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Review

Prevalence and Risk Factors of work-related Musculoskeletal Disorders among Indian Physiotherapists: A Narrative Review of Literature

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Abstract

Background: Physiotherapists (PTs) are at the highest risk of work-related musculoskeletal disorders (WMSDs) because of the nature of demands from their profession. This review aims to describe current knowledge associated with the prevalence and risk factors of WMSDs among Indian PTs. **Methods**: Various electronic databases were searched for literature relating to WMSDs in PTs from India between years 2010 and 2020. Four full texts and two abstracts were selected based on the inclusion criteria and reviewed in a narrative way. **Results**: Overall prevalence of WMSDs among PTs was reported to be high, with lifetime prevalence as high as 91%, and the lower back, neck, upper back, and shoulders as the most frequently affected in descending order. The major risk factors reported for WMSDs were: lifting, physical load, transferring, static and awkward static postures, treating a large number of patients per day, and repetitive movements. WMSDs were reported to be associated with age, gender, and physical activity levels, with a higher prevalence in female PTs. Also the younger PTs and PTs with lower physical activity levels were reported to be more affected. **Conclusion**: It was inferred that the work-related injuries are not prevented by the knowledge about correct body mechanics and skills. PTs need to develop work modification strategies and mechanical aids to reduce WMSDs in without compromising the quality of treatment.

Keywords: Prevention; Physiotherapists; Musculoskeletal disorders; Risk factors; Work-related

Introduction

According to the World Health Organization (WHO), work-related musculoskeletal disorders (WMSDs) can be described as "a wide range of inflammatory and degenerative diseases and disorders that result in pain and functional impairment, arising when individuals are exposed to work activities and conditions that significantly contribute to their development or exacerbation, but which may not be their sole cause".[1] They are caused over time due to the work itself or the employee's work environment. Cromie et al. (2000), conducted a study in Australia, and demonstrated the lifetime prevalence of WMSDs in PTs as high as 91%.[2] In physiotherapy professionals, the lower back is the region that is mostly affected by various WMSDs.[2-4] The reported prevalence of WMSDs is higher among physical therapists below the age of 35, especially those who have less than 5

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years experience.[2, 4-6] Association of WMSDs with gender of PTs is also studied by several researchers. Majority have reported prevalence to be higher in female PTs as compared to male PTs and was between 73-100%.[7-9] Association of WMSDs with other important factors (e.g. BMI, work settings, working hours etc.); impacts of such WMSDs; responses adopted by the PTs; and prevention strategies which can help such musculoskeletal complaints have been explored extensively in various countries.[2, 4-11]

The major occupational factors thought to be responsible for the development of WMSDs are static and awkward postures, force, repetitive movements, vibration and long duration of work.[4-8] PTs expose themselves to all these factors while handling the patients during activities such as heavy lifting, twisting and bending; prolonged working hours; maintaining awkward postures for long period; applying force; etc. In addition, most of PTs don't take enough rest for recovery as they either tend to self-treat or take help from colleague for treatment of their symptoms.[9-11] PTs adapt their work style and continue to work ignoring the symptoms while increasing the risk of aggravation of symptoms. As young PTs are more affected, comprehensive training and treating approach for them can control their symptoms in the initial years of career and thereby prevent potentially disabling conditions.[12-14]

WMSDs are considered one of the most serious global health issues amongst PTs including India. The lifetime prevalence of WMSDs is found to be between 62.73%- 91% in India.[12-14] Indian studies have also reported similar findings in relation to region wise prevalence of WMSDs, concluding that lower back is the most commonly affected region with its prevalence range between 16.66%-72.5%.[12-18] The purpose of this paper was to review current knowledge associated with the prevalence and risk factors of WMSDs among Indian PTs, as there is inadequate evidence suggesting exploration of these aspects in India.

Methods

The scientific literature relevant to WMSDs among physiotherapist in India published between January-2011 and June-2020 was searched. The search was performed online for English language articles through popular databases such as Google Scholar, PubMed (NLM), Embase and PEDrO using the key words such as 'musculoskeletal disorders', 'work related', 'physiotherapists', 'risk factors', 'work settings', 'prevention', 'low back pain', 'neck pain', 'shoulder pain' and 'India'. Screening of the reference lists of all the retrieved articles for any relevant research was also done.

