

CURRENT PRACTICE OF LAPTOP COMPUTER AND RELATED HEALTH PROBLEMS: A SURVEY BASED ON ERGONOMICS

Ekta Chavda¹, Siddharthkumar Parmar^{2,3}, Manish Parmar³

¹ Physiotherapist, District NCD cell, General Hospital, Gandhinagar, Gujarat, India

² Department of Anaesthesia, BJ Medical College, Ahmedabad, Gujarat, India

³ Computer Supervisor Instructor, Industrial Training Institute, Gandhinagar, Gujarat, India

Correspondence to: Siddharthkumar Parmar (drsid25@gmail.com)

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ABSTRACT

Background: In recent years, laptop computers were popular among college students for the purpose of education as well as recreation.

Aims & Objective: The present study was designed to evaluate the current practice of Laptop computer and computer related health problems among college students, based on ergonomics.

Material and Methods: The cross-sectional study was conducted over a three month timeframe, from April to June, 2013 in tertiary care hospital and teaching medical college. We included 100 students with age group 22-28 years, using laptop computer. Pre-designed and content validated, self-reporting questionnaire was used for data collection. Student's refusal for participation and incomplete questionnaire were excluded in the study.

Results: Current practice of laptop's usage was ergonomically improper. Prolonged usage in improper posture has created various musculoskeletal problems among medical students.

Conclusion: Current practice of laptop's usage exposes students to prolonged poor postures which leads to various musculoskeletal problems. There is a need to increase the awareness of ergonomics to improve the current practice of laptop's usage and to minimize health problems among students.

Key-Words: Ergonomics; Laptop Computer; Musculoskeletal Problems; Health Problems

Introduction

Laptop computers allow flexibility to work from a variety of locations, however, it also means that more and more people can be found hunched over their laptops working in poor postures. Laptop computers were not originally designed for long-term use. But with all of the advancements made in technology, people are using laptops as their main computers. Working on a computer in awkward postures for prolong periods may result in a variety of computer related health problems.^[1,2] Proper ergonomic interventions can reduce the incidence of computer related health problems.^[3,4] Thus, present study was designed to evaluate the current practice of Laptop computer and computer related health problems among college students, based on ergonomics.

Materials and Methods

The cross-sectional study was conducted over a three month timeframe, from April to June, 2013 in tertiary care hospital and teaching medical

college. We included 100 students with age group 22-28 years using laptop computer. Pre-designed and content validated, self-reporting questionnaire of laptop ergonomics was used for data collection. The questionnaire accommodated three sections of questions. The first section addressed personal profile of students. The second section was concerned with the practice of students for computing laptop. The third section was concerned with computer related health problems among students. Student's refusal for participation and incomplete questionnaire were excluded in the study.

Results

Mean age of the students was 26 ± 1.4 years. 60% were male and 40% were female. 85% of the students used laptop for more than one hour daily or alternate day but only half of those had a break during laptop's usage. Only a few students used laptop holder, external keyboard and external mouse (figure 1). Only 20% of the students acquired desk sitting every time for laptop's usage. Many students frequently acquired prone

posture, floor sitting, sitting with laptop on lap and other posture which were ergonomically improper (figure 2).

