

NECK AND SHOULDER PAIN AMONG OFFICE WORKERS DUE TO ELECTRONIC DEVICE USAGE AT WORKPLACE.Kiran Khan¹, Shahzaib Qureshi², Faheem Khan³, Ameer Hamza⁴, Allah Bachayo Rajar⁵, Rehana Khalil⁶.**ABSTRACT**

Background: Work-related neck and shoulder musculoskeletal disorders (MSDs) are prevalent among employees who work on electronic devices in offices for prolonged period of time. The purpose of this study is to assess the frequency of neck and shoulder pain among prolong computer users at offices and association of neck/shoulder pain with gender in a metropolitan city of Pakistan. **Methods:** This cross-sectional study was done among all eligible computer office workers of Karachi (n = 500) in 2020. Data were collected using the modified Maastricht Upper Extremity Questionnaire (MUEQ) to examine neck and shoulder complaints. Data was stored and analyzed using IBM-SPSS22. **Results:** It was observed that over three quarters of participants with musculoskeletal system pain complaints (81%) feel the pain in neck and shoulder areas due to spending more time on the computer. There was no statistically significant relationship between gender and pain complaint ($p > 0.05$). Significant relationships were found between persistence of neck/shoulder pains and low-intensity physical activity workplace category ($p < 0.05$). **Conclusion:** Study concludes that work-related musculoskeletal disorders with neck/shoulder pain are common among office workers working in low-intensity physical activity environment spending more time in sitting position. Our study showed that there is no association between gender and neck-shoulder musculoskeletal disorders.

Key words: Neck pain, Shoulder Pain, Office Workers, Electronic Devices, Workplace.

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INTRODUCTION

Incidence of crippling affliction of the musculoskeletal system among computer operators and office workers is 17% to 21%^{1,2,3,4,5}. Neck and shoulders pain is reported to be more prevalent as compared to the pains in other areas of the body and is linked with reduction in the work efficiency of the employee^{1,6,7}. The prevalence of neck/shoulder pain is 42% to 63% among office workers⁸. There is a high risk of disability development among workers who cannot work within 1-2 months and they may cease to perform altogether. Additionally, it leads to the substantial financial burden not only on the industries and countries in the form of workers' compensation claims, but has a severe impact on the psychological health of the individual due to reduced lifetime productivity^{9,10}. A research study by Grooten et al. (2007), revealed that one-third of neck and shoulder

pains complainers were relieved 5 to 6 years later¹¹. Inactive workplace environment with prolonged time in front of screen-based media devices like computers, can lead to musculoskeletal complaints. These complaints have a negative effect on the quality of life^{12,13}. Improper posture by tilting the head forward during use of computer, results increased weight on neck muscles and cervical vertebrae. Todd et al. in 2007 found that risk of upper and lower back pain increases with long-duration sitting and long-duration static posture, also in a study by Myrtveit et al. (2014) showed that risk of neck/ shoulder pain increases with prolonged time sitting in front of screen-based activities^{14,15}. The musculoskeletal complaints are considered as a public health problem of repetitive and chronic nature. Evidence suggests that males and females sit differently while using computers and those females are more

likely to experience neck and shoulder pain. It is not yet clear how gender influences the relationship between posture, neck and shoulder pain and computer use. Assessments of neck and shoulder pain, posture and computer use in the male and female revealed that computer use, posture and neck and shoulder pain were related, but that the relationships differed between males and females. Males used computers more than females, but females were more likely to have neck and shoulder pain¹⁶. It is important to consider males and females separately in research and clinical practice aimed at optimizing use of computers. This study is aimed to find frequencies of neck and shoulder pain among prolong computer users at offices and to assess the association between gender and neck/shoulder disorders among computer office workers.

