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Research Article

STUDY TO KNOW THE WORK ASSOCIATED MUSCULOSKELETAL DISORDERS IN SOFTWARE PROFESSIONALS

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Abstract:

***Objective:** This study was conducted to conclude the pattern and frequency of musculoskeletal disorders (MSD) among software specialists and to estimate the relationship between computer-related factors, sociodemographic factors and MSD.*

***Study Design:** A Cross-Sectional Study.*

***Place and Duration:** In collaboration with Department of Community medicine, King Edward Medical University, Lahore/ Mayo Hospital Lahore among software professionals working in Lahore division for one year duration from March 2018 to March 2019.*

***Method:** The study includes software professionals working in information technology (IT) companies in Lahore. The sampling method was non-probabilistic purposive sampling. In a questionnaire, the data was collected containing business details, standardized Nordic questionnaire and personal data.*

***Results:** The MSD prevalence in the last year, last one week and annual disability was 69%, 49.2% and 16.6%, respectively. The MSD related disorders related prevalence to the studies reported in the last 12 months by body regions was lower back (22.89%), neck (29.56%), knee (9.56%) and shoulder (12.17%). There was a strong significant variation in regular exercise, gender, 5 working days per week, working more than eight hours per day, and the habit of taking small breaks during regular working hours. There was no significant statistically variation in terms of BMI, age and study years.*

***Conclusions:** The study concluded that MSD is reported widely among software professionals working in IT in Pakistan. Therefore, an appropriate prevention strategy should be implemented in order to work comfortably.*

***Key words:** Musculoskeletal disorders, prevalence, software specialists.*

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INTRODUCTION:

Information technology (IT) has played an important role in transforming Pakistan's slow bureaucratic economy in a country of innovative entrepreneurs. The IT sector produces millions of jobs in Pakistan. In today's modern world, Pakistan is one of the largest IT capitals and almost all of the world's most important IT players are in the country. IT-related job opportunities offer a brilliant salary, and the vast scope of this profession attracts many people to this field. Many studies are responsible for the morbidity of the musculoskeletal diseases associated with the study (TMS) in the population, and are known to be a major occupational problem with large compensation and health costs, reduced productivity and poor quality of life. MSD in the workplace is emerging as a growing health problem and has a major impact on the daily activities of IT professionals. MSD represents the second largest cause of short-term or temporary disability after the common cold. Many scientific researchers have identified physical, psychosocial, organizational, business and individual causes as "risk factors for the development of MSD. These studies measured levels of different factors and investigated their association with the incidence (or prevalence) of MSD for affected populations.

In developed countries, many studies have focused on this problem, but only a few studies have been conducted in Pakistan. In a study by Usman and Zia-ud-din, 63% of the study subjects reported musculoskeletal problems. By Giri et al. Loni, Maharashtra Another study found that 73.3% of subjects had musculoskeletal problems. In the study of Kate mall et al. They observed musculoskeletal complaints in 75.5% of the study population.

MATERIALS AND METHODS:

This Cross-Sectional Study was held in collaboration with Department of Community medicine, King Edward Medical University, Lahore/ Mayo Hospital Lahore among software professionals working in Lahore division for one year duration from March 2018 to March 2019.

The participation criterion was that software experts, both men and women, would work with desktop /

laptop computers for more than 4 hours a day during the past year. Exclusion criteria were subjects not willing to participate in the study, a history of musculoskeletal injuries, incomplete questionnaires, and pregnant women. According to the previous studies, the sample size was determined as 500.

The sampling method used for the survey is non-probabilistic purposive sampling. Using the data obtained, the study subjects were reached by e-mail, telephone or in person and explained to them about the study. Informed verbal consent was obtained from subjects who met inclusion and exclusion criteria. Then, the participants were instructed to complete the questionnaire.

