

# A Study on Prevalence, Risk Factors and Prevention of Work-Related Muscular Disorder among Physiotherapists

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**Abstract** - Physiotherapists (PTs) have a much higher-than-average prevalence, risk factors, and prevention of work-related musculoskeletal diseases (WRMDs). Their health is adversely affected by these WRMDs, which may result in both short-term injuries and long-term impairments. Despite its widespread occurrence, its potential dangers are little understood. Our purpose was to examine the present state of information about the incidence, risk factors, and preventative measures for WMSDs in the physiotherapy profession. From its origin until 2021, Google Scholar and PubMed were combed for keywords relevant to WMSDs in physiotherapists of different specializations. Three hundred and fourteen physiotherapists were given a semi-structured questionnaire based on those used in earlier research. There was a response rate of 86%, with 271 completed surveys returned. The data was analyzed using the mean, standard deviation, frequency, percentage, and chi-square test. There was a 62.73 percent prevalence of musculoskeletal problems at work. Most people felt the pain in their lower back (65.3%), followed by their neck (41.8%), and finally their shoulders (26.5%). The majority of therapists (77%) said that prolonged sitting was a risk factor, while 68.2% said that seeing many patients in a day was, and 65.8% said that bending and twisting back in unnatural postures was. Changing patient and self-postures (54.1% of respondents), altering treatment surface height (47.1% of respondents), and using procedures that do not exacerbate or create pain (41%) were common coping mechanisms. It is possible that the incidence of WMSDs may be reduced and the quality of care for patients can be maintained if preventative measures are put in place early in a physiotherapist's career.

**Keywords** - Work-related, musculoskeletal, disorders, Physiotherapy, Neuro-physiotherapy, Job, risk factors

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## INTRODUCTION

Work-related musculoskeletal diseases (WMSDs) are widespread among healthcare professionals, particularly those who have direct patient interactions, such as surgeons (1), nurses (2) and therapists (3). Musculoskeletal discomfort is a potential indication of WMSD, leading to lifelong impairment if left untreated (4). Physiotherapists, who often specialize in fields such as disease prevention and post-trauma care, have a good grasp on how to avoid musculoskeletal injuries. Yet, they still face a significant risk of developing WMSD because to the nature of treatment itself, which includes things like

doing the same activities repeatedly, standing in one place for extended amounts of time, and treating several patients in a day (5–7). Musculoskeletal discomfort is the leading cause of physiotherapy absenteeism, which has serious consequences for productivity and economic advantages, as reported in a recent online survey (8). Just as Nordin (9) and Obembe (10) revealed, physiotherapists could also become patients.[1]

The prevalence of work-related musculoskeletal diseases (WRMDs) among physiotherapists (PTs) is as high as 91%, and the recurrence rate is 88%, as documented in prevalence research done by West

and Gardner. The professional function of a PT is physically demanding in nature and this adds to the high frequency of WRMDs among PTs. Physical therapists (PTs) interact directly with patients and engage in a variety of physically demanding tasks in the clinic setting. The increasing demand for PT services has resulted in a larger patient load, which in turn has raised the workload and the physical strain on PTs.[2]

Musculoskeletal diseases (MSDs) are highly frequent among healthcare personnel. The frequency of MSDs across numerous healthcare professions was studied. Prevalence of above 80% has been recorded among physiotherapists, masseurs, nurses, midwives, dentists and surgeons. The high exposure to MSDs is directly tied to their profession, which involves different duties and a significant physical load. Several studies have emphasized the usage of repeated difficult postures that are typically immobile, notably among surgeons and physiotherapists. [3]

Nurses and physical therapists have also been witnessed doing patient transfers or handling. It has been established that the need for precision in the dental and medical fields contributes to the development of MSDs. [4]

While trying to figure out what causes MSDs to show up, it helps to know which parts of the body are most vulnerable. The lower back has been shown to be an especially vulnerable location in several research conducted on physiotherapists, nurses, and surgeons. The neck and the shoulder have also been mentioned as vulnerable regions for medical staff. There have also been more targeted assessments of MSD prevalence, such as studies of masseurs' thumbs. Multiple sclerosis (MS) in the medical field has been studied from several angles, including the risk factors and responses/treatments used to lessen symptoms. It was first described for physical therapists by Muaidi and Shanb, then for nurses by Tinubu et al., and finally for surgeons by Mohseni-Bandpei et al. [5]

