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An extensive usage of hand held devices will lead to musculoskeletal disorder of upper extremity among student in AMU: A survey method

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Abstract

Title: Extensive usage of hand held devices will lead to musculoskeletal disorder of upper extremity among student in AMU: Survey

Objective: The use of hand held devices (HHD) has been increase dramatically in past decade. While texting or using HHD user has to use their thumb and palm (upper limb) muscle extensively. The objective of this study is to find out the prevalence of musculoskeletal disorder in upper limb among student in AMU.

Method: 200 student was chosen randomly for participating in this research, questionnaires (DASH and Your use of computing and communication devices) was distributed to them and there was instructed to answer all questions, the questionnaires were collected at the same day and for those who participate goodies bag were given.

Result: The result shows that 100% of the students in AMU are cell phone users. The cell phone usage duration was interpreted from questionnaires, based on 24 hours calculation and it was found that the largest duration spend on cell phone was for 14 hours for purpose of email, browsing, Recreation, Gaming, follow by making call for 12 hours and lastly scheduling for 7 hours. The symptoms of pain was evaluated by using VAS (visual analogue scale), 27.5% of them were known to be unaffected by hand pain symptom, 44.5% of them were affected by mild hand pain, for moderate hand pain there were 24% of them. Apart from that there were 3.5% of students were known to be affected by severe hand pain and worst possible pain.

Conclusion: To live in accordance to the current advancements of the technology, the use of cell phone in our daily living is crucial. However, prolonged use of cell phone is known to cause symptoms of musculoskeletal disorder keeping this into consideration, more study should be done in the future to create awareness among cell phone user regarding the seriousness of this matter.

Keywords: Hand held devices, DASH questionnaires, AMU students

Introduction

The terms musculoskeletal disorder (MDs) are injuries and disorder that affect the human body's movement or musculoskeletal system. ^[1] The disorder occur when the body part is called to work harder, stretch further, impact more directly or otherwise function at a great level than it is prepared for. Immediate impact will occur within a minute, but when this incident occur repeatedly the will lead to damage. Musculoskeletal disorders include a large group of conditions that result from traumatizing the body in either a minute or a major way over a period of time. The severity will be vary according to the cause. ^[2] It built up of trauma that causes the disorders, and it also know as cumulative trauma due to improper position or over use. It is also know as repetitive stress injury (RSI) and repetitive motion disorder (RMD). ^[3] Musculoskeletal disorders is mainly focus on a joint and affect the muscle and bone, however other area and structure can be strained and lead to injury. Hand held devices (HHD) are those devices which are used for communication and entertainment purpose such as gaming, media and internet access. ^[4] Hand held it means any portable devices that can be carried and held in one's palm. A hand held devices can be a tab or any electronic devices that is compact and portable enough to be held and used in one or both hands, example of hand held devices may be a cellular communication, but this category can also include other computer devices. Hand held devices also having multiple usability options in the mobile phone this encourage user to engage to substantial period of their time in hand held devices. ^[4]

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The multiple function provide various of audible and vibratory input, and the output range from beeping and vibrating alerts, to melodies and even voice. There are many literature reported that there is an adverse impact on physical, psychological and mental health towards the user of mobile and other information technology. Study has found out that a high incident of musculoskeletal disorder of hand, wrist, forearm, arm, and neck due to prolong, forceful, repetitive use of such devices. The risk factor for musculoskeletal disorder related to hand held devices will be sustain gripping, repetitive movement of wrist, thumb and fingers. Abnormal typing posture and typing style will also lead to difference musculoskeletal disorder condition. [5] A relationship between the design and anthropometry of the devices will lead to discomfort and fatigue in hand, elbow, and shoulder of user while using the hand held devices. [4]

Methods and Materials:

STUDY DESIGN: Cross Sectional survey design
 RESEARCH LOCATION: ASIA Metropolitan University
 STUDY DURATION: 3 months
 SAMPLE SIZE: 200 Subjects
 SAMPLING METHOD: Random sampling

