

Patterns of Mobile Phone use and Self-reported Health Problems among Adults Visiting a Private Dental Institute

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Abstract

Background: Increased use of mobile phones has led to increase in the prevalence of health problems. Hence, the present study was undertaken to assess the pattern of the use of mobile phone and its association with self-reported health problems among adults.

Materials and Methods: A total of 1520 participants visiting a private dental institute in Dhule, Maharashtra, were interviewed using a pre-tested, structured questionnaire. The questionnaire included variables such as socio-demographic details, use of mobile phone use and its pattern, selected health problems, perceived benefits, or threats of the use of mobile phone. Data obtained were analyzed using SPSS software.

Results: The majority of the participants (87.9%) were using mobile phone for up to 3 h daily. The majority of the participants (98.3%) reported using mobile phone for calling facility followed by internet or social networking purpose (67.2%). Health symptoms such as headache, stressful eyes, tiredness, and painful fingers showed an increased prevalence with increase in the daily usage of mobile phones; whereas hypertension was inversely related to the use of mobile phone. Most of the participants agreed that they start feeling stressed or anxious without their mobile phones.

Conclusion: Selected health problems showed a positive association with increasing mobile phone use. People should be made aware of harmful effects caused due to over-indulgence in the use of mobile phone and should restrict the use of focus only on mobile positive phones to the minimum possible.

Key words: Cell phone, Health, Health promotion, Risk assessment

INTRODUCTION

Mobile phone, a device which was once looked on as a luxury of the classes, has now become a necessity for the classes as well as the masses. Starting from its inception in 1973, mobile phone has undergone tremendous changes.^[1] These incredible portable technology boxes have

become an integral part of interpersonal communication. From the upsurge of SMS to anywhere, anytime internet connectivity to mobile photography, mobile phones have been the facilitator for cultural and technological changes over the past few decades. A drastic increase in number of mobile phone users has been seen in past decade with more than 7 billion subscribers in the world.^[2] Mobile has been primarily used for accessing internet in addition to the calling services. Mobile-broadband subscriptions have grown more than 20% annually in the past 5 years and were expected to reach 4.3 billion globally by the end of 2017.^[3]

India, known as the second largest mobile phone-using nation, has the fastest growing telecom network in the world,

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accounting for more than 1.1 billion mobile phone users till April 2017. Mobile phones usage accounts for almost 98% of all telecommunication users and more than 45% of all wireless phone users belong to the rural sector.^[4] India is set to become the world's largest mobile phone using nation in near future. Mobile phones have become an essential part and have made communication a whole lot easier and convenient; but as they say "every coin has two sides," this technology too has its downsides. Mobile phone usage is associated with few ill-effects on health.^[5] These effects depend on many factors such as number of calls per day, length of each call, amount of usage per day, and place where mobile phone is kept. In response to this concern, the World Health Organization started the International Electromagnetic Fields Project in 1996 to evaluate the scientific evidence of potential negative health effects from electromagnetic fields.^[6] These health problems or symptoms are termed as electromagnetic hypersensitivity.^[7] The symptoms most commonly experienced include dermatological symptoms (redness, tingling, and burning sensations) as well as neurasthenic and vegetative symptoms (fatigue, tiredness, concentration difficulties, dizziness, nausea, heart palpitations, and digestive disturbances).^[7]

In spite of the negative impact of mobile phones on health, very few studies have been conducted throughout India in this context.^[8-11] Mobile phone use and addiction reported were high among the previously conducted studies. Furthermore, these studies reported positive association of mobile phone use with increased risk of health problems such as headache, earache, anxiety, and eye pain. There is a growing necessity to assess the usage pattern of mobile phones, their impact on health and how the technology can be utilized for the betterment of health. Hence, the present study was conducted to assess the usage of mobile phones, their self-perceived health effects and how they can be utilized for improvement in health.

MATERIALS AND METHODS

Study Design, Study Setting, and Study Participants

The present cross-sectional survey was conducted on a total of 1520 participants visiting a private dental institute in Dhule, Maharashtra, from August 2017 to November 2017. Ethical clearance was obtained from the Institutional Review Board. Only those people who were using a mobile phone were included in the study and non-users were excluded from the study. Informed consent was obtained from the participants after explaining them the purpose of study.

Data Sources/Measurements

All the participants were interviewed using a pre-tested, structured questionnaire. Face validity of the questionnaire

was assessed by five expert consensuses. Experts evaluated each item for its wording and grammar, understandability, and relatedness and also for any suggestion. The questionnaires were collected and suggestions were considered. Then, this questionnaire was administered to ten subjects using mobile phones on two different occasions and their responses were analyzed for test-retest reliability. Value of kappa statistics was 0.84. Final version of questionnaire consisted of section on demographic features of participants, section on details of mobile phone use, section on self-reported health problems and section on addiction toward mobile phone. Selected health problems included headache, ear pain, stressful eyes, neck pain, restlessness, sleep disturbances, painful fingers, morning tiredness, and dizziness. Hypertension was considered as blood pressure of 130 mm or above.^[12] All the investigators were provided with the training to minimize inter-observer variations.

