



Influence of Excessive Mobile Phone Use on Anxiety and Academic Performance among Medical College Students

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Authors' contributions

This work was carried out in collaboration among all authors. Author AA designed the study, performed the statistical analysis and wrote the protocol. Author SM wrote the first draft of the manuscript. Authors LF and HA managed the analyses of the study. Author NAK managed the literature searches. Manuscript was finally reviewed by author MAUK. All authors read and approved the final manuscript.

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ABSTRACT

Objectives: The objectives of this study were focused on finding the influence of excessive mobile phone usage on academic performance of medical students and to find association between excessive mobile phone usage and anxiety in students of a medical University Karachi.

Methods: It was a questionnaire based study, three different standardized questionnaires were used to assess the sleep pattern and anxiety, however academic performance were evaluated by their last attempted exam.

Results: Excessive mobile phone usage was significantly (p-value = 0.001) associated with disturbed sleep pattern and sleep quality. But we did not had significant results for anxiety and academic performance.

Conclusion: Excessive mobile phone use may disturb sleep pattern and quality of sleep but it does not affect academic performance and does not lead to anxiety.

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Keywords: Excessive mobile use; anxiety; academic performance.

1. INTRODUCTION

The world has now turned into an era of advanced mobile phones, as technology has grown faster the mobile phones are getting smarter and better. Initially the mobiles were just used as a calling and texting device but advancement in technology, competition among manufacturing companies and demand by the public has turned these calling devices to mini computers with features which include GPS, music, video, games, various intent excessing mobile applications and camera with high resolution. Constant access to internet has made these devices as a necessary toll to keep, mobile phones have made people lives better and sophisticated [1,2]. The use of mobile phones is increasing day by day across the globe. As many as 206 published survey reports has suggested that 50% of the youngsters and 27% of the parents feel that they are dependent to mobile phones [3]. On one side these devices are making lives easy but on the other they are also challenging the overall health of individuals and are also causing various disorders in chronic users. Thomée, [4] reviewed that the associations between mobile phone use and adverse mental health outcomes are found in studies that take a psychological or behavioral perspective on the exposure.

The excessive use of mobile phone is responsible for number of acute symptoms such as headache, impaired concentration and fatigue but many scientists have documented that continuous mobile phone usage has various adverse effects on health including variations in brain activity, response timings, and sleep patterns, dry eyes, computer vision syndrome, weakness of thumb and wrist, neck pain and rigidity, nomophobia, insecurity, delusions, auditory, insomnia, hallucinations and lower self-confidence [5,6]. According to the International agency for research on Cancer, excessive use of mobile phones may lead to the formation of brain tumors such as glioma and acoustic neuroma [7]. The over usage of these devices is causing anxiety and restlessness among the users, as the users constantly check their phone for no reason [8]. In A research it was found that heavy and moderate smartphone users felt significantly more anxious over time, they have reported associations between problematic smartphone use and social interaction anxiety compulsive anxiety and general anxiety [9,10]. Khan [11]

reported that impaired concentration in 34.27% of respondents, memory disturbances in 40.56%, sleeplessness in 38.8%, hearing problems in 23.07%, and facial dermatitis in 16.78%.

Currently, the addiction to smartphones among students is 24.8%–27.8%, and it is progressively increasing every year. Mobile phones are now become a necessity for the student in order to keep themselves updated academically and socially. This behavior is increasing dependency while reducing thinking capabilities and affecting cognitive functions at the same time [12]. Unnecessary use of social networking, texting and chatting on mobile phones result in lower grades and poor academic performance of students. The researches have proven that some students have the habit of keeping their mobile phones on during classes and studies, even in the library, thereby distracting others [13]. In this context this study is focused on finding the influence of mobile phone usage on academic performance of medical students in medical University of Karachi and to find association between excessive mobile phone usage and anxiety.