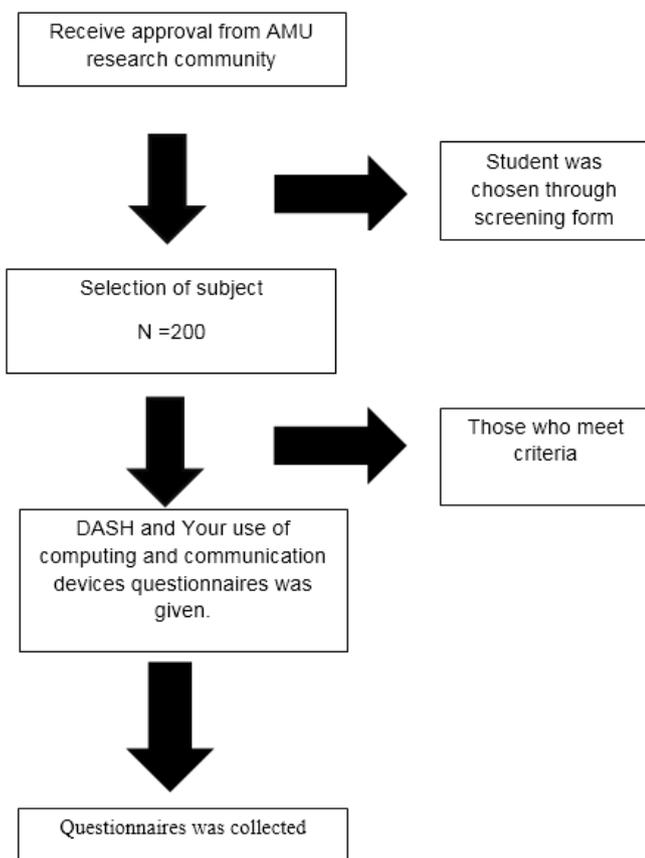
Inclusion Criteria

- Age 18-30 years old
- All race included
- Onset of symptoms

Exclusion Criteria

- Having any injury in arm
- Having any deformity
- Having any musculoskeletal related problem in upper extremity because of other reason
- Having any neurological problem due to other reason

Study methodology flow chart



Procedure: In this research 200 subjects were selected by random sampling method to participate in this research. All the participants were given a screening form to ensure they meet the inclusion criteria. Once they have been confirmed to meet the inclusion criteria there were given a consent form and a set of questionnaires (DASH [14] and your use of computing and communication devices [15]) and they were required to answer all the questions present on the questionnaire. After the survey was completed the questionnaires were recollected and goodie bag was given as a token of appreciation to all participants. Following that the result of this study was analysed from the questionnaires collected.

Data analysis: Disabilities of Arm, Shoulder, and Hand (DASH) questionnaire and your use of computing and communication devices questionnaire has been use to find out the usage, symptoms and also the daily activities of the participants. Statistical analysis was carried out using SPSS 20.0 on a personal computer, Statistical analysis measure for the frequency distribution.

