements in an awkward posture as a part of their job (3). Work related musculoskeletal disorders are major cause of physical disability and chronic pain in a large number of people around the globe. In developing countries, WRMSD are more prevalent due to lack of resources and knowledge which results in these disorders getting worse day by day. Musculoskeletal disorders has significant financial impact on society in terms of medical costs for treating illness due to these conditions (4).

Physical therapists are healthcare professionals who are in direct contact with patients for diagnosis, evaluation and treatment to improve movement, functional ability, and mobility. This significantly contributes to work related musculoskeletal disorders among them. Thumb is most vulnerable for work related and biomechanical injuries among physiotherapist due to particular techniques of mobilization that compress the thumb joint repeatedly (5). There are various factors for occurrence pain at this joint which includes laxity and mobility of joint, the direction of force and position of thumb for particular physiotherapy technique, how repeatedly force is applied, poor posture, number of sessions and importantly rest taken between treatment sessions (6). The prevalence of work related musculoskeletal disorders among healthcare professionals is more than 50%. Different studies reported different results for most prevalent body areas involved like back, upper extremity, thumb neck and lower extremity (7). A cross sectional study conducted by Islam et al, reported 95% of physiotherapist reported work related pain. This pain may be due to poor body mechanics while treating patients (8). Another study by Alrowayeh et al reported that work related musculoskeletal pain was present in 47.6% physiotherapists. The most common affected body part was lower back 32%, followed by 21% neck pain, 13% shoulder, hand to be 11%, thumb 11.1%. The percentages for knee pain was 11%, upper back 19 %, foot 6 %, thigh 3% and elbow to be 4% (9). According to Snodgrass et al. the main reason for thumb pain in physiotherapist performing manual therapy techniques was due to decrease joint stability and muscular strength around thumb. The work related disorders results in poor management of patients, decrease effectiveness of treatment methodology, which increases financial costs for patients. A large number of physiotherapist have left their profession due to work related injuries (10). The aim of current study was to find out prevalence of work related thumb pain in clinical physiotherapists.

METHODOLOGY

A descriptive cross sectional was conducted on physical therapist working in various hospitals of Rawalpindi and Islamabad from September 2022 to February 2023. Ethical approval was taken Institutional Review board & Research ethical committee of university (IRB-IIUI-FAHS/DPT/1022-1201).

Sample size was calculated using Slovin's formula with confidence interval 95% and keeping margin of error 0.05%. The sample size turned out to be 288. Non-probability convenient sampling technique was used for collection of data. The study included both male and female gender of age between 25-50 years, with a complain of current thumb pain, physical therapist working for minimum 3-8 hours per day and working in a clinical setup for at least last one year. While those having any previous history of surgery or trauma to forearm or wrist in past six months and any history of fall or injury related to wrist and thumb were excluded. Written consent was taken from participants of the study before collection of data. The data was collected using self-structured questionnaire which included questions about the prevalence of thumb pain and associated risk factor in clinical physiotherapists.

Data was analyzed by using SPSS version 26. Descriptive statistic was applied. For quantitative variable mean and standard deviation and for qualitative variables frequency and percentages were calculated. Cross tabulation was carried across gender. Data was then presented in the form of graphs and charts.

RESULTS

Out of 288 participants, 18 were excluded based on exclusion criteria and 270 were included on the basis of inclusion criteria. The mean age of participants was 28.15 ± 5.39 (range 25-50 years). Among them 120(44.4) were male, and 150(55.6) were females. The mean BMI was 22.87 ± 3.70. Majority participants 228(84.4%) were between the age of 25-30. Among 270 participants, 254 (94.1%) were right-handed, 16(5.9%) were left-handed. (Table 1)

The overall prevalence of thumb pain was 48.1% (130). Among males 52(43.3%) had thumb pain and 68(56.7%) had no thumb pain. Among females 78(52.0%) had thumb pain and 72(48.0%) had no thumb pain.

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Table 2 shows that 218(80.7%) participants were working from 1-5 years, 62(23%) worked for less than 15 hours per week, 84(31.1%) worked for 5 hours per day, 108(40%) treated up to 5 patients per day. Most of the participants were in pain from < 1 month, 37 (71.2%) were males and 59(75.6%) were females. Moderate intensity pain was present in 82(30.4%) participants, among them 38(73.1%) were males, 44(56.4%) were females. Considering type of pain, 84(31.1%) participants were having ache/dull pain. Most of the participants were having no constant pain 102(37.8%). The number of participants have no pain at rest were 108(40%) (Table 3).

