Bioresearch Communications
Volume 06, Issue 01, January 2020
Journal Homepage: www.bioresearchcommunications.com

Letter to Editor

Mobile phone using pattern and the perception amongst university students in Dhaka city

Tasnuva Ferdous[1], Sanzida Shuchi[2], Asma Begum[2], MdShohag Hossen[2], Mohammad Nazir Hossain[3*]

[1]Department of Biochemistry, Primeasia University, Banani, Dhaka, Bangladesh
[2] Department of Biochemistry, Primeasia University, Banani, Dhaka, Bangladesh
[3]Associate Professor, Department of Genetic Engineering and Biotechnology, Bangabandhu Sheikh Mujibur Rahman Maritime University, Mirpur, Dhaka, Bangladesh*

ABSTRACT: In modern days, people are using cell phone not only as telephone but also as a media for text messaging, email, internet access, short-range wireless communications (Bluetooth), gaming and photography.Besides its hazardous physiological effect due to electromagnetic radiations; it can act as a feasible microbiological threat, serving as vehicles to transfer contamination from place to place. This study investigated the extent of mobile phone use amongst university students and thereby explores perceived effect on their academic performance, as well as it determines personal hygiene factors,the relationships between its using pattern and the psychological effect involved with it. A random sampling was employed to identify the students (N=220) who are using mobile for the last one year from different universities in Dhaka city. The data analyzed using SPSS version 18.0 (SPSSInc.) and are summarized as counts and percentages. Key findings from the study state that out of total 109 (49.5%) male and 111(50.5%) female participants, maximum belongs to age range 21-25 years(70%). Of them, male participants are 70.6 % and female are 69.4%. 37.73% students are using cell phone for 3-5 hours mostly for conversation (50.45%).29.4% male and 32.4% female students agreed that cell phone use can hamper their study very much.46.8% male and 19.8% female students are using cell phone in toilet and 67.27% students confessed that they do not use any disinfectant to wash their cell phone. 51.36% students admitted they feel pain on shoulder or hand while using mobile; when 23.39% felt eye discomfort. Most of the students (75%) put mobile under the pillow while 38.64% are using it when the charge is below 30%. Moreover, 45% male and 54% female students are using it at late night. This exploratory study may be helpful as a preliminary background for further research in this field.

Article History
Received: 12 September 2019
Accepted: 05 December 2019

Scan the QR code to see the online version or,visit- www.bioresearchcommunications.com

Corresponding author
Mohammad Nazir Hossain
Department of Genetic Engineering and Biotechnology, Bangabandhu Sheikh Mujibur Rahman Maritime University, Mirpur, Dhaka, Bangladesh
Email: polash0306@gmail.com
Phone:

Citation: Tasnuva Ferdous, Sanzida Shuchi, Asma Begum, MdShohag Hossen and Mohammad Nazir Hossain; Mobile phone using pattern and the perception. ***Biores Comm.*** 6(1), 872-881

INTRODUCTION

The mobile phone is one of the most promptly growing new technologies in the world,creating an emergent "mobile youth culture" [1].A cell phone is a device that can make and receive telephone calls over a radio link whilst moving around a wide geographic area. In the 21st century this device has been becoming an essential part of everyday life because we are moving into an era when mobile devices are not just for talking

and texting, but can also accessto many internet facilities. Therefore, comparatively more hours are spent on a smartphone than on a conventional phone [6]. Cell phones are considered as a mixed blessing, as teen agersthink mobiles make their lives easy and more convenient, since they also quote new tensions connected to it [2].

By the end of 2010, however, cell phone subscriptions had reached five billion worldwide [23].Obviously, this increase includes a sharp increase in the number of cell phones used by the younger generations [18].In various studies, the unregulated usage and over dependent attitude on these devicesis observed among the youth which could have a serious effect on their academic performances. In an attempt to discuss about the issue of this topic on phones and its usage via the internet, various observations have been seen among student using the phones for visiting social platform, such as the Facebook, Twitter, 2go, Myspace and instant messengers like whats app, Imo, Line, Viberduring academic periods and off academic periods indicating that the internet phones have a strong effect on the students. [23]

It should be pointed that, the usage of mobiles are not intended for negative purpose and influence; however, the attitude and time conducted towards these devices has dominated the student, also making them addicts. A study by the University of Navarra affirms that young people between 15 and 19 admit being addicted to their cell phones (Naval et al., 2004). Also, British scientists noted that more and more people are getting addicted to their cell phones, causing stress and irritability (BBC, 2006). While specialists indicate that the abuse of the use of cell phones could be typified as 'a disorder of addiction that has to be stopped as soon as possible' (Paniagua, 2005).

The mobile phone is apparently a useful tool for health progression. Mobile applications may offer effective ways to promotes one's lifestyle, for example, by increasing physical activity [7], controlling weight [8, 9], and treating obesity [10]. On the other hand, when used excessively, it couldcause physical [11–13] and psychological [14, 15] health problems. Studies showed that mobile phone use at late night negatively impacts sleep outcome [6, 17]. This may be due to exposure to bright light and electromagnetic radiation from electronic devices, disturbing high volume rhythms and then hampering sleep quality [16–18]. Mobile phone overuse may also cause the risk of mobile phone addiction [4, 14], thus contributing to poor sleep quality [13, 14, 19, 20] and psychological problems such as depression and anxiety [13, 21, 22]. Extensive usage of smartphones has an effect on human's brain, upper extremities, back, and neck. [23]

With the advent of the mobile phone, telephony has completely permeated in public space, with people talking on the phone in most public places, such as buses, swimming pools, streets, shopping centers, gyms etc. Interactions between microorganisms and contact material surfaces play an important role in biology and different technologies, including the food, pharmacy and service industries [3].Contaminated hands of mobile phone users play a major role in spreading infections into other areas. Hand hygiene is one of the most important preventive interventions against the spread of infections [4].