2. METHODOLOGY

It was a cross sectional study, conducted from March 2019 to April 2019, in a Medical University of Karachi. It involved 500 students from MBBS and BDS sections and they were from all academic years (1st to final year). Both male and female students voluntarily participated in this study the age range of students was between 17 to 24 years. A video session was arranged to express the benefits of the study to participants followed by an interactive session regarding outcomes of the study. Participants were recruited through consecutive sampling technique, every third participant was selected from row one till end of the lecture hall, and he was asked to fill a consent form. Participants who filled the consent form were evaluated by different questionnaires. Participants with history of the use of alcohols and drugs and those with sleep and metabolic disorders were excluded from the study. The questionnaires included close ended questions regarding mobile phone usage and their demographic data (age, gender, BMI score, lifestyle habits academic year and ethnicity). The survey questions were designed to gauge the health status of the students using cell phones by asking about the frequency of

mobile phone use, the age when they started using it and at the time when they are using mobile phones more frequently. The second part of the questionnaire was used to assess the quality of sleep using the index of Pittsburg sleep quality scale, lastly by using Hamilton anxiety rating scale we evaluated the and anxiety score in students [14]. As we were having ethical approval from intuitional board so we requested the exam department to provide us a copy of last attempted exam of included participants to associate it with mobile phone usage. SPSS 20 was used for entry and interpretation of the data. Initially we performed grouping of the students according to use of mobile phone per day and then we applied ANOVA to correlate that with their academic performance. p-value less than 0.05 was considered as significant.

3. RESULTS

Out of 500 participants, the frequency of mobile phone usage was more in males 350 (70%) when compare to females 150 (30%). Their age varied from 21 to 24 with mean age of 20 ± 1.9 years. The students reported that most of the time they use mobile phone in night 188 (38%). According to 202 (40%) participants the total hours of mobile phone usage (hours /day) were unlimited. 366 (73%) students mentioned that

they start using mobile phone at intermediate level and claimed that no surveillance of the parents being done as shown in Table 2. Students stated multiple reasons for use of mobile phone, the highlighted one was surfing social media. The reasons for using mobile phone by the participants in the study group are given in the Table 3.

Students who were using unlimited mobile phone reported that they take more than 1 hour to sleep that showed a significant (p-value <0.001) correlation between more mobile phone use and time taken to sleep. The sleep quality in these participants who were using unlimited mobile was not good (p <0.001) and they fell restless during the sleep and episodes of disorientation were more in these participants as shown in Table 3.

Table 1. Demographic details of the study participants

Gender	N (%) 500
Male	350 (70%)
Female	150 (30%)
Age	
18-20yrs	127 (25.4%)
21-24yrs	373 (75%)

Table 2. Habituation analysis of mobile phone usage

Time of mobile phone use	
Morning	144 (29%)
Afternoon	33 (6.6%)
Evening	135 (27%)
Night	188 (38%)
Total hours mobile phone use (hrs/day)	
>1-2 hrs	54 (2.8%)
>3-4 hrs	65 (13%)
5-10 hrs	122 (24.4%)
40-60 mins	57 (11.4%)
Unlimited	202 (40%)
Insomnia	
yes	376 (75.2%)
no	124 (24.8%)

Table 3. Sleep routine of participants

Time taken to fall a sleep	
30mins	98 (19.6%)
>1hr	47 (9.4%)
>2hrs	355 (71%)
Sleep quality	
very good	165 (33%)
fairly good	289 (57)
very bad	56 (11.2%)

Effect on academic performance of an individual was evaluated by using his data regarding time spent on mobile and his grade in last attended exam. In our study participants who used mobile phone for 5-10 hours a day mostly (66%) got grade B p-value (0.002), however, students who were using mobile phones for unlimited got grade A 30%, B 40% C 30% (p-value= 0.131) as shown in Table 4.

Most of the students reported in our study that they use mobile more than two hours (Table 2), however, when they were assessed through Hamilton anxiety scale we did not find significant association of mobile phone use with anxiety. According to this scale mostly students were categorized under mild anxiety scores as shown in Fig. 1.

