

Impact of Work-Related Musculoskeletal Disorders on Work Ability in Physiotherapists

Sonumol Ramanan^{1*}, T. Harika², A. K. Vijay Krishna Kumar³

¹Lecturer, Department of Physiotherapy, Dr. B. R. Ambedkar College of Physiotherapy, Bengaluru, India

²Intern, Department of Physiotherapy, Dr. B. R. Ambedkar College of Physiotherapy, Bengaluru, India

³Principal, Department of Physiotherapy, Dr. B. R. Ambedkar College of Physiotherapy, Bengaluru, India

Abstract: Background: The nature of the work in the physiotherapy practice is physically demanding, as it involves repetitive tasks, various manual techniques and awkward positioning of joints during certain prolonged constrained postures. Work related musculoskeletal disorders is currently recognized as one of the most common occupational injuries, for which Physiotherapist's are identified as one of the high-risk groups. **Objective:** To investigate the association between work related musculoskeletal disorders and work ability among Physiotherapists. **Method:** A cross sectional survey conducted with 150 samples, using two validated standard self-administered questionnaires. The survey includes Nordic musculoskeletal questionnaire and Work Ability Index. **Results:** Out of 150 respondents, 76(50.70%) were females and 74(49.30%) were male physiotherapists. The point prevalence rate of WMSDs was 68 (45.30%) and 12-month prevalence of WMSDs was 139(92.70%). The 12-month prevalence rate of WMSDs was highest in neck 83 (55.30%) and low back 83(55.30%), followed by upper back 55(36.70%), shoulders 50(33.30%), wrists 26(17.30%). the least affected was elbows 2(1.30%), ankles 5(3.30%), hips/thighs 7(4.70%) and knees 15(10%). Among 150 respondents, 39.6% had an excellent workability index, 56.1% had good workability index and 40.3% had moderate workability index. **Conclusion:** Physiotherapists are at high-risk for WRMSDs whereas the work ability among them was reported as excellent. Special measures should be taken to ensure that they work in an ergonomically acceptable workplace with the adoption of proper body mechanics. Lifestyle intervention would help in preventing the further musculoskeletal problems.

Keywords: Musculoskeletal disorders, Pain, Physiotherapists, Work ability.

1. Introduction

Numerous studies have shown that musculoskeletal disorders (MSDs) are responsible for the severe chronic pain and physical disability that impact hundreds of millions of people worldwide [1]. Musculoskeletal disorder (MSD), according to the National Institute for Occupational Safety and Health, is an injury that affects the human body's musculoskeletal system, including the bones, spinal discs, tendons, joints, ligaments, cartilage, nerves, and blood vessels. Such injuries may be caused by the repetitive motions, stresses, and vibrations that certain work tasks place on human bodies. When work activities and environmental factors significantly contribute to the development of work-

associated disorders, the World Health Organization recognizes those conditions as being related to the workplace. These conditions include those that cause discomfort and functional impairment in the neck, shoulders, elbows, forearms, wrists, and hands [2]. Our society has a serious problem with work-related musculoskeletal disorders, which have a negative influence on quality of life and lead to high expenses for employers, employees, and healthcare systems owing to absenteeism, lost productivity, disability, and higher healthcare costs. "Any musculoskeletal system condition that occurs at work and causes discomfort, difficulty, or pain while performing a job" is referred to as a "musculoskeletal system disorder."³ Individual factors (gender, age, BMI, and so on), within-person effects (traumatic stress), and work-related factors all contribute to WMSD risk. Physical (biomechanical) workloads, organizational risk factors, and psychosocial risk factors are the three types of workplace risk factors [4]. WMSDs are common among healthcare professionals, including physiotherapists, and they can result in long-term medical care needs, permanent impairment, and loss of working hours [1]. According to WHO, "Physiotherapists are those who evaluate, plan, and carry out rehabilitative programs to improve or restore human motor functions, relieve pain syndromes, achieve greater movement ability, and treat or prevent physical challenges caused by injuries, diseases, and other impairments. They use various techniques, such as movement's, thermotherapy, ultrasound therapy, and laser etc. [5] PTs conduct a variety of physically demanding tasks related to work related musculoskeletal problems (WMSD) [6]. Despite physiotherapists' extensive knowledge of musculoskeletal injuries and prevention strategies, research indicates that this group of workers has a high prevalence of WMSD. The work of a physiotherapist is physically demanding because it involves repetitive tasks, different manual techniques, and awkward joint positioning during certain prolonged constrained postures [3]. WRMD affects as many as 91 percent of physiotherapists (PT) during their careers, with recurrence rates as high as 88 percent. Additionally, throughout the course of a year, 80 percent of PTs are said to develop symptoms in at least one body part. One in every six physical therapists has reportedly changed their area of specialization or left the field

