OPEN ACCESS

ORIGINAL ARTICLE

Is mobile phone a source of hand discomfort for university students?

Fouzia Batool[1] , Anum Khan[2], Khusbakht Bibi[3], Ubaid-Ullah[4], Hania Farheen[5]

[1]Assistant professor, Shifa tameer-e-millat University, H-8/4, Islamabad
[2]Lecturer, Shifa tameer-e-millat University, H-8/4, Islamabad
[3]Lecturer, Shifa tameer-e-millat University, Islamabad
[4]Lecturer, Shifa tameer-e-millat University, Islamabad
[5]Lecturer, Shifa tameer-e-millat University, Islamabad

Keywords

Hand discomfort, Smart phone, Young adults, Cornell Mobile phone hand discomfort questionnaire

Author`s Contribution

[1]Conception, Synthesis, Planning of research, Manuscript writing Discussion
[2]Data analysis, Planning of research
[3]Data analysis, Synthesis,
[4]Conception
[5]Manuscript writing

Article Info.

Received Date: July 24th, 2018
Accepted: June 11th, 2019

Conflict of Interest: Nil
Funding Sources: Nil

Address of Correspondence

Fouzia Batool
sedafouziabatool@gmail.com

Cite this article as: Batool F, Khan A, bibi K, Ullah U, Farheen H. Is mobile phone a source of hand discomfort for university students? JRCRS. 2019; 7(1):31-34.
doi: 10.5455/JRCRS.2019070108

ABSTRACT

Background: Mobile phones users are increasing with the technology advancement and it became one of the important assets of youngster's life. Every device is having its positive as well as negative effects. Due to more usage of these mobile phones, people are complaining of some musculoskeletal and neurological discomforts.

Purpose: The objective of the study was to determine the frequency and intensity of hand discomforts in university students, who were using smart phones and to identify which area of hand is more affected.

Method: A descriptive cross-sectional survey was conducted among young adults with sample size of 470, recruited through non-probability convenient sampling. It was done within the duration of 06 months (August to January 2017) from the medical universities of Islamabad. A standardized questionnaire (Cornell Mobile Phone Hand Discomfort Questionnaire), with a Kappa coefficient between 0.56-0.97 was used. Some self-structured questions were added in it. It was distributed among young adults (18-26 years) who were doing atleast 30sms/Whatsapp/email per day or browsing internet or playing games for more than 2 hours. While those students using desktop computer or laptop (typing) for more than 1hour, having any upper limb musculoskeletal deformity or neurological disorders were not included in the study. Data was analyzed using SPSS version 20.

Results: In the sample of 470, 369 (78.5%) was of females and 101 (21.5 %) of males with a mean age of 20.90 ± 1.94 years. The result reported that 68.4% participants were not having any type of hand discomfort after using smart phone. Mild hand discomfort was found in 28.36% participants, moderate in 2.56% while a very negligible percentage reported severe hand discomfort. This study further revealed that there is a significant association of frequency and duration of usage of mobile phone with hand discomfort.

Conclusion: It is concluded that mobile phone was not a source of hand discomfort for majority of the young adults. A moderate percentage of participants reported mild hand discomfort. However, the frequency and duration of mobile phone usage has a strong association with hand discomfort.

Introduction

Mobile phones are used worldwide. Its subscription has found to be increased during past decade and its use is increasing day by day especially among young adults.[1] The mobile devices are used to send or receive email, to send or receive messages, and to access the internet. A survey was conducted in USA that showed the smartphone is used 3 hours daily (excluding voice activities) by adult users in 2015,double of which they were using in 2012.[2] Mostly mobile phones are used for texting, having 74% users worldwide.[3]

Musculoskeletal discomfort of the upper limb and especially the thumb has been reported in mobile phone users because thumb is repetitively used while using mobile phone for communication and entertainment purpose such as gaming, media and internet access i.e. Whatsapp, Viber, Line in, BBM (blackberry messenger) and social networking applications like Facebook, Twitter and Skype.[4, 5] Excessive use of mobile phones could expose the thumbs and fingers to stresses beyond their normal function which may cause musculoskeletal disorders in the thumbs and the associated joints.[6] A study conducted in Hong Kong showed high prevalence of musculoskeletal symptoms found among university students as pain was found in more than one body sites.[7]

Methodology

This was a descriptive cross sectional study conducted on young adults aged 18-26 years studying in different medical universities of twin cities. The total participants included in this study were 470, calculated by rao-software calculator. The sample was collected through non-probability convenient sampling within six months of duration from August 2017 to January 2017. Young adults who were doing at least 30sms/whatsapp/email per day or browsing internet or playing games for more than 2 hours were included. While those young adults who were using laptop or desktop (typing) for more than 01 hour, having any upper limb musculoskeletal deformity or neurological disorders were excluded from the study. Prior to participation, informed consent (written) was taken from each participant. Anonymity and confidentiality of participant's data was maintained throughout the research.

