

Prevalence of Self-Reported Work-related Musculoskeletal Symptoms among Software Employees in Hyderabad, India

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DOI: <https://doi.org/10.52403/ijrr.20220111>

ABSTRACT

Background: This study has been carried out to analyze the prevalence of self-reported work-related musculoskeletal symptoms among software professionals and to utilize the findings to design an effective preventive interventional program for WRMSDs.

Subjects & Methods: This cross-sectional descriptive data analysis was done among 665 software employees both male and female from various companies in Q city Tech Park, Hyderabad. Data collected with “Cornell Musculoskeletal Discomfort Questionnaire” (CMDQ).

Results: A total of 640 subjects were eligible for this study. Prevalence of WRMSDs to be 67%. The most common sites of reported symptoms are neck (65.0%), upper back (56.4%), lower back (62.6%), right shoulder (41.4%), left shoulder (35.4%) and right thigh (41.4%). Women were more likely to report symptoms in neck, lower back and both shoulder region than men ($p < 0.05$). Discomforts in neck, lower back and right shoulder are greatly shown impact on work performance.

Conclusion: WRMSDs are highly prevalent in software professionals and women are at more risk than men. These findings indicate the need for more attention to WRMSDs and design of effective preventive strategies.

Key Words: musculoskeletal pain, Prevalence, software professionals, work related musculoskeletal disorders

INTRODUCTION

Work related musculoskeletal disorders (WRMSDs) in computer users has become a major concern in recent years (1). Long term use of computer and sitting at desk for long time are main risk factors in WRMSDs (2). These WRMSDs describe a wide range of degenerative and inflammatory changes that cause pain and functional impairment and muscular pain is a usual outcome (3).

Subjective assessment of symptoms is mostly helpful to study the association between musculoskeletal disorders and computer work. This will give a better understanding of WRMSDs as well as good rationale for the design of preventive interventional programs (4). The aim of the study was to analyze the frequency of self-reporting musculoskeletal symptoms and their impact on work performance in computer users. The findings of the study can be utilized in the design of preventive interventions for WRMSDs.

MATERIALS & METHODS

Subjects

The study was done with convenient sampling method, included 665 software employees both male and female from various companies in Q city tech park, Hyderabad. The study subjects age ranging from 21-43 years old. No objection consent was obtained from all the study participants.

Inclusion and exclusion criteria

Inclusion criteria is the subjects with full time software employment for more than 1 year, both genders age ranging from 21 – 50 years old and work time at office is more than 7 hours per day.

Exclusion criteria comprised of participants with old injuries or trauma, Road traffic accidents, recent surgeries or medical treatment and any history of psychological problems and their treatments.

Study Design

This is a cross-sectional descriptive study to investigate prevalence incident rate. All the study subjects were given a questionnaire with two parts. One with demographic data questionnaire and the other one is “Cornell Musculoskeletal Discomfort Questionnaire (CMDQ)”. The CMDQ is a 54-item questionnaire which contains a body chart and questions about musculoskeletal pain and discomfort incidence in 20 parts of the body over the past week. The questionnaire has different versions for men and women. All the study participants were clearly explained about CMDQ independently and requested to complete questionnaire. The demographic data collected with separate questionnaire, consists of details like age, gender, height, weight, marital status, years of experience, number of working hours per day. Statistical analysis estimates musculoskeletal discomforts in study subjects. It assesses frequency and impact on work performance for last 7 days from 11 various risk prone body parts like neck, shoulders, back, upper arms, forearms, wrists, waist, hips, upper legs, knees and lower legs.

Statistical Analysis

Descriptive statistics was used to analyze the data collected from all the study participants. SPSS version 23 software used to perform all the statistical analysis. The Chi – Square test analysis used to validate statistical significance between the

musculoskeletal discomfort symptom and possible risk factors in study participants. Study results were evaluated at 95% CI level and p less than 0.05 was evaluated as statistical significance.

Ethics statement

The study was an analysis of dataset so ethics committee approval not required. Informed consent was obtained from subjects at the time of original data collection.

RESULT

Table: 1 – Demographic data

Characteristics	Frequency	Percentage (%)
Gender		
Men	390	61 %
Women	250	39 %
Age (years)		
21-30	434	67.8 %
31-40	168	26.2 %
41-50	38	5.9 %
Computer use time (hours/day)		
Less than 7 hours	195	30.4 %
More than 7 hours	445	69.6 %

Table-2: Prevalence of self-reported symptoms in last 7 days according to body region.

