

**A STUDY ON UPPER EXTREMITY MUSCULOSKELETAL DISCOMFORT  
RELATED TO COMPUTER USE AMONG COLLEGE STUDENTS**

**By**

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Master of Science in Occupational Safety and Health Management**

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## ABSTRACT

A limited number of studies have focused on computer-use-related upper extremity musculoskeletal discomfort among college students, though risk factors in terms of exposure may be similar to professional workers who use computers. The use of computer has increased among college students, as have musculoskeletal symptoms. There is evidence that these symptoms can be reduced through ergonomics and education approach. From literature reviews, it was found that the following were risks factors related to computer use: body posture, duration of computer use, psychosocial factors, work environment, complaints and history of musculoskeletal problems. In this study, the associations of these independent variables to upper extremity musculoskeletal discomfort (dependent variable) among college students were determined. In other words, the purpose of this study was to examine whether the risk factors for upper extremity musculoskeletal discomfort among college students would significantly lead to musculoskeletal discomfort especially upper extremity musculoskeletal discomfort. A cross-sectional correlation study was carried out to determine the correlation. A total of 132 questionnaires were distributed, only 130 (98.5%) students completed a self-administered questionnaire concerning the risk factors and the upper extremity musculoskeletal discomfort specifically associated with computer use. The research hypotheses were tested using Pearson Correlation Analysis. The results revealed that body posture, psychosocial factors, complaints and history of musculoskeletal pain were significantly correlated to upper extremity musculoskeletal discomfort. However, duration of break time and work environment were on the contrary. Multiple Regression results revealed that 35.8% of the variance (R-square) in upper extremity discomfort has been significantly explained by the six independent variables. There were other factors that need to be considered that might contribute to upper extremity musculoskeletal discomfort. The findings signal a need for intervention, apart from ergonomics parameters various psychosocial workplace factors need to be considered while designing a preventive intervention program, including training and education on posture, prior to entry into the workforce. Students are future workers therefore it is important to determine whether their increasing exposure to computers, prior to entering the workforce may make them already injured or do not enter their chosen profession due to upper extremity musculoskeletal discomfort. The future health of undergraduate students deserves consideration, therefore more research is needed on this matter.

*Keyword: computer risk factors; computer user; upper extremity musculoskeletal discomfort*

## ABSTRAK

Kajian mengenai masalah ketidakselesaian pada anggota atas berkaitan dengan penggunaan komputer dalam kalangan pelajar kolej adalah terhad walaupun risiko pendedahan mungkin sama dengan pekerja profesional. Penggunaan komputer yang meningkat dalam kalangan pelajar kolej menyebabkan peningkatan gejala muskuloskeletal. Bukti menunjukkan bahawa gejala tersebut dapat dikurangkan melalui kaedah ergonomik dan pendidikan. Ulasan dari penyelidikan yang lalu mendapati bahawa faktor risiko yang berkaitan dengan penggunaan komputer adalah seperti postur tubuh, jangkamasa penggunaan komputer, faktor psikososial, persekitaran kerja seperti ruang kerja dan keadaan sekeliling serta aduan dan sejarah masalah ketidakselesaian pada anggota atas. Hubungkait di antara faktor risiko tersebut dan masalah ketidakselesaian pada anggota atas ditentukan dalam kajian ini. Dengan kata lain, tujuan kajian ini adalah untuk menyiasat sama ada faktor risiko yang ada di kalangan pelajar kolej boleh menyebabkan masalah ketidakselesaian pada anggota atas. Untuk tujuan ini, kajian keratan rentas korelasi telah dilakukan untuk memastikan hubungkaitnya. Sebanyak 132 soalselidik telah diedarkan kepada para responden dan hanya 130 (98.5%) soalselidik dikembalikan semula. Hipotesis penyelidikan telah diuji menggunakan Analisis Korelasi Pearson. Didapati postur tubuh, faktor psikososial, sejarah gejala ketidakselesaian pada anggota atas mempunyai hubungan yang positif terhadap gejala ketidakselesaian pada anggota atas. Namun demikian, jangkamasa rehat dari menggunakan komputer dan persekitaran kerja menunjukkan hubungan yang sebaliknya. Ujian Regresi Berganda menunjukkan 35.8% variasi yang terdapat dalam kajian ini telah berjaya dijelaskan oleh enam faktor risiko yang terlibat di dalam kajian ini. Keputusan kajian ini menunjukkan bahawa perlunya ada intervensi selain dari ergonomik, pelbagai faktor psikososial di tempat kerja yang harus dipertimbangkan semasa merangka program intervensi pencegahan. Ini termasuklah latihan dan pendidikan yang seharusnya diberikan sebelum melibatkan diri dalam dunia pekerjaan. Pelajar adalah pekerja kita di masa hadapan, oleh itu penting bagi kita menentukan sama ada peningkatan pendedahan terhadap komputer di kolej atau universiti akan menyebabkan mereka mengalami gejala ketidakselesaian pada anggota atas sebelum menyertai dunia pekerjaan. Akibat dari gejala yang dialami, mereka mungkin tidak dapat memilih kerjaya mereka lantaran dari masalah gejala ketidakselesaian pada anggota atas. Masa hadapan kesihatan pelajar memerlukan perhatian sewajarnya. Maka diharapkan lebih banyak pihak membuat penyelidikan berhubung dengan isu ini di masa hadapan.

*Kata kunci: faktor risiko komputer; pengguna komputer; gejala ketidakselesaian pada anggota atas*

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## **LIST OF ABBREVIATIONS**

NIOSH	National Institute of Occupational Safety and Health
MSDs	Musculoskeletal Disorders
MSK	Musculoskeletal
NADOPOD	Notification of Accident, Dangerous Occurrence, Poisoning and Occupational Disease
OSHA	Occupational Safety and Health Act
SHC	Safety and Health Committee
SHO	Safety and Health Officer
SOCISO	Social Security Organization
UED	Upper Extremity Disorders
U.S	United States
WHO	World Health Organization

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Computer issues**

Computers have become ubiquitous in every home and workplace in today's world. According to U.S Census Bureau (2005), in 2003 itself there were 70 million American households which had more than one computer. This number is an increase from 56% in 2001 to 62% in 2003. Over the years, computer based technology has caused work intensity to increase and created a stressful and unhealthy working condition, inadvertently contributing to an increase in work-related musculoskeletal disorders (WMSDs). Interestingly, computer-related musculoskeletal disorders contribute to a significant public health burden and accounted for one-third of lost work days in 2006 (Bureau of Labor Statistic, 2008).

Generally, it is undeniable that computers help to improve and increase productivity, however, there are many significant adverse effects on musculoskeletal system due to extensive computer use as reported by Wilkens (2003). Work-related musculoskeletal disorders (WMSDs) encompass a spectrum of musculoskeletal injuries that are related to work (Green, 2008). WMSDs are a group of painful disorders of muscles, tendons, and nerves. Carpal tunnel syndrome, tendonitis, thoracic outlet syndrome, and tension neck syndrome are examples. Work activities which are frequent and repetitive, or activities with awkward postures cause these disorders which may be painful during work or at rest.

The contents of  
the thesis is for  
internal user  
only

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