

The Prevalence of Musculoskeletal Disorders Symptoms and Ergonomics Risk Among Engineering, Science, and Technology Students

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Abstract. A high prevalence of musculoskeletal disorders (MSDs) has been reported among university students related to prolonged demands and multiple study tasks. This study investigated the MSD symptoms and ergonomic risk among students who attended online learning classes and prolonged sitting on their study workstations. The study population comprised engineering, science, and technology students (n = 58). The Cornell Musculoskeletal Discomfort Questionnaires (CMDQ) and Rapid Entire Body Assessment (REBA) were used to evaluate body discomfort and posture, respectively. REBA worksheet was employed to assess the entire body posture of the students with 100 and above total body discomfort scores. The body part that obtained higher complaints among participating students was the lower back (19.28%) followed by the upper back (17.93%), neck (10.68%), and wrist (right and left) (9.66% and 7.84%). About 13% of participants were exposed to a very high-risk level, and 27% had a high-risk level. The overall mean score was 7.3, under the medium-risk range. MSD symptoms in students are almost highly prevalent. A mean REBA score of 7.3 equals a medium risk assessment accompanied by guidance to “further investigate, change soon.” The management team in engineering, science, and technology faculties responsible for student health and comfort should prioritize methods to address and control musculoskeletal discomfort.

Keywords: Musculoskeletal disorder (MSD), Body posture, Cornell Musculoskeletal Discomfort Questionnaires (CMDQ), Rapid Entire Body Assessment (REBA), study workstations

1 Introduction

WMSD has an effect on the body's muscles and supporting structures such as legs, arms, fingers, back, neck, hands, and shoulders [1], and early signs include pain weakness in an area, muscle cramping, aching, and stiffness [2]. Most computer users are exposed to MSD due to prolonged sitting at a computer workplace [3, 4]. Basakci et al., (2020) [5] found that the prevalence of WMSDs is rising due to the widespread usage of desktop computers.

An ergonomic workstation is vital to prevent poor postures, such as static force in viewing the computer position, sitting in awkward postures, and repetitive body movement [6]. The ergonomic computer workstation design will maintain the ideal posture and be comfortable for the user [4]. The association between computer use and MSDS may be different from what has been observed in a typical workplace [7]. Risk is higher in-office employees and university students who have significant work strain, constant mouse and keyboard use, high muscle tension, and a history of neck and shoulder MSDs [8]. The situation of computer use and computer workstations have an impact on the presence the WMSDs. The critical review of previous studies has indicated that the main reason for WMSDS was poor postures [9, 10]

Previously, almost the entire sector is doing the concept of working from home due to the COVID-19 pandemic that has hit all countries. Education is one of the sectors affected by this pandemic. The government has decided to switch the face-to-face learning method to a new learning environment, Open Distance Learning (ODL), conducted online or in cyberspace [11]. Almost all students sit in the study station or study space in this new study environment. This scenario led to increased computer and study workstation use, and the daily hours spent on study stations became limitless among them. With this situation, it gives a high probability of getting the MSD symptom among the students. It is because the student will be more willing to execute repetitive movements, static and poor posture, and another factor of MSD [12]. MSD among students has increased to 7% during the COVID-19 pandemic [13]. Moreover, students' home or hostel environments must be ergonomically friendly; if not, they are exposed to postural risk and body discomfort [14].

Based on our knowledge, very few studies have evaluated students' postures in universities exposed to prolonged sitting while working at a computer workstation [15]. This study is proposed to investigate the MSD symptom among students who attend online learning classes because they are prolonged sitting at their study workstations. Therefore, this study aimed to investigate the prevalence of MSD symptoms using CMDQ and apply the REBA method to determine study workstation ergonomic risk among science and technology students.

2 Material and method

2.1 Subject

Engineering, science, and technology students ($n = 58$) at the local University of East Malaysia were selected for this study. The students had an online class session during the previous Malaysian government's movement control order (MCO). The students filled out the survey with their consent without any coercion from any party.