A world-wide promotion of smartphones and a little knowledge about their side effects triggered us to start a research on the extent of mobile phone using pattern of university students which relates to their everyday life.Thissurvey-based researchwas to identify the side effect of using smartphones among users agedbetween 15-35. Focusing on overall hours spent on mobile phone per day, this cross sectional study aims to investigate the prevalence of using mobile phone among university students, as well as the physiological effect and hygiene factors related to it. Findings from this study may be useful to the university students as they will understand the way they use the mobile phone and the consequences of its inappropriate use. Researchers will find some information from this study which can enhance their understanding and ability to provide guidance that inspires positive mobile computing activities.

MATERIALS AND METHODS

This was an observational cross-sectional study performed from 1 September 2018 to 1 November 2018 among some private university students in Dhaka city. The universities were being selected following random sampling method which included Primeasia University, Bangladesh University of Business and Technology, Caledonian College of Nursing, Daffodil University,City University and Dhaka University. A convenience sampling method was applied to find a total of two hundred and twenty (220) students from different level academic background.Self-administered questionnaires were distributed among students with informed consent(both verbal and written). The questionnaire was then filled by the students and returned back to our questionnaire administrators. The questionnaire consisting four parts is mentioned here:

A) General

1. How long have you been using cell phone? a)less than one year b) more than one year
2. How much time do you spend on mobile phone? (on hours) a) <1 b)1-3 c) 3-5 d) >5
3. How much money do you spend on mobile per day?

a)<20 tk b) 20-50 tk c) 50-100 tk d) >100 tk e) Do not know

B) Hygiene :

1. Do you use cell phone in toilets? a) yes b) no

2. How frequently do you clean your cell phone? a) every day b) each month c)twice in a month d) rarely e) never
3. Do you Use any disinfectant/alcohol to clean cell phone? a) yes b) no
4. Do you have any restrictions using phone while working on lab or clinics? a) yes b) no
5. Do you clean your mobile after sneezing or coughing holding your phone? a) yes b) no
6. Do you take food while using cell phone? a)Always b) Sometimes c) Rarely d) Never
7. In which hand do you hold your cell phone most of the time? a)right hand b)left hand
8. In which place do you keep your cell phone? a) chest pocket b) pant pocket c) bag
9. Do you use hand cleaner after touching mobile? a)Very much b) Much c)Somewhat d) Rarely e) Never
10. Do you wear finger ring? a) yes b) no
11. Do you use a phone cover? a) yes b) no
12. If yes, how much frequently do you change the cover? a) every day b) each month c)twice in a month d) rarely e) never
13. Do you share your cell phone with others? a)Very much b) Much c)Somewhat d) Rarely e) Never
14. Do you use hand wash/ soap before meal after using mobile? a)Always b) Sometimes c) Rarely d) Never
15. How often you cut your nails? a) weekly b)1-2 weeks c)3-4 weeks d) more than a month e) do not know
16. Do you brush your teeth at night? a)Always b) Sometimes c) Rarely d) Never

C) Using Pattern:

1. What is the reason of your using mobile? a)Conversation b) Entertainment c) Texting d) Using alarm or calculator e) Other
2. Frequency of text massaging (sending or receiving per day) a) <5 b) 5-10 c) 10-20 d) >20
3. Duration of calls per day (in hours) a) <1 b)1-3 c) 3-5 d) >5
4. Do you think your usage hamper your study? a)Very much b) Much c)Somewhat d) Rarely e) Never
5. Scenario of keeping phone mute a) while in class b) in work c)At movie or concert d)while driving e) while sleeping f)Never
6. Do you use phone while crossing road or driving? a) Never b) Sometimes c) Always d) rarely
7. Scenario when phone is turned off?
   a) While in class b) In work c) At movie or concert d) while driving e) while sleeping f)Never
8. What time do you use your phone mostly? A)Morning b) After noon c) Evening d) Late night
9. Do you feel safe while using mobile while crossing road or driving? a) yes b) no
10. Is it okay to talk loudly in phone on public place? a) yes b) no
11. Do you think you are using phone too much? a) yes b) no
12. Are you trying to reduce using phone? a) yes b) no
13. Do you think students are adopting non-standard languages through SMS texting? a) yes b) no
14. Do you share educational material through mobile? a)very much b) much c)Somewhat d) Rarely e) Never
15. Do you think mobile can increase academic performance of students? a)very much b) much c)Somewhat d) Rarely e) Never
16. Do you think cell phone use can decrease parental control a)Very much b) Much c)Somewhat d) Rarely e) Never

D) Physiological effect:

1. Have you experienced any discomfort or pain in shoulder or hand after prolonged use of mobile? a) Always b) Sometimes c) Rarely d) Never
2. Have you experienced tangling sensation/ numbness in your arm/shoulder/finger after prolonged use of mobile? a) Always b) Sometimes c) Rarely d) Never
3. Which symptoms have you experienced after prolonged use of mobile? (You might have more than one answer)

a) Headache b) Fatigue c) Distraction d) Insomnia e) Eye discomfort f) Body ache g) loss of attention h) Memory loss i) Neck pain j) feeling stressed k) feeling restless l) Anxiety m) Low self esteem n) Other…….

4. Do you put your mobile under the pillow during sleep?

The first part contained questions on demographic information of the respondents; such as gender, age, profession. Second and third part represented about the hygiene and physiological issues respectively, fourth part focused on the using pattern of cell phone. Ethical approval was taken from the Scientific Research Committee of Primeasia University, Dhaka and performed in accordance to the Helsinki Declaration. The data collected were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 18.0 (SPSS Inc.) and were summarized as counts and percentages.