Body location	Symptoms during last work week (n= 640)	
	Number	%
Neck	435	65.0 %
Back		
Upper back	361	56.4 %
Lower back	432	62.6 %
Shoulder		
Right	265	41.4 %
Left	227	35.4 %
Upper arm		
Right	209	32.6 %
Left	170	26.5 %
Forearm		
Right	212	33.1 %
Left	170	26.5 %
Wrist		
Right	230	35.9 %
Left	134	20.9 %
Hip/buttocks		
Right	94	14.6 %
Left	80	12.5 %
Thigh		
Right	79	10.0 %
Left	64	10.0 %
Knee		
Right	99	15.4 %
Left	51	7.9 %
Lower leg		
Right	84	13.1 %
Left	56	8.7 %

A total of 640 study subjects included in this study (n=640). The other 25 participants excluded due to history of

injuries and underwent pain treatments recently. Demographic data presented in table.1 shows that of all study subjects, 390 (61%) male and 250 (39%) was female. Majority of the participants aged between 21 – 40 years old. Least number was presented between 41 – 50 years age group. Regarding computer usage time, 195 (30.4%) was reported less than 7 hours in a day and 445 (69.6%) were working more than 7 hours in a day.

In all, 429 (67%) subjects reported symptoms in last 7 days. Most common musculoskeletal strain region reported by

participants are neck (65.0%), upper back (56.4%), lower back (62.6%), right shoulder (41.4%), left shoulder (35.4%) and right thigh (41.4%). Participants less commonly reported symptoms in body regions like knees (23.4%) and lower leg (21.8%).

Compare to men, women have the higher prevalence rate of WMSDs across various body regions over the past 7 days. However, the difference is statistically significant for neck, lower back and both shoulders. (Chi-square analysis, $p < 0.05$) (Table -3)

Table – 3: Prevalence of Work-related musculoskeletal symptoms during previous 7 working days, according to gender.

Body region	Gender				P
	Male		Female		
	Prevalence	%	Prevalence	%	
Neck	242	62.0 %	193	77.2 %	0.00*
Upper back	226	57.9 %	135	54.0 %	0.32
Lower back	242	62.0 %	192	76.8 %	0.00*
Right shoulder	236	60.5 %	189	75.6 %	0.00*
Left shoulder	124	31.7 %	103	41.1 %	0.01*
Right forearm	113	28.9 %	89	35.6 %	0.07
Left forearm	96	24.6 %	74	29.5 %	0.16
Right wrist	128	32.8 %	83	33.2 %	0.92
Left wrist	73	18.7 %	56	22.4 %	0.25
Right hip/buttock	56	14.3 %	38	15.2 %	0.76
Left hip/buttock	51	13.0 %	28	11.2 %	0.58
Right thigh	48	12.3 %	31	12.4 %	0.97
Left thigh	41	10.5 %	23	9.2 %	0.58
Right knee	31	7.9 %	27	10.8 %	0.22
Left knee	28	7.1 %	23	9.2 %	0.35
Right lower leg	46	11.7 %	38	15.2 %	0.21
Left lower leg	29	7.4 %	27	10.8 %	0.14

