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PREVALENCE OF DISABLING MUSCULOSKELETAL PAIN AMONG MEDICAL PROFESSIONALS IN CHENNAI

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Abstract

Introduction: Musculoskeletal disorders are one of the most common causes of disability. Despite low mortality, the morbidity of this problem is higher, and is often linked with occupations. Health care professionals are a high risk group for musculoskeletal disorders, considering various factors. In this study, we aimed to estimate the prevalence and risk of musculoskeletal disorders among health care professionals. **Methodology:** A cross sectional study was carried out among 752 health care professionals including doctors, postgraduates, interns and undergraduate medical students working in a tertiary care government hospital in Chennai. Disabling musculoskeletal pain was diagnosed based on David Coggon et al classification. Validated Orebro Musculoskeletal Pain questionnaire by Linton and Boersma was used to predict long term disability and failure to return to work. Results were analysed using Microsoft Excel spreadsheet. **Results:** The mean age of the participants was 24 ± 8.2 years. Interns formed a majority (24.2%) among the 302 doctors who participated. Among 752 participants, 23.5% (n=177) had musculoskeletal pain of which 32.7% (n=58) of participants had disabling musculoskeletal pain. Age, Body Mass Index and the Department of work were significantly found to be risk factors for musculoskeletal disorders ($p<0.05$)**.Conclusion:** The prevalence of musculoskeletal pain among doctors is on the high. It calls for necessary modifications in the working habits of medical professionals. Maintenance of ideal body weight is also recommended.

Key-words: Disability, Health care professionals, Musculoskeletal disorders, Occupational diseases, Pain

Introduction

About 1.7 billion people worldwide suffer from musculoskeletal disorders such as back pain and arthritis according to a study conducted in 2012 by American Academy of Orthopedic Surgeons. Musculoskeletal disorders are found to be the second greatest cause of disability. In the same year another study conducted in US by the National Health Interview Survey (NHIS) concluded that 126.6 million adults in the United States report musculoskeletal conditions. It accounts to more than one in two persons aged 18 and above. Chronic musculoskeletal conditions were reported at a rate 76%, which is greater than that of circulatory conditions like coronary diseases and 50% greater than chronic respiratory conditions [1][2]. The World Health Organization recognized that the burden of musculoskeletal diseases is global and declared 2000-2010 as Bone and Joint decade [3]. According to a study conducted by Dr.Sharma R et al the prevalence of musculoskeletal conditions in India varied from 7.5% to 25% [4]. Musculoskeletal pain is a very common subjective complaint among working individuals. Many factors like age, gender, work-place, physical factors like repeated, or sustained exertions, extreme postures of the body, insufficient recovery time and psychosocial factors like monotonous work, time pressure, high work load, lack of peer support, etc., have been attributed to the development of work-related musculoskeletal disorders [5].Health care professionals are more prone to develop work related musculoskeletal disorders, owing to several factors. The prevalence of musculoskeletal pain among health care professionals was found to be high in various studies [6,7]. Increased susceptibility of doctors and medical students to develop musculoskeletal pain is multifactorial. Work posture, repetitive movements, poor positioning, mental stress, handling of instruments, prolonged static posture are attributed to the development of pain.

Doctors and health care professionals play a pivotal role in providing health care to the society. In their absence, the health care system gets disrupted resulting in significant morbidity and mortality to the public. Work related musculoskeletal disorders decrease work productivity, increases work absenteeism and subsequently leads to economic loss [8].

This cross-sectional study aims at estimating the prevalence of disabling musculoskeletal pain in doctors

and medical students. With increasing prevalence of musculoskeletal pain among doctors, studies of this nature will elucidate its burden and can help officials devise a health programme to prevent musculoskeletal pain.

Objectives of the study

To estimate the prevalence of disabling musculoskeletal pain and work absenteeism in doctors and medical students.
To predict the risk of long-term disability and failed return to work in the study population with the Orebro Musculoskeletal Pain questionnaire.
To study the association between the musculoskeletal pain and the risk factors.

Methodology

Study Setting: This study was done as a cross – sectional study among all the doctors and medical students of Government Medical College, Kilpauk. The study was carried out between August and October 2016.

Sample Size and Sampling: There are a total of 363 Doctors including interns and postgraduates and 450 Medical students in our institution. All of those who consented for the study participated. A total of 752 medical professionals participated in the study.

Ethical Approval and informed consent: Approval from the Institutional Ethics Committee was obtained prior to the data collection. Each participant was explained about the study and informed consent was obtained prior to the commencement of data collection.