*Corresponding author: sonuramanan31@gmail.com

as a result of pain or injury [7]. It is considered that the physically demanding nature of work responsibilities and clinical demands contribute to the high incidence of WRMD in therapists [8]. Because of this physically demanding nature, people have been observed adopting awkward postures such as bending and twisting [9].

These work-related musculoskeletal disorders, in turn, have an impact on the work ability of physiotherapists. Work ability is defined as a worker's ability to perform a job while taking into consideration work demands, health, and mental resources. Work ability is the sum of factors that enable employees in a given situation to successfully manage their work demands. Impaired work ability is thought to be caused by an imbalance between job demands and personal factors [1]. Studies have been conducted on the WMSDs of physiotherapists in different parts of the world. However, there is a paucity of data on the work ability of physiotherapists and the association between the WMSDs and work ability of physiotherapists. Thus, there is a need to determine the prevalence of WMSDs and the work ability of physiotherapists.

2. Methodology

- Study setting: Hospitals and Physiotherapy clinics in and around Bangalore
- Study design: Cross-sectional study
- Study Sample: Physiotherapists
- Sample size: 150 Physiotherapists
- Sampling method: Convenient sampling
- Criteria for sample collection:

Inclusion criteria:

1. Male and female physiotherapists
2. Age range 25-45 years
3. Physiotherapists working in hospitals, clinics, fields etc.

Exclusion criteria:

1. Age >45 years
2. Pregnant female physiotherapists
3. MSD due to accidents
4. Any systemic diseases
5. Any known congenital MSD
6. Any surgeries

Procedure:

Sample sizes of 160 physiotherapists were included in this study with age groups 25 to 45 years from different clinics and hospitals in Bangalore. Written informed consent was obtained from all the 160 subjects after explaining the objectives of the study to them. Each subject was screened for, and those subjects who had not met the inclusion criteria were excluded from the study. Information on subjects' demographic variables was collected. The questionnaire was self-administered, personally distributed to the subjects, and collected during visits to various clinics and hospitals in Bangalore. A total of 150 participants completed the study.

3. Results

Statistical analysis of the data was done using SPSS 23.0.

Descriptive statistics were calculated and summarized which includes frequency, mean and standard deviation. Association was done using chi-square test. Level of significance was set at 5%. A total number of 160 samples were collected out of which 150 samples completed the study. The majority of respondents that is 104 (69.30%) were in the age range of 25-30 years, followed by 31-35 years age range 29 (19.30%), and only 9 (6%) were in 41-45 years range and 8 (5.30%) were in 36-40 years range. Out of 150 respondents, 76 (50.70%) were females and 74 (49.30%) were male physiotherapists. The minimum and maximum age of both male and female was 45 and 42 years with the mean value of 29.8 and 28.2 respectively.

