



To Study The Computer Ergonomics Awareness Among Students Of Computer Science and Technology.

SangeetaPuri

Asst Prof in Home Science

Shanti Devi Arya Mahila College, Dinanagar

Abstract:

The present study was aimed to find out the awareness about computer ergonomics among college students. Pre-tested questionnaire was asked to be filled up by 500 students of Gurdaspur city who were studying computer science and IT. Most students were unaware of computer ergonomics. They were operating computers for longer hours without considering their postures of sitting. Students reported shoulder and neck stiffness and tingling numbness in hands during work. Some students, complained about hand and grip pain, headache and stiffness in lower parts of body. The study suggested that muscular fatigue was common problem among those students who were using computers intensively. Results also showed the unawareness of students regarding computer ergonomics. This study is an effort to make students aware of posture management and computer ergonomics.

Keywords- Computers, muscular fatigue, ergonomics, posture, stress and musculoskeletal disorders.

Introduction

Physical ergonomics is concerned with human anatomical, anthropometric, physiological and biochemical characteristics as they relate to physical activity. Work related musculoskeletal disorders (WMSD) are common in computer professionals. Literature says that the occupation which is at the higher risk of neck-shoulder pain is the use of computers(Dinesh .J.Bhandari et al 2007). Intensive use of computers in the work station is the major well known factor for the development of work related musculoskeletal disorders, effect on eyesight, blood pressure and



heart rate (JasbantaSethi et al 2011) In India approximately 76% of computer professionals reported symptoms of musculoskeletal discomfort in various epidemiological studies. The prevalence of musculoskeletal disorders amongst keyboard users has been reported to be as high as 81% (Garde A.H.etal 2002) Studies have shown that awkward posture is strongly associated with the development of musculoskeletal disorders, effect on grip strength, effect on heart rate and blood pressure (Hjortskovn , Rissen. D et al 2004). Published estimates have indicated that almost 75% of work in industrial countries areperformed while seated, a proportion which strongly suggests a certain degree of importance in studying the science of sitting (Treaster and Marras, 1987). Comparatively, while working on computers one has to adopt an erect sitting posture for developing concentration on monitor and side by side one has to play with mouse and keyboard also Studies done by Dr. Michael O'Neill in 2000 indicated that 41% of university students experienced pain and discomfort symptoms while using a computer; by 2008 more than 50% of surveyed university students experienced pain they attributed to computer use. The study shows that the potential exists for more than 2.5 million students to develop injuries to the upper body, arms and back(upper extremity musculoskeletal disorders) before they even enter the workplace

There only a science called Ergonomics can help to remedy the conditions that cause occupational disorders and injuries. So, far no such ergonomic study to assess physiological costs in this field has been conducted in Punjab. Therefore, a due thought was given to undertake the present study to find out awareness about computer ergonomics among students. It is an effort to recommend the most suitable posture for operating computers.According to Methney (1952) there is no single best posture for all individuals. The best posture is that in which the body segments are balanced in the position of least ligamentous strain and minimum muscular effort. So, with the help of this study the knowledge of correct postures, adequate working heights and the right method of work performance can help in reducing the physiological cost of work to the minimum.



Material and Methods

For conducting the present study which was experimental in nature, it was found necessary to know the type of equipment used for typing i.e. Laptop or a PC (desktop) and the setup of their working conditions and posture maintained during work. Hence a survey was conducted in the two colleges of district Gurdaspur. This area was selected purposely since it was easily accessible; students were very responsive and cooperative in giving the requisite information being in touch with the research activities of various departments of College.

These 500 students which were selected randomly were studying computers as a subject, or doing graduation in computer Science. .

Personal interview method with well structured Questionnaire was used for collecting the necessary information from the respondents.

Results and discussion

The findings of study have been categorized as under:

General Information of respondents

It included weight, age and height of the respondents, it was found that the age range of 92% of the respondents was 18-20. The weight range of 87% of the respondents was 48 to 52 kg. The range of height was 5'-5'3" for 93% of respondents.



ANALYSIS OF SURVEY DONE ON 500 COMPUTER STUDENTS

Activity of using computers by students	No. of students	%age
1 . Time spent in using computers:		
a. 1-2 hrs	204	40.80
b. 2-3 hrs	164	32.80
c. 3-4 hrs	069	13.80
d. 4-5 hrs	063	12.60
2 Place of operating computers:		
a. On computer table and adjustable chair	285	57
b. On ordinary table and chair	201	40.2
c. Any other (using laptop sitting on bed)	14	2.8
3. Types of computer used:		
a. Laptop	251	50.2
b. PC	249	49.8
4. Maintenance of particular distance from the computer screen to avoid strain on eyes:		
a. Yes	403	80.6
b. No	97	19.4
5. Continuity of work regardless of any stress on upper back or eyes:		
a. Yes	267	53.40
b. No	233	46.60
6. Feeling of muscular fatigue after long hrs of work:		



