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Prevalence, job risk factors and coping strategies of Work Related Musculoskeletal Disorders among Physiotherapists

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Abstract

Background: Physiotherapists, despite having good knowledge of work related musculoskeletal disorders, are not immune to it. As literature related to these injuries in Physiotherapy profession in India is scarce, this study aims to investigate prevalence of work related musculoskeletal disorder, job risk factors commonly involved and coping strategies used among Physiotherapist in India.

Methods: A semi structured questionnaire adopted from questionnaires used for similar studies around the world was circulated to 314 Physiotherapists. A total of 271 questionnaires were received back with a response rate of 86%. Mean, standard deviation, frequency, percentage and chi square test were used as appropriate for data analysis.

Results: Prevalence of work related musculoskeletal disorders was found to be 62.73%. Lower back region was affected the most (65.3%) followed by neck (41.8%) and shoulder (26.5%). As per response of therapists in this study, the most common risk factors were: working in static positions for longer periods (77%), treating large number of patients in single day (68.2%) and bending and twisting back in awkward positions (65.8%).Common coping strategies adopted by respondents were: modifying positions of patient and self (54.1%), adjusting height of treatment surface (47.1%) and selection of techniques that does not aggravate or provoke discomfort (41.8%).

Conclusion: This study has identified the prevalence of work related musculoskeletal disorders among Physiotherapists in India and possible risk factors associated with this profession. It has also identified the common coping strategies utilized by therapists. These findings would be significant in modifying risk factors to prevent and/or minimize work related musculoskeletal disorders among physiotherapists.

Key words: Coping strategies, Ergonomics, Indian Physiotherapists, Job risk factors, Work related musculoskeletal disorders

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Introduction

Work related Musculoskeletal disorder (WRMD) are work related injuries that occur as a result of work procedures, working environment or equipment that are utilized at work place. WRMD among healthcare workers have been studied in the past with more focus on nursing professionals [1-3], dentists [4-6] and surgeons [7] .

Physiotherapy as an occupation is physically demanding and involves therapists in bending, twisting, reaching or a combination of all positions. Awkward positioning while performing manual therapy techniques by Physiotherapists causes increased loads on spine making them susceptible to WRMD [8]. Owing to the increased level of patient contact, methods employed in the profession, application of manual techniques in practice and various other variables, WRMD are common in Physiotherapy practice [9, 10]. Studies in the past have revealed that

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91% therapists experience WRMD during their career with a recurrence rate of 88%. About 80% of therapists experienced symptoms in at least one body area over a 12 month period and 1 in 6 therapists changed their area of specialty as a result of WRMD [11, 12]. Despite various studies reporting a variance in the prevalence of WRMD among Physiotherapy population, there are few literatures on the prevalence of WRMD among Indian Physiotherapists [13]. Thus, the aim of this study is to estimate the prevalence of WRMD, to identify the potential job risk factors causing WRMD and to identify the possible coping mechanisms/strategies used commonly by Physiotherapists in India. Findings of this study would provide baseline data on the prevalence of WRMD among Physiotherapists in India which in turn would contribute to the body of knowledge. This would be helpful to identify possible job risk factors related to physiotherapy and coping strategies commonly adopted by Indian Physiotherapists.

Methods

A Cross sectional study was conducted by collecting details of all Physiotherapists working in Surat through Medical Directory for South Gujarat (Hello Doctor-2013). Therapists who were involved in direct patient handling were included in the study. Therapists with only administrative responsibilities were excluded from the study. Informed consent was obtained from the participants before the commencement of the study by explaining the details of the study in accordance with the institutional ethical standards of the ethics committee on human experimentation and the Helsinki declaration of 1975.