4. DISCUSSION

Mobile phone has become a necessary toll for youngsters, they use it not only for

communication purpose but due to its diverse applications it is providing help in education, health entertainment and many other things [15]. We found that frequency of mobile phone use in males is greater than females which is in accordance to the "Measuring the Information Society Report" [16]. The participants of our study preferred and highlighted the night time use of mobile phone which is parallel to the findings of Van den Bulck J. [17,18]. According to him more than half youngsters use mobile phone when they go to bed in night time. Various studies have highlighted the effects of excessive mobile phone usage on eyes and according to that continuous use of these devices particularly in night can damage the central vision of a person. In our study students reported that they usually take two hours to fall asleep in bed and they use that time in performing various activities on mobile phone such as chatting with friends, watching serials and movie, listening songs and playing games. Games and videos have multiple color orientations for attraction of audience

Table. 4 Time spent on mobile phone and grades of students

Time spent on mobile phone	Grade A	Grade B	Grade C	p-value
>1-2 hrs	18%	60%	22%	0.001
>3-4 hrs	30%	55%	15%	0.142
5-10 hrs	14%	66%	20%	0.002
40-60 mins	40%	40%	20%	0.111
Unlimited	25%	45%	30%	0.134

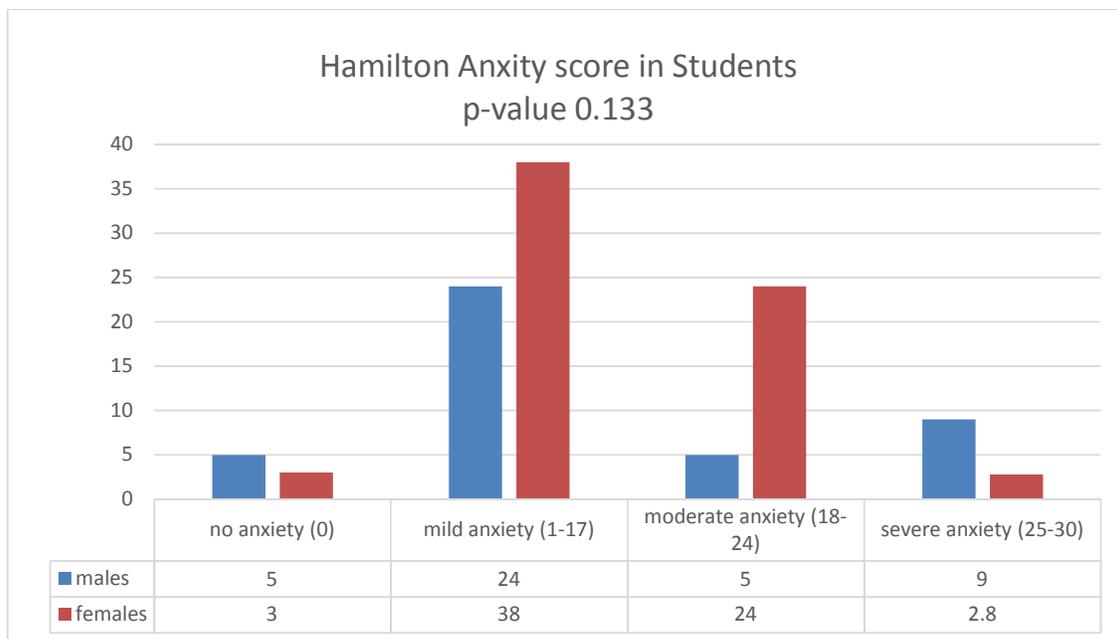


Fig. 1. Representing Hamilton anxiety score in students

specially the blue light emitted from phones can affect the release of melatonin hormone which regulates the sleep cycle. The hazardous effects are not only limited to eyes but its unlimited use may lead to a variety of health problems including cardiac disease, tumors, weight gain, depression and anxiety [19,20]. In a study regarding stress and its coping factors, it was highlighted that students use these devices and its various application to overcome the stress of studies and exams [21]. The relationship between over-use of cell-phones, internet addiction and sleep quality is reported by several workers [22–25]. Use of mobile phones in educational institutes has provoke a new debate on its usage in the classes and even during lectures, about 35% of students of our study claimed that they use mobile phones during lectures. Along with its benefits in education its unnecessary use during the lectures or in exam preparations has affected the results of students. In our study the effect of mobile phone usage on student's performance were not dominating appropriately, as students who reported limited use of mobile phone had the same results when compared to students who used it more than two hours a day. However, students who used mobile phone