



*Original article*

## Awareness and Practice of Computer Ergonomics among University Students

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### ABSTRACT

**Objective:** Improper use of computers results in a variety of health disorders, hence the knowledge of ergonomics is very essential while using computers. Nevertheless, there is insufficient knowledge about the relationship between knowledge and actual practice of ergonomic principles among today's students. The aim of this study was to investigate the awareness and practice of computer ergonomics among university students in Ajman. The attitude of the students towards formal training session on ergonomics was also surveyed.

**Methods:** The survey was conducted with a self administered questionnaire administered to 389 University Students studying in Ajman.

**Results:** Only 44% of the population surveyed was aware of computer ergonomics. The students who had read documents on ergonomics put the principles into practice when compared to those who had formal training sessions.

**Conclusions:** There is a need to improve the knowledge of ergonomics among university students and to determine the most effective ergonomic strategy to enhance their knowledge and practice of ergonomics. More research is needed however to determine the most effective ergonomics intervention for university students.

**KEYWORDS:** Ergonomics, Awareness, Computer, University students

### INTRODUCTION

Increasing use of computers in schools and universities have resulted in a variety of computer related health disorders [1]. Ergonomic training is frequently cited as the best way to reduce the incidence of computer related health disorders [2].

Proper educational intervention is implied to improve the knowledge and practice of ergonomic

principles, which is assumed to reduce the associated health risks [3]. The effect of improper ergonomics manifests even before students reach graduation, hence educational and ergonomic interventions should commence from undergraduate years or even earlier [4].

Having known about the importance of ergonomic principles involved in computer usage, this study aims at studying the awareness and practice of computer ergonomics among university students and their perceived need for formal training on ergonomics.

**METHODOLOGY**

**Study settings and population:** 389 University Students studying in Ajman, UAE, irrespective of their age, gender, Nationality and course or discipline were approached for this cross sectional study.

**Data collection:** Pre-designed and content validated self-administered questionnaire was used for data collection. The questionnaire accommodated three sections of questions. The

**RESULTS**

*Awareness of ergonomics*

Table 1 shows that of the 389 students surveyed, 22.9% have reportedly read documents on computer ergonomics, 64.5% have attended formal educational or training workshops on

first section addressed the variables related to patterns of usage of computers. The second section was concerned with the awareness of ergonomics. The third section assessed the attitude toward training programmes. The study was approved by the Ethics committee of the University and therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

**Data Analysis:** Data was fed into Excel spreadsheet and transferred to PASW 19 version software for statistical analysis. The awareness of ergonomics was expressed as percentage. Chi-square test was used to determine the association between the variables.

computer ergonomics and usage, 12.6% have done both . In spite of the figures above only 171 (44%) of the total students surveyed claim to be aware of the principles of ergonomics.

**Table 1: Awareness of ergonomics**

<b>Variable</b>	<b>Number</b>	<b>Percentage</b>
Total students surveyed	389	
Students aware of ergonomics	171	44%
Read document	89	22.9%
Attended workshop	251	64.5%
Both	49	12.6%

*Practice of ergonomics*

The students who have read documents on ergonomics are seen to put most the principles surveyed into practice. Significantly higher percentage of students who have read documents on ergonomics use correct viewing distance of 50-100cm from the screen. More number of students who have read documents on ergonomics use

screen filters and ergonomic keyboards and also take frequent breaks when compared to students who haven't read any documents. It was however also found that higher numbers of students of students don't use good back support and a significantly higher number don't place the mouse and keyboard at the same level. (Table2)

It was found that even after attending formal training sessions on ergonomics, the pattern of Computer usage remained inappropriate, among greater percentage of students with regard to most

of the variables, though a significant percentage of students who attended workshop used ergonomic keyboard.