Operational Definitions: Pain was classed as disabling musculoskeletal pain by David Coggon et al [10] if:

Pain lasts for longer than a day at any time during the past month, and during that time, the pain had made it difficult or impossible to carry out any of a specified list of everyday activities like,

- Getting dressed
- Doing normal jobs around the house
- Cutting toe nails
- Writing
- Locking/unlocking doors or opening bottles/jars/taps
- Other day to day activities mentioned by the participant, specific for the participant's acctivities.

Data collection method: The study commenced by obtaining the list of doctors and students of our medical college. After obtaining appropriate permissions, each participant was approached and explained in detail about the study. The consenting participants were included. A structured self administered questionnaire was used to collect background information, and a validated questionnaire to assess the disability, and pain.

Data collection tools: A structured, validated and self administered questionnaire was used for data collection. The questionnaire consisted of the following parts-

Part A-Demographic profile
Part B-Validated questionnaire adopted from David Coggon et al 2013[10] (to identify disability)
Part C-Validated Orebro Musculoskeletal Pain questionnaire by Linton and Boersma 2003[11,12] (to predict long term disability and failure to return to work)
The participant was considered to have disabling musculoskeletal pain if he/she provided positive response to any of the questions in PART B of the questionnaire, following which he/she was administered with PART C.
If the participant provided negative response to PART B of the questionnaire, he/she was considered as not having disabling musculoskeletal pain and PART C was not administered to these participants. Participants having disabling musculoskeletal pain were assessed for long-term disability and failure to return to work using Orebro Musculoskeletal Pain (OMPQ) questionnaire.
The Orebro Musculoskeletal Pain Screening Questionnaire (OMPSQ) is a 21-item self-administered tool designed to identify people at risk of developing chronic pain.
It assesses five categories of risk factors for prolonged disability: pain, perceived function, psychological variables, fear-avoidance beliefs, and patient demographics and background.
Scoring instructions :

For question 1, count the number of pain sites and multiply by two – this is the score (maximum score allowable is 10). For questions 2 and 3 the score is the number bracketed after the ticked box. For questions 4, 5, 6, 7, 9, 10, 11, 14, 15 and 16 the score is the number that has been ticked or circled. For questions 8, 12, 13, 17, 18, 19, 20 and 21 the score is 10 minus the number that has been circled. Summation of the scores for questions 1 to 21 provides the total OMPQ score.

Interpreting the results: The OMPQ score is used as a predictor of risk of long term disability and failed return to work, with a higher score indicating higher risk.

S. No	Score	Interpretation
1	≤105	Low risk
2	105-130	Moderate risk
3	≥ 130	High risk

The data was analyzed with MS EXCEL, with each positive response assigned as 1 and negative response assigned as 0.

Statistical Analysis: The data collected was tabulated using MS Excel and the results were expressed as percentages with a 95% confidence interval. The prevalence of low risk, moderate risk and high risk of disability were expressed as percentages with a 95% confidence interval. Chi square test was performed manually to analyze categorical variables.

Results

This cross sectional study was conducted in the Department of Community Medicine among 752 health care professionals of a tertiary care Government Hospital. The mean age of the participants was 24 ± 8.2, the mean BMI of the participants was 23.23 ± 3.82. The average hours of work per week of the participants were 52.20 ± 16.05. The demographic details of respondents are given in Table 1.

The Department wise participants are given in Figure 1. It was observed that interns formed a majority (24.2%) among the 302 doctors who participated. This was followed by General Medicine (14.9%) and Obstetrics and Gynecology (8.3%).

Among 752 participants, 23.5% (n=177) had musculoskeletal pain whereas 76.5% (n=575) did not experience musculoskeletal pain. Among those who had musculoskeletal pain, 32.7% (n=58) of participants had disabling musculoskeletal pain. A total of 149 (49.3%) doctors had pain of which 38.9% (58) had disabling pain. The prevalence of pain and disabling pain are given in Table 2.

Among the 752 participants, 203 participants associated themselves with regular exercise, 38 of them exercised irregularly whereas 511 members did not exercise at all. In this study, among participants associated with pain doctors 149 (49.3%) and students 28 (100%) have work related pain. The particulars regarding the site of pain are given in Table 3.

In this study, among those who had musculoskeletal pain, 82.8% (n=48) of participants had low risk of disability due to musculoskeletal pain and 17.2% (n=10) had moderate risk. Among doctors while dressing 37(12.3%) have disabling pain interfering with activities. There was a significance difference of musculoskeletal pain found between age and Body Mass Index ($p<0.05$). However, the duration of work was not significantly associated with the musculoskeletal pain. The association between mean pain scores and the demographic parameters are given in Table 4. There was a significant difference in the prevalence of pain between professors, assistant professors and postgraduates, and the observed difference was statistically significant ($p<0.05$), table -5.