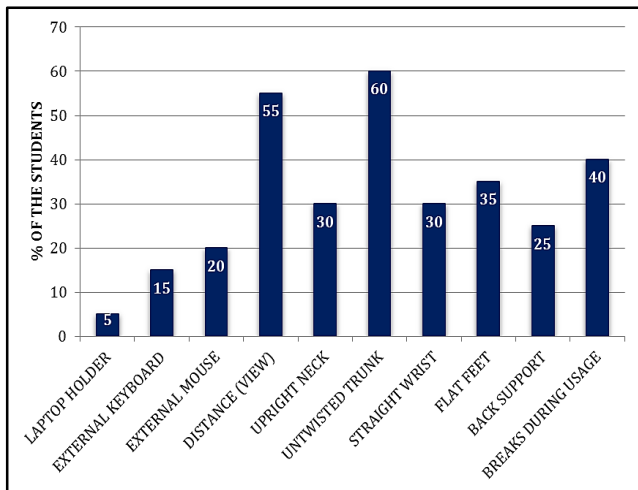


Figure-1: Current Practice of Laptop's Usage

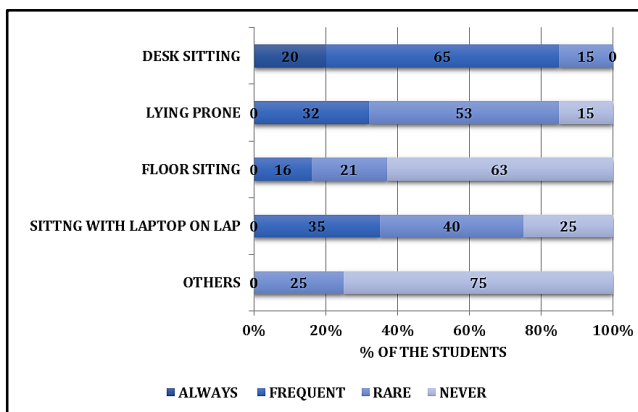


Figure-2: Posture during Laptop's Usage

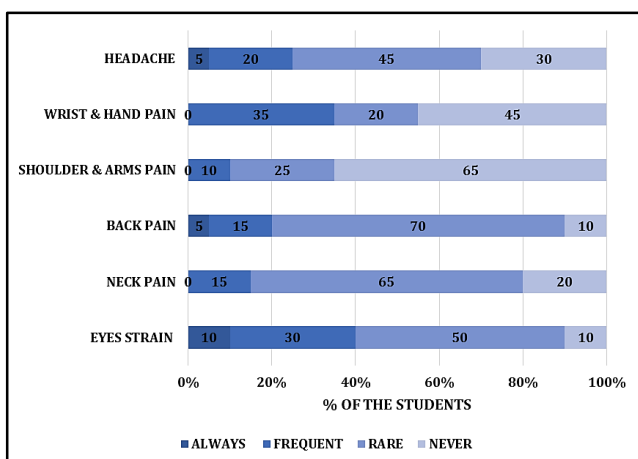


Figure-3: Health problems after Laptop's Usage

Up to 20% of the students suffered from one of the musculoskeletal problems every time when they worked with laptop computer. The students suffered frequently from various musculoskeletal health problems like eyes strain (30%), neck pain (15%), back pain (15%), shoulder & arms pain (10%), wrist & hand pain (35%), and headache (20%) after laptop's usage (figure 3). Current

practice of students for computing laptop was ergonomically improper and Prevalence of health problems among laptop users was high.

Discussion

Laptops were created with mobility in mind. A laptop computer allows a greater flexibility of learning environments and greater access to information throughout the learning process. With increasing usage of laptop for the purpose of education as well as recreation, laptop users need to know about the proper ergonomics to avoid musculoskeletal problems.

In present study, current practice of laptop's usage among medical students was not proper ergonomically. Prolonged usage in improper posture has created various musculoskeletal problems among medical students. Shantakumari N et al^[5] found awareness of ergonomics in only 44% of university students. The students put the principles into practice after reading documents on ergonomics, but showed a negative attitude towards formal training sessions. But the students who had attended training workshop, showed a positive attitude towards formal training sessions but they were not using computers ergonomically. There was a need to develop the most effective ergonomics strategy to improve the knowledge and practice of ergonomics among university students. Khan R et al^[6] found 52% awareness with 10% of the population rating their ergonomic knowledge as excellent and 20% as good in their survey. Only half of the respondents were aware of the principles of safe ergonomic practices, but still they did not apply them.

To avoid cumulative trauma, a person should not maintain a body posture for long periods of time^[7]. Prolonged sitting without break increases load between intervertebral disc and weakens posterior lumbar structures. Hochnanadel^[8] who surveyed 3300 employees using computer work stations in a large industrial complex and demonstrated significant relationships between the percentage of symptomatic respondents and both the hours and years of computers use. Straker et al^[9] suggested that a laptop user would compromise their typing posture more and most of the times compared to desktop user. This is

further supported by Harbison et al^[10].

There is a need to investigate current practice of laptop computer among professional computer operators and their musculoskeletal health problems. More research is needed to evaluate the relationship between practice of laptop computer and musculoskeletal health problems. Although the survey was pre-tested, validated and designed to be as simple as possible and a majority of responses required only selecting options using a mouse. The validity of the information relies on participants understanding the question and answering honestly and accurately.

The physical implications for the use of desktop computers are well documented. When reviewing the literature there is minimal research reported on the use of laptop computers and the physical implications of their use. However, we suggest following recommendations to laptop users.

- Keep top of the viewing screen at approximately eye level.
- Take frequent breaks and change postures frequently.
- Keep arm-length distance between your eyes and Laptop's screen. Keep head, neck and trunk upright. Keep trunk perpendicular to the floor. Keep upper arms and elbows close to the body not extended outward. Keep wrists and hands in line with your forearms and not resting on the edge of your laptop.
- Keep thighs parallel and lower legs remain perpendicular to the floor with feet resting flat on floor.
- Use a document holder to get documents off of the desk.
- Use an external keyboard, external mouse and external monitor (optional) for prolonged usage.
- Use an adjustable chair with back support.
- Use a rolling laptop bag or a backpack with well-padded straps for transporting your laptop.

Conclusion

Current practice of students expose themselves to prolonged poor postures with laptop use which leads to various musculoskeletal problems. There is a need to increase the awareness of ergonomics to improve the current practice of laptop's usage and to minimize health problems among students. Occupational health services should initiate ergonomic interventions by assessing risk factor, safety measures together with training of laptop users; and should provide proper recommendations focussing on ergonomics to increase efficiency by minimising health problems related to laptop's usage.

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