**Table2: Awareness and Practice of ergonomics**

VARIABLE	GROUPS	Read documents on ergonomics		Attended Educational/training sessions	
		YES Number (%)	NO Number (%)	YES Number (%)	NO Number (%)
Distance from computer screen	<50 cm	50(36.3)	130(51.8)*	31(46.3)	143(46.3)
	50-100cm	70(50.7)	96(38.2)	34(42.5)	132(42.7)
	>100cm	18(13)	25(10)	9(11.3)	34(11)
Screen filter	YES	20(14.8)	25(10.1)	10(13.0)	35(11.4)
	NO	119(85.2)	223(89.9)	67(87.0)	271(88.6)
Taking breaks	YES	116(84.1)	201(80.1)	64(80.0)	253(81.9)
	NO	22(15.9)	50(19.9)	16(20.0)	56(18.1)
Support for lower back	YES	64(46.4)	125(49.8)	37(46.3)	152(49.2)
	NO	74(53.6)	126(50.2)	43(53.8)	157(50.8)
Ergonomic keyboard	YES	42(30.4)	60(23.9)	30(37.5) *	72(23.3)
	NO	96(69.6)	191(76.1)	50(62.5)	237(76.7)
Mouse and keyboard same level	YES	82(59.4)	175(69.7)	47(58.8)	210(68.0)
	NO	56(40.6)*	76(30.3)	33(41.3)	99(32.0)

\*P<0.05

***Attitude toward training programmes***

About 56.2% of students who have not read any documents on ergonomics feel a need to attend formal training workshop in ergonomics as opposed to a significantly lower number of 44.9% who had read the documents (Table3). Interestingly it was found that 61.3% of students

who had already attended educational/training workshop on ergonomics still felt the need to attend workshops in the future while 49.8% of students who haven't attended any training workshop felt the need for a formal training.

**Table 3: Attitude toward training programmes**

Variable	Groups	Need for formal educational/training sessions	
		Yes Number (%)	No Number (%)
Read documents	Yes	62(44.9) *	76(55.1)
	No	141(56.2)	110(43.8)
Attended workshops	Yes	49(61.3)	31(38.8)
	No	154(49.8)	155(50.2)

\*P&lt;0.05

## DISCUSSION

### *Awareness of ergonomics*

The results of this study showing awareness of ergonomics in about 44% of university students is similar to other studies conducted among computer users .A survey conducted by Khan R et al, 2012 on computer users from different professional background shows a 52% awareness with 10% of the population rating their ergonomic knowledge as excellent and 20% as good [5].

Educational programmes on ergonomics have been proven to decrease the frequency of computer related disorders and have enhanced the knowledge regarding proper use of computers especially when the focus of these educational interventions have been overall postural health, environmental ergonomics and body mechanics[6,7].Workshops with participatory ergonomics approach has been found to be resulting in increased knowledge and application of computer ergonomics among university students[8].It was found by Jacobs et al that when students were involved in planning, developing and implementing ergonomic solutions, there was

an increase in knowledge of ergonomics and a decrease in computer related musculoskeletal discomfort[9].

The results of this study are consistent with Kamaroddin et al 2010 who found that though university students who have attended HCI courses are well aware of ergonomic principles, only about half of them put them into practice [10].

The inability of students to put into practice ergonomic principles even after attending the training workshops, as seen in our study may have resulted from two possibilities. Firstly the workshops could have been non participatory and inefficient. The second possibility is that attendance to workshops may be due to external compulsion and not necessarily from intrinsic motivation. An agent's activity is said to be intrinsically motivated if the agent engages in it for its own sake rather than by compulsion. Intrinsic motivation leads individuals to explore

and develop broad competence rather than being directed to more externally-directed goals [11].

In our study we found that the students who have read documents on ergonomics put most of the ergonomic principles into practice. This could be explained by the fact that reading documents on ergonomics is driven by intrinsic motivation to learn about the subject and it is this motivation which may have led them to put the principles into practice.

### *Attitude toward training programmes*

While 50% of the students who had read documents on ergonomics felt the need to attend training workshops, majority of the students who had attended ergonomics training session showed positive attitude towards attending workshops in the future. This is in spite of the fact that the practice of ergonomics by students who had attended training workshops previously remained incorrect with regards to most of the variable. This could possibly be explained students probably feel the need to improve upon their knowledge of ergonomics by attending workshops in future and probably find the experience enjoyable

### **CONCLUSION**

There is a need to increase the awareness of ergonomics among university students .The results of the study show that though attendees of previous training workshop show positive attitude towards further training sessions, they are not found to use computers ergonomically. Even though the students who have read documents on ergonomics practice the principles better, they didn't show a positive attitude towards formal training sessions. Hence it becomes importance to determine the most effective ergonomic strategy to improve their knowledge and practice of ergonomics.

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