Analysis of data and result

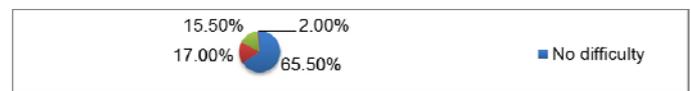


Fig 1: Pie chart show the Distribution of DASH score question 1

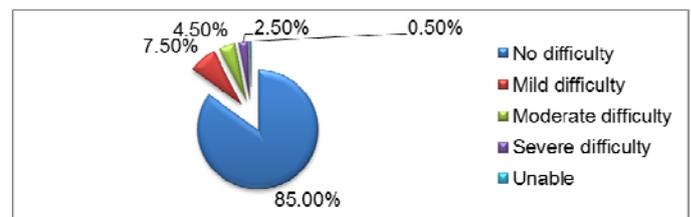


Fig 2: Pie chart show the Distribution of DASH score question 2

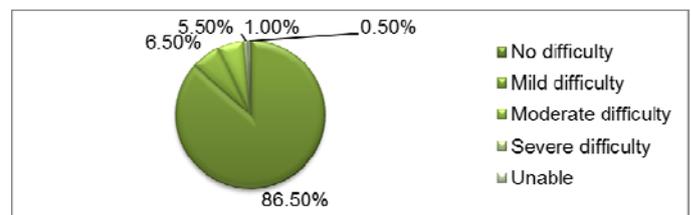


Fig 3: Pie chart show the Distribution of DASH score question 3

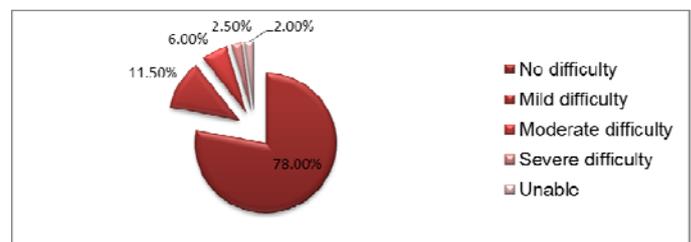


Fig 4: Pie chart show the Distribution of DASH score question 4

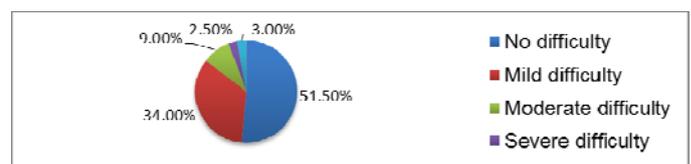


Fig 5: Pie chart show the Distribution of DASH score question 5

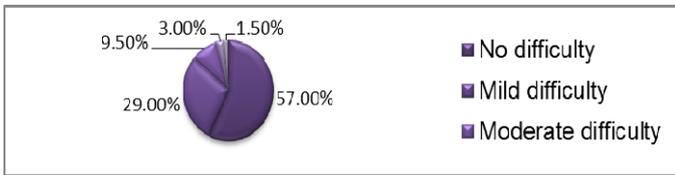


Fig 6: Pie chart show the Distribution of DASH score question

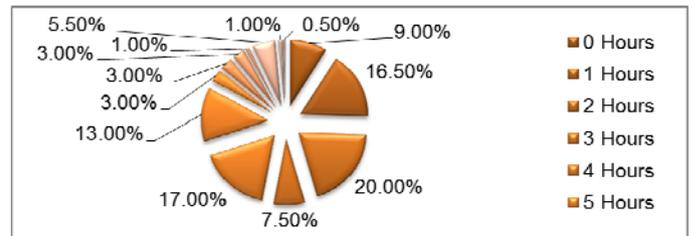


Fig 13: Pie chart show the Distribution of Your use of computer and communication devices (Question 6)

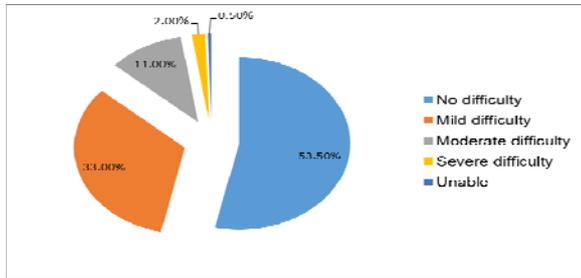


Fig 7: Pie chart show the Distribution of DASH score question 7

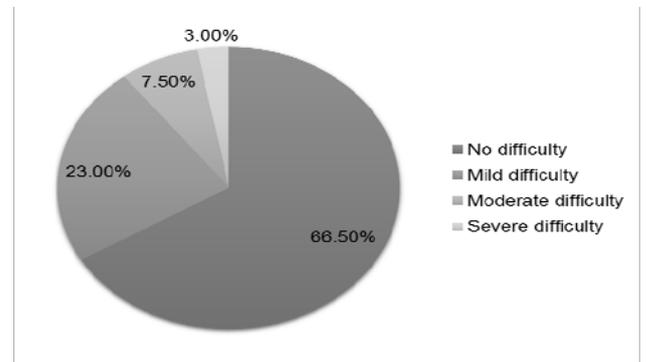


Fig 14: Pie chart show the Distribution of Your use of computer and communication devices (Question 7)

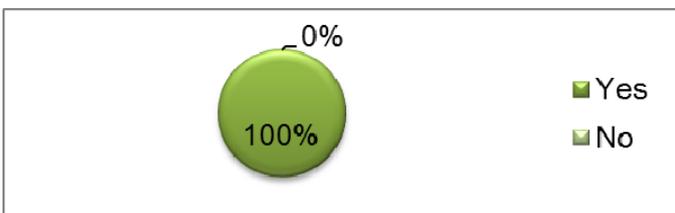


Fig 8: Pie chart show the Distribution of Your use of computer and communication devices (Question 1)

