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PREVALENCE OF WRIST AND HAND PAIN AMONG PHYSICAL THERAPISTS PRACTICING MANUAL THERAPY TECHNIQUES IN PESHAWAR

Original Research

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ABSTRACT

Background: Musculoskeletal disorders (MSDs) represent a significant occupational hazard among healthcare professionals, particularly physical therapists (PTs), due to the physical demands of their profession. Work-related musculoskeletal disorders (WRMSDs) frequently involve the upper limbs, resulting from repetitive force, sustained loading, and awkward postures during manual therapy. These disorders can impair therapist performance, reduce productivity, and compromise patient care. Understanding the prevalence and contributing factors is essential for developing preventive strategies to safeguard therapists' health and efficiency.

Objective: To determine the prevalence of wrist and hand pain among physical therapists practicing manual therapy techniques in tertiary care hospitals of Peshawar.

Methods: A descriptive cross-sectional study was conducted among 62 licensed physical therapists from six tertiary care hospitals in Peshawar, including both public and private institutions. Participants were recruited through convenience sampling and completed a structured, self-administered questionnaire adapted from validated tools on WRMSDs. Data included demographic characteristics, clinical experience, dominant hand, frequency of manual therapy, and pain patterns. Statistical analysis was performed using SPSS version 21, applying descriptive statistics such as frequencies, percentages, means, and standard deviations for relevant variables.

Results: Among 62 respondents, 39 (62.9%) were male and 23 (37.1%) female, with a mean age of 28.3 ± 3.2 years. The overall prevalence of wrist and hand pain was 72.6% (n = 46). Pain was most common in the right hand (61.3%), followed by the left (25.8%) and bilateral involvement (12.9%). The most frequently associated manual therapy techniques were passive range of motion, muscle stretching, and strengthening (46.8%), followed by spinal mobilization (29%) and extremity joint mobilization (19.4%). Approximately 66% reported pain interference with clinical work, and 75% noted worsening symptoms during therapy sessions.

Conclusion: The study identified a high prevalence of wrist and hand pain among physical therapists practicing manual therapy in Peshawar. Repetitive movements, high patient load, and inadequate ergonomic practices were major contributing factors. Implementation of ergonomic training, workload regulation, and early preventive measures is essential to minimize WRMSDs and ensure therapist well-being.

Keywords: Ergonomics, Hand pain, Manual therapy, Musculoskeletal disorders, Physical therapists, Prevalence, Wrist pain.

INTRODUCTION

Musculoskeletal disorders (MSDs) constitute one of the most significant occupational health concerns among healthcare professionals, particularly physical therapists whose clinical responsibilities demand sustained physical exertion. These disorders involve injury or dysfunction of the muscles, joints, ligaments, tendons, and associated neurovascular structures, frequently resulting in chronic pain, functional limitation, and, in some cases, long-term disability. Work-related musculoskeletal disorders (WRMSDs) not only compromise the physical health of practitioners but also diminish job satisfaction, reduce career longevity, and adversely affect healthcare delivery by decreasing therapist productivity and efficiency (1-3). Physical therapists are uniquely vulnerable due to the manual nature of their work, which involves repetitive hand and wrist movements, forceful exertion, awkward postures, and prolonged static loading during patient handling. Recurrent performance of manual therapy techniques such as joint mobilization, soft tissue manipulation, and resistance training contributes to biomechanical strain and localized microtrauma, especially in the upper extremities (4). Previous studies report that 53–91% of physical therapists experience WRMSDs during their careers, with the most affected regions being the low back, wrist, hand, neck, and shoulders (5,6). Among these, disorders of the wrist and hand are recognized as the second most prevalent after low back pain (7), often manifesting as carpal tunnel syndrome, De Quervain's tenosynovitis, thumb carpometacarpal arthritis, and other repetitive strain injuries (8). Contributing factors such as inadequate ergonomics, suboptimal posture, insufficient rest breaks, and high patient load further amplify the risk of injury. The physical and psychosocial consequences of such disorders can be profound, limiting the therapist's ability to perform manual techniques effectively and potentially compromising patient outcomes (9-11). While the global prevalence of WRMSDs among physical therapists is well-documented, research within Pakistan remains sparse, particularly concerning wrist and hand pain among those practicing manual therapy. Considering the rapid expansion of physiotherapy services in the country, there is an urgent need to assess the occupational risks that threaten practitioners' well-being and clinical performance. Therefore, this study aims to determine the prevalence of wrist and hand pain among physical therapists practicing manual therapy techniques in public and private tertiary care hospitals in Peshawar, thereby identifying a critical occupational health concern and emphasizing the necessity for preventive ergonomic interventions and workplace reforms.