In this study, there were no significance difference of musculoskeletal pain found between men and women. There is a clear significance of musculoskeletal pain in comparison to department and designation. There is a significance difference of musculoskeletal pain in participants who do regular exercise with others. The results are given in Table 6.

The association between various demographic parameters and pain scores are tabulated in figures 1-5.

Table 1:Demographic characteristics of participants

Particulars	Frequency N =752	Percentage (%)
Age (in years)		
20 and below	452	60.1
21-30	182	24.2
31-40	73	9.7
41-50	27	3.6
51 and above	18	2.4
Gender		
Males	378	50.3
Females	374	49.7
Designation		
Professor	12	1.6
Assistant professor	79	10.5
Postgraduates	138	18.4
Interns	73	9.7
Undergraduates	450	59.8

Table 2 Prevalence of pain and Disabling pain among study participants

Prevalence of	Pain		Disabling pain	
	Frequency	Percent (%)	Frequency	Percent (%)
Participants		**N= 752**	**N=177**	
Yes	177	23.5	58	32.7
No	575	76.5	119	67.2
Doctors		**N= 302**	**N=149**	
Yes	149	49.3	58	38.9
No	153	50.7	91	61.1
Medical Students		**N= 450**	**N=28**	
Yes	28	6.2	0	0
No	422	93.8	28	100

Table 3: Prevalence of site of pain among Doctors

Site of pain	Doctors		Medical Students	
	n=149*	(%)	n =28	(%)
Neck	24	16.1	2	0.4
Shoulder	15	10.1	2	0.4
Arm	9	6.04	1	0.2
Low back ache	60	40.3	9	2
Upper back ache	5	3.4	0	0
Knee	10	6.7	1	0.2
Leg	12	8.1	15	3.3
Ankle	1	0.6	0	0
Generalized myalgia	13	8.7	0	0
More than one site	63	42.3	-	-

***the number will not total to 100.**

Table 4: Disabling pain interfering with activities among doctors

Activities	Frequency (n= 302)	Percentage (%)
Dressing	8	2.6
Normal household work	37	12.3
Cutting toe nails	8	2.6
Writing	9	3
Opening bottle caps/jars and unlocking home	2	0.6
Driving	8	2.6
Others	6	2

Table 5:Mean comparison between musculoskeletal pain and Parameters.

Parameters	Mean±S.D	Mean difference	95% C.I		pvalue
			Upper	Lower	
Age					
Pain	32.09±8.9	2.187	0.144	4.229	0.036*
Pain absent	29.91±9.07				
BMI					
Pain	26.08±3.88	1.308	0.466	2.151	0.002*
Pain absent	24.77±3.53				
Hours of work					
Pain	64.47±18.49	-1.955	-6.075	2.165	0.351
Pain absent	66.42±17.89				

Table 6:Factors associated with musculoskeletal pain

Particulars	Pain n(%)	Chi-sq.	Df	p value
Department				
Physicians	72(45.9)	6.085	2	0.048
Surgeons	60 (58.8)			
Pre/para clinicals	17(39.5)			
Designation				
Professor	7(58.3)	10.01	3	0.018
Assistant Professor	48(60.8)			
Post graduates	68(49.3)			
Interns	26(35.6)			
Gender				
Men	62(45.6)	1.392	1	0.238
Women	87(52.4)			
Exercise				
No exercise	120(23.5)	14.103	2	0.001
Regular	18(47.4)			
Irregular	39(19.2)			

Discussion

The prevalence of disabling musculoskeletal pain was estimated in this cross sectional study that consists of 752 doctors and medical students. Health care professionals are more prone to develop musculoskeletal pain as an