Standard questionnaire Cornell Mobile Phone Hand Discomfort Questionnaire was used to collect the data which includes frequency, discomfort and interference. It is a valid and reliable questionnaire with a Kappa coefficient between 0.56-0.97, to mark the areas of discomfort in both hands.[11] It has 6 areas of hand labeled as A-F. Each area has 90 score. The young adults were also asked about frequency and duration of mobile phone usage daily. Chi-square was applied to find the association of frequency and duration of mobile phone usage with hand discomfort. Data was analyzed through SPSS version 20.

Results

In this study, the sample was 470. Total males and females were 101(21.5%) and 369(78.5%) respectively. The mean age of the participants was 20.90 ± 1.94 years. Among the students, 458(97.4%) were using smart phones and 12(2.60%) were having feature phones. Majority of the participants were using mobile phone often 213(45.3%) and 149(31.7%) were using it all the time. Among the participants 262(55.7%) were using their smart phones, for more than 4 hours daily.

Majority of the participants were not having any type of hand discomfort and those reported mild to severe type of discomfort is given in the (Figure 1)

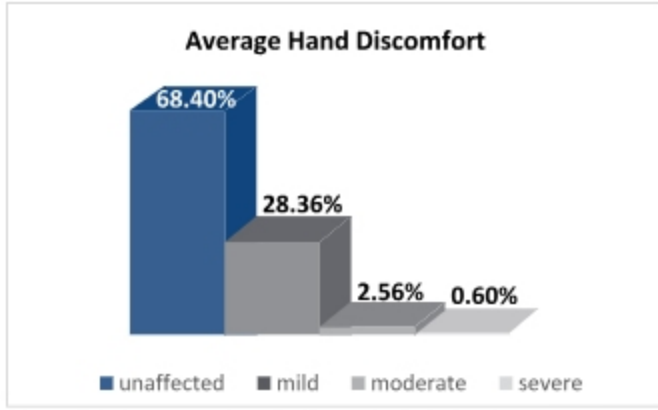

Figure 01: Average hand discomfort of hand.

Highest percentage of mild discomfort was found in Area C 178 (37.90%), and the lowest was found in Area D 108(23%). Further details about the all areas are show in the (Figure 2).

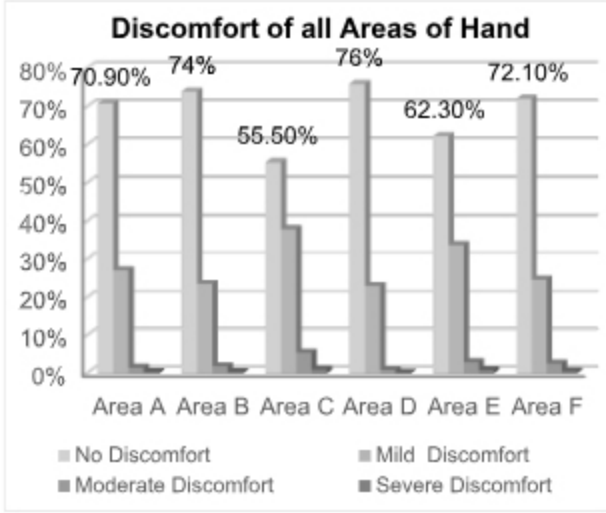

Figure 2. Percentages of discomfort in all areas of hand

e-ISSN: 2410-888X p-ISSN: 2226-9215

There was a significant association ($p<0.05$) between hand discomfort and duration of mobile phone usage. Also frequency of cell phone usage has a strong association ($p<0.05$) with hand discomfort.

Discussion

In this study majority participants (68.40%) were not having any type of hand discomfort due to mobile phone use. Mild hand discomfort was found in 28.36% participants, while very less percentage of participants reported hand discomfort of moderate to severe level. A study done in India found that 27.5% of participants were unaffected by hand pain while 44.5% of them were affected by mild hand pain. And moderate and severe hand pain was found out in less percentage. The difference may be due to number of hours of mobile phone usage among the students.[12]

The study conducted by Balakrishnan et al. reported that the largest duration spend on mobile phone for purpose of email, browsing etc. was for 14 hours. While in this study 55.7% of participants were spending more than 4 hours on mobile phone for the purpose of email, browsing etc. [12]

This study showed that frequency and duration of cell phone usage has a strong association with hand discomfort. The study done on AMU students also discovered that the duration and frequency of mobile phone usage and typing style also play a role in causing symptoms of upper limb pain. [12]

