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Association between Musculoskeletal Disorders and Computer use among the Patients Who Attended a Selected Rehabilitation Centre of Dhaka City

A. K. M Rewzan & Jeonal Abedin

Abstract:

Musculoskeletal disorders are the most common causes of severe long-term pain and physical disability, affecting hundreds of millions of people around the world. Objective: The aim of the study was to determine the association between musculoskeletal disorders and computer use among the patients who attended a selected rehabilitation centre of Dhaka city Materials and method: It was a cross sectional study. Sample size was 128 and a pre-tested, modified, semi-structured questionnaire was used to collect the data. Data were analyzed using SPSS software version 16.0.Results: Majority of the respondents (32.50 %) belonged to 41-55 year age group. Mean age was 36.75 ± 10.17 years. Most of the respondents were male (64.8 %). Study revealed that neck pain (39.1%) was the major complaint followed by back pain (17.2%). Regarding pattern of pain, continuous (32.0%) type was predominant (32.8%) graduate education groups used more (58.6%) the desktop and (59.4%) controlled computer by mouse, Majority of the respondents (40.6 %) belonged to 2-5 years regarding using computer, mean($\pm$ SD) was (6.45$\pm$ 2.685) years. Most of the respondents (32.8%) used computers up to 3 hours. Near about 40 percents (39.1%) complained musculoskeletal disorders more than 1 hour of computer use. Regard measurement of pain grading scale (46.1%) of the respondents had been suffering moderate pain, about 50 percents (52.3%) were taken self medication and (65.6 %) were visited doctors. Near about 45 percents (46.9%) respondents don't know about the effect of computer use and there were statistically significant association (P=0.012) between physically medical problem and types of computer use, There was also statistically significant association (P=0.036) between physically medical problem and control of computer. Conclusion: Study concluded that common areas of musculoskeletal pain were neck followed by back and shoulder, pain characteristics were intermittent, radiating, numbness and burning in nature. Respondents were taken self medication, different type of medical and physiotherapy service.

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INTRODUCTION

Computer related musculoskeletal disorders continue to be a substantial public health problem. The computer has been identified as a device that has a unique potential to improve the quality of health care system as well as the efficiency of the health workers both in the developed and developing countries [1]. Despite the fact that information, communication and technology are being used to improve health care systems, there may be associated health hazard with the use of these devices. Computer related musculoskeletal disorders affect millions of computer users in developed nations. With proliferation of computer systems in the developing nations, the associated musculoskeletal pain is yet to be investigated [2]. Computer is now one of the most widespread work tasks in the world. In some western countries more than half of the work force uses a computer station for more than half of their working day. Adverse effects of the computer could thus have a large impaction public health, even if effect sizes are small. Most concern has been expressed about pain and disorders of the musculoskeletal system in those using the keyboard for data entry and other keying tasks, and in the use of the computer mouse and other input devices. Working with computer has been associated with a high prevalence of musculoskeletal complaints among computer users in many developed countries. Various factors have been incriminated in the development of musculoskeletal disorders among computer users [3].

The impact of musculoskeletal disorders in the general population has been associated with disability and assessed by measures of health related quality of life and has become an important measure when studying health status and health outcome. Surveys from the industrialized world revealed a high prevalence of MSD and its negative effect on the perceived HRQL, as compared with other common chronic conditions. Musculoskeletal impairments rank number one in chronic impairments in the United States and 1 out of every 4 people in developed and less developed countries reports chronic musculoskeletal pain. As such, the United Nations and WHO declared the decade 2000-2010 as the Bone and Joint Decade with the aim of increasing the understanding of the burden posed by MSD and improving the HRQL of people suffering from them [4]. Various musculoskeletal system disorders occur as a result of the use of computers, which have become an integral part of modern life. The most important among such disorders is known as cumulative trauma disorder (CTD). In this study, we attempt to investigate CTD's effects on daily life and the effectiveness of training and exercise programs in the management of this disorder at a state department where computers are widely used. Fifty patients with CTD between the ages 25 and 50 were recruited for the study and were randomized into two groups. The complaints of patients with CTD had appeared after they had started working in this job and they reported that their complaints were related to their occupation [5]. The one thing that has had the greatest impact on our lives in modern time is the computer. Along with smaller size and affordable prices, there has been the advent of the Internet. This has ensured that people use this technology either at their work place or at home. Meanwhile, the applications of computer technology and the accompanying use of video display terminals (VDTs) are revolutionizing the workplaces worldwide, and their use will continue to grow in the future [6]. Since the price of computers has gone down considerably in Bangladesh the number of users has greatly increased as many organizations and individuals could afford them. Consequently, complaints of musculoskeletal pain are daily reported in the physical medicine, Orthopedic and physical therapy department. The was conducted with the objective to find out association between musculoskeletal disorders and computer use.