The point prevalence rate of WMSDs was 68 (45.30%) and 12-month prevalence of WMSDs was 139 (92.70%). The 12-month prevalence rate of WMSDs was highest in neck 83 (55.30%) and low back 83 (55.30%), followed by upper back 55 (36.70%), shoulders 50 (33.30%), wrists 26 (17.30%). the least affected was elbows 2 (1.30%), ankles 5 (3.30%), hips/thighs 7 (4.70%) and knees 15 (10%). There was no significant association between age, years of experience, working hours and work ability, whereas there was a significant association between gender ($p= 0.04$) and respondents' work ability. It was observed that respondents aged between 25-30 years reported the highest 99 (95.2%) prevalence of WMSDs. It was also observed that out of 150 (100%) participants, 144 (96%) participants said that their work was physically as well as psychologically demanding were as only 6 (4%) said it was only physically demanding.

The statistical analysis of the present study showed that there is significant association between the 12-month prevalence of WMSDs of the respondents and work ability ($p<0.05$). Among those who had pain from last 12 months, 39.6% had an excellent workability index, 56.1% had good workability index and 40.3% had moderate workability index. Thus, the results indicate that the respondents had work related musculoskeletal disorders but that wasn't influencing their workability as there was better work ability in majority of the respondents.

Table 1
Descriptive statistics

Characteristics	N	Minimum age	Maximum age	Mean	Standard deviation
Male	74	25	45	29.8	5.20142
Female	76	25	42	28.2	4.27621

Interpretation: Majority of samples were females. The minimum and maximum age of both male and female was 45 and 42 years with the mean value of 29.8 and 28.2 respectively.

Interpretation: From table 2, the point prevalence rate of WMSDs was 68 (45.30%) for all the respondents. Of the 150 respondents, 139 (92.70%) complained of musculoskeletal pain in last 12 months. The 12-month prevalence rate of WMSDs was highest in neck 83 (55.30%) and low back 83 (55.30%), followed by upper back 55 (36.70%), shoulders 50 (33.30%), wrists 26 (17.30%). the least affected was elbows 2 (1.30%), ankles 5 (3.30%), hips/thighs 7 (4.70%) and knees 15 (10%).

Table 2

Point prevalence, 12-month prevalence, and parts of the body affected by work-related musculoskeletal disorders (WMSDs)

Variables	Frequency (n)	Percentage (%)
Point prevalence		
Yes	68	45.30%
No	82	54.70%
Total	150	100%
12 months prevalence		
Yes	139	92.70%
No	11	7.30%
Total	150	100%
Parts of the body affected		
Neck	83	55.30%
Shoulders	50	33.30%
Elbows	2	1.30%
Wrists	26	17.30%
Upper back	55	36.70%
Lower back	83	55.30%
Hips/Thighs	7	4.70%
Knees	15	10%
Ankles	5	3.30%

Interpretation: From table 3, it was observed that respondents aged between 25-30 years reported the highest 99(95.2%) prevalence of WMSDs. There was no significant

association between age, gender, years of experience, working hours and 12-month prevalence of WMSDs.

Interpretation: From table 4, it was observed that out of 150 (100%) participants 144 (96%) participants said that their work was physically as well as psychologically demanding were as only 6(4%) said it was only physically demanding.

Interpretation: From table 5, a significant association was evident between gender ($p=0.04$) and respondents' work ability whereas there was no significant association between the age, years of experience and working hours per day with the respondents' work ability.

Interpretation: From table 6, the analysis showed that there is significant association between the 12- month prevalence of WMSDs of the respondents and work ability ($p<0.05$). Among those who had pain from last 12 months, 39.6% had an excellent workability index, 56.1% had good workability index and 403% had moderate workability index.

Table 3

Association between age, gender, years of experience, working hours, and work status with the 12-month prevalence of WMSDs

