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Assessment of musculoskeletal disorders among computer users

Sasmita Dandasena, Shishir Kala and Aelena Takhellambam

Abstract
Introduction: Now a days a large number of population was using computer for their daily activities, which leads to increase in the number of users complaining about various musculoskeletal problems.
Objective: To study the socio-economic profile and Musculoskeletal problems and other health related problems of computer users.
Materials and Methods: A pre structured questionnaire was prepared to collect all the information of computer users working in DRPCAU campus.
Results: Majority of respondents (60%) were working on their computer for 5-6 hours for performing their official work. All the computer users (100%) had taken break from the computer work as they had felt tired after working for a long time. Computer users (86.67%) felt persistent pain in their neck; Persistent pain in upper and lower legs was felt by respondents (36.67%), a large number of the respondents (83.33) had aching in their eyes and (36.67%) had suffered persistent pain in their head.
Conclusion: Musculoskeletal Problems are common in case of computer users as they performed for prolonged hours. It can be prevented by adopting proper ergonomic parameters and proper working postures.

Keywords: Musculoskeletal disorders, computer users, pain

Introduction
In the present scenario, the technology is well developed and has made our life so advantageous that it is very difficult to imagine our life without computer, internet, mobile phones and electronic gadgets. Some years back increasing number of people were using computers for their official and personal use. With the increasing use of computer, it has become an essential part of human life. The use of computer is helpful as well as harmful as the use of computer is increasing day by day, it also increases the risks related to human health. However the risks related to use of computer varies with gender, time spent in the computer, human health status and the postures used by the users (Reema, 2018) [11]. Working long hours with the computer may cause musculoskeletal disorders (MSD) due to incorrect postures, repetitive strain injuries, occupation overuse syndrome, trauma disorders, muscles stiffness, joint pain and eyesight problems (Sen and Richardson, 2002) [12].
Musculoskeletal problems are significant burdens on users. The term musculoskeletal disorders encircle inflammatory and degenerative conditions, which affect the tendons, muscles, joints, ligaments, blood vessels and peripheral nerves with pain or discomfort and ache. It is the most common work related problem in the present era. About 50 per cent of the working population are having musculoskeletal problems in their lower part of the back region. The computer users who, works in the Bank are having greater prevalence of neck pain (71.6%) and in shoulder pain (48.33%) during working time (Vinothini, 2018) [14].
Musculoskeletal injuries increase with longer hours of works performed with computer. The computer screen may cause musculoskeletal injuries as it is kept too high or low in relation to the computer user (Kumar *et al*. 2018) [8]. The user adjusts him or her to find a position to see the computer screen, which lead to poor working posture.
According to National Institute for Occupational Safety and Health (NIOSH, 1990) [9] more than 75 per cent of users have discomfort in their back, neck and shoulder. Further, it was reported that 20-25 per cent of computer users have problem in their upper back area. Shoulder pain, neck pain, backache, pain in legs and arms and even swelling in joints and muscles are the frequent disorders among computer users. Job stress and demand of computer user leads to risky physical and cognitive work related processes, which may be due to adoption of awkward posture and lack of break in working hours.

Muscle fatigue is the important factor which results in musculoskeletal disorder (MSD).

Materials and methods

Selection of Study Area: The present study was conducted in Dr. Rajendra Prasad Central Agricultural University Pusa, Pusa Block office, Kendriya Vidyalaya, Pusa and Uma Pandey College, Pusa.

Selection of Sample: Out of 60 respondents, half respondents were male and half were female. 30 respondents from the university, 10 respondents from Block office, 10 respondents from College and 10 respondents from the school were selected purposively.

Data Collection: A pre-structured interview schedule was developed to gather information and self- observation technique and was also used to evaluate information related to the condition of work environment. Field survey was accomplished in following step by step procedure.

Results

Age: The data in Table1 shows that the majority of computer users (48.33%) were in the age group (20-30 years), followed by 43.33 percent in the age group (30-40 years), and 8.34 percent in each of the age group (40-50 years) and (50 years and above). According to this report, the majority of computer users fall under the ages of 20-30 years.

Table 1: Distribution of Computer users by their Socio-economic Characteristics

Sl. No.	Particulars	Frequency	Per cent
	Age		
1.	Below 20 years	-	-
2.	20-30 years	29	48.33
3.	30- 40 years	26	43.33
4.	50 years and above	5	8.34
	Gender		
1.	Male	30	50.00
2.	Female	30	50.00

The present study also revealed that half of the computer users were male and half were found to be female. In this scenario, the study's results are attributed to the fact that fifty percent of the samples were taken on purpose for both male and female subjects.