METERIAL AND METHOD

A pretested, modified, interviewer administrated, semi-structured questionnaire was distributed to the computer users who complain of musculoskeletal disorder in a rehabilitation centre of Dhaka city, total 128 respondent wear selected in both male and female who complain of musculoskeletal disorders, non randomized, purposive sampling technique applied and application of computer at least one year and above , different types of questioners employed for collection of data and it wear summarized using the descriptive statistics of means, standard deviation and percentages Pearson's chi squared test was used to determine association prevalence, Data was entered into the computer into a data base in the software package. Statistical package for the social science (SPSS 16.0) using descriptive statistics such as frequency, distribution, range, mean, and percentage. The significant level was set as 0.05

RESULTS

Table-1: Distribution of respondents by age (n=128)

Age in years	Frequency	Percentage
20-30	37	28.35
31-40	36	27.65
41-50	41	32.50
51-55	14	11.50
Total	128	100
Mean $\pm$ SD		36.75 ± 10.17

It was found from the table 1 revealed that the mean age of the respondents were 36.75 $\pm$10.17 years with a range from 20 to 55 years. It was found that 28.35 % , 27.65%, 32.50%,11.50% of the respondents belonged to age group 20-30 years, 31-40 years, 41-50 years, 51-55 years , and above respectively. The table found that young age groups were more computer use.

Table-2: Distribution of respondents by sex (n=128)

Sex	Frequency	Percentage
Male	83	64.8
Female	45	35.2
Total	128	100

It was found from the table 2 shown that among the respondents, 64.8 % were male and 35.2% were female.

Table 3: Distribution of respondents by Marital status (n=128)

Marital status	Frequency	Percentage
Married	98	76.6
Unmarried	30	23.4
Total	128	100

It was found from the table 3 found that among the respondents 76.6 % were married, 23.4 % were unmarried.

Table-4: Distribution of respondents by Educational status (n=128)

Educational status	Frequency	Percentage
Secondary	22	17.2
Higher secondary	40	31.2
Graduate	42	32.8
Post graduate	24	18.8
Total	128	100

It was found from the table 4 that 17.2%, 31.2%, 32.8%, and 18.8 % of the respondents belonged to the level of education had secondary, higher secondary, graduate, and post graduate respectively. The table shown that graduate education groups were more computers used.

Table-5: Distribution of respondents by Type of computer used (n=128)

Type of computer	Frequency	Percentage
Desktop	75	58.6
Laptop	49	38.3
Tablet	4	3.1
Total	128	100

It was found from the table-5 found that among the respondents, 58.6 % were used desktop, 38.3 % tablet and 3.1 % I-phone in this table shown that most of the respondents used desktop

Table-6: Distribution of respondents by computer control (n=128)

Variables	Frequency	Percentage
Mouse	76	59.4
Keyboard	48	37.5
Touch pad	4	3.1
Total	128	100

It was revealed from the table-6 that 59.4%, 37.5 %, 3.1 % of the respondents belonged to use of mouse, keyboard and touch pad respectively. In this table represented that most of the respondents used mouse.