METHODS

A descriptive cross-sectional survey was done from January 2020 to August 2020. Ethical approval was obtained from Institutional Review Board of Humdard Medical University. Participants were fully informed of the nature of the study and the use of the data. They were free to withdraw from the interview at any time or refuse to answer any particular question. Participants were also ensured of confidentiality. Simple Random Sampling technique was used to recruit the study participants, from specific organizations in the city of Karachi. A sample of 500 employees from different organization was selected. Sample size was calculated on the assumption that the prevalence of musculoskeletal disorders reported would be 63% amongst office workers. The confidence level was set at 95% with a Confidence limits as 5% of 100(absolute +/- %) (d) And design effect of 1. A total of 500 workers were recruited for the study. Men and women of age 25-55 years, doing computer office tasks (administrative, graphical and data entry tasks) more than 6 hours a day and willing to participate in the study were considered eligible for inclusion. Data were collected using the modified Maastricht Upper Extremity Questionnaire (MUEQ) to examine neck and shoulder complaints. Variables included individual demographic characteristics, chair adjustment, total duration of daily sitting at work, frequency of pain, past history of pain, postural care and frequency of breaks from sitting. The data were entered and analyzed using IBM-SPSS for Windows, version 22. Descriptive and inferential statistics were generated. The continuous variables were expressed in the form of frequency table and percentages. Chi-square test was applied to determine any association between variables. A p-value less than 0.005 were taken as significant.

RESULTS

In this study, total 500 participants from different organizations in the city of Karachi were selected, who were serving administrative, graphical and data entry tasks. This observational study was based on 8 months'

time period. More than half (59.4%) of the participants belonged to 25–35 years' age group and three fourth (74.4%) of them were males. Almost 38% were serving as managers in their organizations. Computer usage of majority (40.8%) was 8 hours per day and type of device in common use (59.2%) was found to be Desktop with a large percentage (70%) was not using back support chair. (See Table 1)

Table 2 displays more than half sample (58%) had neck and shoulder stiffness and 64% felt localized pain, with frequency of neck pain 25.2%, shoulder pain 27.4%, while both neck and shoulder pain complaints were present among 28.4%. About 47% employees got relief by rest, 31.3% by medicine and 22% by change in posture. Out of 500, more than three quarters (81%) felt fatigue during their lunch break. Almost 76% of them were aware about ergonomic standards like proper posture. (See Table 2)

Significant association ($p = 0.003$) was found between musculoskeletal symptom (pain) and employees of bankers and stock exchange market while association between musculoskeletal sign (stiffness) and male female employees was non-significant ($p = 0.444$).

DISCUSSION

The purpose of this study was to find frequencies of neck and shoulder pain among prolong computer users at office and to assess the association between gender and neck/shoulder pains among office workers. Computers use has increased enormously among office-workers during last few decades. In current study the frequency of neck pain attributed to prolonged computer use, was found to be 25.2%, shoulder pain as 27.4%, while both neck and shoulder pain complaints were reported by 28.4% of participants, which is far lower than prevalence of neck or shoulder pains reported in a study done by Gerr F et al in 2002 among computer operators (63%)¹⁷. In a study published by Choobineh et al. in 2013, prevalence of neck and shoulder pains was reported as 59.6% and 58.2%, respectively among computer operators of banks¹⁸. Other studies conducted in Nicaragua (30% upper extremity pain)¹⁹ and in Netherlands (neck/shoulder, arm 54%)²⁰. Few other studies have demonstrated a range of 10-62% of neck/shoulder pains among computer users.^{21, 22, 23}. This study introduces several potential risk factors, which can be helpful for healthcare providers in assessing the prognosis of patient with musculoskeletal disorders like neck and shoulder stiffness and pain. Our study confirms the importance of reduction in prolonged duty hours by demonstrating higher neck-shoulder issues (40.8%) among employees who work for continuous 8 hours per day on desktop (59.2%) without back support chair (70%). Even though 76% of them were aware about ergonomic standards like proper posture, but still more than three quarters (81%) study participants of this study, felt fatigue during their lunch break.

Table 1 Characteristics of the study respondents (N = 500)

Characteristic	Frequency (n)	Percentage (%)
Age distribution		
25-35	297	59.4
36-45	157	31.4
46-55	46	9.2
Gender distribution		
Male	372	74.4
Female	128	25.6
Designation of employees		
Computer operator	162	32.4
Manager	188	37.6
Clerk	88	17.6
Cashier	62	12.4
Type of computer system in use of employees		
Desktop	296	59.2
Laptop	204	40.8
Use of cushion support on chair		
Yes	148	29.6
No	352	70.4
Number of hours of daily computer use.		
7.0	168	33.6
8.0	204	40.8
9.0	70	14
10	58	11.6
Fatigue and Exhaustion during lunch time		
Yes	409	81.8
No	91	18.2

