Relationship between neck and shoulder pain among computer users working at different organizations of Karachi

Muhammad Atif Khan

Vice Principal and Assistant Professor

ISRA Institute of Rehabilitation Sciences, ISRA University, Karachi Campus, Pakistan

Hira Islam Rajput

Assistant Professor

ISRA Institute of Rehabilitation Sciences, ISRA University, Karachi Campus, Pakistan

Muhamad Asif

Principal and Professor

ISRA Institute of Rehabilitation Sciences, ISRA University, Karachi Campus, Pakistan

Erum Tanveer

Additional Director and Assistant Professor

Hidayat Institute of Rehabilitation and Emerging Sciences, Sukkur

Saman Habib Malik

Sr. Lecturer, ISRA Institute of Rehabilitation Sciences, ISRA University, Karachi Campus, Pakistan

Saher Pasha

Sr. Lecturer, ISRA Institute of Rehabilitation Sciences, ISRA University, Karachi Campus, Pakistan

Muhammad Riaz Baig Chughtai

Principal, College of Physiotherapy, Jinnah Postgraduate Medical Centre, Karachi, Pakistan

ABSTRACT

Objective: To determine the neck and shoulder pain among computer user in different working environment of Karachi.

Methodology: It was a cross sectional study. Randomly selection of computer users from different organization of Karachi. The data collected from January 2012 to June 2012. We selected computer users from both gender between 17 to 41 years of age by convenient sampling. Those selected, were subjected had a work experience of about one year using computer for at least two hours. A self-administered questionnaire was used to determine the computer users' complain of neck and shoulder pain.

Results: The greater incidence of pain was found in the shoulder region and participants showed frequent complaints of neck and shoulder pain and their frequency was 116 (33.1%) and 146 (46%). 56.6% participants responded that pain starts when they perform their work. 64.6% participants responded that they keep their neck in bending position and shoulders elevated while using computer.

Conclusions: The frequency of shoulder pain is greater than neck pain among computer users. Symptoms increases with the increase contact time with the computer. So the complaints of neck and shoulder pain among computer users of Karachi are much higher as compared to the other countries. Therefore, it is recommended that as ergonomically designed furniture can decrease complaints of pain and occurrence of injuries, increase productivity, improve morale, and decrease work-related musculoskeletal disorders.

Key words: Neck pain, Shoulder pain, computer user, postural training.

INTRODUCTION

Pain is defined as a private, internal event that cannot be observed directly. Pain assessment is usually based on a person's self-report and it seems that pain is not uni-dimensional phenomenon.¹ Pain can be best understood as an interaction of psychological as well as physical components.² Pain usually affects the physical performance of a person but also diminishes emotional, behavioral, social, and occupational functioning as well.

Different mechanisms should be discussed for an understanding of pain perception. These include: 1. Nociception, 2. Pain perceiving, i.e. the factors that interact with the processes of the brain to develop the person's perception of the pain stimuli, 3. Pain response, i.e. overt learned expressions that communicate pain and distress to the social environment, 4. Person suffering, which leads to the perception of debilitating threat or damage to the self caused by the pain and its outcomes.³⁻⁴

Some conditions which leads to neck and shoulder pain are well defined but most of the conditions are difficult to diagnose.⁵⁻⁸ Neck and shoulder pain can be a result of serious problems like dislocations, fractures, myelopathy, any infections, neuro-vascular pathologies etc. But these conditions are rarely seen in the general population as compared to other more common types which include musculoskeletal and neuro-musculoskeletal disorders.⁶

In addition, neck and shoulder pain can be a result of referred pain which can be associated with psychological stress, somatisation and functional disability.⁹⁻¹⁰

Neck and shoulder pain have been defined as ache, discomfort, stiffness, spasm, numbness, tenderness, and muscle pain in several studies. Symptoms like pain, stiffness, aches etc are difficult to separate from each other in relation to their origin. Although most studies consider the neck and shoulder pain as a separate region while few studies consider the neck and shoulder pain combinely. In the present study, we have considered both cases who reported either neck pain or shoulder pain or both, on the basis of the concept that numerous muscles perform their function on both pectoral girdle and cervical spine and it is difficult to separate these regions structurally and functionally as they are interconnected with each other.^{1,11-13}

The human cervical spine consists of seven irregular bones, called vertebrae, five resilient intervertebral discs and about thirty seven intervertebral joints on which different muscles and ligaments are attached that makes this part of the spine as the most mobile and least stable portion of the spine.¹⁴

The structural and functional components of the human spine are divided into two categories that are hard and soft tissues. Hard tissue consist of vertebrae and intervertebral discs, function as load bearing and they are resilient to compressive forces which are continuously being applied to the spine in different activities.

The soft tissue component includes muscles and ligaments, attached to the cervical spine. Muscles are responsible to perform different movement of the neck while ligaments stabilize the cervical spine in static posture as well as during movements.