The research tool consists of two parts. In Part 1; age, gender, marital status, height, weight, regular exercise and years of experience, daily working hours, weekly working days, shift schedules and personal information such as receiving habits of breaks during working hours. Chapter 2 deals with musculoskeletal disorders. The questionnaire used was the accepted Nordic questionnaire. This standardized questionnaire includes information on musculoskeletal conditions affecting the body regions, ie shoulders, neck, wrist / hands, elbows, lower back, upper back, knee, hip / thigh and feet/ ankles.

Data entry and analysis was performed with SPSS 18 version. The final data were summarized as a percentage and analyzed by cross-tabulation for different variables. Chi-square test (χ^2) was used for statistical significance and associations were evaluated with Odds ratio and 95% confidence interval.

RESULTS:

The total number of software specialists worked is 500. The mean age was 22 to 54 years and the body mass index was 24.38 ± 3.61 . kg / m². The subjects worked in IT companies for an average of 9.40 ± 2.13 hours per day and their average experience was between 12 and 22 years and 12.73 ± 5.61 years. A summary of the descriptive statistics of the demographic variables collected from the study participants is presented in Table 1.

Table 1: Descriptive statistics for demographic variables collected from study participants.

Variable	Minimum	Maximum	Median	Mean±SD
Age (in years)	22	54	28	27.62±3.28
BMI (Kg/m ²)	17.80	34.50	23.78	24.38±3.61
Experience (in years)	1	22	10.5	12.73±5.61
Working hours per day	6	14	10	9.40±2.13

SD = Standard Deviation

The study population was 57.6% (288/500) of men and 42.4% (212/500) of women. Among the study subjects, 48% (240/500) of the participants were married. Approximately 28.1% (141/500) of the software professionals routinely participated in physical activities such as exercise, sports and yoga. In the study population, 94% (470/500) were working only during the day shift, 51.4% (257/500) were

working 5 days a week and 34.4% of the software specialists. (172/500) The software specialist has the habit of interrupting at regular intervals during working hours. According to the Nordic MSD survey, the prevalence of MSD in the last 12 months, last 7 days and annual disability was 69%, 49.2% and 16.6%, respectively Table 2.

Table 2: Prevalence of work related MSD with respect to the body locations among study participants.

Human body location	Prevalence of work related MSD during last 12 months		Prevalence of work related MSD during last 7 days		Annual Disability	
	n	%	n	%	n	%
Neck	102	29.56	74	30.08	24	28.92
Shoulders	42	12.17	33	13.41	06	07.23
Elbows	16	04.64	08	03.25	04	04.82
Wrists/Hands	24	06.95	12	04.88	06	07.23
Upper back	18	05.21	17	06.91	03	03.61
Lower back	79	22.89	58	23.58	30	36.15
Hips/Thighs	16	4.64	9	03.66	01	01.20
Knees	33	9.56	23	09.35	07	08.43
Ankles/Feet	15	4.35	12	04.88	02	02.41
Total (n=500)	345	69.00	246	49.2	83	16.6

The prevalence of work-related MSD reported over the past 12 months was neck (29.56%), waist (22.89%), shoulder (12.17%), and knees (9.56%), depending on the position of their bodies. The prevalence of MSD related to the studies reported in the last 7 days depending on the location of their bodies was generally the neck (30.08%), the back

(23.58%), the shoulders (13.41%) and the knees (9.35%). Last year, software experts reported that they were removed because of low back pain (36.15%), neck (28.92%) and knee pain (8.43%). Table 2 details the prevalence of work-related MSD according to the location of their bodies.

Table 3: Predictors of MSD during last 12 months among study participants.