Figure 1: BMI and musculoskeletal pain

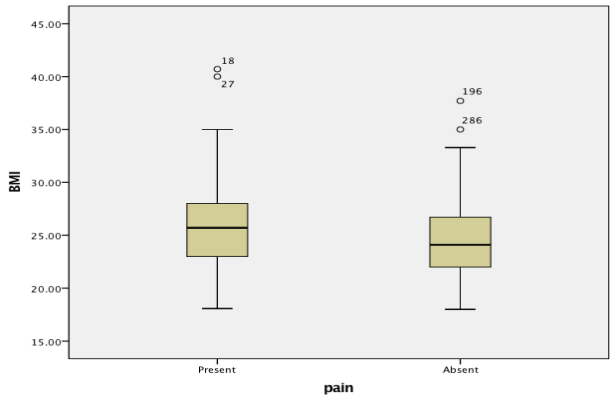


Figure 2: Age and musculoskeletal pain

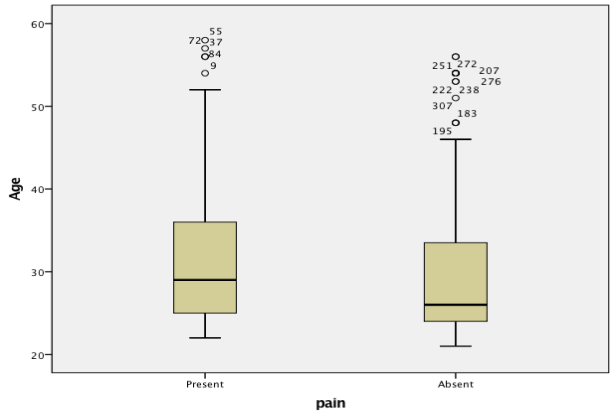


Figure 3: Hours of work and musculoskeletal pain

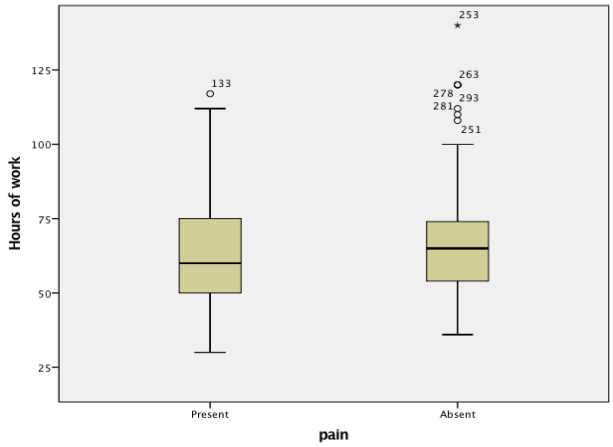


Figure 4: Age groups and musculoskeletal pain

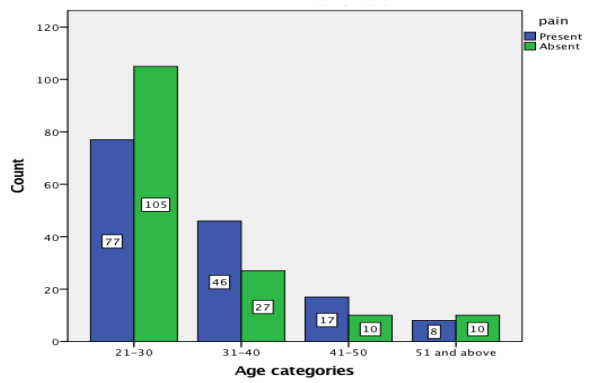
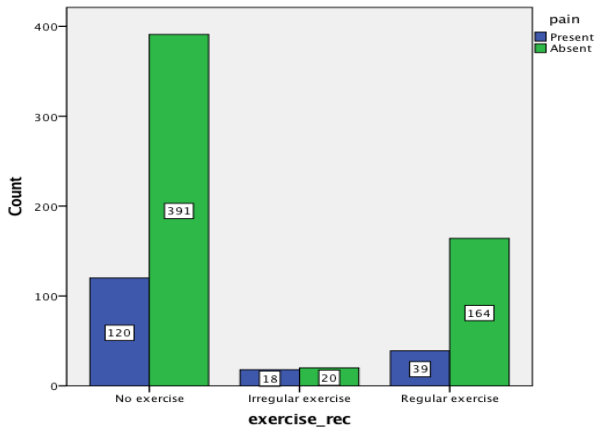


Figure 5: Exercise and musculoskeletal pain



occupational disorder. Repetitive stress injuries in medical professionals initiate a series of events, which result in the development of musculoskeletal pain.

The overall prevalence of musculoskeletal pain among 752 doctors and medical students was 23.5% (n=177). The prevalence of musculoskeletal pain among 302 doctors was 49.3% (n=149).This is in accordance with the study by Lahoti et al who had found 58% prevalence of musculoskeletal pain in doctors [13]. The prevalence of musculoskeletal pain among 450 Undergraduate students was 6.2% (n=28).This is in contrary to the study conducted by Mustaffa ahmed alshagga et al. which concluded a prevalence of 45.7%among medical students [9]. The decreased prevalence of musculoskeletal pain among undergraduate students can be explained by the fact that they were involved in physical activities in higher frequencies.