Data Collection involved a self – administered, semi – structured questionnaire consisting of 3 parts. The first part of the questionnaire collected demographic and profession related information of participants. This included the years of experience, work set up in which they were working, number of working hours per day, number of patients treated per day and specialty they belong to wherever applicable. It also included question on their knowledge of ergonomics and training in ergonomics. This part of the questionnaire also covered WRMD related symptoms in the past 12 months, part(s) of the body affected, onset of the symptoms and modifications done based on the symptoms.

The second part of the questionnaire included listing of 17 conditions and tasks based on previous published surveys [9, 14, 15], modified for use among Indian population. The respondents were instructed to indicate on a score of 1 to 4, on how the 17 factors contributed to their WRMD. A score of 1 indicated irrelevant or no contribution, 2 indicated the factor contributed to WRMD in a minor or insignificant way, 3 moderately significant and 4 indicated major contributions of the factors. During analysis, responses of each factor were dichotomized into two categories: not a significant contributor (1 and 2) and significant contributor (3 and 4).

The final part of the questionnaire required the participants to choose the coping strategies commonly adopted by them from a list of nine coping methods. The coping strategies mentioned in this study was also adopted from previous published surveys [16]. They were instructed that the response to coping strategies should reflect what they actually do in practice rather than what they would like to do or think should do. Responses were graded as strategies used almost always, sometimes and almost never.

Questionnaires were hand delivered to 314 Physiotherapists from different corporation zones of Surat city, Gujarat state, India. The list of Physiotherapists was collected from the Medical Directory of South Gujarat. Apart from the list mentioned in the directory, Physiotherapists in direct contact were also included in this study, based on the inclusion criteria. They were asked to complete and return the questionnaire within a week. It was collected from their respective places by the researchers in person. A reminder was sent after a week if the questionnaires were not received back. Questionnaires were number coded to facilitate follow up on respondents.

Collected data were analyzed using SPSS v 20.0 with alpha level set at $p<0.05$. Descriptive statistics of mean, standard deviation for continuous variables and percentage (frequency) for categorical variables were used. Inferential statistics of Chi square analysis was used to determine the association between the presence of WRMD symptoms and certain demographic factors like age group, gender, Body Mass Index (BMI), experience of therapists, specialty of work, type of work setup, number of working hours per day, number of patients treated per day, type of specialty other than fitness, knowledge of ergonomics, ergonomics training.

Results

A total of 271 questionnaires were returned out of 314 distributed questionnaires, with an overall response rate of 86%. A total of 64.9% of respondents were in the age group of 21-25 years and 28.8% of respondents belonged to the age group of 26-30 years. Female respondents (72.3%) were higher as compared to their male counterparts (27.7%). Frequency analysis of BMI category of respondents revealed 77.1% in normal category and 15.3% in overweight and obese category. Almost 75% of therapists had professional experience in the range of 1-5 years, with 13.3% having less than 1 year and 11.8% more than 5 years. 68.6% worked in clinical setup, 38% were attached to hospitals and 55.7% treated patients through home visits. 69% of therapists were working 6-10 hours a day, 13.3% more than 10 hours and rest 17.7% less than 5 hours a day. On an average the working hours of therapists who participated in this study was 8 hours per day. 32.5% treated 11-20 patients per day while 56.5% therapists treated less than 10 patients per day. 58.7% therapists had general practice, 42.1% focused only on patients with musculoskeletal disorders, 31% were practicing neurological physiotherapy, 21.4% were functioning as pediatric physiotherapists and 11.8% had fitness as their specialty.

Table 1 shows the detailed demographic data of respondents which were analyzed collectively and gender wise separately.

Out of 271 respondents, 170 complained of having WRMD symptoms in the past 12 months which contributed to overall prevalence of 62.7%. It was found that female physiotherapists were affected more (69%) than their male counterparts (31%). Out of the ten anatomical regions specified in the questionnaire, low back (65.3%) was identified to be the common region affected, followed by the neck (41.8%) and shoulder (26.5%) (Figure: 1).

