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## Survey Of The Consumer Awareness Of Computer Ergonomics

### Abstract

Computer ergonomic is a medium of interaction between human and computer equipment that serves to prevent health problems to users. However, most users do not have formal knowledge on the importance of computer ergonomic. Therefore, a survey on whether computer users are aware of the importance of computer ergonomic had been carried out. The survey was conducted at Universiti Tun Hussein Onn Malaysia (UTHM), with a total of 270 respondents which consists of 17 academic staff, 19 non-academic staff and 234 students from Universiti Tun Hussein Onn Malaysia. The results of this questionnaire were analyzed using SPSS. From part I : The awareness of the correct sitting position, the respondent answered 7 questions for 'no' out of 9 questions. For part II : The awareness of computer ergonomic, the respondents answered 'no' for 4 questions out of 6 questions. Finally, for part III : The problems face by the respondents, respondents answered 'no' to 5 questions out of 8 questions. Many respondent suggested that exposure to computer ergonomic should be started from the primary school level. Most respondents said that the government or company do not provide exposure to computer ergonomic to their employees. They also stated that the lack of knowledge about computer ergonomic is the main cause why the users do not practice the science of ergonomic when using the computer. In conclusion, since users do not know the importance of computer ergonomic and they suggest that the computer ergonomic should be taught from school level.

*Keywords:* Ergonomic, computer, survey

## Introduction

Computer technology plays an important role in national development. With the era of technology today, most of the work or study involves the use of computers. Even primary schools students already use computer when they want to do their homework or projects. The importance of computer ergonomic is important to ensure safety, health and comforts when using computer. Unfortunately, there is no exposure on this topic from primary schools to university level. Users are facing problems with their health such as eye disorders and vision, headaches and pain in the shoulder portion, the rear weight, waist, back, knees and feet due to long period of using computers.

Since there is no formal education given to all users, the aim of the study is to survey the awareness of the users on computer ergonomic. The research was done in University Tun Hussein Onn Malaysia. The research questions of this research are as follows:

I.      Do the computer users aware of the correct posture when using the computer?
II.     Do the computer users aware of the importance of computer ergonomic when using the computer?
III.    What are the problems faced by the users due to their style when using the computer?

## Literature Review

The awaress of the importance of computer ergonomic is critical because not only the number of users is increasing, the hours of usage is also increasing. With longer hours and doing repetative work, users can get discomfort, muscle ache and so on. Wrong body posture when using the computer can effect the health of the users. Hazlam (2012) said when using computer in the office, there four factors that is important. The first is furniture which the table and chair and second is the lighting, which effect the dryness of the eyes, headache and focus in the work. (Hazlam, 2012). The third is the area and the fourth is the air. Lastly, the flow of the air is important so that users get fresh air to breath. (Hazlam, 2012).

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Zafir et al (2007) said that the workplace environment that involved computer effect workers psycholgically and physiologically. He also said that main health problem which is cumulative trauma disorders are related to stress in workplace.

Zafir (2009) said that repetative movement that occur continuously and frequently can cause serious musculoskeletal disorders (CTD). According to the research by Atroshi et all ( 2007), in Huntsville, United States, about 275,000 cases the workers face is musculoskeletal disorders (MDs ) which effect the muscles, joins, tendons and ligaments.  They found that  13 percents of injuries at work comes from Carpal Tunnel Syndrome (CTS), a syndrome of pain in the wrist. Women tend to have the syndrome than men with the ratio of 3 : 1 (Atroshi et al, 2007).  Brewer, J.M. et al (2009) said that in the recent years, school-aged children have been suffering musculoskeletal pain in alarming rate. They found that the percentage of students experience body discomfort with the most problematic region being middle-lower back pain (48.9%), followed by neck pain (46%) and upper back (25.9%). (Brewer, J.M. et al, 2009)


**Research Methodology**

The research design used is of survey descriptive. Quantitative data was collected from the respondents using questionnaires where the respondent needs to answer "Yes" or "No".   270 respondents consisted of students, academic and non-academic staff from the Universiti Tun Hussein Onn Malaysian participated in this research. The questionnaire consisted of 4 sections as  in Table 1.

Table 1: Main Section

| Section | Content |
|---|---|
| A | Respondent background |
| B(I) | Users awareness of their sitting position |
| B( II) | Users awareness of computer ergonomic |
| B (III) | Problems faced by the users |
| C | Comments and Suggestions |


**Data Analysis**

The data was analyzed using SPSS, and a pilot test was done where ten respondents were randomly selected to answer the questionnaire. The pilot test was done in order to determine the validity of the questionnaire. The main aim is also to determine the students' understanding of all questions.  The result from the pilot test is 0.778 for Section B(I) , 0.796 for Section B(II) and 0.654 for Section B(III) where according to Mohd Najib (1999)  if the *Alpha-Cronbach* value is below 0.6, then some modification must be done to the questionnaire. From the questionnaire that was collected, for Section A, the respondents' background is given in Table 2.