RESULT

Two hundred and twenty (220) university students from Dhaka in Bangladesh are counted in this study .Table 1 shows the result of demographic variables and the status of Cellular Phone using Pattern. The relationship of two

demographic factors (gender, age) with the condition of Cellular Phone using Pattern is examined.
Demographics of study participants are summarized in the representing table 1.The location of study respondents are Dhaka. Study respondents are more likely to be females who are 50.5% while the remaining 49.5% are males. Figure 1 represents the prevalence of using cellular phone on the basis of their different age groups.

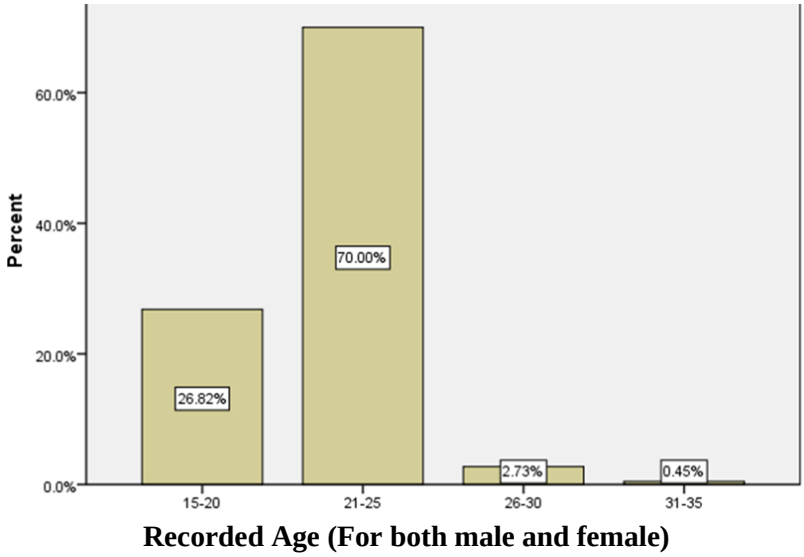
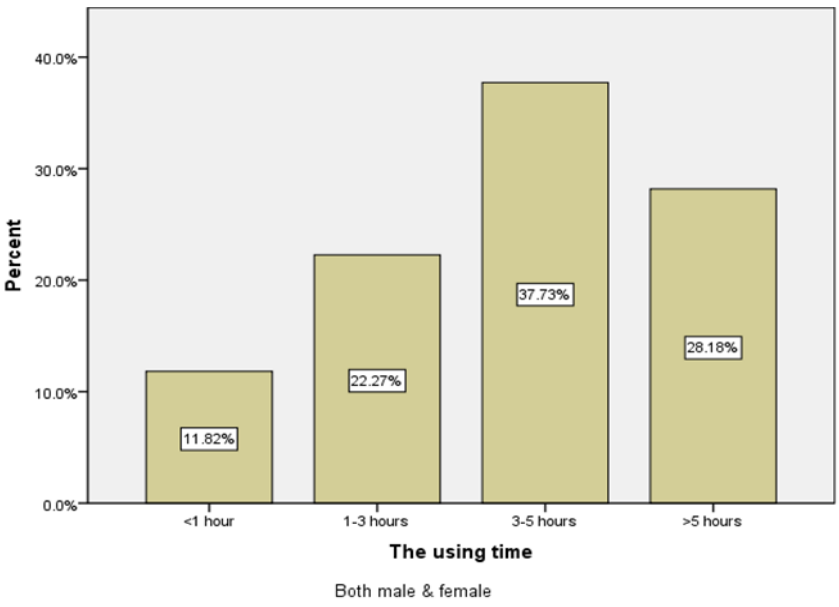


Figure 1. Mobile phone using pattern in different age groups (n=220)

Figure1 shows prevalence of using cell phone is high among the age group of 21-25 years (70%) and among 15-20 years it is 26.82%.
Figure 2 represents mobile phone using Pattern Based on Different Time Limits.



The using time (in hours)

Figure 2. Using Pattern Based on Different Time Limits (n=220).

This graphs shows the time limits of both male and female/s regarding using cellular phone. It seems 37.73% of students are using mobile phones for3-5 hours per day and 28.18% student use cellular phone for more than 5 hrs.

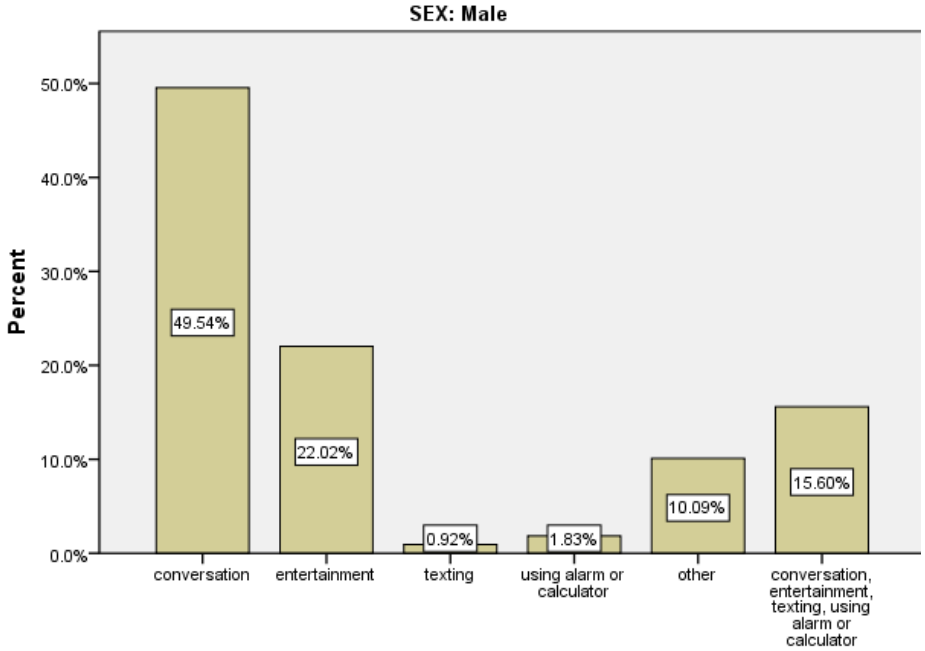


Figure 3. Reasons for using cell phone for male (n=109)

