Original Research Article

Mobile phone usage pattern and its health effects among medical students in north Karnataka: an observational study

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ABSTRACT

Background: The mobile phone is viewed as an important communication tool and is an integral part of the human society in the present era. Medical students use smart phones for note taking, imaging, web browsing, text books, question banks etc. Excessive mobile phone use has been found to be associated with health problems such as impaired concentration, headache, fatigue, thermal sensations in and around ear, stress, sleep disturbances and frustration. Objective was to explore the mobile phone usage pattern and its health effects among medical students.

Methods: An observational study was conducted among medical students of Belagavi. The calculated sample size was 277 after taking the prevalence of mobile phone usage pattern of 76.4%. The questionnaire consists of socio-demographic characteristics, pattern of mobile phone usage like mode of use, time of maximum use etc. and the health effect variables like headache, restlessness, neck pain, painful fingers etc. Statistical analysis was done using MS-Excel 2007 and SPSS v 22, proportion and chi-square test was applied and \( p<0.05 \) was considered significant.

Results: 98.19% were using smart phone and 85.56% were having single phone. Maximum were using for 2-4 years (42.60%). Internet was used for academic purpose in 89.89%. Majority of them experienced eyes symptoms (55.23%) followed by sleep deprivation (46.21%) and headache (42.60%).

Conclusions: Even though mobile phone has positive role in our daily lives, its overuse leads to negative impact on health, sleep, and academic performance of students.

Keywords: Mobile phone, Usage pattern, Health, Medical students

INTRODUCTION

The mobile phone is a modern-day communication invention, which has helped to reach the different parts of the world. Technological development in field of communication have made mobile phone smart enough to be able to make video calls, surf the internet, play games etc.

The usage of mobile internet has seen a more than threefold increase since 2010, which has reached 6.319 billion in April 2019.1 The rapid upheaval of technology and storming fast internet has led to an enormous growth in the number of smart phone users in India. India ranks second in terms of telecommunication, subscription, internet subscribers and application downloads globally.2 Out of 830 million young people who are online, 320 million (39%) are in India and China.5

Today, the potential of smartphone as an educational tool has started to gain recognition Smartphones are used for various purposes by medical students viz., note taking, cloud storage, imaging, web browsing, clinical handbooks and text books, question banks, medical calculators, simulation apps etc.11
Mobile phone excessive use has been found to be associated with health problems such as impaired concentration, headache, dizziness, fatigue, thermal sensations in and around ear, facial dermatitis, stress, sleep disturbances owing to night time use, and frustration. Hence the study was conducted to know the usage pattern of mobile phones and the health effects among medical students.

METHODS

An observational study was conducted among the medical students of BIMS, Belagavi. The calculated sample size was 277 by taking 76.4% usage pattern of smart phone from a study conducted by Gupta et al with 95% confidence interval and 5% absolute error. It was two months study from August 2018 to September 2018. The study was conducted after the Ethical clearance from IEC of BIMS, Belagavi. All the medical students were included in the sampling frame except the first year as they were on post university exam leave and they were explained about the purpose of the research. The questionnaires were distributed to the respondents and were asked to fill it up after giving the informed consent. It was a self-administered, pre-designed, pre-tested semi-structured questionnaire. The questionnaire comprised of socio-demographic characteristics, pattern of mobile phone usage (mode of use, time of maximum use, etc.), behavioural pattern (midnight checking of mobile, early morning checking, restroom usage), their opinion on mobile phones and the health effect variables experienced like headache, restlessness, fatigue, neck pain, painful fingers etc.

Inclusion criteria

All the medical students were included to participate in the study.

Exclusion criteria

Students who did not give informed written consent.

Statistical analysis

Data was analysed using MS-Excel 2007 and SPSS v 22, proportion and Chi-square test was applied and p value <0.05 was considered significant. Results were presented in form of tables and figures.

RESULTS

Out of a total of 277 student participants, 62.09% were males and 37.91% were females. Majority of them were in the age group of 21-23 years (51.99%) as shown in the (Table 1).

85.56% (237) had one mobile phone and only 5.42% (15) were having three mobile phones and 98.19% were having smart phones and both keypad and smartphone was owned by 1.44% of them. Among them 11.55% were using mobile phone for more than six years and 42.60% were using since 2 to 4 years. As far as the behavioural pattern is concerned 23.83% of study participants kept the mobile under the pillow while sleeping, only 7.58% of them switched off their phone during sleep, 21.30% of them check the mobile for any missed calls or messages at midnight and 65.70% of them were checking the mobile as soon they get up from the bed. The usage of mobile phone among medical students in the classroom during the break time was 48.43%, 6.86% driving and 91.70% were using for study purpose (Table 2).