METHODS

The present study adopted a descriptive cross-sectional design to determine the prevalence of wrist and hand pain among physical therapists engaged in manual therapy practices. The research was carried out across six major tertiary care hospitals in Peshawar, namely Lady Reading Hospital (LRH), Khyber Teaching Hospital (KTH), Hayatabad Medical Complex (HMC), Rehman Medical Institute (RMI), North West General Hospital (NWGH), and Peshawar Institute of Cardiology (PIC). These hospitals were selected to ensure representation from both public and private healthcare sectors, thereby providing a broader understanding of the occupational risks faced by practicing therapists within the region. The study population comprised licensed physical therapists who were actively providing manual therapy to patients as part of their regular clinical duties. Participants were included if they had at least one year of professional experience, were practicing manual therapy techniques such as joint mobilizations, myofascial release, or soft-tissue manipulations, and provided voluntary consent to participate. Physical therapists were excluded if they had undergone hand or wrist surgery within the preceding three months or had any pre-existing neurological disorders, such as radial or median nerve compression, that could confound the assessment of musculoskeletal pain. A convenience sampling strategy was employed, and a total of 62 eligible physical therapists were recruited. Although this sample size provided useful preliminary data, the reliance on convenience sampling may limit the generalizability of the findings, as it does not ensure random representation of the broader therapist population. The data collection instrument consisted of a self-administered, structured questionnaire adapted from previously validated studies on work-related musculoskeletal disorders among healthcare professionals.

The questionnaire obtained demographic details including age, gender, educational qualification, and years of experience, as well as information related to manual therapy workload, type and frequency of wrist and hand pain, aggravating and relieving factors, and potential ergonomic or occupational contributors. Data collection was conducted in person, with participants provided adequate time to complete the questionnaire anonymously. Ethical approval for the study was obtained from the Institutional Research Committee (IRC) of NCS University System, Peshawar. Prior permissions were granted by the administrative authorities of all participating hospitals.

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Each participant was informed about the purpose, voluntary nature, and confidentiality of the study, and written informed consent was obtained before inclusion. All collected data were coded and entered into IBM SPSS version 21 for statistical analysis. Descriptive statistics, including frequencies and percentages, were applied to summarize categorical variables such as gender, education level, and prevalence of wrist or hand pain, while means and standard deviations were calculated for continuous variables such as age and years of experience. The results were tabulated and graphically represented using tables and charts for clarity and interpretation.