The articles were not considered for reviews if they were not relevant to the WMSDs in physiotherapists; were published in other languages, and their full texts were not available. As it is shown in figure-1, out of 12 studies which were found online, 7 were found relevant. Total 4 full texts were available whereas 3 abstracts were available. As the total number of studies were too less, decision to include abstracts was taken. A traditional approach to narrative review is said to have more potential for bias when compared to systematic reviews or meta-analyses. But, due to the scarcity of literature we tried to be inclusive and open-minded. Table 1 shows the brief summary of all these 7 studies.

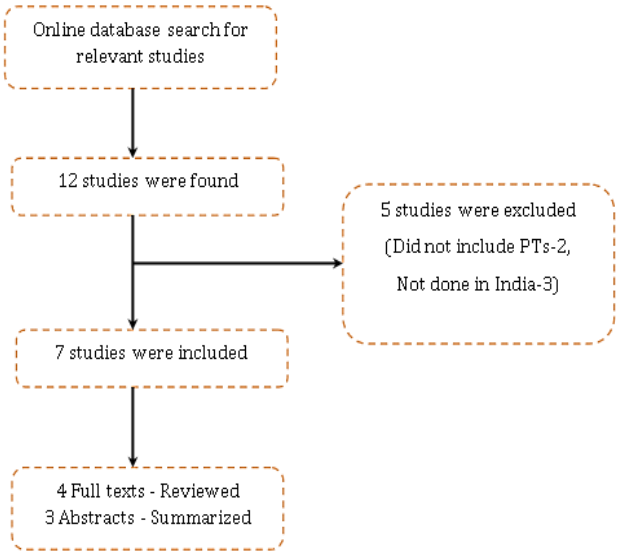

Figure 1. Search and Selection of Studies for Review

Table 1. Lifetime and region wise prevalence of WMSDs and Risk factors

Author/s	Type of Study	Year of Publication	Study Group (n)	Method	Prevalence (%) Lifetime	Prevalence (%) Region wise	Risk factors
Buddhadev & Kotecha (15)	Full text	2012	29	Questionnaire		Low back (35%) Neck (25%) Shoulder (15%) Upper back (15%) Wrists/Hands (5%) Elbow/Forearm (5%)	• Large number of patients in a day • Lifting with sudden maximal effort • Adoption of uncomfortable posture • Working in same position for long • Lack of enough rest/break during the day • Prolonged sitting • Patient falling or sudden unanticipated movement • Carrying, lifting or moving heavy materials or equipments • Continuing to work while injured
Maheshwari P et. al. (14)	Full text	2015	100 (M=22, F=78)	Questionnaire	91%	Lowerback (72.5%) Neck (72.5%) Upperback (28.6%) Shoulder (20.9%) Wrist/Hands (17.6%) Knee (12.1%) Ankle/Foot (12.1%) Hip (7.70%)	• Dealing with an excessive number of patients in one day • Lifting or transferring dependent patients • Continuing to work while injured or hurt • Work scheduling • Not enough rest breaks or pauses during the workday • Performing the same task over and over • Bending or twisting your back in an awkward way
Malarvizhi D et. al. (18)	Full text	2017	210 (M=117, F=93)	Questionnaire		Neck (62.9%) Lowerback (60%) Upperback (51.9%) Shoulder (31.4%) Knee (30.4%) Wrist/Hand (22.5%) Ankle/Feet (19.5%) Hip (13.4%) Elbow (11.5%)	• Treating large number of patients in one day • Lifting heavy equipment and patients during sessions • Transferring patient in ICU • Maintaining the same posture for a long period of treatment • Manual therapy sessions • Responding to patients' sudden movements • Repeated movements • Maintaining neck position for a long time while reading • Standing and sitting for a long time • Writing on board while taking classes
Kalyani VR et. al. (17)	Full text	2017	60	Questionnaire		Neck (13.3%) Lowerback (16.6%) Shoulder (5%) Upperback (5%) Leg (3.3%)	• Severe physical activity • Quality and Quantity of sleep • Psychological status and depressive behavior