Table 1: Socio-demographic profile of medical students (n=277).

| Age (years) | Number of students |
|-------------|--------------------|
| 18-20       | 162 (58.48)        |
| 21-23       | 144 (51.99)        |
| >24         | 1 (0.36)           |

| Gender | Number of students |
|--------|--------------------|
| Male   | 172 (62.09)        |
| Female | 105 (37.91)        |

| Religion | Number of students |
|----------|--------------------|
| Hindu    | 261 (94.22)        |
| Muslim   | 9 (3.25)           |
| Christian| 3 (1.08)           |
| Others   | 4 (1.44)           |

| Socio-economic status | Number of students |
|-----------------------|--------------------|
| I                     | 172 (62.09)        |
| II                    | 59 (21.29)         |
| III                   | 31 (11.19)         |
| IV                    | 7 (2.53)           |
| V                     | 8 (2.89)           |

Students’ opinion on usage of mobile phone was as such- 47.65% thought it as academic hinderance and 66.06% as distractions but 93.14% of them had an opinion that mobile phones are beneficial for studies. 30.69% said that mobile phone is boring but normal. 46.25% said they have faced decline in study habits and grades (Table 3).

Internet used for academic purpose was 89.89%, entertainment 97.75% and for social networking 89.53% by the participants (Table 4).

46.21% faced sleep deprivation due to mobile use and 21.30% had been late for classes and 17.33% have missed classes. More than half of them (51.26%) experienced decrease in concentration.

Sleep and academic disturbances were more common in participants who were using mobile phones more than five hours compared to participants using for less than five hours and their association was highly significant (p<0.005) (Table 5).
Table 2: Pattern of mobile phone usage among medical students (n=277).

| No. of students | N (%) |
|----------------|-------|
| **Number of mobile phones** | |
| One | 237 (85.56) |
| Two | 25 (9.02) |
| Three | 15 (5.42) |
| **Duration of mobile phone usage (years)** | |
| <2 | 90 (32.49) |
| 2-4 | 118 (42.60) |
| 4-6 | 37 (13.36) |
| >6 | 32 (11.55) |
| **Type of phone** | |
| Smart phone | 272 (98.19) |
| Keypad | 1 (0.36) |
| Both | 4 (1.44) |
| **Mode of usage (most of the time)** | |
| Ringing | 104 (37.55) |
| Vibration | 109 (39.35) |
| Silent | 64 (23.10) |
| **Use at places** | |
| Classroom | 112 (40.43) |
| Restroom | 101 (38.46) |
| Driving | 19 (06.86) |
| **Money spent on mobile phone (Rs/month)** | |
| <300 | 165 (59.57) |
| 300-1000 | 106 (38.27) |
| >1000 | 6 (02.17) |
| **Switch off phone during sleep** | |
| 21 (07.58) | |
| **Ever stayed a day without phone** | 119 (42.96) |

Majority of them have faced eye symptoms (55.23%) and headache 42.60%. One fourth of them had faced neck pain (27.44%), restlessness (24.55%) and painful fingers (24.19%) (Figure 1).

Table 3: Opinion on usage of mobile phone.

| Opinion on usage | No. of students |
|------------------|-----------------|
| Academic hindrance | 132 (47.65) |
| Distractions | 183 (66.06) |
| Beneficial for study | 258 (93.14) |

Table 4: Usage of mobile phones other than communication among medical students.

| Use of internet for | Number of students |
|---------------------|-------------------|
| Academic | 249 (89.89) |
| Entertainment | 268 (96.75) |
| Social networking | 248 (89.53) |

*: multiple answers.

Table 5: Association of sleep and academic disturbance with duration of mobile phone usage (n=277).

| Sleep and academic disturbances | Duration of mobile phone usage | Chi-square | P value |
|---------------------------------|-------------------------------|------------|---------|
| Sleep deprivation (n=129) | 44 (34.11) | 85 (65.89) | 80.14 | <0.001 |
| Waking time tiredness (n=110) | 42 (38.18) | 68 (61.82) | 61.98 | <0.001 |
| Difficulty in waking up (n=136) | 52 (38.24) | 84 (61.76) | 74.88 | <0.001 |
| Decline in study habits and grades (n=128) | 54 (42.19) | 74 (57.81) | 59.31 | <0.001 |
| Decrease in concentration (n=142) | 59 (41.55) | 83 (58.45) | 65.67 | <0.001 |
| Increase in missed classes (n=48) | 18 (37.50) | 30 (62.50) | 26.37 | <0.001 |
| Being late for classes (n=59) | 16 (27.12) | 43 (72.88) | 46.51 | <0.001 |

Table 6: Association of health problem faced with duration of mobile phone usage (n=277).