Table 2 symptoms and related factors among employees (N = 500)

Symptom/ related factor	Frequency (n)	Percentage (%)
Neck and Shoulder Stiffness		
Yes	235	58
No	170	42
Type of pain		
Neck	128	14.
Shoulder	137	1
Both	142	27.
No pain at all	95	4
		28.
		4
		19.
		0
Nature of pain		
Continuous	57	14.1
Localized	267	64.4
Radiating	87	27.7
Relief from pain		
Rest	18	46.7
Medicine	9	31.6
Change in posture	12	22.0
	7	
	89	
Awareness of posture care		
Yes	379	75.8
No	121	24.2

Table 3 Association among variables (N = 500)

Variable	distribution	Category	Pearson Chi-Square		
			Value	Df	Asymptomatic Sig.(2-Sided)
Crosstab: stiffness and gender					
Stiffness	Male	Female	Total		
Yes	176	59	235	1.623	2
No	130	40	170		
Total	306	99	405		
Crosstab: pain and workplace					
Workplace	Neck	Shoulder	Both	13.833	3
Bank	80	64	59		
Stock exchange	46	73	83		
Total	126	137	142		
			405		

*P value is significant at <0.005

Findings of our study are in agreement with earlier studies done by Fosterold KI (2006), Galinsky T et al in 2000 and 2007^{24, 25, 26}. Work-related musculoskeletal disorders especially those related to neck - shoulder areas are more common among women as compared to men^{27,28}. Various risk factors including forceful exertions, heavy lifting, awkward postures, repetitive movements and vibrations are found to be associated with neck and shoulder complaints²⁹. Nevertheless, no specific mechanisms are identified yet to explain why women are more susceptible to neck and shoulder musculoskeletal disorders than men. Possible reasons identified by a study done in 2012, include job-related task allocations differences to men and women, different ways of performing same task by men and women and

different physiological effects while performance of the same tasks even in the same way by women and men³⁰. All these risk factors can create a complexed interaction to explain gender differences in musculoskeletal disorders occurrences. However, our study showed that there is no association between gender and neck-shoulder musculoskeletal disorders. Our finding is consistent with the finding of a study done by Fuller JR et al in 2009, which revealed that there is no gender difference in frequency of musculoskeletal disorders³¹. Similar results were reported by other studies by Pincivero DM et al (2003) and Hunter SK (2014). It is impossible to compare maximal or sub-maximal iso kinetic contractions or intermittent loads effects in women and men. Therefore, one should be very careful in generalizing results of

different studies as they may be highly task-specific^{32, 33}.

Appropriate measures can help in reducing neck and shoulder problems among computer users at workplace. The impact design of seat and sitting habit of office workers using computers depends upon working hours and conditions. Work-related disorders are affected by both physical and psychosocial risk factors. To keep the neck in proper position is very important in preventing neck pain. Taking mini-breaks or micro breaks of 30 seconds once every 20 to 40 minutes is very effective to reduce neck pain at workplace and these short breaks have no adverse effect on work reproductively. It is recommended that efforts should be made to identify sources and effects of discomfort among employees of professional workplace. Workers with high height have complaints of severe pain in neck regions; main reason is because of office chair as compared to their height. Primary prevention measures like adjust of seat can reduce the incidence of musculoskeletal disorders. Providing ergonomic counseling to frequent computer users with neck-shoulder pain may help to reduce morbidity associated with the MSDs. Secondary prevention is usually geared toward preventive measures for people in a population who have developed a disease, yet remain asymptomatic. The use of neck muscle exercises may be a useful tertiary prevention approach to reduce morbidity and to rehabilitate workers by preventing the disease progression.

CONCLUSION

Study concludes that work-related musculoskeletal disorders (MSDs) with neck/shoulder pain are common among office workers working in low-intensity physical activity environment spending more time in sitting position. Frequency of neck/shoulder pain was observed to be very high among prolonged computer users. Bad posture and lesser frequency of breaks at work may contribute to MSDs among employees. Our results showed that there is no association between gender and neck-shoulder musculoskeletal disorders. Necessary measures required by the responsible authorities for implementation of ergonomics and frequent breaks during work time.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

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