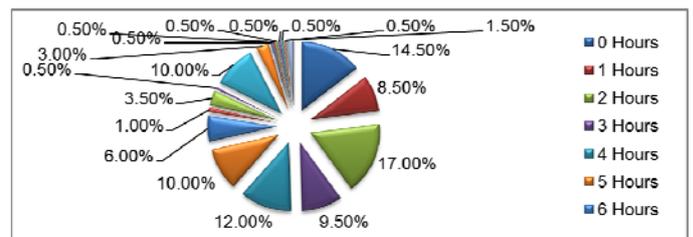


Fig 15: Pie chart show the Distribution of Your use of computer and communication devices (Question 9)

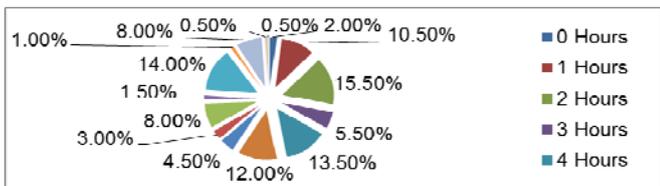


Fig 9: Pie chart show the Distribution of Your use of computer and communication devices (Question 2)

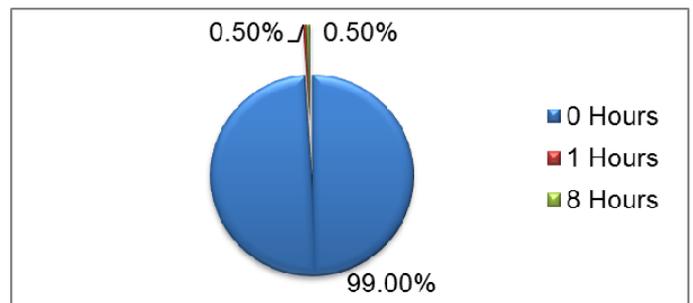


Fig 16: Pie chart show the Distribution of Your use of computer and communication devices (Question 10)

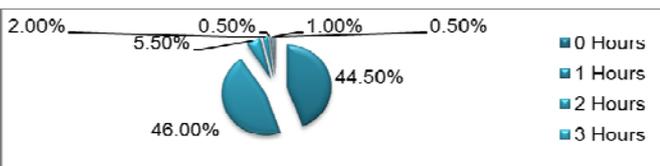


Fig 10: Pie chart show the Distribution of Your use of computer and communication devices (Question 3)

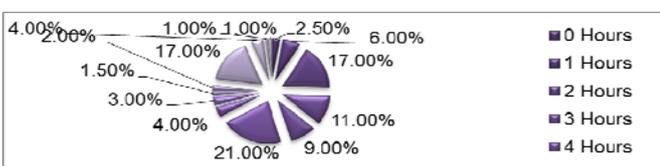


Fig 11: Pie chart show the Distribution of Your use of computer and communication devices (Question 4)

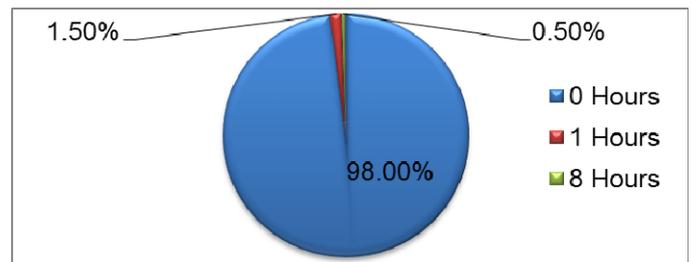


Fig 17: Pie chart show the Distribution of Your use of computer and communication devices (Question 11)

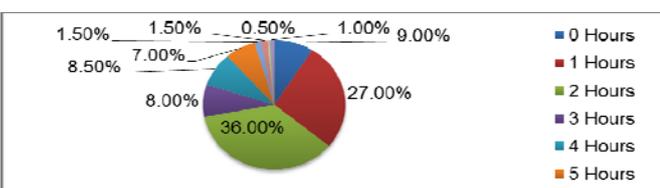


Fig 12: Pie chart show the Distribution of Your use of computer and communication devices (Question 5)