| Health problem faced | Duration of mobile phone usage | Chi-square | P value |
|----------------------|-------------------------------|------------|---------|
| Headache (n=118) | 44 (37.29) | 74 (62.71) | 62.31 | <0.001 |
| Earache (n=45) | 12 (26.67) | 33 (73.33) | 35.73 | <0.001 |
| Neck pain (n=76) | 27 (35.53) | 49 (64.47) | 43.61 | <0.001 |
| Painful fingers (n=67) | 23 (34.33) | 44 (65.67) | 38 | <0.001 |

Continued.
A study conducted by Damor et al in Gujarat indicated that 41.8% said mobile phones impaired academic performance which is almost similar to our study.4

According to George et al in Kerela, 34% were checking their phone at midnight which was higher compared to the present study.8 In the present study 6.86% were using the mobile phone while driving and 17.4% in a study conducted in South India.15

Health problems faced in our study was eye symptoms (55.23%), followed by headache (42.60%), neck pain (27.44%) which was almost similar to a study conducted by Arumugam et al where 64.3% had experienced health problems like headache, sleep disturbance, ear pain, irritability.14 Similar study was conducted by Paul et al among the medical students found that 35.4% of the students complained of headache and spasms of arm or neck muscles (31.0%) or loss of attention (24.7%).13 Among the medical students of Western Maharashtra, headache was 30.20% among girls, 15.60% in boys, eye symptoms 5.50%, sleep deprivation 21% by Yadav.7

The present study found that mobile phone was used for more than five hours by most of the students, and almost everyone was using for academic purpose, entertainment and social networking and they had experienced health problems. So, the students should be educated regarding the health problems owing to the over usage of mobile phones, prohibition of usage of mobile phones in the college campus should be implemented and strictly followed by the administrative authority.

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REFERENCES

1. World Bank information and communication for development 2019. Accessed 2 July 2019.
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3. Bagdey P, Adikane H, Narlawar U, Dhage D, Surwase K, Kaware A. Cross-Sectional Study of Prevalence of Internet Addiction and its association with mental health among college going students in
Nagpur city. Int J Community Med Public Health. 2018;5(4):1658-65.

4. Damor RB, Gamit SP, Modi A, Patel J, Kosambiya J. Pattern of smart phone and internet usage among medical students in Surat, Gujarat- A cross sectional study. National J Community Med. 2018;9(7):469-73.

5. ICT Facts and Figures 2017. Available at: http://www.itu.int/en/ITU-D. Accessed on 3 July 2019.

6. Susila T, Somasundaram A, Jenifer A, Kamalipriya S, SwarnaPriya M, Gayathri G, et al. A cross sectional study on electronic device addiction among youth in an urban area, Chennai. Stanley Med J. 2017;4:1-7.

7. Yadav JU, Yadav DJ. Study of mobile phone usage in medical students of deemed university of Western Maharashtra, India. Int J Community Med Public Health. 2017;4:1.

8. George S, Saif N, Joseph B, Joseph B. A study on mobile phone usage pattern and its dependence among medical students of a college in Kerala, India. Int J Res Med Sci. 2017;5:3615-9.

9. Gupta N, Garg S, Arora K. Pattern of mobile phone usage and its effects on psychological health, sleep and academic performance in students of a medical university. National J Physiol Pharmacy Pharmacol. 2016;6:132-9.

10. Ghosh A, Jha R, Malakar SK. Pattern of smart phone use among MBBS students in an Indian medical college. Int J Applied Res. 2016;2:5.

11. Mohapatra D, Mohapatra M, Chittoria R, Friji M, Kumar S. The scope of mobile devices in health care and medical education. Int J Advanced Med Health Res. 2015;2:469-73.

12. Aggarwal S, Ambalkar D, Kale K, Aswar N, Bhatule P. pattern of internet use among medical students. A cross sectional study. Asian J Sci Tech. 2015;6:4.

13. Paul B, Roy S, Saha I, Misra R, Chattopadhyya S, Basu M. Mobile phone usage pattern among undergraduate medical students at a Medical College of Kolkata, West Bengal, India. Turk J Public Health. 2014;12(3):178-87.

14. Arumugam B, Sachi S, Nagalingam S. A descriptive study on behavior associated with mobile phone usage and its effect on health among medical students in Chennai. J Evol Med Dental Sci. 2014;3(7):1590-5.

15. Subba S H, Mandelia C, Pathak V, Reddy D, Goel A, Tayal A, et al. Ringxiety and mobile phone usage pattern among students of a medical college in South India. J Clin Diagnos Res. 2103;7(2):205-9.

16. Unnikrishnan B, Kulshreshtha V, Saraf A, Agrahari AC, Prakash S, Samantary L, et al. Pattern of computer and internet use among medical students in coastal South India. South East Asian J Med Edu. 2008;2(2):18-25.

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