Statistical Analysis

Data were collected, compiled, and analyzed using SPSS version 17. Results were presented in frequency and percentage. The differences in the prevalence of self-reported health problems and hypertension according to daily usage of mobile (no. of hours of use) were compared using Chi-square test. Level of significance was kept at $P \leq 0.05$.

RESULTS

Table 1 shows the distribution of participants according to age and gender. The majority of the study participants belonged to the age group of 18–50 years. Table 2 presents the detailed information about mobile phone usage among study participants. More than half of study participants (54.5%) reported using mobile phone for <1 h in a day whereas 33.4% of the participants reported using mobile phone for 1–3 h daily and 6.8% of the participants reported using mobile daily for more than 6 h. When asked about the place where mobile phone is kept while sleeping, 45.5% of the participants keep mobile away from the bed while sleeping whereas 29.5% keep mobile phone next to bed while sleeping and 12.5% reported that they keep mobile phone under the pillow while sleeping. Almost all the participants (98.3%) reported using mobile phone for calling purpose. Other reasons for using mobile phones were text messaging (42.7%), internet (67.2%), playing games (40%), for alarm (33.5%), and for listening to music (27.4%).

Table 3 shows the prevalence of self-reported health problems associated with mobile phone use. Health problems reported increased with increase in the daily duration of mobile phone usage. Among the participants

Table 1: Demographic details of the participants

Demographic variable	Frequency (%)
Age (in years)	
18–30	451 (29.6)
31–40	404 (26.6)
41–50	418 (27.5)
51–60	121 (8.0)
61–70	82 (5.4)
>70	44 (2.9)
Gender	
Males	983 (64.7)
Females	537 (35.3)

Table 2: Details of usage of mobile phone among study participants

Details of mobile phone use	Frequency (%)
Daily usage of mobile phones (in hours)	
<1 h	828 (54.5)
1–3 h	508 (33.4)
3–6 h	80 (5.3)
>6 h	104 (6.8)
Place where mobile phone is kept while sleeping	
Under the pillow	184 (12.1)
Next to bed	448 (29.5)
Away from bed	692 (45.5)
Switched off	196 (12.9)
Purpose	
Calling	1494 (98.3)
Text messaging (SMS)	649 (42.7)
Internet/social networking	1021 (67.2)
Playing games	608 (40.0)
Alarm	509 (33.5)
Listening to music	417 (27.4)

using mobile phone for more than 6 h/day, 58% reported to suffer from headache, 35% reported suffering from ear pain, and 49% of participants reported stressful eyes after using mobile for more than 6 h daily. Increase in the daily usage of mobile phone was also associated with painful fingers ($P = 0.001$). Hypertension showed inverse relation with mobile phone use ($P = 0.001$). Sleep disturbances ($P = 0.043$) and morning tiredness ($P = 0.001$) also increased with increase in mobile phone usage.

Table 4 shows assessment of mobile phone addiction. When asked about the addiction toward mobile phone, 55.52% of the participants reported that they felt stressed and alone without their mobile phone and 59.21% of the participants reported feeling anxious when their mobile phone did not show good signal strength. Only 10.52% participants reported using mobile phone while driving. When asked for positive benefits of mobile, 74.74% participants stated that excessive usage of mobile phones can have a negative impact on health and on academic or work performance; However, 60.26% also agreed on the fact that mobile phone can be used for safety reasons and as an educational tool for health promotion (62.89%).

Table 3: Prevalence of health problems a/c to duration of usage of mobile phones (in %)

Health problem	No of hours of daily usage				P value
	<1 h	1–3 h	3–6 h	>6 h	
Headache	25	46	46	58	0.001*
Ear pain	20	27	32	35	0.037*
Stressful eyes	30	32	46	49	0.012*
Neck pain	19	30	37	38	0.031*
Restlessness	10	12	14	15	0.479
Sleep disturbance	14	20	25	27	0.043*
Painful fingers	10	15	23	27	0.001*
Morning tiredness	13	20	19	20	0.001*
Dizziness	2	5	10	12	0.001*
Hypertension	7	4	2	2	0.018*

Chi-square test; * - indicates significant at $P \leq 0.05$

Table 4: Assessment of addiction and perception of benefits of mobile phones

Criteria	Question	Yes/agree (%)	No/disagree (%)
Assessment of addiction	Do you feel stressed and alone when you don't have your mobile phone? (Y/N)	55.52	44.48
	I cannot relax if my mobile phone does not have good signal strength. (A/D)	59.21	40.79
Perception of positive/negative impact	Do you use mobile phone while driving? (Y/N)	10.52	89.48
	Excessive usage of mobile phones can have a negative impact on health and/or academic or work performance. (A/D)	74.74	25.26
	Mobile phone is required for safety and security reasons. (A/D)	60.26	39.74
	Mobile phones are used for educational purpose to promote health. (A/D)	62.89	37.11

DISCUSSION

Mobile phones are undeniably the most effective means of communication of the present times. However, this “smart mobile phone revolution” of recent times is not full-proof; it too comes along with its flaws, majority of which are health-related. Hence, the pattern of the use of mobile phones and its associated effect on health needs to be studied. The results show that excessive use of mobile phone leads to addiction and has been associated with risk of developing various health problems.