Author/s	Type of Study	Year of Publication	Study Group (n)	Method	Prevalence (%) Lifetime	Prevalence (%) Region wise	Risk factors
Sharan D et. al. (13)	Abstract	2014	225	Questionnaire	81.25%	Neck (56.25%) Upperback (56.25%) Lowerback (50.07%) Wrists/Hands (25%) Shoulder (22.65%) Ankle (17.18%)	• Prolonged standing • Adopting static postures • Frequent application of force with hands or arms • Frequent bending or twisting of upper body • Working in awkward postures • Lifting or transferring heavy patients
Prerana S et. al. (12)	Abstract	2015	271	Questionnaire	62.73%	Lowerback (65.3%) Neck (41.8%) Shoulder (26.5%)	• Treating large number of patients in a single day • Bending and twisting the back in awkward positions • Working in static positions for longer periods
Murugana-ntham et. al. (16)	Abstract	2015	169	Questionnaire		Lowback (47.31%) Neck (18.28%) Upperback (15.05%) Knee (10.75%)	• Not described in abstract

Results

Prevalence of WMSDs in Indian Physiotherapists

3 studies evaluated the lifetime and region wise prevalence of WMSDs in Indian PTs (Tabe 1). The lifetime prevalence of WMSDs was reported in one of the studies was as high as 91% (14), while remaining studies reported it to be 81.25%[13] and 62.73%.[12] In all reviewed studies, the lower back is reported to be the most frequently affected region. Estimated lifetime prevalence of affection of lower back ranges from 16.66%-72.50% (12-18). Affection of lower back is followed most often by neck (13.3%-72.5%), upper back (5%-56.25%) and shoulders (5%-31.4%). It has been documented by American Physical Therapy Association (APTA) that work related low back pain is an important issues which needs to be seriously addressed and has formed a task force for investigation of the problem.[3]

Maheshwari et. al (2015) reported that the PTs who participated were from younger age groups (Mean: 26.03±2.818 years) and showed increase in musculoskeletal complaints with increase in age. They also reported that respondents had mean experience of 2.87±1.884 years which indicated that most of the PTs who had less experience reported more WMSDs and that the it is common for younger professionals to adopt suboptimal ergonomic job practices.[14] Malarvizhi et. al. (2017) reported that among clinical PTs, females were affected more in regions of the neck, back, knee, ankle and elbow regions than males whereas among teaching PTs female and male subjects showed equal prevalence of WMSDs. They suggested that less height and more body weight in female PTs may put them at a disadvantage during patients' treatment and transfer, thereby causing higher prevalence of WMSDs.[18]

Risk Factors for WMSDs in Indian Physiotherapists

Daily activities performed by the PTs such as assisting patients during gait, providing manual resistance , transferring dependent patients and lifting heavy equipments put PTs at risk of both acute and chronic WMSDs.[2,3] Excessive physically loading activities (table-1) such as maintaining an awkward static posture; twisting and bending the back in awkward positions; lifting with sudden maximal effort; frequent heavy lifting; transferring patients; working in the same position for prolonged periods; adoption of uncomfortable posture; frequent application of force with hands or arms during manual therapy sessions; lifting and transferring patient in ICU etc. have been reported as causal factors for WMSDs in PTs.[2-6] The primary risk factors responsible for WMSDs, reported by Buddhadev & Kotecha, were management of large number of patients per day (26.7%) and lifting with sudden maximal effort (20%) followed by adoption of uncomfortable posture (18.4%), working for long time in same position (11.7%), not having enough rest (8.3%), prolonged sitting (6.7%), carrying heavy equipments (3.3%) and continuing to work while injured (1.7%).[15] Maheshwari et. al. mentioned that dealing with an larger number of patients in a single day (59.1%); lifting or transferring patients who are dependent (54.5%); continuing to work despite being injured or hurt (54.5%); hectic work schedule (45.5%); lack of rest breaks or pauses during the day (31.8%); performing the same task repeteadly (31.8%); and bending or twisting back in an awkward way (22.7%) were described as the most common risk factors by PTs who participated in their study.[14]

Malarvizhi et. al. (2017) proposed that treating excessive patients in a day; lifting patients and heavy equipment for routine treatment; transferring patient in ICU; maintaining one posture for a long period of treatment; tiresome manual therapy sessions; responding to patients' sudden movements; and repeated movements were the main cause for WMSDs among clinical PTs.