RESULTS

A total of 62 physical therapists participated in the study, comprising 39 males (62.9%) and 23 females (37.1%). The mean age of respondents was 28.3 ± 3.2 years, with the majority aged between 25 and 30 years. Most participants (59.7%) held a Doctor of Physical Therapy (DPT) degree, while 12.9% had completed a master's degree. Regarding professional experience, 41.9% of respondents had one to three years of clinical practice, and right-hand dominance was reported by 88.7%. The majority treated 1–10 patients daily, with 24% performing manual therapy for less than 25% of their workload, whereas 76% reported it as a regular part of their clinical practice. In terms of manual therapy techniques, passive range of motion (PROM), muscle stretching, and resistance exercises were most frequently performed (46.8%), followed by spinal joint mobilization or manipulation (29.0%) and extremity joint mobilization (19.4%). Only 3.2% indicated soft-tissue massage as their primary manual therapy technique. The overall prevalence of wrist and hand pain within the past 12 months was 72.6% (n = 46). Pain was most frequently localized to the right hand (61.3%), followed by the left hand (25.8%) and bilateral involvement (12.9%). The wrist and thumb regions were the most commonly affected sites, with 75.8% of participants attributing their symptoms directly to physiotherapy-related activities. Approximately 66% reported that pain interfered with work performance, and 75% noted worsening of symptoms during therapy sessions. In terms of pain duration, 58% of respondents experienced wrist or hand pain lasting 1–7 days during the preceding year, while 9.7% reported pain persisting for more than 90 days. Regarding symptom progression, 44% reported no change in pain intensity since onset, 8% experienced worsening, and 10% indicated complete recovery.

Table 1: Demographic Characteristics of Physical Therapists (n = 62)

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	39	62.9
	Female	23	37.1
Age (years)	Mean ± SD	28.3 ± 3.2	—
	25–30 years	—	Majority
Educational Qualification	Doctor of Physical Therapy (DPT)	37	59.7
	Master's Degree	8	12.9
	Others (unspecified)	17	27.4
Clinical Experience	1–3 years	26	41.9
	>3 years	36	58.1
Hand Dominance	Right-hand dominant	55	88.7
	Left-hand dominant	7	11.3
Daily Patient Load	1–10 patients/day	62	100
Manual Therapy Workload	<25% of workload	15	24.0
	Regular part of practice	47	76.0

Table 2: Distribution of Manual Therapy Techniques Practiced

Technique	Frequency (n)	Percentage (%)
Passive range of motion (PROM), muscle stretching, and resistance exercises	29	46.8
Spinal joint mobilization/manipulation	18	29.0
Extremity joint mobilization	12	19.4
Soft-tissue massage	2	3.2
Total	62	100

Table 3: Prevalence and Distribution of Wrist and Hand Pain (Past 12 Months)

Variable	Categories	Frequency (n)	Percentage (%)
Overall Prevalence	Reported wrist/hand pain	46	72.6
	No pain reported	16	27.4
Laterality of Pain	Right hand	28	61.3
	Left hand	12	25.8
	Bilateral	6	12.9
Pain Location	Wrist and thumb region	—	Majority
Pain Related to Work	Attributed to physiotherapy practice	47	75.8
Interference with Work	Pain interfered with work	41	66.0
Pain Worsened During Therapy	Reported worsening	46	75.0

Table 4: Pain Duration and Symptom Progression

Variable	Categories	Frequency (n)	Percentage (%)
Pain Duration (in past 12 months)	1–7 days	36	58.0
	>90 days	6	9.7
	Intermediate duration (8–89 days) *	20	32.3
Pain Progression	No change	27	44.0
	Worsened	5	8.0
	Complete recovery	6	10.0
	Ongoing/missing data	24	38.0