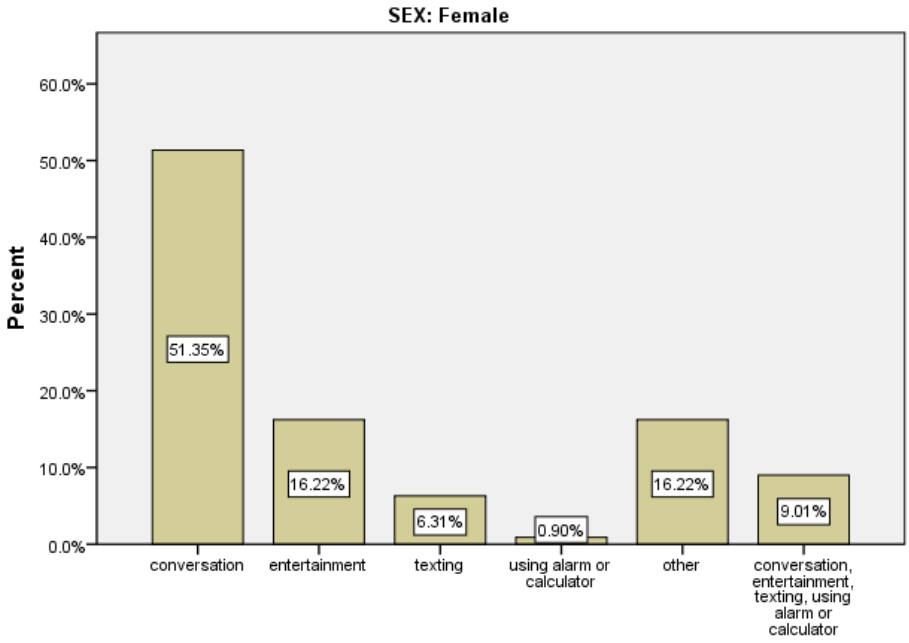


Figure 4. Reasons for using cell phone for female (n=111)

From figure 3 we can see out of total 109 male students, 49.5% are using cellular phone for conversation whereas 22% of them are using for entertainment purpose. Figure 4 represents out of total 111 females 51.4% are using cellular phone for conversation, 16.2% of them are using for entertainment purpose. Figure5represents about the pattern of using dis-infectants for washing cell Phone.

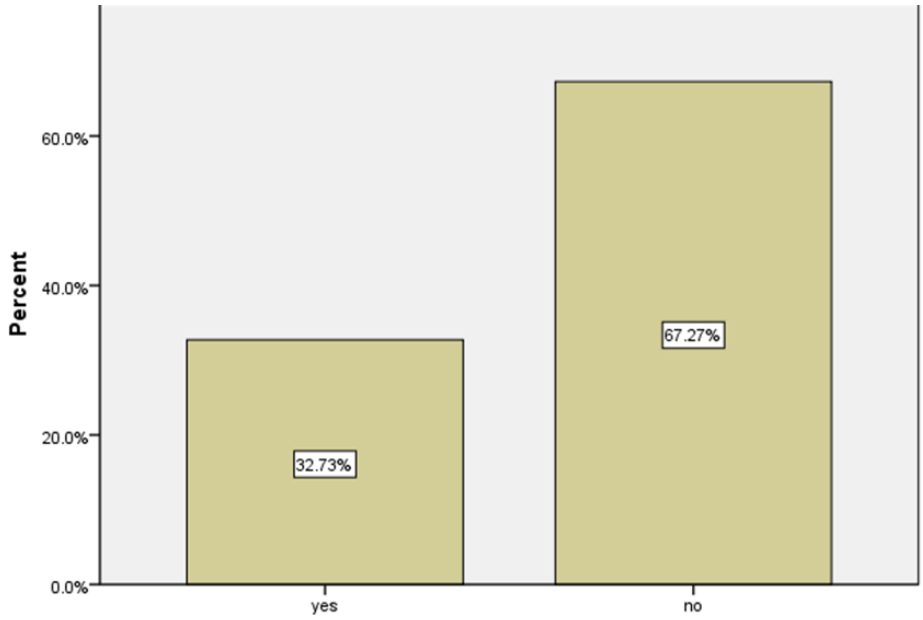


Figure 5. Using dis-infectants for washing cell Phone (n=220)

The figure 5 shows in this issue; 32.73% said YES, and 67.27%said NO. This study can be compared with the study conducted in Nigeria where 62% respondents do not use any disinfectants.[42]Disinfectants means chemical liquid that destroys bacteria, such as 70% isopropyl alcohol or ethyl alcohol. The proper use of medical disinfectants can help to prevent the spread of harmful bacteria and viruses. Many infectious diseases can be halted by the proper use of medical disinfectant products, and by the routine disinfection and sterilization of hand hold devices. One study conducted in Slovakia significantly proves the impact of using disinfectants.Their results revealed reduction of contamination with antibacterial wet wipe led to a significant reduction of microbial contamination of surfaces, with effect ranging from 36.8 to 100%.[45

Figure 6 represents the frequency of feeling discomfort while holding mobile for a long time.