Predictors	Category	Total (n=500)	With MSD (n=345)	Without MSD (n=155)	OR	95% CI	p value
Age(in years)	<35	311	216	95	1.00	-	-
	>35	189	129	60	1.06	0.72	1.56
Gender	Male	288	182	106	1.00	-	-
	Female	212	163	49	1.94	1.30	2.89
BMI (Kg/m ²)	Normal	326	225	101	1.00	-	-
	Obese	174	120	54	1.00	0.67	1.49
Exercise	Yes	141	47	94	1.00	-	-
	No	359	298	61	9.78	6.29	15.26
Experience (in years)	<10	234	161	73	1.00	-	-
	>10	226	184	82	0.98	0.67	1.44
Working hours per day	<8	115	61	54	1.00	-	-
	>8	385	284	101	2.50	1.62	3.83
Working days per week	<5	243	127	116	1.00	-	-
	>5	257	218	39	5.11	3.34	7.80
Taking breaks	Yes	172	96	76	1.00	-	-
	No	328	249	79	2.50	1.68	3.70

Table 3 shows the relationship between "MSD" and "without MSD" over the last 12 months by age, sex, BMI, exercise, years of experience, number of daily working hours, habit of taking regular breaks during working days and working hours per week. In general, participants in the MSD group were younger and worked more than five days a week at regular intervals for more than eight hours per day without the habit of working. There was a statistically significant difference in gender, regular exercise, 5 working days per week, working more than eight hours per day, and the habit of taking small breaks during regular working hours. There was no statistically significant difference in terms of age, BMI and study years.

DISCUSSION:

The frequency of work-related MSD varies between different occupational groups and across national borders. Individuality of the terms, changes in assessment tools, organizational diversity in working environments and cultural diversity in perception, pain and discomfort reports are associated with variability in the prevalence of MSD. The prevalence of MSD related to the study among software experts was 69% in the last 12 months; this meant that almost 3 of the 4 experts suffered from this situation and had been 49.2% in the last 7 days and had annual disability 16.6%

In the general population, very few studies have been conducted on MSD related to the study. These studies report the prevalence of work-related MSD in the study population, ranging from 20% to 93.3%. Similar

studies were performed by Sharma et al. In Delhi, 77.5% reported of body pain. Giri et al. Showed 73.3% of musculoskeletal problems in Loni, Maharashtra. Prasad et al in Nagpur reported that 67% of musculoskeletal problems and the work of Usman and Zia-ud-Din reported 63% of MSD among our software experts in Pakistan, similar to our studies. A study among professional computer users in Jordan by Shbair and Abdulla showed a prevalence of 93.3%, which was higher than this study. In this study, 69.45% in the age group younger than 35 years and 68.25% in the age group older than 35 years reported MSD during the last 12 months. Prevalence of MSD has been reported in previous studies with female predominance in the general population. This study showed that female software specialists had a 1.94-fold higher risk of developing MSD than male software specialists (OR = 1.94). This may be due to the cultural factor that women need to take care of family and children at home in addition to software work. This study was supported by Shrivastava & Bobhate, Sharma et al., Demure et al., Karlqvist et al., Ming et al., And Shbair and Abdulla, and opposed Bhanderi et al., And Ortiz-Hernandez et al.

It has been found that software specialists with high BMI are at risk of MSD and the contributing factor may be increased physiological and mechanical burden in tissues due to excessive weight / obesity. In this study, it was found that there was no relationship between software specialists and MSD between overweight / obesity (OR = 1.00). Some previous

studies have suggested that regular exercise is very important to prevent MSD. In this study, software professionals involved in physical activities such as aerobics, gait and yoga provided 10 times more protection against MSD.

CONCLUSION:

Demographic factors analyzed in the study indicate that strategies involving lifestyle changes and working style changes are the best option to reduce the risk of MSD, which is more common among software professionals. The prevalence of MSD among women is higher in subjects who work more hours per day on computers and more days per week. The prevalence of MSD among those who did not take regular breaks during working hours was also high and was found to be low in software professionals performing regular physical activities.

The ergonomics of the work environment of software professionals have a direct impact on their health and well-being. Therefore, adequate prevention and intervention strategies should be emphasized in order to provide a better working environment for their organization. Therefore, this work is a wake-up call for software industry professionals as well as for the IT industry. For software professionals, it is recommended that education and training programs for prevention and coping strategies for MSD be mandatory.

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