**MATERIALS AND METHOD**

Many research, including those by Cromie JE et al. (2000), Bindu PH et al. (2014), Milhem et al. (2016), Ramanandi V et al. (2021), Karanikas N et al. (2021), etc., have examined the prevalence of WMSDs in the physiotherapy profession and found it to be rather high. Several research have highlighted the general risk factors and preventative techniques of WMSDs among physiotherapists. Nonetheless, the prevalence of WMSDs among physiotherapists may vary with their area of expertise, as each subfield serves a distinct function. The purpose of this research was to examine the present state of knowledge about the incidence, risk factors, and preventative measures for WMSDs among physiotherapists in different fields of practice. [6]

Work-related musculoskeletal disorders, physical therapists, physiotherapists, prevalence, risk factors,

prevention strategies, musculoskeletal physiotherapy, neuro physiotherapy, cardio respiratory physiotherapy, sport physiotherapy, pediatric physiotherapy, and physiotherapy were all searched for in Scopus, Web of Science, PEDro, EMBASE, MEDLINE, Google Scholar, and PubMed (NML) until January 2022 using a predefined strategy. The data from publications were not restricted in any way. All papers with potentially relevant titles and abstracts were read. All articles that were found were examined, including their cited sources. [7]

Criteria for inclusion in the research included:

- (1) Studies written in English
- (2) Studies dealing with WMSDs in PTs
- (3) Study type randomized control trials only. [8]

Articles that did not pertain to WMSDs in PTs, were originally published in languages other than English, or lacked access to the complete text were not considered. This narrative review draws conclusions after rationally analyzing articles and references. [9]

**RESULT**

Table 1 provides information on the research that have been done on the prevalence of WMSDs in different physiotherapy subspecialties. For the purpose of making evidence-based recommendations (1a), this review solely included randomized controlled trials.[10]

**Table 1: Summary of studies included in this study.**

Specialization	Study	Study group (n)	Work setup	Prevalence (Pain in last 12 months)
Physiotherapy in Musculoskeletal Conditions	Rugelj D 12	113	OPD	LBP (73.7%)
			hospital settings	LBP (50.4%)
	Buddhdev & Kotecha	20	OPD	Neck (25%) Upper back (15%)
	G. Rossetini et al.	219	OPD	Thumb (49.3%)
Physiotherapy in Cardiorespiratory Conditions	Santos RM et al.	18	ICU	Neck (27%) LBP (18%)
			Ward	Neck (14%)
	Yang S et al.	702	ICU	LBP (80.1%) Neck (78.6%) Knee (37.4%)

Physiotherapy in Neurological Conditions	Bork BE et al.25	928	hospital-based settings	LBP (45%)
	Molumphy et al.	344		LBP (29%)
	Cromie JE et al.	824	OPD and home-based rehabilitation	neck, upper back and upper limbs followed by low back pain (42%)
Physiotherapy in Sports	Ju YY et al.	146	Sports field	LBP (42%), Finger (38%), shoulder (26%)
Physiotherapy in Paediatrics	Atia DT et al.	106	OPD	neck (63.2%), shoulder (58.5%), wrist and hand (56.6%), knee (53.8%)

Anatomical sites impacted in Physiotherapists are shown in Table 2 by gender. Comparisons between the sexes show that women are more likely to have pain in their low back, neck, and shoulders than men are, but both sexes experience pain in their low back, neck, wrists, and hands. [11]

**Table 2: Anatomical regions affected among Physiotherapists - Gender wise**

Anatomical region	n (%) Male	n (%) Female
affected	(n=53)	(n=117)
Neck	16 (30.2)	55 (47)
Shoulder	7 (13.2)	38 (32.5)
Elbow	2 (3.8)	8 (6.8)
Wrist and hand	8 (15.1)	19 (16.2)
Thumb	0 (0)	11 (9.4)
Upper Back	6 (11.3)	21 (17.9)
Lower back	36 (67.9)	75 (64.1)
Hip and Thigh	2 (3.8)	5 (4.3)
Knee	6 (11.3)	13 (11.1)
Ankle and Foot	2 (3.8)	5 (4.3)

Figure 2 shows that the majority of physiotherapists (60%) encounter WRMD during the first five years of practice after graduating, whereas only 4.1% have WRMD after this timeframe. A similar reaction was seen in a study that divided participants by gender and examined when WRMD symptoms first appeared. (Table 3). [12]

**Table 3: Onset duration of WRMD among Physiotherapists- Gender Wise**

Onset Duration	n (%) Male	n (%) Female
	(n=53)	(n=117)
Before PT	6 (11.3)	5 (4.3)
As PT student	7 (13.2)	26 (22.2)
1st 5 Years	34 (64.2)	68 (58.1)
5-15 years	2 (3.8)	5 (4.3)

Overwhelmingly (97%), respondents said they are familiar with ergonomics, and over 60% said they have had training on the topic. (Third Picture). [13]