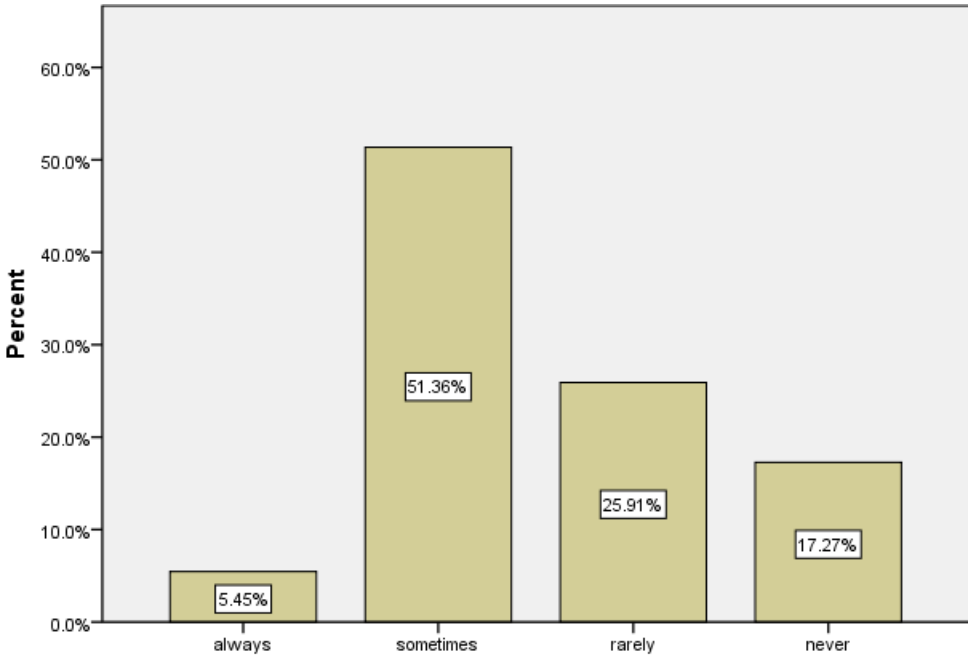


Figure 6. Frequency of feeling discomfort while holding mobile for a long time (n=220)

Figure 6 shows 51.36% students admit that, they sometimes fell discomfort while holding mobile for too long.

Figure 7 represents about symptoms experienced after prolonged use of mobile. All that staring from frequent phone use, computer use, and TV-watching can all lead to eye strain, an eye health issue that, when

found in this context, is often called Computer vision Syndrome. Blue Light from mobile Phone May Be Permanently Damaging eyes. Too much screen time can wreck eyes. Smart phones, laptops, and other handheld devices all transmit light. These reactions within the eye can be poisonous to the photoreceptor cell molecules rendering them damaged[43]. From this figure we find that the highest number of students (23.39%) fell eye discomfort which is followed by headache (16.06%). Various studies show the connection between cell phone usage and physical state of the users' health. Some studies report that users complain about a headache, hand tremor and finger discomfort. This data can be compared with a study by a group of Korean scientists from Injr University. The result concluded "a significant association between the total times spent using a mobile device each day and pain in the right shoulder, and between times spent internet browsing and pain at the base of the right thumb."[44]. Rajan Balakrishnan and Elanchezhian Chinnavan conducted another research on the extensive usage of handheld devices and their impact on musculoskeletal disorder. In their work the scientists acknowledged that "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 cellphone user regarding the seriousness of this matter". [44] Another interview based study performed in America can be stated here. The Interview results revealed that extended usage of smartphones/HHDs affected human health. Mainly, prolonged usage of smartphones/HHDs increased tension on muscles such as upper trapezius, extensor pollicis longus and abductor pollicis and caused eye tension and fatigue. In this study, 90% respondents felt pain in shoulder and hand, 60% had symptoms such as a headache, fatigue, distraction, inattention after using mobile phone more than two hours, and 100% respondents felt eye tension after prolonged smartphones/HHDs usage [44].

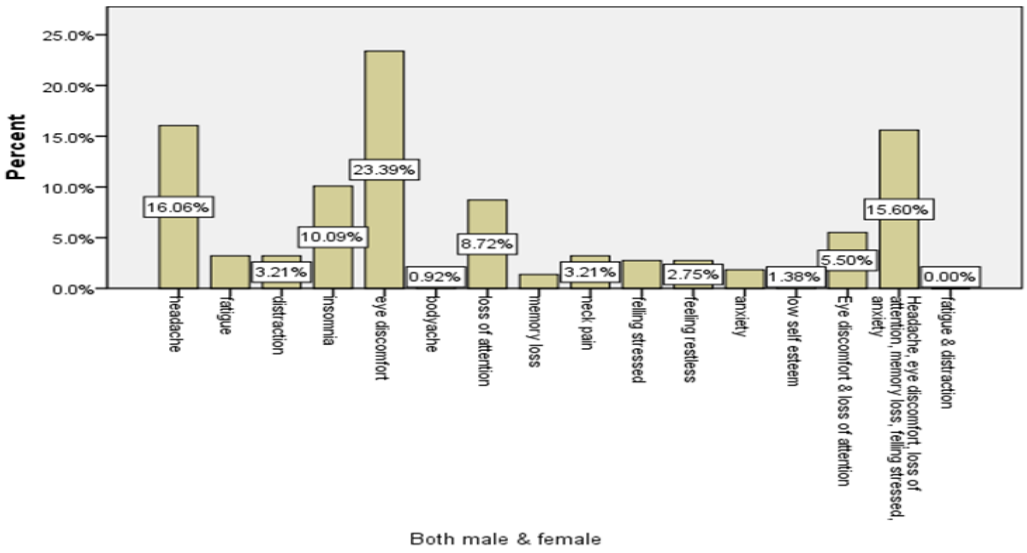


Figure 7. Symptoms experienced after prolonged use of mobile (n=220)