The overall prevalence of disabling musculoskeletal pain among 752 participants was 7.7% (n=58). The prevalence of disabling musculoskeletal pain among 302 doctors was 19.2% (n=58). There was no disabling musculoskeletal pain among undergraduate students. Among the 19.2% (n=58) of doctors who had disabling musculoskeletal pain, 82.8% (n=48) had a low risk and 17.2%(n=10) had a moderate risk of developing chronic musculoskeletal pain. None had high risk of developing chronic musculoskeletal pain. Among the 302 doctors, 2.6%(n=8) had pain which made it difficult for them to get dressed, 12.3% had pain which caused difficulties in doing normal jobs around the house, 2.6% had difficulty in cutting toe nails, 3% had difficulty in writing, 0.3% had difficulty in locking or unlocking the home, 0.3% had difficulty in opening bottles/jars/tap,1% had difficulty in walking, 2.6% had difficulty in driving and 1% had difficulty in carrying out their day to day activities.

The prevalence of pain among surgeons was the highest with 58.8%,followed by physicians with a prevalence of 45.9%. The prevalence of pain among PrePara clinicals / Study by Rambabu et al had also found an .%39.5was increased prevalence of musculoskeletal pain in surgeons compared to physicians [7]. Among the 302 doctors, 11.6%(n=35) had neck pain,7%(n=21) had shoulder pain,3%(n=9) had arm pain,27.5%(n=83) had lower back ache,1.7%(n=5) had upper back ache,3.3%(n=10) had knee pain,11.6%(n=35) had leg pain,0.3%(n=1) had ankle pain and 4.3%(n=13) had generalized myalgia. Among the 450 undergraduates, 0.4%(n=2) had neck pain,0.4%(n=2) had shoulder pain,0.2%(n=1) had arm pain,2%(n=9) had lower back ache,0.2%(n=1) had knee pain and 3.3%(n=15) had leg pain.

The prevalence of musculoskeletal pain increased with age. The prevalence of musculoskeletal pain was 42.3% in the age group of 21-30,63% in the age group of 31-40 and 41-50 and 44.4% in the age group of 51 and above (p=0.011).A similar relationship between age and musculoskeletal pain was proved by parsonsa et al in his study on Prevalence and comparative troublesomeness by age of musculoskeletal pain in different body locations[14]. The slight dip in prevalence of MSDs among professionals aged 51 and above can be explained by the fact that they are well trained to maintain efficient posture during activities and have better coping strategies than younger professionals [13].

The BMI of majority of the respondents were in overweight category. Those who were overweight had an increased risk of developing musculoskeletal pain. There was a significant correlation between BMI and musculoskeletal pain in our study (p=0.002). Significant relationship (P≤0.004) was observed between BMI and musculoskeletal pain in a study by Tsiros MD et al [15]. However no significant association between age, BMI and musculoskeletal pain was reported by Mirsaaed et al[16].

There was no significant association between hours of work per week and musculoskeletal pain in our study (p=0.351). Adriana Cristina et al in their study had also found that there was no significant association between hours worked and development of musculoskeletal pain [17].However Lipscomb JA et al had found a significant association between hours worked and musculoskeletal pain in their study [18]. Regular physical exercise conferred a decreased risk of developing musculoskeletal pain for the subjects in our study(p= 0.001). Wedderkopp N et al also proved this in their study [19]. Evidence suggests that yoga may be useful for pain-associated disorders [20].

The prevalence of pain among professors and assistant professors was highest at 58.3% and 60.8% respectively followed by post graduates with 49.3% followed by interns with 35.6%.

85.8% (n=152)of the doctors believed that their pain was a work related musculoskeletal disorder.100%(n=28) of the undergraduate students believed that their pain was related to work. Work absenteeism among medical professionals was not significant in our study. Only 17

doctors had work absenteeism totally accounting for 76 days. Undergraduate students had no work absenteeism because of musculoskeletal pain.

Conclusion: The prevalence of musculoskeletal pain among doctors is quite high. It is important for the doctors to remain healthy and fit in order to treat the community. Hence they must concentrate on their health. The concerned officials should implement proper health programme to prevent musculoskeletal pain. Stretching exercises should be practiced regularly. Necessary modifications in the working habits of medical professionals should be implemented. Owing to the busy schedule of medical professionals, in-built gym facilities within the hospital can be provided so that they can work out in their leisure time. Maintenance of ideal body weight should also be recommended.

Limitations: Detailed research regarding the risk factors for musculoskeletal pain should be carried out in future to eliminate those factors. Various work postures adopted by the doctors should be studied extensively and interventions to eliminate injuries should be implemented. The various postures of the doctors could not be studied in our study, which is a limitation.

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