Thumb pain recorded at IP joint was 47 (17.4%), 26(50%) in male and 21 (26.9%) in female. Mostly 67(24.8) were affected with MP joint among them 20(38.5) were males and 47(60.3) were females. Furthermore, 108(40) were affected with the thumb of dominant hand (table 4). According to physiotherapy techniques 67(24.8%) were using technique in which (thumbs not supported by index fingers, MCP joints are not touching, thumbs are not overlapping), where 28(53.8) were males and 37(47.4) were females, 27 (10%) were using in which thumbs not supported by index fingers, MCP joints are touching, thumbs are not overlapping where 8(15.4%) were male and 18 (23.1 %) were females. 23 (8.5%) were using thumbs supported by index fingers, MCP joints are touching, thumbs are not overlapping, 8 (3%) using trigger point release and 3 (1.1%) using glides and traction techniques (figure 1). Trigger point therapy was the most aggravating symptom 46(17%) experienced by 22(42.3%) males and 23(29.5%) females. Followed by performing ischemic compression 23 (8.5%). (Figure 2)

Table 1: Demographic characteristic of participants

Characteristic	n (270)	%
Age (Mean±SD = 28.15±5.39)		
25-30 years	228	84.4
31-40 years	24	8.9
41-45 years	11	4.1
45-60 years	7	2.6
Gender		
Male	120	44.4
Female	150	55.6
Marital status		
Married	86	31.9
Unmarried	184	68.1
BMI		
Underweight	43	15.9
Normal	157	58.1
Over weight	56	20.7
Obese	14	5.2
Dominant hand		
Right handed	254	94.1
Left handed	16	5.9
Work status		
Full time	158	58.5
Part time	112	41.5
Education		
Masters	117	43.3
DPT	153	56.7
Residence		
Islamabad	176	65.2
Rawalpindi	94	34.8

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Table 2: Work related characteristics of participants N =270

Variable		*n* (%)
Working years	1-5 years	218 (80.7)
	6-10 years	34 (12.6)
	11-20 years	10 (3.7)
	Over 20 years	8 (3)
Hours worked per week	Less than 15 hours	62 (23)
	16-25 hours	48 (17.8)
	26-35 hours	61 (22.6)
	36-45 hours	48 (17.8)
	more than 45 hours	51 (18.9)
Hours worked per day	3 hours	39 (14.4)
	5 hours	84 (31.1)
	7 hours	82 (30.4)
	More than 7 hours	65 (24.1)
Number of patients attended per day	Up to 5 patients	108 (83.1)
	More than 5 Patients	61 (22.6)
	Up to 10 patients	44 (16.3)
	More than 10 patients	57 (21.1)

Table 3: Pain characteristics across gender.

Characteristics	n (%)		Male	Female
Pain Duration	< 1 month	96 (35.6)	37 (71.2)	59 (75.6)
	2-3 months	22 (8.1)	8 (15.4)	14 (17.9)
	4-5 months	5 (1.9)	3 (5.8)	2 (2.6)
	> 5 months	7 (2.6)	4 (7.7)	3 (3.8)
Pain Intensity	1-3 Mild	43 (15.9)	12 (23.1)	31 (39.7)
	4-6 Moderate	82 (30.4)	38 (73.1)	44 (56.4)
	7-10 Severe	5 (1.9)	2 (3.8)	3 (3.8)
Pain Type	Burning	12 (4.4)	2 (3.8)	9 (11.5)
	Ache/dull	84 (31.1)	30 (57.7)	54 (69.2)
	Sharp/stabbing	25 (9.3)	16 (30.8)	8 (10.3)
	Pins/needles	6 (2.2)	2 (3.8)	4 (5.1)
	Other	3 (1.1)	0 (0.0)	2 (2.6)
Constant pain	Yes	28 (10.4)	13 (25.0)	15 (19.2)
	No	102 (37.8)	39 (75.0)	63 (80.8)
Pain at rest	Yes	22 (8.1)	4 (7.7)	18 (23.1)
	No	108 (83.1)	48 (92.3)	60 (76.9)

Table 4: Site of thumb pain in participants

Location		n (%)	Males	Females
Affected joint	IP	47 (17.4)	26(50.0)	21(26.9)
	MP	67 (24.8)	20(38.5)	47(60.3)
	CMC	16 (5.9)	6(11.5)	10(12.8)
Affected Thumb	The thumb of the dominant hand	108(83.1)	41(78.8)	67(85.9)
	The thumb of the non-dominant hand	15 (5.6)	7(13.5)	8(10.3)
	Both thumb	7 (2.6)	4(7.7)	3(3.8)

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Table 5: Work-related factors across Gender contributing to thumb