Table 1: Overall & Gender wise demographic characteristics of respondents

Demographic Characteristics/Factors	Mean (SD) Overall (n=271)	Mean (SD) Male (n=75)	Mean (SD) Female (n=196)
Age (Years)	25.38 (3.20)	26.95 (3.27)	24.79 (2.97)
Height (cm)	160.77 (8.79)	169.71 (8.52)	157.34 (6.08)
Weight (kg)	57.19 (10.62)	67.06 (9.4)	53.41 (8.42)
BMI (kg/cm^2)	22.05 (3.22)	23.32 (3.25)	21.56 (3.08)
Years of Physiotherapy Practice	3.98 (2.82)	3.78 (2.79)	2.46 (2.69)
Number of patients /day under direct care	13.26 (11.63)	18.87 (13.79)	10.57 (6.1)
Number of hours / day in direct patient care	8.07 (2.54)	9.72 (2.44)	7.44 (2.28)

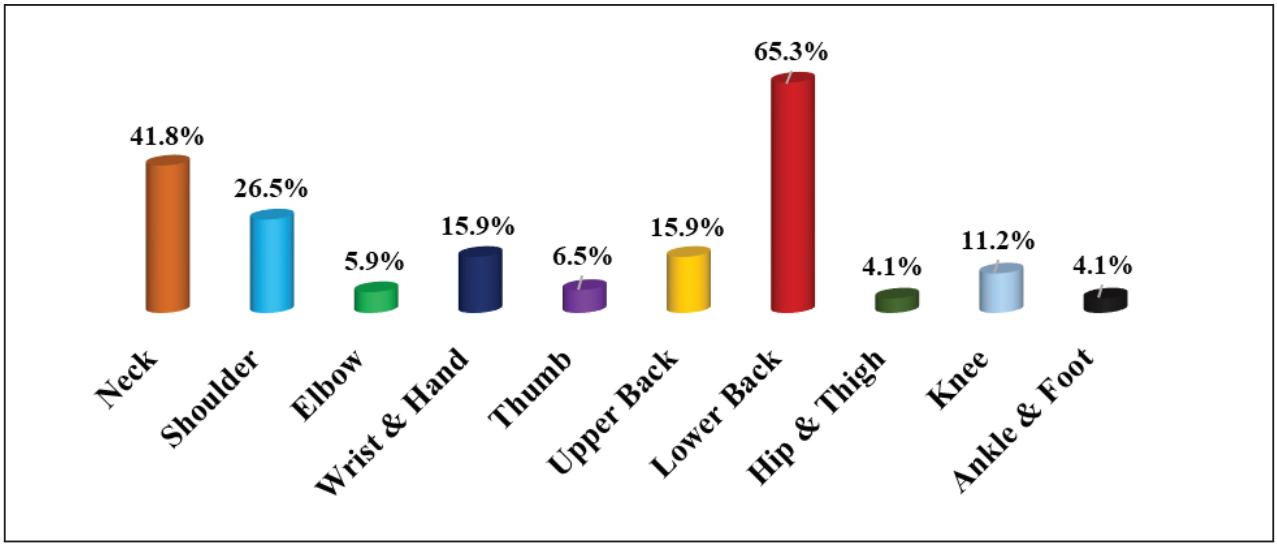

Figure 1: Distribution of Anatomical regions affected among Physiotherapists - Overall

Table 2 represents the anatomical regions of the body affected in Physiotherapists as per gender. When analyzed separately based on gender, it was found that low back, neck and shoulder were commonly involved in females as compared to low back, neck and wrist and hand involvement in males.

Table 2: Anatomical regions affected among Physiotherapists - Gender wise

Anatomical region affected	n (%) Male (n=53)	n (%) Female (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)

Duration of onset of WRMD among Physiotherapists was found to be 60% during the first five years of Physiotherapy practice (Figure 2), while only 4.1% experienced WRMD after 5 years of graduation. Gender wise analysis of onset of WRMD also showed similar response (Table 3).