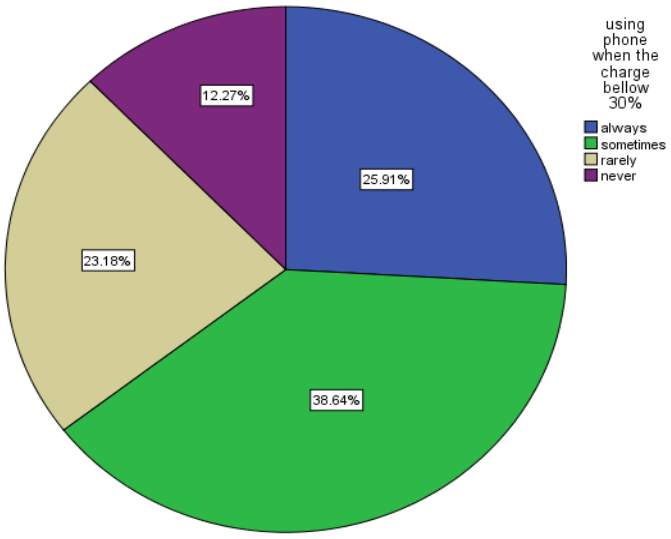


Figure 8. Frequency of using phone below 30% charge.

The pie chart represents (Figure 8) the highest number of students (38.64%) in green area showing sometimes, followed by 25.91% (blue area) admits always while 23.18% students are using cell phone rarely when the charge in below 30%. Low battery and high cell phone radiation do not form a causal relationship, but there is an indirect relationship. According to wiki, it is erroneously assumed that a cell phone with lower battery has higher radiation. The key variable is the quality of the network. Low network quality causes battery drainage and also high radiation. Various studies indicate that the emissions from a cell phone can be extremely harmful, causing genetic damage, tumors, memory loss, increased blood pressure and weakening of immune systems. Increase risk of brain tumor in people who have used a mobile phone for a long time. [46]

DISCUSSION

The pattern of using mobile phones relates to hygiene and physiological effects, as previous studies identified, is much higher in developing countries than developed countries. The present study showed how mobile phone using pattern is associated with hygiene issues as well as excessively long hours of mobile phone use is allied with some physiological effect. Our practice focused among 220 university students in Dhaka city. In Kenya,the data comprised of 100 percent mobile users among university students and distributed into 55% male and 45 % female; a well distributed age groups from 19 to 25.Most of the users (77 %) spent 1-3 minutes to make their calls [39]. The other studies done in Malaysia recorded a total of 26 thousands users during that year. More than half (56.4%) of the users were males and the rest (43.6%) were females. The survey further revealed that the main users of the mobile phone were those ranging in age from 20 to 49 years. While pre-teens and students below 19 years old make up 20.9% and the elderly consists of 12.3% [40]. These date is comparable to the present study which showed that female students used mobile phones slightly higher (50.5%) than males (49.5%). The highest using age ranged between 21-25 (70%) compared to the study done in Kenya [39].Many studies also indicated that women anticipated to overuse online applications for social function or communication, such as e-mail, chat, and SNS [26–28].Thus, female adolescents, particularly, should be more careful to avoid mobile phone overuse. Additionally, It is reported that internet addiction can be forecasted by the use of SNS (e.g., Facebook, Twitter or Instagram) and chat rooms [30,31]; and that the use of SNS endorsed to psychological distress and suicidal attempts [32,33].Moreover, overuse of online communication was more likely to cause sleep disturbances and stress among women [29]. Among adolescents in Hong Kong, long hours of mobile phone use were correlated with short sleep duration, poor sleep quality, and excessive daytime sleepiness [24]. Another study in Japanese high school students reported that long hours of mobile phone use was associated with short sleep time and fatigue [25].Compared to the another study done in Ghana, the research revealed that 20.0% of the respondent always listening to music on their mobile phones, playing games 7.9%, watching movie 2.0%, social networking 46.5% , work-related research 12.9%, educational related research 17.8%, religious programmers 3.2%, personal finance 15.0%, current events 3.2% and making and receiving calls 65.0%. The research also looked at the duration of usage by the students at school, home and at the work place. When it comes to using the mobile phone at home 32.0% said they spent 7 hours or more on their mobile phone at home, 9.9% spent 7 hours or more at school and 3.5% spend the same hours or more at the office [41].Sampasa-Kanyinga and Lewis [33] reported that using SNS for more than 2 h every day was independently associated with poor self-rating of mental health, high levels of psychological distress and suicidal ideation, which is related to our study. More than half of the students felt discomfort (51.36%) such as eye discomfort (23.39%) or felt headache or anxiety (15.60%).

According to a previous study [34], 32 % of people use their mobile phone in toilet and almost half of the people do not wash their hands after using it [35-38], everyone needs to be conscious that the transfer of potentially pathogenic microorganisms on the mobile phone surfaces is very natural. Which relates to our study where we see about 46.8% male students are using mobile phone in toilets and more than half of the students do not wash their mobile at all. According to Cuttler et al. [35], 16 % of hands and 16 % of phones were found to harbor bacteria of a faecal origin, where those who had bacteria on their hands were more likely to have bacteria on their phone as well. In such situations, hand washing is the simplest and also the most effective measure to prevent the spread of agents responsible for communicable diseases.

CONCLUSION

This study was carried out in an attempt to understand the behavior of mobile phone users among university students. The effect of cell phones and their influence on human health are still being tested and studied. Mobile phone use has been hugely accepted by Bangladeshi students especially in Dhaka. Born in this technological era, it is seen that users not only espouse the technology for simple use, but also they are actually adopting the technology according to their lifestyle and individual desires.

The findings from this study may be used as a foundation for other researchers who intend to ex-amine how mobile phones are used among students, as well as other issues relating to it. Data obtained from the present study provided baseline information regarding

the patterns and problems of mobile phone usage, and psychological health of university students.