Associated Factors	Male		Female	
	Agree n (%)	Disagree n (%)	Agree n (%)	Disagree n (%)
Treating large number of patients, a day	35 (67.3)	17 (32.7)	37 (47.4)	41 (52.6)
Performing same task over and over	38 (73.1)	14 (26.9)	61 (78.2)	17 (21.8)
Continue to work when thumb is injured	30 (57.7)	22 (42.3)	40 (51.3)	38 (48.7)
Working at or near to physical limits	37 (71.2)	15 (28.8)	53 (67.9)	25 (32.1)
Not enough rest breaks	33 (63.5)	42 (53.8)	19 (36.5)	36 (46.2)
Experience an increase in your thumb use	38 (73.1)	14(26.9)	60 (76.9)	18 (23.1)
Use soft tissues techniques using thumb	46 (88.5)	6 (11.5)	63 (80.8)	15 (19.2)
Follow percussion, vibration or shaking movements	34 (65.4)	18 (34.6)	53 (67.9)	25 (32.1)
Performing mobilization or manipulation techniques	48 (92.3)	4 (7.7)	64 (82.1)	14 (17.9)

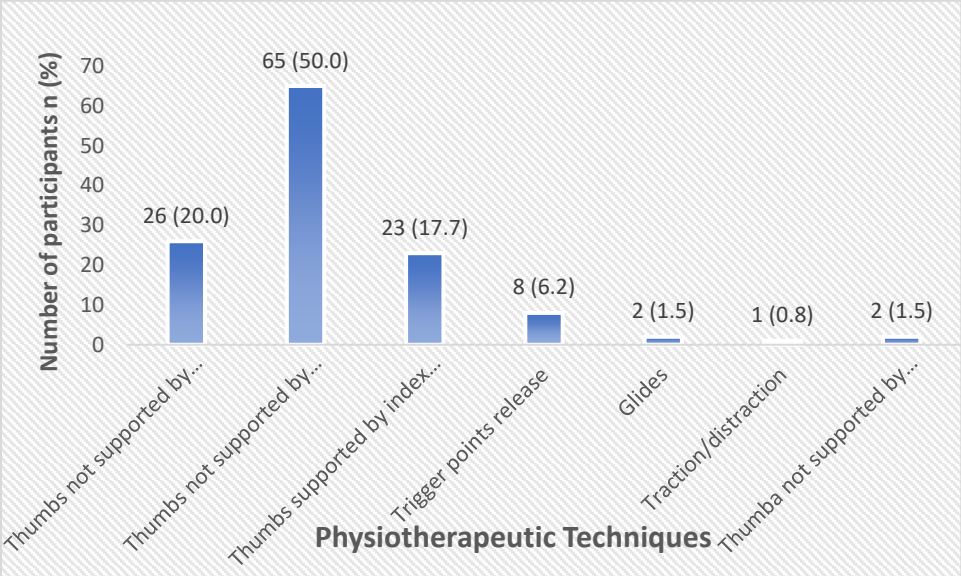

Figure 1: Thumb pain with performing physiotherapy techniques

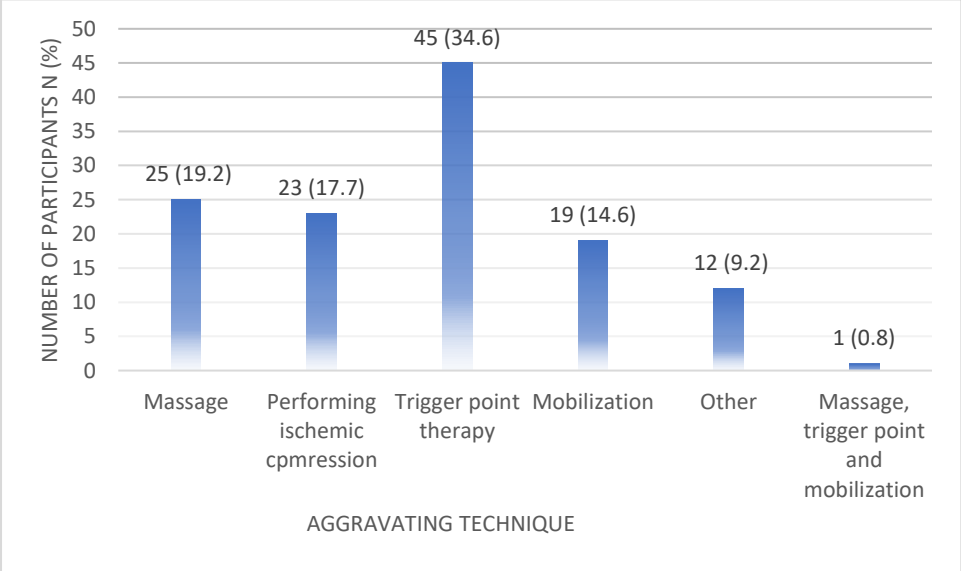

Figure 1 Aggravating technique among physiotherapists

DISCUSSION

The present study showed that 48.1% physiotherapists have thumb pain. There were 52 (43.3%) male and 73 (52.0%) female with thumb pain. Most participants were between 25 to 30 years of age. Right hand was dominant in 254 participants. There were 218 (80.7%) participants having 1-5 years' work experience. Most physiotherapist (84) worked 7 hours per day. 108 physiotherapist treated up to 5 number of patients per day. Most of the participants were in pain from < 1 month and showed moderate intensity of pain. Metacarpophalangeal joint 67(24.8%) and interphalangeal joints 47(17.4%) were most affected joint in thumb. 67 physiotherapist reported thumbs not

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supported by index fingers, MCP joints are not touching, thumbs are overlapping technique using for treatment. 49 physiotherapist reported trigger point therapy as aggravating technique for thumb pain.

Van De et al. conducted study to determine thumb pain prevalence, risk factors in physiotherapists. The study revealed that 44% physiotherapists had thumb pain once in their career. 55.1% females and 44.9% males suffered from thumb pain. They reported a score of median 3 out of total 10 on numeric pain rating scale for thumb pain severity. Thumb pain was provoked primarily due to friction and massage techniques. The finding that thumb pain was not related to age and area of practice is in contrast with the results. Moreover, 58% reported that rest was the best treatment for thumb pain followed by exercise (33%), medicines and bracing were other non-popular treatment for thumb pain relieve (6). Philippe Gorce et al in their recent systemic review reported prevalence of work related musculoskeletal disorders by body area. They reported that lower back and neck were the most affected with mean prevalence that is 41.7 ± 19.3 % and 36.2 ± 23.8 % respectively. In upper limb, thumb was the most affected area with mean prevalence to be 38.0 ± 40.0 % (7). The reported prevalence thumb pain in our study is slightly different from systemic review, which may be due to difference in sample of study. Vitaly Rozenfeld et al in their study found 83% lifetime prevalence for musculoskeletal disorders. They also concluded that physiotherapists