Results: The result shows that 100% of the students in AMU are cell phone users. The cell phone usage duration was interpreted from questionnaires, based on 24 hours calculation

and it was found that the largest duration spend on cell phone was for 14 hours for purpose of email, browsing, Recreation, Gaming, follow by making call for 12 hours and lastly scheduling for 7 hours. From the frequency table generated for the mailing activities is was found that the highest frequency showed 31 (15.5%) students spent a total of 2 hours on their cell phone for this purpose. Where else for scheduling, the highest frequency noted was 92 (46.0%) of them spending only 1 hour for this activity. For the internet browsing the highest frequency showed 42 (21.0%) students spend a total of 5 hours for browsing. Making phone calls and talking on the phone had a highest of 72 (36.0%) students spending a total of 2 hours for this purpose. Next is recreation, the highest frequency showed 40 (20.0%) students spending a total of 2 hours on listen to music, watching video, and taking picture. Lastly for gaming, the highest frequency noted was 65 (32.5%) students spending 0 hour for gaming. Regarding typing style base on the frequency table showed that 76 (38.0%) students are mostly using both thumb during typing. Regarding symptoms base on the frequency table there were 106 (53.0%) students having no arm, shoulder or hand pain, at the same time there were 66 (33.0%) students having mild pain, 21 (10.5%) students having moderate pain, 6 (3.0%) of them having severe pain, and 1 (.5%) of them having extreme pain. Besides that, there were 100 (50.0%) students reported not to have any arm, shoulder or hand pain during performing any specific activity. Rest of 66 (33.0%) students were having mind pain, 26 (13.0%) students were having moderate pain, followed by 7 (3.5%) of them having severe pain, and 1 (.5%) of them having extreme pain in arm, shoulder and hand during performing any specific activity. Next is about tingling in arm, shoulder and hand, the frequency table showed that there were 104 (52.0%) students not having any sign of tingling sensation, for mild tingling sensation there were 62 (31.0%) of them, 24 (12.0%) of them having moderate tingling sensation, 9 (4.5%) of them having severe tingling sensation, and also 1 (.5%) of them having extreme tingling sensation in arm, shoulder and hand. Follow by 116 (58.0%) of the student having weakness in the arm, shoulder and hand, 47 (23.5%) student having mild weakness, 28 (14.0%) students having moderate weakness, and 9 (4.5%) of them having severe weakness. About stiffness in arm, shoulder and hand base on the frequency table they were 112 (56.0%) students do not have any stiffness, 52 (26.0%) students having mild stiffness, 26 (13.0%) student having moderate stiffness, 6 (3.0%) students having severe stiffness, and 4 (2.0%) of them having extreme stiffness in their arm, shoulder and hand. The symptoms of pain was evaluated by using VAS (visual analogue scale), 27.5% of them were known to be unaffected by hand pain symptom, 44.5% of them were affected by mild hand pain, and there were divided into 3 category of score 1 (15.0%), score 2 (10.5%), and score 3 (19.0%). For moderate hand pain there were 24% of them, they had also been divided into 3 different categories, score 4 (11.0%), score 5 (9.0%), and score 6 (4.5%). Apart from that there were 3.5% of students were known to be affected by severe hand pain and worst possible pain, also categorized into 3 score, score 7 (2.0%), score 8 (.5%), and lastly at score 10 (1.0%).

Discussion

During the period of data collection no known difficulties were present in distributing and re-collecting the questionnaires as all samples were recruited within the University compound. Moreover, no missing questionnaires were reported and this enabled a smooth process of data collection and analysis.

Based upon the result obtained in this study it is obvious that a cell phone is essential in everyone's life these days. From this study done to determine the affect regarding musculoskeletal disorder, caused by hand held devices, it was found that only 3.5% of students were having worst possible pain for symptoms of upper limb pain, 27.5% are having no pain at all, followed by 44.5% of them having mild pain, and 24.5% of them were having moderate pain. This study discovered that the duration and frequency of cell phone usage and typing style also plays a role in causing the symptoms of upper limb pain.

Limitation of study: The duration for this study was relatively short and this lead to lack of time in recruiting more students to participate in this study.

Recommendation

A bigger sample size can be chosen if there is a longer time frame for this study, and this study can also be conducted in a population from different geographical location. Recruitment of samples from professions which require high usage of hand held device is also recommended.

Conclusion

To live in accordance to the current advancements of the technology, the use of cell phone in our daily living is crucial. However, prolonged use of cell phone is known to cause symptoms of musculoskeletal disorder keeping this into consideration, more study should be done in the future to create awareness among cell phone user regarding the seriousness of this matter.

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