Table- 7: Distribution of respondents by duration of computer used in years (n=128)

Duration in Years	Frequency	Percentage
2-5	52	40.6
6-8	47	36.9
9-12	29	22.5
Total	128	100
Mean $\pm$ SD	6.45 ± 2.685	

It was found from the table 7 shown that the mean duration of computer used in 6.45 ± 2.685 years with a range from 2years to 12 years, It was found from the table 7 that 40.6 %, 36.9 % and 22.5 % of the respondents used computers from 2-5 years, 6-8 years and 9-12 years respectively

Table-8: Distribution of respondents by computer used without interval in hours (n=128)

Computer used without interval in hours	Frequency	Percentage
Up to 1 hour	7	5.5
Up to 2 hours	33	25.8
Up to 3 hours	42	32.8
Up to 4 hours	35	27.3
Up to 5 hours	11	8.6
Total	128	100

It was found from the table 8 revealed that the duration of computers used without interval is with a range from 1 to5 hours. It was found from table 8 that 5.5 %, 25.8%, 32.8 %, 27.3 %, and 8.6 % of the respondents used computers up to 1 hour, up to 2 hours, up to 3 hours, up to 4 hours and up to 5 hours without interval respectively. It was shown that most of the respondents used computers up to 3 hours.

Table- 9: Distribution of respondents by used adjustable height of the chair (n=128)

Used adjustable height of the chair	Frequency	Percentage
Yes	65	50.8
No	63	49.2
Total	128	100

It was found from the table 9 found that 50.8 % respondents used adjustable height of the chair and 49.2 % respondents were not.

Table-10: Distribution of respondents by physically comfortable feel during using computer (n=128)

Physically comfortable	Frequency	Percentage
Yes	54	42.2
No	74	57.8
Total	128	100

Table-10 found that 42.2 % of the respondents used comfortable feel during computer used and 57.8 % respondents were not.

Table-11: Distribution of respondents by pattern of musculoskeletal disorders (n=128)

Area of pain	Frequency	Percentage
Shoulder	17	13.3
Neck pain	50	39.1
Back pain	31	17.2
Wrist	18	14.1
Elbow	16	12.5
Muscular pain	5	3.9
Total	128	100

It was found from the table 11 reveals that 13.3%, 39.1%, 17.2%, 14.1%, 12.5%, 3.9% and 4.5% of the respondents belonged to complain the shoulder pain, neck pain, back pain, wrist pain, elbow pain and muscular pain in both upper limbs, According to the result one third of the respondents complained neck pain.

Figure-11: Distribution of respondents by pattern of musculoskeletal disorders
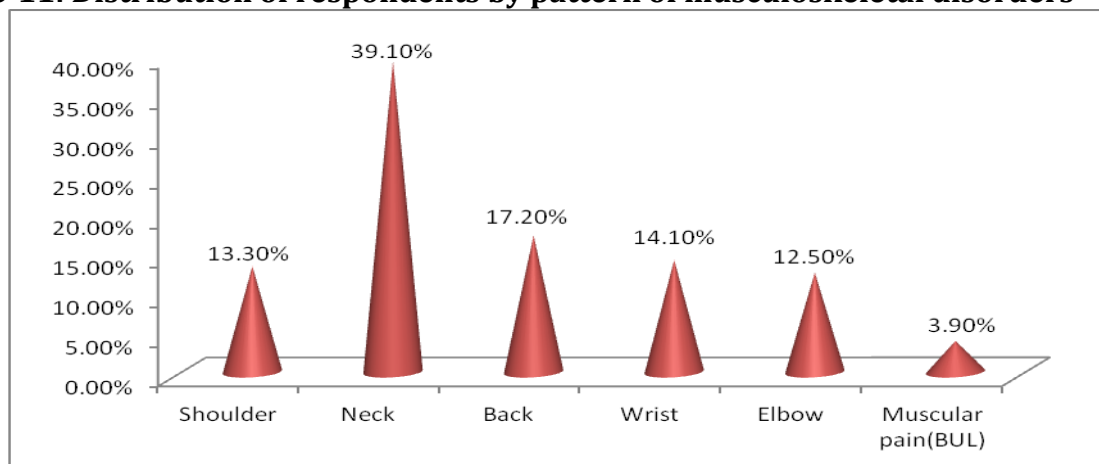
Table-12: Distribution of respondents and duration of problem persist (n=128)