Whereas, in teaching PTs it may be because of continuous faulty posturing and prolonged standing; maintaining one posture for a long time; standing and sitting for a long time; atypical postures while teaching treatment techniques to students in practical; reading books for a long time and writing on board while taking classes. But the amount of responses was not quantified and the frequencies were not recorded.[18] Kalyani et. al. (2017) studied correlation of WMSDs in PTs with severe physical activity, quality and quantity of sleep as well as with psychological status and depressive behavior. They found a weak correlation between the levels of physical activities and intensity of musculoskeletal pain. Amount and quality of sleep were not found to be correlated with musculoskeletal pain and majority PTs showed normal REM sleep pattern in them. Similarly, psychological status and depressive behaviour were found not to be correlated with incidence of musculoskeletal pain.[17]

In Sarvanan et al. (2015) study from Surat 77% of PTs reported that "working in static positions for longer periods" was the major activity precipitating WMSDs followed by treating large number of patients in a single day (68.2%) and bending and twisting the back in awkward positions (65.8%). Similarly, Sharan D et. al. (2014) have reported that among 225 PTs from various parts of India, majority stated that prolonged static postures, bending or twisting of upper body, application of force with hands or arms, working in awkward postures, and lifting or transferring heavy patients are major biomechanical risk factors which exposed almost 67.18% PTs to adverse work style risk.[13] Though, Muruganantham et. al. (2015) mentioned that one of the objectives of their study was to identify the risk factors; there is no specific mention of any relevant details in the abstract which was available.[16]

Discussion

PTs are reported to be at high risk of WMSDs globally, with the low back as the major body part affected .[2-4, 6, 8] Most of the studies conducted worldwide have found that, in addition to physical and personal factors, psychosocial demands of job, social relations at work and interpersonal cultural factors are associated with WMSDs. In many studies, PTs are reported to be affected by or at risk of WMSDs before the age of 30 and within the first 5 years of employment.[2, 4] Similar findings were reported in the study conducted by Maheshwari et. al. (2015), suggesting universally similar pattern of prevalence of WMSDs in young PTs, suggesting that newly qualified therapists tend to work in clinical areas which are physically demanding with less knowledge and minimal skills early in their careers. They also proposed that lack of knowledge regarding various coping strategies for avoiding WMSDs and higher motivation for working extended hours in order to give direction to their careers.[14] It is also suggested in many studies that as the older PTs with more experience tend to develop positive coping strategies, they are less susceptible to injuries when compared to younger therapists.[10, 13] Most studies have indicated that female PTs had a more increased risk of developing WMSDs than male PTs.[2, 5, 6] The higher prevalence among female PTs has been attributed to the fact that females are generally smaller and physically weaker than males, which may place them at a disadvantage during care tasks, particularly when lifting and transferring patients. Malarvizhi et. al. (2017) and Maheshwari et. al. (2015) reported similar findings in Indian PTs, from Chennai and tricity area of north India respectively, who participated.[14, 18]

As reported in many studies, the factor most likely to contribute to WMSDs are lifting or transferring dependent patients.[2, 11, 19] Other postural factors and workload factors such as

working posture or position; the frequency or repetitiveness of treatment; and time management issues were also contributing factors to WMSDs.[2, 5, 6] The studies reviewed in this paper also reported he factors responsible for WMSDs to be same as reported previously in various studies. The factors included treating large number of patients in one day, maintaining the same posture for a long period, lifting heavy equipment and patients, transferring patient in ICU, manual therapy sessions, repeated movements and responding to patients' sudden movements.[12-14, 18] As with any study, this study has its limitations. The review has included only 7 studies out of which 3 were only abstracts and therefore cannot be reviewed in depth. The authors of these abstracts can be approached for availability of full texts and then can be reviewed again.