Although there is very limited range of motion occurring at each joint of the cervical spine. But combined motion of all segments makes the cervical spine as the most mobile part of the human vertebral column and about 140 degrees of sagittal plane, 180 degrees of transverse plane and about 90 degrees of frontal plane movements are taking place at the cervical spine.¹⁵

Pectoral girdle is also called as the shoulder girdle, consist of clavicle (collar bone), the flat triangular bone, the scapula and the longest bone of the upper limb, the humerus. The clavicle is the only bone which connects the appendicular skeleton with the axial skeleton and forms the sternoclavicular joint with sternum and acromioclavicular joint with the acromion process of the scapula.¹³

The shoulder joint is the most unstable and most dynamic joint in the human body because glenoid cavity is a shallow cavity which is deepened by the glenoid labrum that increases its stability. Apart

from labrum and joint capsule, the stability of the shoulder joint is mostly depended on the muscles which are surrounding this joint. The muscles which surround the shoulder joint are called as rotator cuff muscles.¹⁶ This study finds out the neck and shoulder pain among computer user in different working environment of Karachi. With the help of this research the level of awareness of postural training and ergonomically assessment may be enhanced among computer users working in different organization of Karachi and by this study the computer users would be able to work efficiently.

MATERIAL AND METHODS

350 participants were randomly selected in different organization in Karachi. The duration of the study was six months from January 2012 to June 2012. The participants were randomly selected, who were using computer in different organizations in Karachi and self-administered questionnaires with consent form were distributed to all participants. Participants were asked to complete the self-administered questionnaire and returned to the researcher or the person who gave it to them after one week of time. The targeted population of this study was both gender computer users aged between 17 to 41 years and had a work

experience of about one year using computer for at least two hours were included in this study. Computer users aged above 41 years and below 17 years were excluded from this study. Laptop users and those employees who had a history of severe trauma, such as a fracture, neurological injury involving the spine, shoulders or head, or a recent whiplash injury (i.e. less than two years ago) were also excluded from the study. A self-administered questionnaire was used as a data collection tool as it is useful method of covering a large population in a relatively short time and economically it is a cheap method rather than any other type of methods. This method is useful for straight forward questions and self-administered questionnaires provide more ease to the participants as participants can answer the questionnaire in their free time which may also helpful for them to consider each question carefully. The questionnaire for this study was developed to check out the complaints of neck and shoulder pain in computer users. The first part of the questionnaire contained questions concerned participants' demographic details: age, gender, occupations, working hours per day in front of computer, place of work, duty, and work experience. The second part of the questionnaire was consisting of questions regarding frequency, severity, nature

and duration of neck and shoulder pain and its relationship with work. The questionnaire was based on close ended questions as close ended type of questions are easy to answer and this format of questions is more easy to understand for the researcher as well as for the respondents as there is no language problem in close ended type of questions as they require very little or no explanation. An inform consent form was also attached with the self-administered questionnaire and the procedure, rationale and aim of the study was fully explained to the respondents. All the responses were collected in person by the researcher. All the data was entered in computer software Statistical Package for Social Sciences (version 14.0). Descriptive statistics were applied out to summarize the data. Mean and standard deviation ($\pm$ SD) was calculated for all the quantitative variables i.e. age, duration of computer usage. Frequency and percentages were calculated for qualitative variables i.e. gender, intensity of neck and shoulder pain. Each question was coded according to the number of options and a unique code was used for each option of the closed questions.

RESULTS

350 computer users were selected from different organizations of Karachi with a mean value of age (mean30), and having a standard deviation of ($S.D \pm 10.357$) with the standard error of mean ($S.E.M \pm 0.073$). Ratios of male respondents were greater as compared to females and 54.3 percent participants were male and 45.7 percent were females. Time duration has been described which was being spent by the respondent in front of computer. Those participants who were spending about 2

to 4 hours in front of computer were 29 out of 350 participants and their percentage was 8.3 percent. 8.3 percent participants who were spending about 2

to 4 hours in front of computer, 8.0 percent participants were spending about 5 to 6 hours in front of monitor screen. 24.6 percent participants were spent about 7 to 8 hours and 20.9 percent participants were showing the number of contact hours greater than 9 hours. 61.7 percent participants were showing the number of contact hours lies between 2 hours till greater than 9 hours. 24.6 percent participants 'always' had neck pain and 25.1 percent participants had sometime neck pain. 33.1 percent had frequently neck pain whereas 11.7 percent had rarely neck pain. 46% participants had frequently shoulder pain, 22.3% had sometime whereas 12.6% had always shoulder pain when using computer. 30.3% participants had neck pain and it was increased with the use of computer.