Education: In terms of respondent educational levels, Table 2 indicates that three quarters (75.00%) of the respondents were postgraduates, followed by graduate (23.33%) and intermediate respondents (1.67%). The results were contradictory to the study of (Kaur, 2014) who divulged that more than half of the respondents were post graduate followed by graduate and intermediate.

Table 2: Distribution of computer users by their Educational level

Sl. No.	Particulars	Frequency	Per cent
	Education		
i.	Up to Matriculation	-	-
ii.	Up to Intermediate	1	1.67
iii.	Up to Graduation	14	23.33
iv.	Post Graduation and above	45	75.00

Duration of Computer Use: It was observed that majority of respondents (60%) were working on their computer for 5-6 hours for performing their official work. This was followed by the least number of respondents (38.33%) who had usually worked for more than 7 hours and only a few (1.67%) were working for 3-5 hours.

Table 3: Distribution of Computer Users by their computer use per day

Sl. No.	Particulars	Frequency	Per cent
	Use of computer per day		
i.	2-3 hrs	-	-
ii.	3-5 hrs	1	1.67
iii.	5-7 hrs	36	60.00
iv.	7 hrs and above	23	38.33

Break from computer: All the computer users (100%) had taken break from the computer work as they had felt tired after working for a long time.

Reason of taking breaks: It is noticed that 41.67 per cent of the computer users were taking breaks from the computer work due to tiredness followed by 35 per cent of the computer users took breaks because they felt fatigue from the work. It is also recorded that 16.67 per cent of the computer workers were having breaks due to vision problems.

Table 4: Distribution of Computer Users by their breaks from computer work

S. No.	Particulars	Frequency	Per cent
	Break		
i.	Yes	60	100.00
ii.	No	-	-
	Reason of taking break		
i.	Headache	3	5.00
ii.	Tiredness	25	41.67
iii.	Vision problem	10	16.67
iv.	Fatigue	21	35.00
v.	Technical fault in computer	-	-

Musculoskeletal Disorders: Computer users (86.67%) felt persistent pain in their neck followed by aching in the neck (8.33%) and numbness in the neck (1.67%) because of working for longer hours on computer. A large number of the respondents (83.33) had aching in their eyes and 15 per cent of the respondents had persistent pain in eyes and only 1.67 per cent were having numbness in their eyes because of the reflection of the computer screen, while working in long hours with the computer. The respondents (36.67%) expressed that they had suffered persistent pain in their head. 40 per cent of the respondents felt aching, while moving their shoulder and persistent pain in shoulder (8.33%) as the main symptoms for shoulder. In upper back region, persistent pain was felt by respondents (28.33%) as the main symptoms followed by aching in their upper back (13.33%). For lower back, major symptoms felt by the respondents were persistent pain (51.67%) along with aching in the lower back (5%). This is the symptom usually appears in severe cases or if earlier symptoms of pain or stiffness are not taken seriously.

Persistent pain in upper and lower legs was felt by respondents (36.67%) followed by aching in (23.33%) both lower legs and upper legs as the respondents had to sit in the chair for extended period of time and they continuously work on the computers. Moreover, absence of foot rest could also be the reason for pain and swelling in the legs as legs did not get proper support.

Various body parts of the respondents like lower arms, upper arm, palm, wrist and fingers were not much affected due to

working for longer time on computer. Further, a less number of respondents reported for having various symptoms like lower arm (1.67%), upper arm (1.67%), wrist (3.33%), palm (3.33%) and fingers (3.33%).

Aching in the feet was also felt by 23.33 per cent of computer users and only 1.67 per cent of computer users felt aching in ankle and 3.33 per cent of the respondents felt aching in their buttock, while working on the computers.