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

Onset Duration	n (%) Male (n=53)	n (%) Female (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)

97% of respondents revealed that they have knowledge of ergonomics and close to 60% respondents reported that they were trained in ergonomics. (Figure: 3).

Table 4 shows the commonly perceived risk factors identified by the participants in percentage. Multiple responses were obtained and percentages of significant contributor to WRMD are displayed. Prolonged static positions used during treatment (77%), and number of patients handled per day (68.2%) and bending ,twisting back in awkward positions while giving treatment to patients (65.8%) were considered to be the most common risk factors as identified by the participants.

Modifying the patient's position self-position during treatment application is used commonly as a coping mechanism to overcome WRMD. Adjusting the height of the plinth accordingly has also been used as a coping strategy (Table 5).

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)

Table 5: Coping strategies commonly used by Physiotherapists with WRMD

Strategies	Always n (%)	Sometimes n (%)	Never n (%)
I get someone else to help me handle a heavy patient	42 (24.7)	102 (60)	26 (15.3)
I modify patient's position/ my position	92 (54.1)	71 (41.8)	7 (4.1)
I use a different part of my body to administer a manual technique	66 (38.8)	73 (42.9)	31 (18.2)
I warm up and stretch before performing manual technique	15 (8.8)	62 (36.5)	93 (54.7)
I use electrotherapy instead of manual techniques to avoid stressing an injury	17 (10.0)	61 (35.9)	92 (54.1)
I pause regularly so I can stretch and change posture	46 (27.1)	93(54.7)	31 (18.2)
I adjust plinth/bed height before treating a patient	80 (47.1)	67 (39.4)	23 (13.5)
I select techniques that will not aggravate or provoke my discomfort	71 (41.8)	79 (46.5)	20 (11.8)
I stop a treatment if it causes or aggravate my discomfort	25 (14.7)	85 (50.0)	60 (35.3)

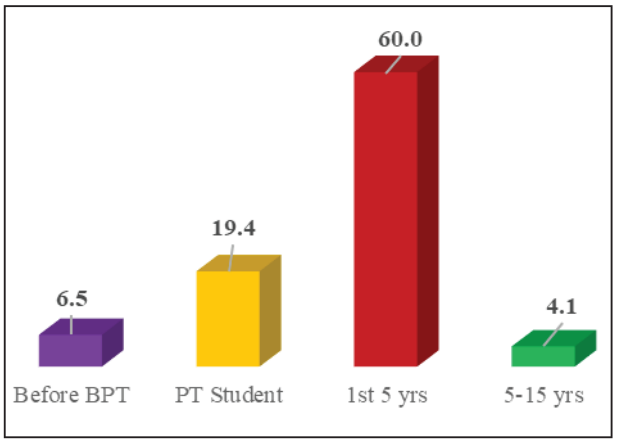

Figure 2: Onset duration of WRMD among Physiotherapists- Overall

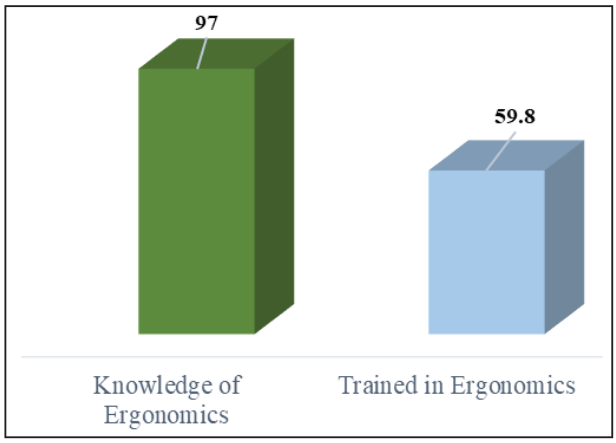

Figure 3: Percentage distribution of Physiotherapists with Ergonomic knowledge and training

The least adopted coping strategies observed were, performing warm up and stretching before providing treatment to patients (8.8%) and switching to electrotherapy modalities in place of manual therapy (10%).