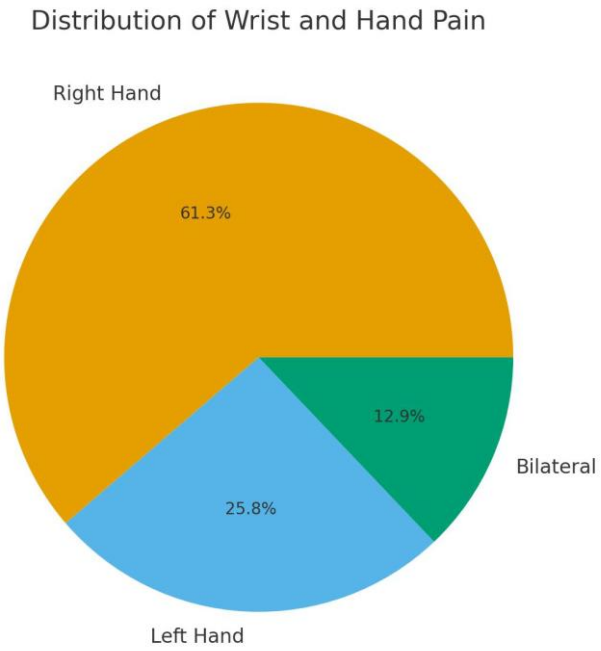

Figure 2 Distribution of Wrist and Hand Pain

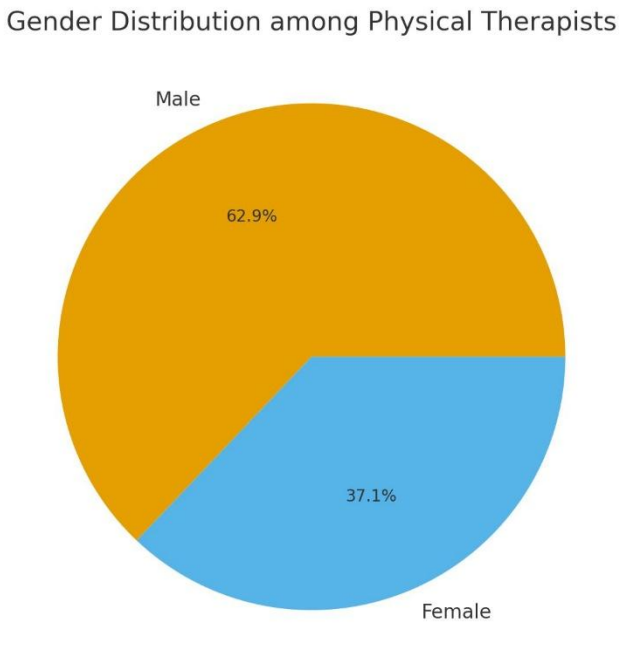

Figure 1 Gender Distribution among Physical Therapists

DISCUSSION

The present study revealed a notably high prevalence of wrist and hand pain (72.6%) among physical therapists practicing manual therapy techniques in tertiary care hospitals in Peshawar, highlighting a significant occupational health concern within this professional group. The prevalence observed was consistent with global reports, where musculoskeletal symptoms affecting the upper extremities among physical therapists range between 60% and 80% (10,11). This finding reinforces that despite differences in healthcare settings, the biomechanical and ergonomic risks associated with manual therapy are universally evident across clinical environments. The predominance of pain in the right hand was strongly associated with right-hand dominance, reported by the majority of participants. This relationship underscores the repetitive mechanical strain imposed on the dominant limb during manual therapy procedures such as mobilizations and soft-tissue techniques. Similar trends have been documented by other researchers, where repetitive manipulation and sustained grip strength requirements contributed significantly to hand and wrist discomfort (12,13). These repetitive microtraumas, when combined with poor posture and inadequate recovery time, can gradually result in chronic tendinopathies and compressive neuropathies affecting the wrist and thumb joints. A clear association between increased patient load and the occurrence of wrist and hand pain was observed, consistent with previous literature emphasizing workload intensity as a major risk factor for WRMSDs among healthcare professionals (14,15). Therapists attending to more than five patients per day are exposed to cumulative biomechanical stress and reduced muscle recovery intervals, predisposing them to overuse injuries. The frequent application of manual techniques such as passive stretching and resistance exercises particularly overloads the carpal and metacarpophalangeal joints, explaining the localized nature of pain observed in this study (16,17).