Table 2 : Respondents background

| | Category | No of respondent | Percent (%) |
|---|---|---|---|
| **Status** | Lecturer | 17 | 6.3% |
| | Non-academic staff | 19 | 7.0% |
| | Student | | 86.7% |
| **Programme (student)** | Diploma | 107 | 45.7% |
| | Degree | 108 | 46.2% |
| | Master | 13 | 5.6% |
| | Phd | 6 | 2.6% |
| **Gender** | Male | 127 | 46.0% |
| | Female | 143 | 51.8% |
| **Age** | 18 – 25 | 228 | 84.4% |
| | 26 – 30 | 18 | 6.7% |
| | > 30 | 24 | 8.9% |
| **Race** | Malay | 224 | 83.0% |

| | | | |
|---|---|---|---|
| | Chinese | 34 | 12.6% |
| | Indian | 7 | 2.6% |
| | Other | 5 | 1.9% |
| **Area of residents** | City | 135 | 50.0% |
| | Town | 59 | 21.9% |
| | Village | 76 | 28.1% |
| **Type of Computer** | Notebook | 237 | 85.9% |
| | Computer desk | 33 | 12.0% |
| | Tablet | 6 | 2.2% |

In Section B(I), there are 9 items which the respondents need to response on whether the users are aware of the correct posture such as sitting position, height of the computer screen and table, position of the hands on the keyboard and how to sit in a chair when using the computer. The data is given in Table 3.

Table 3 : Users are awareness of their sitting position

| No | Section B(I) :Questions | 'Yes' | 'No' | Result |
|---|---|---|---|---|
| BI-1 | Do you sit in an upright position when using computer? | 70 (26.9%) | 190 (73.1%) | No |
| BI-2 | Do you lean back in order to sit up straight? | 119 (45.8%) | 141 (54.2%) | No |
| BI-3 | Are your feet flat on the floor when you sit on your computer chair? | 124 (47.7%) | 136 (52.3%) | No |
| BI-4 | Did you put your hand on the armrest of the chair? | 69 (26.5%) | 191 (73.5%) | No |
| BI-5 | Are your wrists in a straight line with your computer desk? | 120 (46.2%) | 140 (53.8%) | No |
| BI-6 | Are your hands and fingers in a $90^{o}$ point downward when typing? | 116 (44.6%) | 144 (55.4%) | No |
| BI-7 | Do you use all your fingers to type? | 98 (37.7%) | 162 (62.3%) | No |
| BI-8 | Is the mouse according to the size of your hand? | 198 (76.1%) | 62 (23.9%) | Yes |
| BI-9 | Do you use a computer in a bright place and not dependent on computer light? | 210 (80.8%) | 50 (19.2%) | Yes |

From the finding, majority of the respondents are not aware of the correct sitting position. There is a large percentage of respondents who do not sit in an upright position and do not lay a hand on the armrest of a chair while using the computer. This is likely due to equipment such as seats being used inappropriately, which cause people not to sit in an upright position. More than half of the respondents do not have their feet flat on the floor while sitting on a computer chair, not in a state of 90o hands and fingers pointing down while typing, and do not use all their fingers to type.

In Section B(II), there are 6 items which the respondents' need to response on whether the users are aware of the importance of computer ergonomic. The data is given in Table 4.

Table 4: Users are awareness of computer ergonomic

| No | Section B(II) :Questions | 'Yes' | 'No' | Result |
|---|---|---|---|---|
| BII-1 | Do you have early exposure related to computer ergonomic? | 108 (41.5%) | 152 (58.5%) | No |
| BII-2 | If you have the exposure on computer ergonomic, will you practice it? | 131 (50.4%) | 129 (49.6%) | Yes |
| BII-3 | Do you know the importance of computer ergonomic? | 114 (43.8%) | 146 (56.2%) | No |
| BII-4 | Do you know the height of a computer screen that suits you? | 99 (38.1%) | 161 (61.9%) | No |
| BII-5 | Do you know after using the computer for more than 30 minutes, you need to rest and stand for a while? | 124 (47.7%) | 136 (52.3%) | No |

| BII-6 | Do you know how to avoid the effects and health problems brought about by the computer ergonomic? | 134 (51.5%) | 126 (48.5%) | Yes |
|---|---|---|---|---|

From the finding, majority of the respondents are not aware of the importance of computer ergonomic, as they do not have any early knowledge on computer ergonomic. However more than half said they know how to avoid the effect and health problems brought by using computer.