However, the present study had some limitations. The present subjects were limited to participants in some of the private universities in Dhaka city, so the findings from this study cannot be largely generalized to other areas of the country. Furthermore, the questionnaires were self-administered; thus the reliability and validity of the information obtained depended solely on the honesty of the respondents. Despite the limitations, the current study should provide the motivation for new investigations to refine the understanding of mobile phone use amongst university students. Further research could be investigated which could shape the mobile phone behaviors of the students.

ACKNOWLEDGEMENT

We would like to express our gratitude to all the students who participated in this study and cordially helped by providing their information to clarify our thoughts through the study

REFERENCES

1. Castells, Fernandez-Ardevol, Qiu, and Sey, (2007), Mobile Communication and Society: A Global Perspective, J. of information technology and politics, 154-155.
2. Amanda Lenhart,(2010), Teens and Mobile Phones, Pew Research Center's Internet & American Life Project Rich Ling, ITU, Copenhagen, Telenor and University of Michigan Scott Campbell, University of Michigan
3. Andrej OVCA , Barbara REDNAK , Karmen TORKAR , Mojca JEVŠNIK , Martin BAUER,(2012) Students' mobile phones – how clean are they?, International Journal of Sanitary Engineering Research, vol 6;6-18
4. NCCNSC.: National Collaborating Centre for Nursing and Supportive Care (UK) 2003. Infection Control-Prevention of Healthcare-associated Infections in Primary and Community Care. London: Thames Valley University.
5. SafiekMokhlis, AzizulYadiYaakop, (2012), Consumer Choice Criteria in Mobile Phone Selection: An Investigation of Malaysian University Students, International Review of Social Sciences and Humanities, vol. 2(2); 203-212
6. Lemola, S.; Perkinson-Gloor, N.; Brand, S.; Dewald-Kaufmann, J.F.; Grob,(2015), A. Adolescents' electronic media use at night, sleep disturbance, and depressive symptoms in the smartphone age. J. Youth Adolesc., vol 44, 405–418,
7. Benson, A.C.; Bruce, L.; Gordon, B.A. (2015), Reliability and validity of a GPS-enabled iPhone "app" to measure physical activity. J. Sports Sci., vol 33; 1421–1428
8. Mameli, C.; Brunetti, D.; Colombo, V.; Bedogni, G.; Schneider, L.; Penagini, F.; Borsani, B.; Zuccotti, G.V.,(2016), Combined use of a wristband and a smartphone to reduce body weight in obese children: Randomized controlled trial. Pediatr. Obes.vol 13(2); 81-87
9. Pellegrini, C.A.; Duncan, J.M.; Moller, A.C.; Buscemi, J.; Sularz, A.; DeMott, A.; Pictor, A.; Pagoto, S.; Siddique, J.; Spring, B.(2012), A smartphone-supported weight loss program: Design of the ENGAGED randomized controlled trial. BMC Public Health, vol12, 1041
10. O'Malley, G.; Clarke, M.; Burls, A.; Murphy, S.; Murphy, N.; Perry, I.J.,(2014), A smartphone intervention for adolescent obesity: Study protocol for a randomised controlled non–inferiority trial. Trials, vol 15(43); 1-6
11. Chiu, C.T.; Chang, Y.H.; Chen, C.C.; Ko, M.C.; Li, C.Y.,(2015), Mobile phone use and health symptoms in children. J. Formos. Med. Assoc., vol. 114; 598–604.
12. Zarghami, M.; Khalilian, A.; Setareh, J.; Salehpour, G.,(2015), The impact of using cell phones after light-out on sleep quality, headache, tiredness, and distractibility among students of a university in north of Iran. Iran J. Psychiatry Behav. Sci.,vol 9
13. Cerutti, R.; Presaghi, F.; Spensieri, V.; Valastro, C.; Guidetti, V.(2016), The potential impact of internet and mobile use on headache and other somatic symptoms in adolescence. A population-based cross-sectional study. Headache, vol 56; 1161–1170
14. Demirci, K.; Akgonul, M.; Akpinar,(2015), Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. J. Behav. Addict,vol 4; 85–92,
15. Sahin, S.; Ozdemir, K.; Unsal, A.; Temiz, N.,(2013), Evaluation of mobile phone addiction level and sleep quality in university students. Pak. J. Med. Sci.,vol 29; 913–918
16. Exelmans, L.; van Den, B.J.,(2016), Bedtime mobile phone use and sleep in adults. Soc. Sci. Med,vol 148; 93–101,
17. Fossum, I.N.; Nordnes, L.T.; Storemark, S.S.; Bjorvatn, B.; Pallesen, S.,(2014), The association between use of electronic media in bed before going to sleep and insomnia symptoms, daytime sleepiness, morningness, and chronotype. Behav. Sleep Med, vol12; 343–357
18. HarukaTamura,Tomoko Nishida, Akiyo Tsuji,and HisatakaSakakibara,(2017), Association between Excessive Use of Mobile Phone and Insomnia and Depression among Japanese Adolescents, Int J Environ Res Public Health, vol 14(7); 701.
19. Cain, N.; Gradisar, M,(2010), Electronic media use and sleep in school-aged children and adolescents: A review. Sleep Med.,vol 11; 735–742,
20. Mohammadbeigi, A.; Absari, R.; Valizadeh, F.; Saadati, M.; Sharifimoghadam, S.; Ahmadi, A.; Mokhtari, M.; Ansari,(2016), Sleep quality in medical students; the impact of over-use of mobile cell-phone and social networks. J. Res. Health Sci , vol. 16; 46–50.
21. Mak, Y.W.; Wu, C.S.; Hui, D.W.; Lam, S.P.; Tse, H.Y.; Yu, W.Y.; Wong H.T.,(2014), Association between screen viewing duration and sleep duration, sleep quality, and excessive daytime sleepiness among adolescents in Hong Kong. Int. J. Environ. Res. Public Health, vol11; 11201–11219
22. Augner, C.; Hacker, G.W, (2012), Associations between problematic mobile phone use and psychological parameters in young adults, Int. J. Public Health, vol 57; 437–441
23. Leonid Miakotko,(2017), The impact of smartphones and mobile devices on human health and life, American Journal of Educational Research vol 5(5);564-567
24. .Mak, Y.W.; Wu, C.S.; Hui, D.W.; Lam, S.P.; Tse, H.Y.; Yu, W.Y.; Wong H.T,(2014), Association between screen viewing duration and sleep duration, sleep quality, and excessive daytime sleepiness among adolescents, Int. J. Environ. Res. Public Health, vol 11(11); 11201-19.
25. Kayoko Ikeda and Kazutoshi Nakamura,(2014), Association between mobile phone use and depressed mood in Japanese adolescents: a cross-sectional study, Environmental Health and Preventive Medicine,vol19(3);187-193
26. Haruka Tamura, Tomoko Nishida, Akiyo Tsuji, and HisatakaSakakibara,(2017), Association between Excessive Use of Mobile Phone and Insomnia and Depression among Japanese Adolescents, Int J Environ Res Public Health, vol. 14(7)
27. Rosanna E. Guadagno, Nicole L. Muscanell, Lindsay M. Rice, and Nicole Roberts, (2013), Social Influence Online: The Impact of Social Validation and Likability on Compliance, Psychology of Popular Media Culture, vol. 2(1); 51-60
28. Barker, Valerie,(2009), Older Adolescents' Motivations for Social Network Site Use: The Influence of Gender, Group Identity, and Collective Self-Esteem, : Cyberpsychology& behavior : the impact of the Internet, multimedia and virtual reality on behavior and society,vol.12(13)