Conclusion

The specialized nature of the practice of physiotherapy creates risk of WMSDs for PTs worldwide. The extent of WMSDs reported among Indian PTs suggests that their skills and knowledge are less effective to protect them from WMSDs. We believe that there is need of development of specific strategies to reduce incidence of WMSDs thus, preventing potentially disabling situations. Majority of the Indian studies have not focused on studying the use of aids and equipment, like sliding sheets or lifts, by PTS to prevent WMSDs. Therefore, further research can be done to estimate the advantages of using such different mechanical aids while treating and handling patients for reducing WMSDs amongst PTs.

Conflict of interests

Authors declare no conflicts of interests.

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References

1. WHO. Identification and control of work-related diseases. Geneva:World Health Organization; 1985.
2. Cromie JE, Robertson VJ, Best MO. Work-related musculoskeletal disorders in physical therapists: prevalence, severity, risks, and responses. Physical therapy. 2000;80(4):336-51.
3. Campo M, Weiser S, Koenig KL, Nordin M. Work-related musculoskeletal disorders in physical therapists: a prospective cohort study with 1-year follow-up. Physical therapy. 2008;88(5):608-19.
4. Holder NL, Clark HA, DiBlasio JM, Hughes CL, Scherpf JW, Harding L, et al. Cause, prevalence, and response to occupational musculoskeletal injuries reported by physical therapists and physical therapist assistants. Physical therapy. 1999;79(7):642-52.
5. Bork BE, Cook TM, Rosecrance JC, Engelhardt KA, Thomason M-EJ, Wauford IJ, et al. Work-related musculoskeletal disorders among physical therapists. Physical therapy. 1996; 76(8): 827-35.
6. Glover W, McGregor A, Sullivan C, Hague J. Work-related musculoskeletal disorders affecting members of the Chartered Society of Physiotherapy. Physiotherapy. 2005;91(3):138-47.
7. Mierzejewski M, Kumar S. Prevalence of low back pain among physical therapists in Edmonton, Canada. Disability and rehabilitation. 1997;19(8):309-17.
8. King P, Huddleston W, Darragh AR. Work-related musculoskeletal disorders and injuries: differences among older and younger occupational and physical therapists. Occupational rehabilitation. 2009;19(3):274-83.
9. Adegoke BO, Akodu AK, Oyeyemi AL. Work-related musculoskeletal disorders among Nigerian physiotherapists. BMC musculoskeletal disorders. 2008;9(1):112.
10. Salik Y, Özcan A. Work-related musculoskeletal disorders: a survey of physical therapists in Izmir-Turkey. BMC musculoskeletal disorders. 2004;5(1):27.
11. Shehab D, Al-Jarallah K, Moussa MA, Adham N. Prevalence of low back pain among physical therapists in Kuwait. Medical principles and practice. 2003;12(4):224-30.
12. Prerana S, Saravanan M, Krunal L, Krishna R, Ruchi V. Prevalence, risk factors and coping strategies to work related musculoskeletal disorders reported by physiotherapists in Surat district, India. Physiotherapy. 2015;101:e1338.
13. Sharan D, Mohandoss M, Ranganathan R, Rajkumar J, Jerrish AJ. Musculoskeletal disorder among physiotherapists–A survey report. [POSTER] at: Proceedings of the Nordic Ergonomics Society Annual Conference;2014.
14. Maheshwari P, Soni R, Parkash N. Work related musculoskeletal disorders: a survey of physiotherapists in tricity. International journal of physiotherapy. 2015;2(6):1091-6.
15. Buddhadev NP, Kotecha IS. Work-related musculoskeletal disorders: a survey of physiotherapists in Saurashtra region. National journal of medical research. 2012;2(2): 179-81.

16. Muruganantham B, Nayak B, Dave D, Kotia P. Work-related musculoskeletal disorders among Indian Physiotherapists. Physiotherapy. 2015;101:e1059-e60.
17. Kalyani VR, Wani SK, Rairikar S, Shyam A, Sancheti P. Correlation of physical factors with musculoskeletal pain among physiotherapists. Indian journal of pain. 2017;31(1): 50.
18. Malarvizhi D, Kumar MK, Sivakumar VPR. Prevalence of work-related musculoskeletal disorders among clinical and teaching physiotherapists - an observational study. International journal of
physiotherapy. 2017;4(2).
19. Scholey M, Hair M. Back pain in physiotherapists involved in back care education. Ergonomics. 1989;32(2):179-90.