more than two hours in a day got B grade in last attempted exam mostly. This finding is reflecting that more mobile phone usage is not influencing the academic performance. Though increased usage was significantly associated with B grade results but it was observed that with these results students were seemed quite satisfied. Similar findings are reported in many studies that usage of mobile phone may does not affect academic performance directly as its usage depend upon the activities one can perform on mobile phone [26,27]. As far as anxiety is concerned with mobile phone usage in our study there was no any significant association with mobile phone usage and anxiety. Parallel to this finding, according to Ali A. et al. medical students use these devices to cope the anxiety and stress particularly social networking help them to overcome the burden of stress and anxiety [19]. The same finding was reported by Elhai et al. he stated that there is mild risk of development of anxiety by excessive use of mobile phone [28]. Tavakolizadeh et al. [29] found in their study that was also a significant relation between education degree (in Masters and doctoral degree students) and the prevalence of excessive mobile phone ($p > 0.05$). Medical students are supposed as assets of nation, as they have to serve humanity in their lives ahead but use of mobile phone may be a

distraction in their aim and it may lead to their failure if not overcome on time. We suggest that medical institutes should arrange seminars and workshops on proper use of mobile phones.

5. CONCLUSION

Excessive use of mobile phone may affect the sleeping pattern and sleep timing of an individual. Use of mobile phone does not result in poor academic performance directly, but its excessive use may affect general physical health of students and may lead to decrease in concentration and results in poor academic performance of students. There is no significant association of anxiety and excessive mobile phone use.

6. LIMITATIONS

Participants were only medical students recruited from single medical university.

7. SUGGESTIONS

An observational study is needed to record the activity of students on mobile phone that can differentiate that whether the excessive use is for educational purpose or it is due to other applications.

CONSENT

As per international standard or university standard, students' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Study was approved by Ethical board of Baqai University.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Suhag A, Larik R, Mangi G, Khan M, Abbasi S, Madiha HJJCSSB. Impact of excessive mobile phone usage on human. 2016;9:173-7.
2. Thomée Sjiioer, Health P. Mobile phone use and mental health. A review of the research that takes a psychological