a. Yes	389	77.8
b. No	111	22.2
7. Maximum stress felt during work in particular organs:		
a. Eyes	249 - a+b	49.8
b. Neck	212 - a+b+c	42.4
c. Upper back	39 - a+b+c+d	7.8
d. Hands		
8. Opinion regarding the activity of using computers:		
a. Interesting	413	82.60
b. Do it for the sake of doing it	72	14.4
c. Very stressful and fatiguing	15	3
9. I Impact of season on this activity:		
a. Less tiring winter	223	44.6
b. Less fatiguing for arms & neck	92	18.4
c. More tiring in summer	128	25.6
d. More fatiguing in summer	57	11.4
Activity of using computers by students	No. of students	%age
10. Feeling of uneasiness or breathlessness:		
a. Yes	294	58.80
b. No	206	41.20
11. Suggesting regarding use of adjustable chair & table for working:		
	418	83.6
a. Yes	82	16.4
b. No		
12. Effect of Yoga, exercise and knowledge of proper ergonomics regarding		



posture maintenance or reducing muscular fatigue:	459	91.8
a. Yes	41	8.2
b. No		

Information regarding working on computers

This part included information on the type of equipment used, frequency and place of using computers. which indicates that most of the respondents used computer daily and majority (40.8) of them used to operate computer for 1-2 hrs, but 32.8% respondent used it for 2-3 hrs 13.8% of them were using it for 3-4 hrs and 12.6% respondents were using computers for 4-5 hours.

Place of using computer

It was further observed that 57% respondents weremaking use of adjustable table and chair, but 40.2 % respondents were using ordinary table and chair,and 2.8% respondents were using laptops when setting in bed only.

Type of computer used

The ratio of respondents using Laptop and PC was almost equal i.e. 50.2% and 49.8%.respectively

Awareness of respondents regarding posture maintenance and stress felt after long hours of work

The data on the maintenance from the computer screen distance from the computer screen to avoid strain on eyes indicated that 80.6% respondents were distance from the screen but 19.4% respondents did not bother about this. 53.40% respondent are in the habit of continuing their work regarding of any stress fell in eyes and upper back of their bodies but 46.60% respondents do care about this and theydiscontinue their work.

Muscular fatigue felt by the respondents

Muscular fatigue was felt by (77.80%) of respondents after long hours of typing on computer and22.2% respondents did it get affected by the long duration pf work done.



Stress felt during activity

The data on the muscular fatigue felt by the respondents indicated that 49.8% respondents felt stress on eyes and muscular fatigue in neck during and after the work, 42.4% respondents felt stress and muscular fatigue in eyes, neck and upper back. 7.8% respondents reported strain on all the four organs i.e. eyes, neck upper back and hand.

Opinion regarding the activity of using computer

The data revealed that 82.6% respondents were highly in favour of using computer as they found this activity very interesting whether 14.4% respondents said they were it for the sake of doing means doing under computer and 3% of respondents found it very stressful and fatiguing. 58.8% respondents felt uneasiness and breathlessness while working on computer for long durations, while 41.20% respondents were not affected by this feeling and they worked normally.

Effect of season on the performance of working on computer

It was observed that 44.6% respondents found this activity less tiring and easy to do in winter season. 18.4% found it less fatiguing for Arms and neck in winter season. In Comparison 25.6% respondents found that this activity causes discomfort and more tiring in summer season and more fatiguing for arms and neck as felt by 11.4% respondents.

Suggestions regarding use of adjustable chair and table to minimize stress and fatigue while working on computer

Majority of respondents (83.6%) strongly recommended the use of adjustable chair and table while working on computers. According to them it will help in maintaining proper body postures which will reduce stress and fatigue during work. But 16.4% respondents were having different opinion and they thought it will not affect the stress and fatigue caused by the activity.

Views regarding effect of Yoga, exercise and knowledge of proper

Ergonomics on reducing muscular fatigue during the activity

Majority of respondents (89.8%) suggested that use of Yoga, exercise and knowledge of proper ergonomics will definitely reduce the muscular fatigue caused during working on computer only 8.2% respondents were unaware about this fact and having no knowledge regarding use of yoga, exercise and knowledge of ergonomics.



Conclusion

The foregoing results revealed that operating computers repeatedly for long durations can cause muscular fatigue, stress in upper back, pain in neck, shoulders and eyes.. It can also affect the grip strength of arms and hand wrist. It is a combination of both static and dynamic muscular efforts which require prolonged sitting. Which can cause damage to intervertebral discs, circulatory disturbances and degeneration in muscle ligaments, tendons and joints. So use of adjustable chair and table is recommended for the computer operator to minimize the hazards of musculoskeletal disorders and stress on eyes. This study will certainly make students realize that maintaining of wrong posture during working on computers for long hours contributes to physical exhaustion and hazardous results on upper back. Students have also been awakened about the role of yoga and exercise and changing of posture in between working hours to release stiffness caused by prolonged sitting during operating computers..

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