* $p < 0.05$

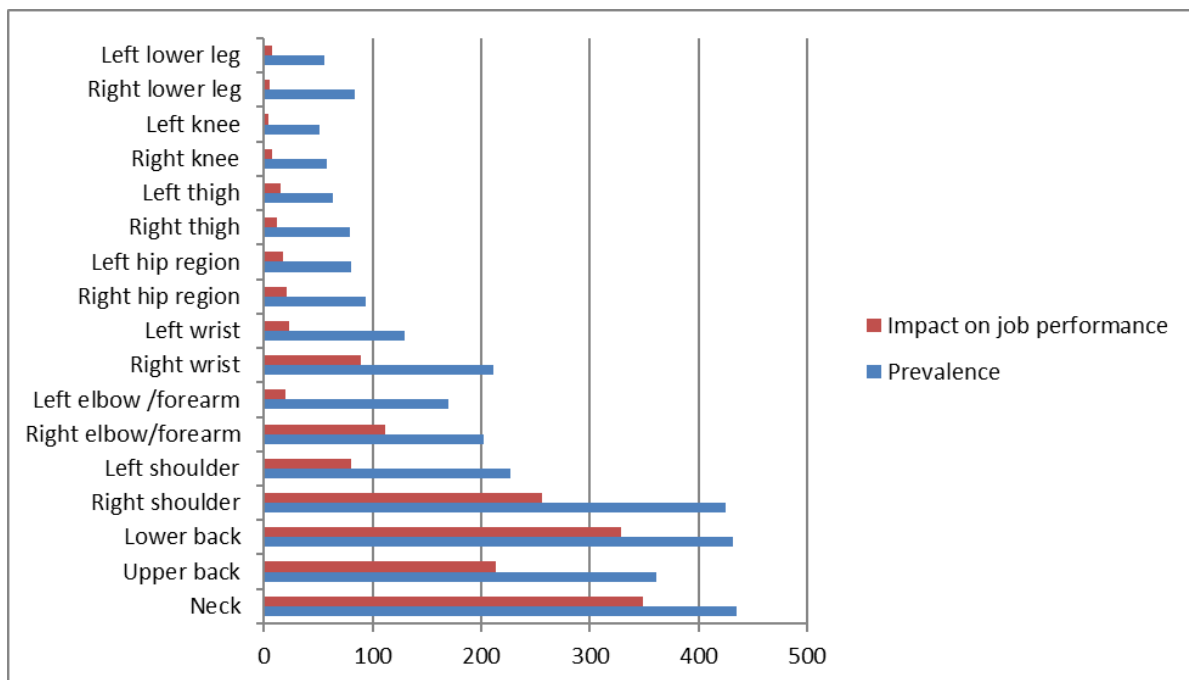


Figure:1 – Prevalence of WMSDs and impact on job performance

Figure-1 shows the proportion of participants whose job performance was affected by musculoskeletal discomfort. Discomforts in neck (80.2%), Lower back (76.1%) and right shoulder (60.2%) are greatly shown impact on job performance, whereas discomfort in knees (7.8%) and lower leg (14.2%) has very minimal effect on work performance.

DISCUSSION

Computer usage with longer hours sitting can lead to musculoskeletal symptoms in IT professionals. It was observed that in this study, participants reported most common musculoskeletal strain in neck, upper back, lower back and both shoulders during the past 7 days. These findings are consistent with previous study results. Computer work is often requiring prolonged sitting, which has been shown to be a risk factor for musculoskeletal symptoms. Prolonged sitting with poor workstation ergonomics may cause continuous static contraction of muscles, builds up more tension in muscles and ligaments, decreased muscle flexibility, weakened muscle strength and such changes result in musculoskeletal strain or injuries.

In the present study, the prevalence rate for women was significantly higher compared to men, which is similar with previous studies. The gender difference in prevalence rate may result from women less likely has the history sports and fitness activities, anthropometric reasons, diet and nutrition factors and differences in stress management between men and women.

Majority of participants reported these musculoskeletal discomforts are interfered with their work performance as well as daily activities. Most of the participants consulted healthcare professionals because of neck and lower back symptoms. Also, they shown more impact on job performance like getting frequent intervals from work and often absent to work. Discomforts in other body regions are also reported by fewer

participants, but their impact on work is negligible.

CONCLUSION

This study found that IT professionals with prolonged sitting work felt musculoskeletal discomforts most commonly in neck, back and shoulders. Women are at high risk than men. Neck pain and lower back pain are most common symptoms often require medical attendance. Also, they directly interfere with work performance and daily activities.

Further research

IT professionals perform predominantly sedentary work with prolonged sitting and musculoskeletal symptoms or discomforts occurrence is very common. This suggests the need to develop a specific prevention program at workplace. Further studies should focus on designing work-related musculoskeletal risk assessment programs in order to prevent or reduce prevalence of symptoms.

Limitation of study

The limitations of the study include recall bias of the self reported questionnaire. Moreover, physical activity levels (overuse/underuse) of participant not included in study. Another limitation is unequal number of men and women in sample size.

ACKNOWLEDGEMENT

The author would like to thank all the IT professionals who volunteered to participate in this study.

Conflict of Interest: None declared

Source of Funding: None

Ethical Approval: Approved

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How to cite this article: Madhubabu Kothapalli. Prevalence of self-reported work-related musculoskeletal symptoms among software employees in Hyderabad, India. *International Journal of Research and Review*. 2022; 9(1): 69-73. DOI: <https://doi.org/10.52403/ijrr.20220111>