Variables	12-month prevalence				
	Yes n (%)	No n(%)	Total n (%)	X2	p-value
Age range					
25-30	99(95.2%)	5(4.8%)	104(100%)	2.079	0.354($p>0.05$)
31-35	25(86.2%)	4(13.8%)	29(100%)		
36-40	6(75%)	2(25%)	8(100%)		
41-45	9(100%)	0(0%)	9(100%)		
Total	139(92.7%)	11(7.3%)	150(100%)		
Gender					
Male	72(93.5%)	2(2.7%)	74(100%)	4.609	0.032($p<0.05$)
Female	67(88.2%)	9(11.8%)	76(100%)		
Total	139(92.7%)	11(7.3%)	150(100%)		
Years of experience					
1-5	101(93.5%)	7(6.5%)	108(100%)	3.988	0.136($p>0.05$)
6-10	25(86.2%)	4(13.8%)	29(100%)		
>10	13(100%)	0(100%)	13(100%)		
Total	139(92.7%)	11(7.3%)	150(100%)		
Working hours per day					
<8hours	50(100%)	0(100%)	50(100%)	3.578	0.059($p>0.05$)
≥8hours	89(89%)	11(11%)	100(100%)		
Total	139(92.7%)	11(7.3%)	150(100%)		

Table 4

Work demand and points rating of respondents work ability

Variables	Frequency (n)	Percent (%)
Work demand		
Physically demanding	6	4%
Physically and psychologically demanding	144	96%
Total	150	100%
Current workability points		
0-2	0	0%
3-4	0	0%
5-6	6	4%
7-8	88	58.70%
9-10	56	37.30%
Total	150	100%
Grades		
7-27	0	0%
28-36	6	4%
37-43	78	52%
44-49	66	44%
Total	150	100%

Table 5
Association between age, gender, years of experience and work ability

Variables	Work ability					X2	p-value
	7 – 27 n (%)	28 – 36 n (%)	37 – 43 n (%)	44 – 49 n (%)	Total n (%)		
Age range (years)							
25-30	0(100%)	4(3.8%)	53(51%)	47(45.2%)	104(100%)	4.873	0.30(p>0.05)
31-35	0(100%)	0(100%)	18(62.1%)	11(37.9%)	29(100%)		
36-40	0(100%)	0(100%)	2(25%)	6(75%)	8(100%)		
41-45	0(100%)	2(22.2%)	5(55.6%)	2(22.2%)	9(100%)		
Total	0(100%)	6(4%)	78(52%)	66(44%)	150(100%)		
Gender							
Male	0(100%)	2(2.7%)	32(43.2%)	40(54.1%)	74(100%)	6.326	0.04(p<0.05)
Female	0(100%)	4(5.3%)	46(60.5%)	26(34.2%)	76(100%)		
Total	0(100%)	6(4%)	78(52%)	66(44%)	150(100%)		
Years of experience							
1-5	0(100%)	4(3.7%)	55(50.9%)	49(45.4%)	108(100%)	4.077	0.396(p>0.05)
6-10	0(100%)	0(100%)	16(55.2%)	13(44.8%)	29(100%)		
>10	0(100%)	2(15.4%)	7(53.8%)	4(30.8%)	13(100%)		
Total	0(100%)	6(4%)	78(52%)	66(44%)	150(100%)		
Working hours per day							
<8hours	0(100%)	0(100%)	28(56%)	22(44%)	50(100%)	4.058	0.131(p>0.05)
≥8hours	0(100%)	6(6%)	50(50%)	44(44%)	100(100%)		
Total	0(100%)	6(4%)	78(52%)	66(44%)	150(100%)		

Table 6
Association between work ability and a 12-month prevalence of WMSDs

Variables	12-month prevalence			X2	p-value	
	Work ability (Grades)	Yes n (%)	No n (%)			Total n (%)
7-27		0(0%)	0(0%)	0(0%)	15.108	p<0.05
28-36		6(4%)	0	6(4%)		
37-43		78(52%)	0	78(52%)		
44-49		55(83.3%)	11(16.7%)	66(44%)		
Total		139(92.7%)	11(7.3%)	150(100%)		

4. Discussion

Musculoskeletal disorders are one of the most common work-related injuries. Of which previous studies showed that healthcare professionals are more prone for musculoskeletal disorders [1], [3]. This study was conducted to explore the prevalence of WMSDs in physiotherapists in Bangalore and to determine the work ability of physiotherapists. The study included a total of 150 respondents working in different hospitals and clinics in Bangalore, India.