According to the present study, daily usage of mobile phone for majority of the participants was up to 3 h; whereas small proportion of participants reported using mobile for more than 6 h/day. A study done previously reported usage in terms of more than 4 h (60.5%) and

<4 h (39.5%).^[8] The previous studies have evaluated use of mobile phone in terms of daily average talking time, number of years of use, users versus non-users, etc.^[9,10,13,14] Out of 1520 participants, 12.1% of the participants reported that they keep mobile phone under the pillow and 29.5% keep mobile phone next to bed while sleeping. These results are similar to a study conducted where 80% of the participants reported keeping their mobile with them while sleeping.^[8] Experts recommend that the cell phones should be kept at least three feet away from the body during sleep. This is because the radiation that the mobile phones emit are dangerous and not advisable for any reason and having our cell phone nearby can lead to nightmares, inability to sleep, and waking up several times each night. The majority of the participants reported keeping mobile phone either away from bed or switched off while sleeping. Study participants used calling facility more than SMS facility which was similar to the study conducted by Stalin *et al.*^[10] However, a study conducted in Japan in 2012 among 73 high school students showed that the frequency of using SMS facility was more when compared to calling facility.^[13] This difference might be attributed to change in reduction in calling charges in recent years and upsurge of social networking sites and messenger applications. The use of mobile phones for accessing internet or social networking sites was reported by 67.2% of the participants. This is in accordance with the report published by the global social media agency which states that mobile social media use has increased by 30% year-over-year to surpass 2.5 billion users globally, with 91% of social media users accessing it from mobile.^[16]

Our results show that increase in daily usage of mobile phone is associated with increase in health problems such as headache, ear pain, stressful eyes, neck pain, restlessness, sleep disturbances, painful fingers, morning tiredness, and dizziness. Headache may result from the radiations emitted by mobile phone affecting the part of skull against which it is being held. Continuous staring at any screen, either small or large, may result in eye strain. Continuous use of fingers especially thumb over a small keypad may result in painful fingers. These results are similar to the previously conducted studies^[10,13] where cell phone users suffered from health problems when compared with non-users. A study reported increase in fatigue (odds ratio – 1.85) and sleeping problems (odds ratio – 1.25) among children who were using mobile phones for more than 1 year.^[14] A study conducted reported that usage of multimedia for more than 1 h/day was associated with increased risk of health problems.^[11] Similar results were reported in a study conducted in Sweden where high mobile phone use was associated with sleep disturbances and symptoms of depression for the men and symptoms of depression for the women at 1-year follow-up.^[17] However, a study conducted

in the United Kingdom reported no association between mobile phone usage and subjective health symptoms.^[18] This calls for an extensive, large-scale research in this area to get evident affirmation on the association of mobile phone usage with subjective health symptoms.

In the present study, it was seen that hypertension was inversely proportional to mobile phone use which was similar to study conducted by Stalin *et al.*^[10] and Suresh *et al.*^[19] It might be attributed to an increase in parasympathetic activity and reduction in sympathetic activity originating in the brainstem because of usage of mobile phone.^[20] Another probability is that increased social media usage on mobile phones might help in establishing greater connectedness of the users with their communities and ultimately reduce stress. This has been reported in the previous research where social networks were associated with lower total mortality by reducing deaths from cardiovascular disease.^[21]

More than half of the study participants reported that they tend to be stressed or anxious when they did not have their mobile phones with them or their mobile phones did not have good signal strength. This mobile phone separation anxiety (PSA or nomophobia) is all set to become a matter of global concern.^[22] PSA can adversely affect not only the mental well-being and social life but also the relations and communication skills in the “real world.” 10.52% of the participants reported using mobile phone while driving which can prove to be dangerous and can take a toll on their life. Similar results were observed in a previous study where 67% participants said that they feel unsettled when they forget to carry mobile phone with them and 13% participants used their mobile while driving to receive calls and messages.^[8] Another study conducted reported that students felt anxious without their mobile phone and were addicted to its use.^[23] The majority of the participants in our study were aware about the adverse sequelae of excessive use of mobile phone on health and academic or work performance. The majority of them also agreed on the use of mobile phones for security and educational purpose.

LIMITATIONS

The present study involved a convenient sample of the local population visiting dental college from in and around Dhule city. Hence, the results of the study cannot be generalized to entire population of Dhule District. Therefore, an extensive research is recommended to reinforce the results of the present study. Furthermore, the present study focused only on mobile users and non-users were excluded from the study. Hence, widespread research involving mobile phone users as well as non-users is recommended

to compare the prevalence of health problems among users and non-users.

CONCLUSION

There is a growing concern over impact of mobile phone on human health. The present study shows that an alarming proportion of population, practicing excessive use of cell phones, has been inflicted with a wide array of physical as well as mental health problems. These symptoms cannot be ignored and hence require timely measures to curb the excessive use of mobile phones. The simplest and the most effective measure can be to raise the awareness among the population regarding possible health effects of mobile phones and lay down guidelines to use it judiciously, thus minimizing its exposure and avoiding its addiction.

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