Duration of problem in hours	Frequency	Percentage
For some time	4	3.1
Near about 1 hour	32	25.0
More than 1 hours	50	39.1
Many hours	31	24.2
Whole days	11	8.6
Total	128	100

It was found from the table 12 shown that 3.1%, 25.0%, 39.1% 24.2% and 8.6% of the respondents had been suffering from for some time. Near about 1 hour, more than 1 hour, many hours and whole days respectively. According to the table 12 most of the respondents complained musculoskeletal disorders more than 1 hour of computer used

Table-13: Distribution of respondents by pain characteristics (n=128)

Characteristics of pain	Frequency	Percentage
Intermittent	10	7.8
Continuous	41	32.0
Tingling	33	25.8
Numbness	21	16.4
Burning	12	9.4
Radiating	11	8.6
Total	128	100

It was found from the table 13 revealed that 7.8 %, 32 %, 25 %, 16.4 %, 9.4% and 8.6% of the respondents Complained intermittent pain, radiating, continuous, numbness, burning, and tingling sensation. According to results most of the respondents complained continuous pain and it is near about one third of the total respondents.
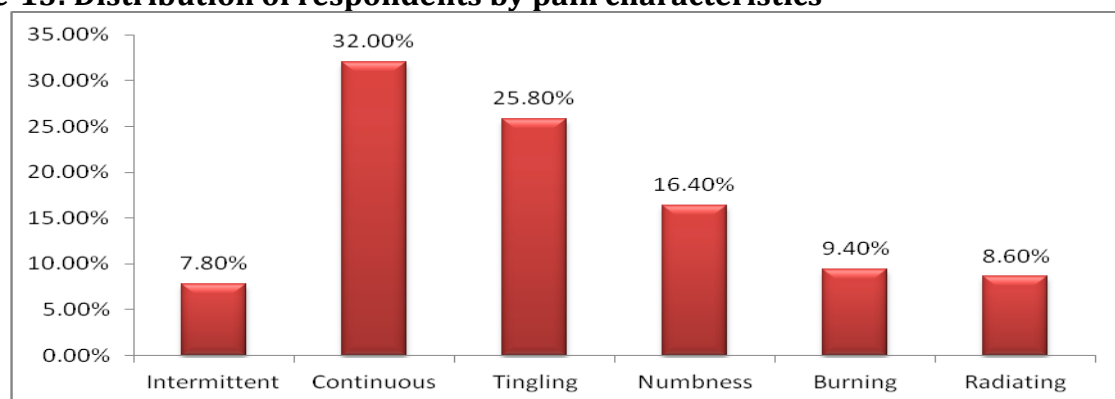
Figure-13: Distribution of respondents by pain characteristics

Table-14: Distribution of respondents by severity of pain (n=128)

Severity of pain	Frequency	Percentage
Mild	25	19.5
Moderate	59	46.1
Severe	37	28.9
Intolerable	7	5.5
Total	128	100

It was found from the table 14, 46.1% respondents were suffering moderate pain, 19.5% mild pain, 28.9 % severe pain, and 5.5% are feeling intolerable pain. According to the measurement of pain grading scale most of the respondents were suffering moderate pain and it was near about half of the sufferer.

Table-15: Distribution of respondents by self medication (n=128)

Medication uses	Frequency	Percentage
Yes	67	52.3
No	61	47.7
Total	128	100

Table 15 reveled that 52.3 % respondents were take medication and 47.7 % respondents were not.

Table- 16: Distribution of respondents by doctor visit (n=128)

Doctor visit	Frequency	Percentage
Yes	84	65.6
No	44	34.4
Total	128	100

 Table-16 revealed that 65.6 % respondents were visit doctors and 34.4 % were not.