The present study revealed that the 12-month prevalence of WMSDs among physiotherapists was 92.70% which shows almost the same prevalence of 92.20% of a similar study which was conducted in Slovenian physiotherapists [2], [10]. A study was conducted to explore the prevalence, characteristics and impacts of work-related musculoskeletal disorders among physical therapists in the state of Kuwait [11]. The study resulted that, the one-year prevalence rate of WMSDs among the participants was 47.6% this was less than the prevalence reported in United States (61%) [12], Australia (91%) [13] and Nigeria (91.3%) [14]. A possible explanation for this lower rate maybe practice differences, with more physical therapist aides being available in the State of Kuwait to help with the varied work-related tasks [11].

To know the prevalence of WMSDs in physiotherapists the study was done in different parts of the body i.e., neck, shoulders, elbows, wrists, upper back, lower back, hips/thighs, knees and ankles using NMQ. In this study it showed that neck and low back were the most affected body parts with an equal prevalence rate of 55.30%. Excessive work load and non-

standard work posture may be considered as the cause for these WMSDs. Followed by upper back with 36.70% and shoulders 33.3%. And also, it was observed that elbows, ankles were the least affected. Another study conducted by Falguni sharma et al. among nurses, 18 showed that the prevalence of WRMSD was found to be 80% during the last 12 months with low back pain, the most commonly reported problem followed by ankle and foot, shoulder, neck, knee, hip/thigh, wrist/hand, elbow. The same study also reported that majority of the nurses communicated moderate workability [15]. The prevalence rate of lower back WMSDs was higher followed by neck, upper back, shoulder and hand/wrist complaints among physical therapists in a study conducted by Hesham N. Alrwayeh et al. [11] which was also consistent with other previous research [13], [16].

There was no significant association between age, years of experience, working hours and work ability, whereas there was a significant association between gender ($p=0.04$) and respondents work ability. The results also showed that only 4% participants considered their work demands as physically demanding, while 96% considered their work to be both physically and psychologically demanding.

The statistical analysis of the present study showed that there is significant association between the 12-month prevalence of WMSDs of the respondents and work ability ($p<0.05$). Among those who had pain from last 12 months, 39.6% had an excellent workability index, 56.1% had good workability index and 40.3% had moderate workability index. Based on the research results, it can be concluded that the work ability of physiotherapists employed at Zagreb University Hospital Centre, Croatia, has been estimated as good, which can have a

positive effect on the physiotherapists productivity and efficiency [17]. Thus, the results indicate that the respondents had work related musculoskeletal disorders but that wasn't influencing their workability as there was better work ability in majority of the respondents.

5. Limitation

- This study included a finite number of participants.
- This study included inadequate responses of physiotherapists and unwillingness to fully answer the questions in the questionnaire which may be because of the number of items and their busy schedule.
- It was also assumed that the responses given by physiotherapists were true.

6. Conclusion

Based on the present results of this study, the following conclusions are given. There is a high prevalence of the symptoms of WMSDs among physiotherapists in Bangalore. The neck and lower back is the most commonly and equally affected part of the body. Excessive work load and non-standard work posture may be considered as the cause for these WMSDs. The job risk factors reported by physiotherapists is working in repeated awkward and cramped positions for longer duration. There was good work ability among physiotherapists working in Bangalore, which was not influenced by the prevalence of the symptoms of WMSDs. Despite of having the musculoskeletal pain, the work ability was reported good which shows that the physiotherapists may not be much concerned about the musculoskeletal problems instead they focus to perform their work with better quality. However, age, years of experience, working hours did not show any impact on their work ability.

7. Recommendation

- Future study should include a large sample size.
- Future research should include studies that enlighten the high prevalence of symptoms of WMSDs and possible predisposing factors among physiotherapists.
- Future research should include studies to provide proper ergonomic training and education about lifestyle, health promotion programs like physical activities, exercises, lifestyle modification etc. to prevent symptoms of WMSDs.

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