working in outpatient clinics were associated with increased prevalence of thumb or wrist pain due to manual therapy techniques performed by them repetitively with odd ratio to be 1.11 (11). Our study results revealed that young physiotherapist between 25 to 30 years suffered from thumb pain more than those of older age. Similar results were reported by Jean E Cromie and his colleagues in which the explored prevalence, risk factors, severity and measures to prevent work related musculoskeletal disorder in physiotherapists. They found that younger physiotherapist were most affected by WRMDs and thumb pain was related to mobilization techniques among them. They also reported that one out of six physiotherapist leave their work due to work related disorders (12). Thumb pain was found to be more common in male as compared to female physiotherapists in present study. According to Cornwell, 38.5% physiotherapist reported work related musculoskeletal disorders which was related to manual therapy techniques. The injuries were reported more in female physiotherapists. They also concluded that such disorders begin early in physiotherapist's profession and increased with experience (13). Rossettini et al in their work found prevalence of thumb pain to be 49.3% which is similar to our study results. They reported that female physiotherapists were having thumb pain 2.6 time more than male physiotherapists (14). Kareem et al conducted a cross sectional study on 190 physiotherapist working in Lahore to determine frequency of thumb pain. There were 58 male and 132 female participants. The results showed that thumb pain was present in 35.26% of physiotherapists with pain intensity of mild to moderate on visual analogue scale. Physiotherapy techniques like massage, mobilization, ischemic pressure release and gliding were causes for thumb pain (15). Our study results showed that moderate pain was present at MCP joint of thumb in physiotherapists. Similar results were reported by Anne Wajon et al study of thumb pain among 155 physiotherapists. Manual therapy techniques aggravated thumb pain. Mild pain of 4/10 was reported in their study at Meta carp phalangeal joint (16). Moulten et al suggested that pain in MCP joint of thumb is particularly due to demineralization, weakness and decrease joint stability (17). McLeod and colleagues in a cross sectional study in 160 osteopaths working in Austrailia reported prevalence of wrist disorders to be 41 %. The common reason for wrist and finger was repetition of therapeutic techniques and manipulation (18). Meng-Tzu Hu et al. conducted a study to check the muscular activity at thumb using EMG when performing different physiotherapy techniques in relation to working experience of physiotherapists. They found that physiotherapists with more experience develops effective force with changing the position of thumb for compressive load which prevents thumb from work related overuse injuries (19).

CONCLUSION

Work related musculoskeletal disorders affects most of younger physiotherapists. Females were having more thumb pain as compared to male participants. Most of the participants reported thumb pain due to mobilization and manipulation techniques.

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