The findings also indicated that younger therapists with fewer years of experience were more frequently affected. This trend may reflect limited ergonomic awareness and improper body mechanics during early professional practice, a factor highlighted in other reports linking inexperience to higher injury susceptibility (18). The integration of ergonomic and self-care education within undergraduate physical therapy curricula has been shown to reduce such risks by promoting proper positioning, pacing, and the use of mechanical assistance during therapy sessions (19). The occupational profile of physical therapy inherently involves repetitive manual exertion, awkward postures, and high patient throughput. Prior investigations have consistently identified these factors as principal contributors to upper limb WRMSDs among therapists (20,21). The current findings reinforce these associations within a local context, emphasizing

the universality of occupational strain irrespective of geographical or institutional differences. The interference of pain with clinical performance, reported by two-thirds of participants, mirrors global trends where WRMSDs lead to absenteeism, decreased job satisfaction, and in some cases, career modification (22,23). Such outcomes have long-term implications for workforce sustainability and quality of patient care. This study's findings underline the urgent need for structured preventive interventions. Ergonomic training, workload regulation, and the introduction of assistive devices can substantially mitigate repetitive strain on therapists' upper limbs. Moreover, institutional policies promoting task rotation, scheduled rest breaks, and early musculoskeletal screening may enhance occupational safety and longevity in clinical practice. The results also highlight a public health need for institutional health surveillance programs that can identify and manage occupational pain at an early stage before it progresses to chronic disability.

One of the strengths of this study lies in its inclusion of therapists from multiple tertiary care hospitals, providing a diverse representation of practice settings. The use of a structured, validated questionnaire further enhances reliability in identifying common risk patterns. However, several limitations must be acknowledged. The relatively small sample size restricts the generalizability of the findings to the wider population of physical therapists. The reliance on self-reported data introduces potential recall bias, and the absence of objective measures such as clinical examinations or pain intensity scales limits the depth of analysis. Additionally, female participation was lower, likely due to sociocultural factors affecting workforce representation in certain institutions. Despite these limitations, the study contributes meaningful evidence regarding the burden of wrist and hand pain among manual therapists in Pakistan. Future studies should employ larger, randomized samples and include objective clinical assessments to establish causal relationships between workload, ergonomics, and pain severity. Longitudinal or interventional research exploring ergonomic modifications, preventive exercise programs, and workplace redesign could provide actionable solutions for reducing WRMSDs among physical therapists.

CONCLUSION

The study concludes that wrist and hand pain is a significant occupational health issue among physical therapists practicing manual therapy in Peshawar. The repetitive nature of manual techniques, combined with increased patient load, inadequate ergonomic practices, and insufficient rest, contributes substantially to the development of these disorders. These findings emphasize the need for proactive preventive strategies, including ergonomic training, workload management, and incorporation of self-care and injury prevention education within professional practice. Promoting occupational health awareness and adopting evidence-based preventive measures are essential to enhance therapists' well-being, sustain clinical performance, and ensure long-term professional efficiency.

AUTHOR CONTRIBUTION

Author	Contribution
Ahsan Khalid	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Umra Ihsan*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published

REFERENCES

1. McGee C. Upper extremity arthritis - current practices, new evidence, and future directions. J Hand Ther. 2022;35(3):317-8.

2. Mostafaee N, Divandari A, Negahban H, Kachooei AR, Moradi A, Ebrahimzadeh MH, et al. Shoulder and scapula muscle training plus conventional physiotherapy versus conventional physiotherapy only: a randomized controlled trial of patients with lateral elbow tendinopathy. Physiother Theory Pract. 2022;38(9):1153-64.

3. Tekavec E, Nilsson T, Dahlin LB, Huynh E, Axmon A, Nordander C, et al. Serum biomarkers in patients with hand-arm vibration injury and in controls. Sci Rep. 2024;14(1):2719.

4. Zhou Z, Meng P, Jia N, Zhang H, Ling R, Liu Y, et al. Risk and related factors of elbow musculoskeletal diseases: a nationwide cross-sectional survey in China. J Occup Health. 2024;66(1).

5. Dahlgren G, Liv P, Öhberg F, Slunga Järvholm L, Forsman M, Rehn B. Ratings of Hand Activity and Force Levels among Women and Men Who Perform Identical Hand-Intensive Work Tasks. Int J Environ Res Public Health. 2022;19(24).