A strong association was observed between BMI and WRMD among the participating Physiotherapists, $x^2(3, 9.091)$, p=0.028 (Table 6). Similarly results of chi square analysis showed significant associations between fitness specialty and WRMD, $x^2(1, 7.271)$, p=0.007 (Table 7)

Table 6: Chi-Square test of BMI Vs WRMD

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

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

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

DISCUSSION

This study found higher prevalence of WRMD among practicing physiotherapist from Surat city. Response rate was 86% which was higher than any other previous studies conducted on Physiotherapists across the globe.

Prevalence of WRMD among Physiotherapists in our study showed 62.73% therapists reporting WRMD symptoms in the past 12 months. This prevalence rate is higher as compared to studies conducted among

physiotherapists from California, Iowa, Jeddah, Kuwait and Queensland [9, 17-20]. However, studies by Cromie J E [12], Adegoke O A [21], Nkhata L A [22], Salik Y [23] found higher prevalence of WRMD among physiotherapists than the present study.

About 65.3% reported Low Back as the most common anatomical region of body affected due to WRMD, which was followed by neck and shoulder (Figure 2). Result of this study were consistent with findings from previous studies by Molumphy M et al [17], Alroweyah N H et al [20], Isabelle C N et al [19], Nkhata L A et al [22], Salik Y & Ozcan A [23], Bork et al [9], Adegoke O A et al [21], Holder N L et al [10], West D J et al [18], Glover et al [24] and Cromie J E et al [12]. WRMD in the wrist and hand, thumb when combined was 22.5% and this may reflect the less frequent application of manual therapy techniques in an Indian set up where therapists mostly rely on modality based management rather than on a hands on approach. Higher percentage of male physiotherapists complained of low back problem as compared to their female counterparts (Table 2). First episode of WRMD as reported by 60% respondents was during the first five years of practice. This can be attributed to lack of experience in handling techniques and enthusiasm to work harder at an entry level to treat patients.

Most important job risk factors identified by physiotherapists as a cause for WRMD in this study were working in the static positions, treating a large number of patients in a day, bending and twisting of back. These results were consistent with results of other studies [9, 10, 12, 17, 18, 22, 25]. Commonly adopted coping strategies for the prevention of WRMD were modifying positions of self or of patients, adjusting the treating surface (plinth, bed) prior to treatment and choice of techniques that does not provoke or aggravate their symptoms or discomfort. Only 8.8% of respondents reported warming up or stretching before performing manual therapy. Similarly despite 97% of respondents having knowledge in ergonomics and 60% trained in ergonomics, lack of application of stretching or warming up before performing a manual technique and absence of practical implication of ergonomic principles in the professional work place set up by Physiotherapists, are areas of concern which needs to be addressed.

Chi-Square statistics revealed statistically significant associations between BMI category and WRMD (Table 6), χ^2 (3) = 9.091, p=.028; Fitness specialty and WRMD (Table 7), χ^2 (1)=7.271, p=.007. However, weak associations were observed between age group, gender, experience of therapists, type of work setup, number of working hours per day, number of patients treated per day, type of specialty other than fitness, knowledge of ergonomics, ergonomics training and WRMD.

Conclusion

Prevalence of WRMD among Physiotherapists from India was higher than most of the values reported from around the globe. Low back was the most affected anatomical region of the body. Static positions combined with bending & twisting contributed more to WRMD as did treating large number of patients in a day. Since, eliminating these risk factors are least possible due to nature & pattern of job involvement in Physiotherapy, there is a need to implement ergonomic modifications suitable to the work situation. Results of this study would help in planning prevention strategies, modifying risk factors causing WRMD and appropriate application of ergonomic changes in preventing WRMD among practicing Physiotherapists.

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