

# 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 computer ergonomics is essential while using computers. Nevertheless, there is not much documented evidence 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 on ergonomics was also assessed.

**Materials and Methods:** A total of 389 Students studying in Gulf Medical University, Ajman and Ajman University of Science and Technology participated in the study. A pre-tested and content validated self-administered questionnaire was used for data collection.

**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 attended formal training sessions.

**Conclusion:** There is a need to increase the awareness of ergonomics among university students. The results of the study indicate that though attendees of previous training workshops show positive attitude towards further training sessions, they do not put the principles learned into practice. In contrast, the students who have read documents put their learning into practice better, but do not show a positive attitude towards formal training sessions. Hence, it becomes important to determine the most effective ergonomic strategy in improving the students' knowledge and practice of computer ergonomics.

**Key words:** ergonomics, awareness, computer, university students

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## INTRODUCTION

Increasing use of computers in schools and universities has resulted in a variety of computer-related health disorders<sup>1</sup>. Ergonomic training is frequently cited as the best way to reduce the incidence of these disorders<sup>2</sup>.

Proper educational intervention is expected to improve the knowledge and practice of ergonomic principles, which is assumed to reduce the associated health risks<sup>3</sup>. The effect of improper ergonomics manifests even before students reach graduation, hence the need for commencing educational and ergonomic interventions from undergraduate years or even earlier<sup>4</sup>.

As it is known that ergonomic principles involved in computer usage are important, this study aims at studying the awareness and practice of computer ergonomics among university students

and their perceived need for formal training on ergonomics.

## MATERIALS AND METHODS

A total of 389 university students studying in Ajman, UAE, irrespective of their age, gender, nationality and course or discipline participated in this cross sectional study. A pre-tested and content validated self-administered questionnaire was used for data collection. The questionnaire consisted of three sections of questions. The first section addressed the variables related to pattern of usage of computers. The second was concerned with the awareness of ergonomics, while the third assessed the attitude toward training programs. The study was approved by the Ethics Committee of the University and therefore has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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.

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

Table 1. Awareness of ergonomics

Variable	Frequency	Percentage
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. A significantly higher percentage of students who have read documents on ergonomics use correct viewing distance of 50-100cm from the screen. A greater number of students who have read documents on ergonomics use screen filters and ergonomic key boards and also take frequent breaks when compared to students who have not read any documents. It was, however, also found that higher numbers of students do not use good back support, and a significantly higher number do not place the mouse and keyboard at the same level. Details are given in Table 2.

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

Table 2. Awareness and Practice of ergonomics

Variables	Groups	Read documents on ergonomics		Attended Educational/training sessions	
		Yes No. %	No No. %	Yes No. %	No No. %
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

variables, though a significant percentage of students who attended workshops used an ergonomic keyboard

### Attitude toward training programs

About 56.2% of students who have not read any documents on ergonomics feel a need to attend formal training programs in computer ergonomics in comparison to a significantly lower number of 44.9%, who had read the documents. Interestingly, it was found that 61.3% of students who had already attended educational/training workshops on ergonomics still felt the need to attend workshops in the future while 49.8% of students who had not attended any training workshop felt the need for a formal training. Details are given in Table 3.

Table 3- Attitude toward training programs

Variables	Groups	Need for formal educational/training sessions	
		Yes	No
		No. %	No. %
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<0.05

## DISCUSSION

### Awareness of ergonomics

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

Educational programs on computer ergonomics have been proven to decrease the frequency of computer-related disorders and have enhanced the knowledge regarding the proper use of computers, especially when the focus of these educational interventions has been on overall postural health, environmental ergonomics and body mechanics<sup>6,7</sup>.

Workshops with participatory ergonomics approach have been found to result in increased knowledge and application of computer ergonomics among university students<sup>8</sup>. 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<sup>9</sup>.

The results of this study are consistent with those of Kamaroddin et al., who found that though university students who had attended human-computer interaction (HCI) courses were well aware of ergonomic principles, only about half of them put them into practice<sup>10</sup>.

The inability of the students to put into practice the ergonomic principles even after attending the workshops, as seen in our study, may have resulted from two possibilities. Firstly, the workshops could have been non-participatory and ineffective. The second possibility is that attendance at 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 through compulsion. Intrinsic motivation leads individuals to explore and develop broad competence rather than being directed to more externally-directed goals<sup>11</sup>.

In our study we found that the students who had 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 programs

While 50% of the students who had read documents on ergonomics felt the need to attend workshops, the majority of the students who had attended ergonomics training sessions 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 regard to most of the variables. This could possibly be explained on the basis that the students probably felt 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. As the results of the study show that though attendees of previous training workshop show positive attitude towards further training sessions, they do not put the principles learned into practice, while the students who have read documents put it into practice better but do not show a positive attitude towards formal training sessions. Hence it becomes important to determine the most effective strategy to improve their knowledge and practice of computer ergonomics.

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