In Section B(III), there are eight items on which the respondents' need to response on the problems face by them. The data is given in Table 5.

Table 5: Problems faced by the users

| No | Section B(III) :Questions | 'Yes' | 'No' | Result |
|---|---|---|---|---|
| BIII-1 | Do you have astigmatism? | 123 (47.3%) | 137 (52.7%) | No |
| BIII-2 | Are you going to relax your eyes if your eyes are dry? | 221 (85.00%) | 39 (15.00%) | Yes |
| BIII-3 | Do you think the myopic eyes after using the computer? | 135 (51.9%) | 125 (48.1%) | Yes |
| BIII-4 | Do you feel pain in the shoulder, and neck after using the computer? | 158 (60.8%) | 102 (39.2%) | Yes |
| BIII-5 | Do you feel dizzy after using the computer? | 95 (36.5%) | 165 (63.5%) | No |
| BIII-6 | Do you suffer from heart pain? | 57 (21.9%) | 203 (78.1%) | No |
| BIII-7 | Have you ever had surgery on your hand? | 12 (4.6%) | 248 (95.4%) | No |
| BIII-8 | Have you ever had surgery due to the use of computers? | 16 (6.2%) | 244 (93.8%) | No |

From the finding, majority of the respondents have problem with their eyes, shoulder and neck but not as a major problems.

In Section C, Q1 : The best time to learn computer ergonomic, the responds from the respondents are shown in Table 6.

Table 6 : Section C, Q1

| Item | No of respondent | Percentage % |
|---|---|---|
| At any time | 79 | 30.86 |
| University | 12 | 4.69 |
| Work | 3 | 1.17 |
| Secondary school | 22 | 8.59 |
| Primary school | 116 | 45.31 |
| Not sure | 24 | 9.38 |
| Total | 256 | 100 |

From the finding, majority of the respondents said they should learn it in primary schools.

In Section C, Q2 : Companies or government should expose the importance computer ergonomic to the workers, the responds from the respondents are shown in Table 7.

Table 7 : Section C, Q2

| Item | No of respondent | Percentage % |
|---|---|---|
| No | 125 | 48.83 |
| Yes | 69 | 26.95 |
| Not sure | 62 | 24.22 |
| Total | 256 | 100 |

From the finding, majority of the respondents answer 'No',

In Section C, Q3 : The main reason the importance of computer ergonomic is not being practiced, the responds from the respondents are shown in Table 8.

Table 8 : Section C, Q3

| Item | No of respondent | Percentage % |
|---|---|---|
| Not knowledge | 122 | 47.66 |
| Do not bother | 92 | 35.94 |
| Not sure | 42 | 16.41 |
| Total | 256 | 100 |

From the finding, majority of the respondents answer the reason is due to 'Not knowledgeable',

**Conclusion**

Based on the results, it can be concluded that the importance of computer ergonomic is not exposed to the users. Thus these create problems to them especially with their eyes, shoulder and neck as found by J.M. Brewer et al(2009) in their research. In order to avoid these problems, the knowledge should be given earlier and from this research, majority of the respondents said they should be given in primary school. Zafir (2009) found that the awareness on the importance of computer ergonomic is needed to workers as with the knowledge, workers can improve their safety and health. In addition, users must learn informally the importance of computer ergonomic since there is no formal education on this topic.

**References**

Hazlam Anuar, (13 January 2012), *Fungsi dan Faktor Ergonomik Dalam Pejabat*, diperolehi pada 3 April 2014  daripada http://www.majalahniaga.com/fungsi-dan-faktor-ergonomik-dalam-pejabat.html

Mohamad Najib Abdul Ghafar (1999). *Penyelidikan Pendidikan*. Skudai, Johor. Universiti Teknologi Malaysia.

Atroshi I., Gummesson C., Ornstein E., Johnsson R., and Ranstam J. (November 2007). Carpal Tunnel Syndrome and Keyboard Use at Work, pp 3620–3625, DOI 10.1002/art.22956.

Brewers, J.M., Davis, K. G., Dunning, K.K., Succop, P.A. (2009). Does ergonomic mismatch at school impact pain in school children? Work. IOS Press. pp 455 – 463.

Zafir Mohd Makhbul (2009). "Persepsi Organisasi Multinasional Terhadap Pengurusan Stesen kerja Ergonomik." Journal of Social Science and Humanities. Volume 4 Number 1, 2009. E-Bangi, FSSK, UKM. pp 137 – 146.

Zafir Mohd Makhbul and Fazilah Mohamad Hasun (2007). Ergonomik dan Stes di Malaysia : Implikasi terhadap Teori, Metodologi dan Penfgurusan. Jurnal Pengurusan 26(2007). pp 99 – 130.