The percentages of individuals who recognized each widely held risk factor are shown in Table 4. Many replies were collected, and the shares of those with a notable impact on WRMD are shown. Most participants (77%) cited prolonged static postures employed during treatment as a risk factor, [14] followed by the number of patients treated each day (68.2%), and finally, bending, twisting back in uncomfortable positions when treating patients (65.8%). [15]

**Table 4: Job risk factors identified by Physiotherapists as common contributors to WRMD**

Job Risk Factors	n (%)
Performing the same task over and over	83 (48.8)
Treating a large number of patients in one day	116 (68.2)
Not enough rest breaks during the day	93 (54.7)
Performing manual orthopedic techniques (joint or soft tissue mobilization)	69 (40.6)
Working in awkward or cramped positions	108 (63.6)
Working in the same position for long periods (standing, bend over, sitting, etc)	131 (77.0)
Bending or twisting back in an awkward way	112 (65.8)
Reaching or working away from body	90 (53.0)
Unanticipated sudden movement or falls by patient	80 (47.1)
Assisting patient during gait activities	69 (40.6)
Lifting or transferring dependent patients	97 (57.0)
Working with confused or agitated patients	63 (37.0)
Carrying, lifting or moving heavy materials or equipment	80 (47.1)
Working at or near physical limits	85(50.0)
Continuing to work when injured or hurt	108 (63.6)
Work scheduling (over time, irregular shift, length of workday)	94 (55.3)
Inadequate training in injury prevention	84 (49.4)

Participating physiotherapists showed a significant correlation between body mass index and WOMAC,  $\chi^2(3, 9.091)$ ,  $p=0.028$  (Table 6). [16] Similarly,  $\chi^2(1, 7.271)$ ,  $p=0.007$  from a chi-square test revealed statistically significant relationships between fitness sub-specialty and WRMD (Table 7)

**Table 6: Chi-Square test of BMI Vs WRMD**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.091a	3	.028
Likelihood Ratio	9.174	3	.027
Linear-by-Linear	5.584	1	.018
Association			
N of Valid Cases	271		

**Table 7: Chi-Square test of Fitness practice Vs WRMD**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.271a	1	.007
Likelihood Ratio	6.259	1	.012
Linear-by-Linear	8.164	1	.004
Association			

**DISCUSSION**

**Low Back Pain:**

According to Rugelj D, physiotherapists in primary care settings experience 73.7% more cases of low back pain than those working in hospitals. 15 Buddhdev & Kotecha found a 35% prevalence of LBP, Maheshwari et.al. found a 72.5% prevalence, and Malavizhi D et.al. found a 60% prevalence; these studies all focused on the low back. [17] Common risk factors for LBP include serving a high volume of patients in a single day, assuming uncomfortable postures such as bending or twisting the back, standing in one place for extended periods of time, moving or transporting heavy equipment or dependent patients, and not taking enough breaks. [18]

Many factors contribute to WMSD, and certain risks cannot be controlled for (e.g., genetics). [19] Yet, we may lessen the likelihood of developing low back discomfort by avoiding potentially precipitating activities and behaviors. 18 Low back discomfort in healthy professionals may be reduced via careful patient handling, the use of patient transfer equipment (e.g., lifts), getting other personal support for lifting, adjusting the posture of the patient or therapist, and frequent practice of physical exercise. Manual therapy, manually resisted exercises and assisted stretches, adequate body mechanics, and other strategies like changing posture, adjusting bed height, using aids and

equipment, using a different body part, substituting electro therapy, etc. are all necessary to reduce the amount of strain placed on the body during activities. 6,11 Physical therapists may lessen their strain by scheduling patients with varying degrees of physical difficulty and taking breaks in between sessions. [20]

Full, normal spinal mobility is made possible by the strength and pliability of tissues around the spine and pelvis, which also prevents excessive stresses on the joints and lessens the likelihood of damage. Abdominal and back muscles that are sufficiently strong aid in stabilizing the spine, facilitating healthy spinal movement, and making it simpler to maintain upright posture. [21] To lift with the correct form and mechanics, you need strong hip and leg muscles. Hence, in order to keep the therapist physically healthy, abdominal and lower limb strengthening activities should be undertaken. Flexibility may be enhanced through stretching. Muscle fatigue, pain, and future WMSDs of the low back may all be avoided with frequent self-stretching exercises.[22]