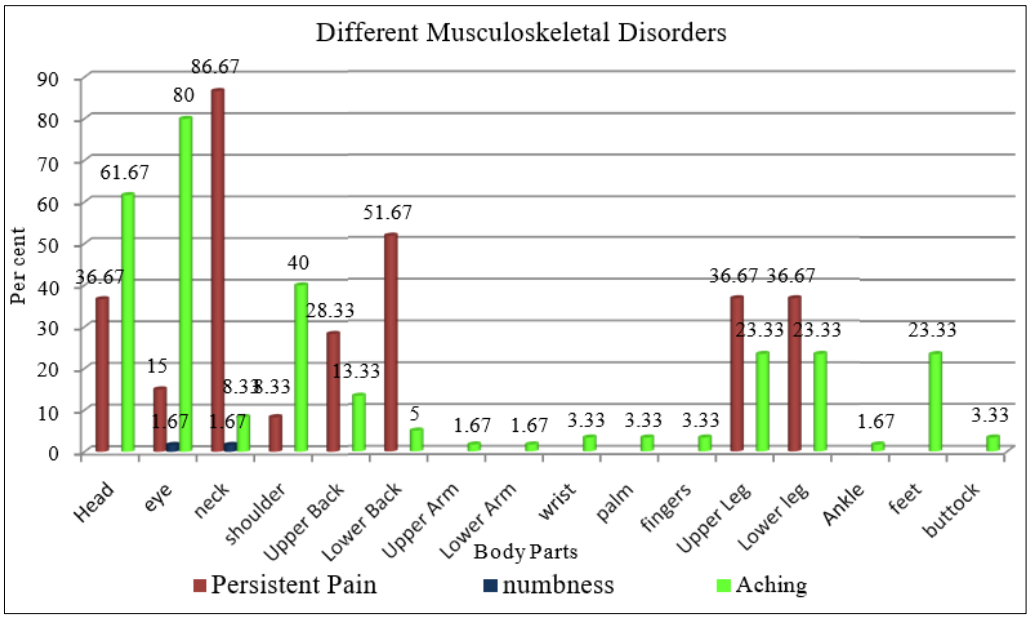

Fig 1: Distribution of computer users by their different pattern of musculoskeletal disorders

Discussion

Age of the respondents is one of the important factors, which affect the efficiency of the computer users. Gupta (2012) [5] noted that 41 per cent of the computer users belonged to the age group 31-35 years, 28 per cent belonged to the age group 36-40 years and 26 per cent of the computer users came under the age group of 26-30 years.

The results were quiet contradictory to the study of Heidari *et al*, (2019) [6], who divulged that 75 per cent of the young groups were using laptop more than 1 hour per day and 43 per cent of the respondents had used more than 3 hours per day, while 27 per cent had utilized more than 5 hours per day. It was also revealed by the study of Dubey *et al*. (2019) [4] that 55 per cent of computer workers worked more than 7 hours per day.

The findings of the study were little far from the study of Dessie *et al*. (2018) [3], who noted that 273 (45.0%) were using computer for more than 4.6 hours in a day, whereas 266 (43.8%) of the participants, who were working for more than 5-7 hours and 214 (35.3%) of the computer users were taking regular break, while working with computer.

The results were contradictory with the findings of Prodanovska *et al*. (2015) [10], who found that majority of the respondents never took break from computer work at least for 10 minutes and also found that associated with not enough time to rest and insufficient break over computer work resulted in appearance of musculoskeletal disorders.

Mostly affected area of pain of the respondents was found that majority of them had pain in the neck region of the body. The results were contradictory to the study of Tasneem Borhany *et al*. (2018) [2], who reported that 41.3 per cent of the respondents were suffering from severe neck pain.

A large number of the respondents (83.33) had aching in their eyes and 15 per cent of the respondents had persistent pain in eyes and only 1.67 per cent were having numbness in their eyes because of the reflection of the computer screen, while working in long hours with the computer. These results from the present study are divergent with Soumya, V. H *et al*. (2016) [13], who divulged that 83.5 per cent respondents were having computer vision syndrome followed by 53.9 per cent had eye strain.

Persistent pain in the head was experienced by the respondents, which was equivalent to the study to the study of Tasneem Borhany *et al*. (2018) [2] that 46 per cent of respondents were suffering from headache.

Shoulder pain was also felt by the computer users. The results were quite familiar with the study of Amin Md R. et,al. (2016) [1] that 30.8 per cent of the respondents felt shoulder pain.

Conclusion

A large proportion of computer users among Dr. RPCAU campus, Pusa reported musculoskeletal disorders at some body parts in their occupational life as they are sedentary workers diagnosed with the neck region affected the most. Work Related Musculoskeletal disorders are slowly rising among them. Most of these issues can be prevented by providing affordable ergonomic work environment, good postures during work and regular exercises.

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