Table-17: Distribution of respondents by doctor referred physiotherapist (n=128)

Referred physiotherapist	Frequency	Percentage
Yes	65	50.8
No	63	49.2
Total	128	100

It was shown by table 17 that 50.8 % respondents referred physiotherapist by doctor and 49.2% were not.

Table-18: Distribution of respondents by diagnosis of diseases (n=128)

Diagnosis	Frequency	Percentage
Don't know	60	46.9
Cervical Rediculopathy	24	18.8
De-Duervain diseases	16	12.5
Carpal tunnel syndrome	8	6.2
Tennis elbow	9	7.0
Lumber rediculopathy	11	8.6
Total	128	100

It was shown by table 18 that respondent of 46.9% don't know there disease and 18.8% cervical rediculopathy,12.5% de-quervain disease, 6.2% carpal tunnel syndrome, 7% tennis elbow and 8.6% lumber rediculopathy diagnosed by the doctor, many of the patients don't know there disease and secondly most of the respondent suffering cervical rediculopathy.

Table-19: Distribution and association of respondent between physically medical problem and types of computer uses.

Types of computer use	Physically medical problem						Total	P-Value
	shoulder pain	Neck pain	Back pain	Wrist pain	Elbow pain	Muscular pain		
Desktop	9	28	12	14	11	1	75	0.12
Laptop	4	21	11	4	5	4	49	
Tablet	3	1	0	0	0	0	4	
Total	16	50	23	18	16	5	128	

P value obtained from Pearson Chi-square(x^2) Test

The table-19 showed the association between physically medical problem and types of computer use, it was found that a significant positive association exists between physically medical problem and types of computer use ($P < 0.05$)

Table-20: Distribution and association of respondent between physically medical problem and control of computer

Computer control	Physically medical problem						Total	P-value
	shoulder pain	Neck pain	Back pain	Wrist pain	Elbow pain	Muscular pain		
Mouse	8	30	14	9	10	5	76	0.036
Key board	5	19	9	9	6	0	48	
Touch pad	3	1	0	0	0	0	4	
Total	16	50	23	18	16	5	128	

P value obtained from Pearson Chi-square(x^2) Test

The table-20 showed the association between physically medical problem and control of computer, it was found that a significant positive association exists between physically medical problem and control of computer. (P< 0.05)

DISCUSSION

The present study found that the mean age of the respondents was 36.75 ± 10.17 years and within the respondents more in male 64.8 % and 76.6 % were married, 23.4 % were unmarried. Graduate education groups were more computers used and desktop user were is 58.6%. Maximum respondents are used mouse. The mean duration of computer used in 6.45 $\pm$ 2.685 years. And duration of computers used without interval is with a range from 1 to5 hours. Most of the respondents used computers up to 3 hours. This study 50.8 % respondents used adjustable height of the chair in computer desk and arise pain in shoulder, neck, back, wrist, elbow and muscles of upper limb, According to the study one third of the respondents complained neck pain that are similar findings found by Oha K [7] Most of the respondents complained musculoskeletal disorders more than 1 hour of computer used. According to pain grading scale, near about (46.1%) respondents were suffering moderate pain, these findings similarly found by Hakala [8.] (65.6%) of the respondent visited doctor and 46.9% of respondent don't know there disease and 18.8% of respondent feel cervical rediculopathy, Statistically significant association found between the physically medical problem and types of computer uses. another association found between physically medical problem and control of computer both were statistical significant P- value was less than 0.05.

CONCLUSION

Computer users suffer from different types of musculoskeletal disorders due to frequently exposure to certain risk factors for long period of time such as, keying for long periods of time without breaks or rest, using force when striking the keyboard, working with poor postures, remaining in the same position for long period of time with little or no movement, working without back support of chair and job stress. The most common problems are neck pain, and low back pain and shoulder pain [9]. Upper back are the least complained pain when operating

on computer systems. Pains are more severe in people with five or more than five hours per day and five or more than five years working experience on the computer system. Practically, the result of this study would help in preventing occupational injury associated with the use of computer with emphasis on good posture and computer workstation design [10].

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