**Neck, upper back and upper extremity:**

Many studies show that the neck is the second most common site of injury for physiotherapists. Buddhdev & Kotecha reported a prevalence of 25% for neck pain and 15% for upper back pain, whereas Maheshwari et al. reported 72.5 and 28.6 percent, while Malavizhi D et al. reported 62.9 and 51.9%. [23] The shoulder, wrist/hand, and elbow were the additional upper limb joints affected. Physiotherapists often treat patients with neck and upper limb WRMDs such tension headaches, muscle strains, myalgia, carpal tunnel syndrome, de Quatrain’s disease, trigger finger, digital neuritis, arthritis of the carpometacarpal joint, etc. Mobilization and manipulation procedures, therapeutic massage techniques and other hands-on therapy, as well as repetitive performance of the same work, may all contribute to the development of WMSDs in the neck, upper back, and upper limbs. Treating a high patient volume per day has also been linked to increased risk of thumb and hand discomfort. Physiotherapists may help prevent injuries by using measures like work rotation and reducing the amount of time spent doing repetitive actions. [24] Physical therapists can reduce strain on their upper body and spine by, among other things, taking frequent breaks, scheduling less physically demanding patients immediately after more physically demanding ones, and making use of lightweight or ergonomically designed equipment that does not require an awkward, hunched over position while using it. Muscle tension and discomfort, as well as potential work-related musculoskeletal disorders (WMSDs) of the neck, upper back, and upper extremities, may be avoided with regular strength training and a variety of self-stretching activities.[25]

**Lower limb:**

In the lower body, the knee joint is the most often afflicted area, followed by the ankle/foot area and the hip area. According to Bindu H et.al., the prevalence of knee was 15%; according to Maheshwari et.al., it was 12.1%; and according to Malavizhi D et.al., it was 30.4%. [26] Because of the long periods spent kneeling and squatting, paediatric physiotherapists have a greater incidence of knee complaints. 2,13. If you have to work in a kneeling posture for more than an hour straight, your knees will start to hurt unless you take regular rests, sit on a mat or other soft, firm surface, and wear knee protectors. A physiotherapist's day often consists of a number of different tasks, including manual therapy, stretching and limb physiotherapy, and the use of electrotherapeutic modalities. The physiotherapist should sit in a more ergonomic posture, with their feet flat on the floor and their back straight, to reduce the risk of knee discomfort while treating the patient. [27] Therapists who must stand for extended periods of time to provide therapy should take on derived standing stances like walking and striding and constantly transfer their weight from one leg to the other.[28]

#### **Relationship of age and WMSDs in physiotherapists:**

Among physiotherapists, several studies have shown that the correlation between age and WMSDs is strongest for those in their early twenties. Studies show that this is because newly certified therapists, in search of career direction, choose to work in therapeutic areas that are physically demanding and need higher work hours. It's possible that freshly licensed physiotherapists, as compared to their more seasoned counterparts, don't know as much about the many ways to deal with stress and anxiety that might help avoid WMSDs.[29]

#### **Relationship of Gender and WMSDs in physiotherapists:**

As compared to male physiotherapists, the prevalence of WMSDs was shown to be considerably greater among female physiotherapists in a study by Nordin NAM et al. Female physiotherapists have been shown to be more prone to WMSDs than their male counterparts in a number of studies, which has been attributed to the fact that women tend to be shorter and physically weaker than men, which can put them at a disadvantage when performing care tasks like lifting and transferring patients.[30]

Studies found that male physiotherapists, perhaps due to their increased use of mobilization & manipulation techniques, had more neck, wrist, hand, & thumb complaints than female physiotherapists.[31]

Changes in spinal posture and a weakening of joint structures<sup>5</sup> make the lower back a frequent target of pregnancy-related stress, which also affects women.

Postnatal treatment and core muscle strengthening may be conducted on female physiotherapists to avoid improper spinal postures after pregnancy.[32]

#### **CONCLUSION**

When it comes to getting patients back on their feet after an illness or accident, physiotherapists play a vital role in the healing process. The prevalence of WMSDs in various body parts may vary with a physiotherapist's area of expertise. As musculoskeletal physiotherapists have to conduct a lot of manual treatment and stand in one place for lengthy periods of time, they often have pain in their thumbs, necks, and lower backs. More patients relying on the neuro physiotherapist for transfer and lifting activities, as well as passive and supported mobility for ADL, increases the risk of low back WMSDs. Treating a high volume of patients each day and standing in awkward postures while bending and twisting both increase the risk of developing WRMD. Therefore, owing to the type and pattern of employment participation in Physiotherapy, removing these risk factors is unlikely. The literature review highlights the following risk factors: patient transfer and lifting, manual therapy techniques, static postures, responding to unexpected patient movement, repetitive tasks, bending, twisting, continuing to work even while injured, treating an excessive number of patients in a single day, inappropriate work scheduling, and so on. Nevertheless, further research is needed to determine the full scope of WRMD's risk factors and to create relevant and effective PT-specific tools for use with Pts.

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