29. : Okajima I1, Nakajima S, Kobayashi M, Inoue Y,(2013), Development and validation of the Japanese version of the Athens Insomnia Scale., Psychiatry and clinical neurosciences,vol.67(6);420-425.
30. Yadav P, Banwari G, Parmar C, Maniar R.,(2013), Internet addiction and its correlates among high school students: a preliminary study from Ahmedabad, India, Asian J Psychiatr.,vol. 6(6);500-5.
31, Kormas G1, Critselis E, Janikian M, Kafetzis D, Tsitsika A.(2011), Risk factors and psychosocial characteristics of potential problematic and problematic internet use among adolescents: a cross-sectional study., BMC Public Health,vol.11,595:1-8
32. Sampasa-Kanyinga , Hamilton,(2015), Social networking sites and mental health problems in adolescents: The mediating role of cyberbullying victimization, The Journal of the European psychiatric association,vol.30 (8); 1021–1027
33. Sampasa-Kanyinga , Lewis ,(2015), Frequent Use of Social Networking Sites Is Associated with Poor Psychological Functioning Among Children and Adolescents, Cyberpsychology, Behavior, and Social Networking,vol.18(7)
34. Samsung Galaxy. Users Guide: http://admin.gsmaparati.com/upload/documents/7456241734325886.pdf (25. 8. 2011).
35. A. Ovca, B. Rednak, K. Torkar, M. Jevšnik, M. Bauer,(2012), Students' mobile phones – how clean are they? International Journal of Sanitary Engineering Research, vol. 6(1)
36. Jereb G. Likar K. Umazaneroke – grožnjanašemuzdravju. V: ZbornikradovaMeđunarodnistručno – znanstvenisimpozijSanitarnoinženjerstvo – Sanitary engineering, Opatija, 9. do 11. 3. 2006. Rijeka: Hrvatskaudrugazasanitarnoinženjerstvo. HUSI, 2006.
37. Dr Christina M Pollard, XingqiongMeng , Sophe Williamson , Jim Dodds , Colin W. Binns1 (2013) Eating out is associated with self-reported food poisoning: a Western Australia population perspective 1998 to 2009, Public Health Nutrition
38. JaeMin Cha, Carl Borchgrevink, SeungHyun Kim, handwashing behaviors in foodservice establishment restrooms: an observational study, The School of Hospitality Business Michigan State University.
39. Richard KipkemoiRonoh, (2014), Usage Patterns of Mobile Phones amongst University Students in Kenya, International Journal of Science and Research,3 (9)
40. David North, Kevin Johnston, and Jacques Ophoff,(2014), The Use of Mobile Phones by South African University Students, Informing Science and Information Technology,vol.11;115-138
41. Samuel Chris Quist , Henry Osborn Quarshie (2014), The Use of Mobile Phones among Undergraduate Students-a Case in Ghana, South American Journal of Academic Research
42. Kabir O. Akinyemi, Audu D. Atapu , Olabisi O. Adetona and Akitoye O. Coker (2014), The potential role of mobile phones in the spread of bacterial infections, J Infect Dev Ctries 2009; 3(8):628-632.
43. Jun Hyung Moon, Kyoung Woo Kim and Nam Ju Moon, ((2016) Smartphone use is a risk factor for pediatric dry eye disease according to region and age: a case control study, 16:188,1-7
44. Leonid Miakotko, The impact of smartphones and mobile devices on human health and life Retrieved from, https://www.nyu.edu/classes/keefer/waoe/miakotkol.pdf
45. Jana Koscova,,Zuzana Hurnikova,and Juraj Pistl, (2018), Degree of Bacterial Contamination of Mobile Phone and Computer Keyboard Surfaces and Efficacy of Disinfection with Chlorhexidine Digluconate and Triclosan to Its Reduction, Int J Environ Res Public Health, 15(10): 2238
46, Nidhi Saikhedkar, Maheep Bhatnagar, Ayushi Jain, Pooja SukhwalChhavi Sharma, Neha Jaiswal (2014), Effects of mobile phone radiation (900 MHz radiofrequency) on structure and functions of rat brain,Neurological research,1-8