6. Mavrovounis G, Meling TR, Lafuente J, Fountas KN, Demetriades AK. Postural ergonomics and work-related musculoskeletal disorders in neurosurgery: lessons from an international survey. Acta Neurochir (Wien). 2021;163(6):1541-52.

7. Argus M, Pääsuke M. Musculoskeletal disorders and functional characteristics of the neck and shoulder: Comparison between office workers using a laptop or desktop computer. Work. 2023;75(4):1289-99.

8. Lucado AM, Day JM, Vincent JI, MacDermid JC, Fedorczyk J, Grewal R, et al. Lateral Elbow Pain and Muscle Function Impairments. J Orthop Sports Phys Ther. 2022;52(12):Cpg1-cpg111.

9. de Freitas Cardoso V, Stefane CA, de Barros FC, Gonçalves JS, Figueiredo LC, de Oliveira Sato T. Influence of gender and age on musculoskeletal symptoms in white-collar and blue-collar workers: a cross-sectional study. Int J Occup Saf Ergon. 2022;28(4):2482-91.

10. O'Brien L, Robinson L, Parsons D, Glasgow C, McCarron L. Hand therapy role in return to work for patients with hand and upper limb conditions. J Hand Ther. 2022;35(2):226-32.

11. Gracia-Ibáñez V, Agost MJ, Bayarri-Porcar V, Granell P, Vergara M, Sancho-Bru JL. Hand kinematics in osteoarthritis patients while performing functional activities. Disabil Rehabil. 2023;45(7):1124-30.

12. Hunn S, Alfano L, Seiffert M, Weihl CC. Exploring hand and upper limb function in patients with inclusion body myositis (IBM). Neuromuscul Disord. 2023;33(8):643-50.

13. Mezian K, Ricci V, Güvener O, Jačisko J, Novotny T, Kara M, et al. EURO-MUSCULUS/USPRM Dynamic Ultrasound Protocols for Wrist and Hand. Am J Phys Med Rehabil. 2022;101(9):e132-e8.

14. Ricci V, Güvener O, Chang KV, Wu WT, Mezian K, Kara M, et al. EURO-MUSCULUS/USPRM Dynamic Ultrasound Protocols for Elbow. Am J Phys Med Rehabil. 2022;101(6):e83-e92.

15. Schick S, Elphingstone JW, Hood C, Casp AJ, Shihab Y, Jardaly A, et al. Elective Hand Surgery Is Delayed among Private Insurance Holders. South Med J. 2023;116(3):270-3.

16. Tilley PM, Mulla DM, Keir PJ. Effects of sex and age on work-related upper extremity musculoskeletal disorders in Ontario, Canada. Work. 2023;75(3):1009-20.

17. Friesen KB, Lang AE. Do Musculoskeletal Disorders Affect Work Tasks in Farmers: A Study of Rural Saskatchewan. J Occup Environ Med. 2022;64(9):e591-e6.

18. Rapicault C, Roquelaure Y, Bodin J, Fouquet N, Bertrais S. Development and validation of a work-related risk score for upper-extremity musculoskeletal disorders in a French working population. Scand J Work Environ Health. 2023;49(8):558-68.

19. Hall S, Compton MR. Common Occupational Upper Extremity Musculoskeletal Disorders. Am Fam Physician. 2025;111(5):451-8.

20. Tabatabaeifar S, Dalbøge A. Carpal tunnel syndrome and occupational hand exposures: a Danish nationwide cohort study. Occup Environ Med. 2024;81(8):417-24.

21. Anderson AR, Hensley CP. Manual therapy for work-related wrist pain in physical therapists. Physiother Theory Pract. 2021;37(11):1244–51.

22. Currie KB, Tadisina KK, Mackinnon SE. Common hand conditions: a review. JAMA. 2022;327(24):2434–45.

23. KINACI E, ATAOĞLU S. Work-related musculoskeletal disorders among physiotherapists: a Turkish sample. Turk Klin J Health Sci. 2020;5(3):495–502.