Table IV-1: Suffer From Neck Pain

Neck Pain	Frequency	Percent	Valid Percent	Cumulative Percent
Always	86	24.6	24.6	24.6
Sometime	88	25.1	25.2	49.9
Frequently	116	33.1	33.2	83.1
Rarely	41	11.7	11.7	94.8
Never	18	5.1	5.2	100.0
Total	349	99.7	100.0

Figure IV-1: Do You Suffer From Neck Pain

Table IV-2: Suffer From Shoulder Pain

Shoulder Pain	Frequency	Percent	Valid Percent	Cumulative Percent
Always	44	12.6	12.6	12.6
Sometime	78	22.3	22.3	35.0
Frequently	161	46.0	46.1	81.1
Rarely	37	10.6	10.6	91.7
Never	29	8.3	8.3	100.0
Total	349	99.7	100.0

Figure IV-2: Suffer From Shoulder Pain

Table IV-3: Neck Pain * spend time in front of Computer

		Spend time in front of Computer				Total
		2-4 Hrs	5-6 Hrs	7-8 Hrs	>9 Hrs	
Neck Pain	Always	2	2	24	30	58
	Sometime	4	9	26	17	56
	Frequently	14	8	28	19	69
	Rarely	9	8	6	3	26
	Never	0	1	2	4	7
Total		29	28	86	73	216

Figure IV-3: Neck Pain * spend time in front of Computer

Table IV-4: Shoulder Pain * Spend time in front of Computer

		Spend time in front of Computer				Total
		2-4 Hrs	5-6 Hrs	7-8 Hrs	>9 Hrs	
Shoulder Pain	Always	3	2	9	6	20
	Sometime	5	9	22	16	52
	Frequently	10	6	45	44	105
	Rarely	9	6	8	3	26
	Never	2	5	2	4	13
Total		29	28	86	73	216

Figure IV-4: Shoulder Pain * spend time in front of Computer

DISCUSSION

Majority of the participants showed that they frequently suffered from neck and shoulder pain. It is the first research that finds out the neck and shoulder pain among computer users working in different organization of Karachi. This study emphasize to determine the prevalence of upper extremity Musculoskeletal disorders in intense computer users and the results showed that the relationship between use of computer and development of musculoskeletal symptoms. There was a high prevalence of upper extremity cumulative disorders among long term desktop users. It was concluded that there was a positive association between upper extremity musculoskeletal disorders and use of computer.¹⁷ These results similar with our study among computer workers in the Karachi with prevalence of 23.1% of complaints of neck and 46% shoulder pain. Furthermore, these results are inconsistent with the study that was conducted in the Sudan, which shows 53% complaints of arm, neck and shoulder pain complaints for the duration of at least one week over a one-year. The result of our study is also not supporting the study which was conducted in the Netherlands shows 54% prevalence of complaints of neck, arm and shoulder pain among computer users for at least one week period of time. 28% prevalence of neck, shoulder pain was found in 12 months period of time, a survey was carried in the Netherlands during the years 2002 and 2004.¹⁸

Furthermore research shows that prevalence of musculoskeletal disorders is more common in all ages of females as compared to males. Most of the population showed a positive relation between their work and pain and they responded that either pain starts or aggravate when they perform their VDT tasks and they usually take NSAIDs for the relieving of pain. The results showed that although a large number of population keep their arms and forearms perpendicular to the ground but their elbows and shoulders are not closed to the body rather their shoulder remain I abducted position this is usually because of the placement of the mouse or input device too far so the user had to keep his or her shoulder in abducted position.¹⁸

Results also showed that most of the participants do not use proper back rest so the chance of developing lower back pain is also too high. And also, their seat width and depth is not comfortable and ergonomically suit them. Most of the participants responded that they have arm rest in their chairs and they usually support their forearms on the arm rest. A greater number of participants responded that the position of the monitor screen is not exactly in front of them so they have to perform the twisting movement while looking at the monitor screen.

In this study they suggested that poor head and neck posture is the main cause of pain in the region of neck and shoulder among the computer users. This study assessed and compared posture office workers with or without symptoms of having discomfort in the region of head, neck and shoulder. Symptomatic subjects also showed protracted acromion and greater movement in head region as compared to asymptomatic subject. It was demonstrated 10% increase in head posture in all subjects as compared with their relaxed position, and it was also noticed that everyone's posture remain same throughout the time period.¹⁹

This study determines a relationship between severity of incorrect posture and frequency of neck and shoulder pain. Future research is needed, however, to determine the postural training which improves the postural alignment can reduce the incidence of neck and shoulder pain. It is predictable to found what the associations are between pain reduction and postural training in order to give the reasons of management of postural correction and exercise techniques used in clinical practice. Future research in the area of quantifying postural abnormalities would also be beneficial in establishing what relationships do exist.

CONCLUSION

The frequency of shoulder pain is greater than neck pain among computer users. So the complaints of neck and shoulder pain among computer users of Karachi are much higher as compared to the other countries. As ergonomically designed furniture can decrease complaints of pain and

occurrence of injuries, increase productivity, improve morale, and decrease work-related musculoskeletal disorders.

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