In this study, the highest percentage of population reported mild discomfort in Area C (thumb) 37.90%. It may be due to the repetitive movements of thumb during mobile phone use. The second highest percentage of discomfort is of Area E which is thenar region as 33.8%. A study conducted in Canada, Cornell musculoskeletal hand discomfort questionnaire was used. According to their results, the thenar area (Area E) and the area distal to the wrist (Area F) were the hand regions with the highest frequency of ache/pain and discomfort. The difference may be due to difference in the target population. Their population was 140 office workers who were computer users. [13]

In this study majority respondents were smartphone users (97.4%). Mild discomfort of hand was found in 28.36% of participants. In a previous study the prevalence of mobile phone usage was 70%. Prevalence of painful fingers was 4% in mobile while of tingling fingers was 2.6%. The marked difference in percentage may be due to reason that the data was recruited from a semi urban population where there was low usage of mobile phones as compared to the present study. [14]

This was a cross-sectional survey, carried out on a limited number of students. Further it should be done on larger level like the longitudinal studies. Also, the other body areas especially the neck and shoulder musculoskeletal symptoms should be explored after the prolong use of smart phones.

Conclusion

The study concluded that smart phones are not the source of hand discomfort for majority of the participants. A moderate percentage of participants reported mild hand discomfort. However, hand discomfort was found to be associated with increasing frequency and duration of usage of mobile phone.

It is recommended that awareness should be created among young adults about frequency and total usage of smart phone, as more frequent and more hours of usage can result in mild to serve discomfort in young adults.

References

1. Iqbal S, Khan MN, Malik IR. Mobile Phone Usage and Students' Perception towards M-Learning: A Case of Undergraduate Students in Pakistan. 2017.
2. Toh SH, Coenen P, Howie EK, Straker LM. The associations of mobile touch screen device use with musculoskeletal symptoms and exposures: A systematic review. PloS one. 2017;12(8)
3. Sharan D, Mohandoss M, Ranganathan R, Jose J. Musculoskeletal disorders of the upper extremities due to extensive usage of hand held devices. Annals of occupational and environmental medicine. 2014;26(1):22.
4. Sharan D, Mohandoss M, Ranganathan R, Jose J, Rajkumar J, editors. Distal upper extremity disorders due to extensive usage of hand held mobile devices. Human Factors In Organizational Design And Management–Xi Nordic Ergonomics Society Annual Conference–46; 2014.
5. Eapen C, Kumar B, Bhat AK, Venugopal A. Extensor pollicis longus injury in addition to De Quervain's with text messaging on mobile phones. Journal of clinical and diagnostic research: JCDR. 2014;8(11):LC01.
6. Jonsson P, Johnson PW, Hagberg M, Forsman M. Thumb joint movement and muscular activity during

mobile phone texting–A methodological study. Journal of Electromyography and Kinesiology. 2011;21(2):363-370.
7. Woo EH, White P, Lai CW. Musculoskeletal impact of the use of various types of electronic devices on university students in Hong Kong: An evaluation by means of self-reported questionnaire. Manual therapy. 2016;26:47-53.
8. Eapen C, Kumar B, Bhat AK. Prevalence of cumulative trauma disorders in cell phone users. Journal of Musculoskeletal research. 2010;13(03):137-145.
9. Berolo S, Wells RP, Amick BC. Musculoskeletal symptoms among mobile hand-held device users and their relationship to device use: a preliminary study in a Canadian university population. Applied Ergonomics. 2011;42(2):371-378.
10. Gustafsson E, Thomée S, Grimby-Ekman A, Hagberg M. Texting on mobile phones and musculoskeletal disorders in young adults: a five-year cohort study. Applied ergonomics. 2017;58:208-214.
11. Erdinc O, Hot K, Ozkaya M. Turkish version of the Cornell Musculoskeletal Discomfort Questionnaire: cross-cultural adaptation and validation. Work. 2011;39(3):251-60.
12. Balakrishnan R, Chinnavan E, Feii T. An extensive usage of hand held devices will lead to musculoskeletal disorder of upper extremity among student in AMU: A survey method. International Journal of Physical Education, Sports and Health. 2016;3(2):368-372.
13. Fagarasanu M, Kumar S. Musculoskeletal symptoms in support staff in a large telecommunication company. Work. 2006;27(2):137-142.
14. Stalin P, Abraham SB, Kanimozhy K, Prasad RV, Singh Z, Purty AJ. Mobile phone usage and its health effects among adults in a semi-urban area of southern India. Journal of clinical and diagnostic research: JCDR. 2016;10(1):LC14.

e-ISSN: 2410-888X p-ISSN: 2226-9215