- perspective on exposure. 2018;15(12): 2692.
3. Parasuraman S, Sam AT, Yee SWK, Chuon BLC, Ren Lyjijopi. Smartphone usage and increased risk of mobile phone addiction: A concurrent study. 2017;7(3): 125-31.
 4. Thomée S. Mobile phone use and mental health. A review of the research that takes a psychological perspective on exposure. *International Journal of Environmental Research and Public Health*. 2018;15(12): 2692.
 5. Sundari TT, JI JoAR. Effects of mobile phone use on academic performance of college going young adults in India. 2015;1(9):898-905.
 6. Zivin K, Eisenberg D, Gollust SE, Golberstein Ejjoad. Persistence of mental health problems and needs in a college student population. 2009;117(3):180-5.
 7. Bayram N, Bilgel Njssp, *Epidemiology P*. The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. 2008;43(8):667-72.
 8. Vishnu K, Nithyaja B, Pradeep C, Sujith R, Mohanan P, Nampoori VJLP. Studies on the effect of mobile phone radiation on DNA using laser induced fluorescence technique. 2011;21(11):1945-9.
 9. Naeem Zjijohs. Health risks associated with mobile phones use. 2014;8(4).
 10. Sage C, Carpenter DOJP. Public health implications of wireless technologies. 2009;16(2-3):233-46.
 11. Khan M. Adverse effects of excessive mobile phone use. *International Journal of Occupational Medicine and Environmental Health*. 2008;21(4):289-293.
 12. Hussain Z, Griffiths MD, Sheffield D. J. *Joba*. An investigation into problematic smartphone use: The role of narcissism, anxiety, and personality factors. 2017;6(3): 378-86.
 13. Oftedal G, Wilen J, Sandström M, Mild KHJOM. Symptoms experienced in connection with mobile phone use. 2000;50(4):237-45.
 14. Thompson EJOM. Hamilton rating scale for anxiety (HAM-A). 2015;65(7):601.
 15. Chen W, Wellman B. *Charting digital divides: Comparing socioeconomic, gender, life stage, and rural-urban internet access and use in five countries*. Cambridge, MA: MIT Press; 2005.
 16. Hilbert M, Editor. Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics. *Women's Studies International Forum*. Elsevier; 2011.
 17. Van den Bulck JJJoSR. Text messaging as a cause of sleep interruption in adolescents, evidence from a cross-sectional study. 2003;12(3):263.
 18. Eggermont S, Van den Bulck JJYSA. Nodding off or switching off? The use of popular media as a sleep aid in secondary-school children. 2007;26(1):60-1.
 19. Irmak MK, Fadilloğlu E, Güleç M, Erdoğan H, Yağmurca M, Akyol ÖJCB, et al. Effects of electromagnetic radiation from a cellular telephone on the oxidant and antioxidant levels in rabbits. 2002;20(4):279-83.
 20. Gamble AL, D'Rozario AL, Bartlett DJ, Williams S, Bin YS, Grunstein RR, et al. Adolescent sleep patterns and night-time technology use: Results of the Australian Broadcasting Corporation's Big Sleep Survey. 2014;9(11):e111700.
 21. Ali A, Shaheen S, Ahmed F, Zahid N, Israr N, Zehra DJAJoM, et al. Association of depression, anxiety and stress in medical students studying in modular, semester and annual examination system. 2019;1-8.
 22. Thomée S, Härenstam A, Hagberg M. Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults-a prospective cohort study. *BMC Public Health*. 2011;11(1):66.
 23. Sansone RA, Sansone LA. Cell phones: The psychosocial risks. *Innov Clin Neurosci*. 2013;10(1):33-37.
 24. Billieux J, Philippot P, Schmid C, Maurage P, De Mol J, Van der Linden M. Is dysfunctional use of the mobile phone a behavioural addiction? Confronting symptom-based versus process-based approaches. *Clin Psychol Psychother*. 2015;22(5):460-468.
 25. Mohammadbeigi A, Valizadeh F, Saadati M, Sharifimoghadam S, Ahmadi A, Mokhtari M, Ansari H. Sleep quality in medical students; the impact of over-use of mobile cell-phone and social networks. *Journal of Research in Health Sciences*. 2016;16(1):46-50.
 26. Muhammed H, Umaru Y, Ahmed HJESJ. Impact of mobile phone usage on academic performance among secondary school students in Taraba State, Nigeria. 2016;12(1):1857-7881.

27. Gupta N, Garg S, Arora KJNJoP, Pattern of mobile phone usage and its effects on psychological health, sleep, and academic performance in students of a medical university. *Pharmacy, Pharmacology*. 2016;6(2):132.
28. Elhai JD, Dvorak RD, Levine JC, Hall Bjjoad. Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. 2017;207: 251-9.
29. Tavakolizadeh J, Atarodi A, Ahmadpour S, Pourgheisar A. The prevalence of excessive mobile phone use and its relation with mental health status and demographic factors among the students of Gonabad University of Medical Sciences in 2011-2012. *Razavi Int J Med*. 2014;2(1): e15527.

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