# Mobile phone usage pattern and dependency among school going adolescents in Davanagere, Karnataka

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## Abstract

**Background**: There are several newer technologies in this Era; one of such is Mobile Phones. The mobile phone has many attributes and characteristics that make it especially attractive to adolescents. Research has shown excessive use of mobile phones leads to addiction like behavior and various adverse effects.

**Aim:** This study was designed to study the pattern of mobile phone usage and to evaluate the prevalence of mobile phone dependence among school going adolescents.

**Methods:** A cross-sectional study was conducted among school going adolescent students, 253 adolescents participated in the study. Data collected by using a questionnaire to obtain information on mobile phone usage pattern and mobile phone dependency. Statistical analysis is done using SPSS software, relevant statistical tests Chi Square and Fischer Exact test were applied**.**

**Results:** Mean age of the participants is 14.65yrs. Majority of the participants possessed a smart phone 205(81%). The average time spent on mobile phones per day is 101 minutes with the mean duration of usage in years 3.26yrs Prevalence of mobile phone dependency was found to be 170(67.2%).Nearly half 125(49%) of the students reported false perception of mobile phone ringing and 88(34.8%) of them reported they slept late due to mobile phone usage.

**Conclusion:** Mobile Phone dependency is a new emerging public health concern, due to the ill effects it predisposes on the younger generation. But, mobile phones can act as a boon also, when used effectively; hence adolescents need right motivation for the better usage of mobile phones.

**Keywords:** Mobile Phone Dependency, Adolescents, Prevalence

## Introduction

There are several newer technologies in this Era, one of such is Mobile Phones (also known as cell phone[1]. Over the previous decade mobile phones have gone from being almost non-existent to being the most used and desired devices by majority of the population, especially adolescents. The Purpose of these technology/ Mobile Phone are to ease life.[2] However Mobile phone can be a classical example of "a paradox of technology". The use of mobile phones has become both necessity and addictive at the same time.[3] Currently mobile phones are acting as a key tool in Information, Communication and Technology. The mobile phone has many attributes and characteristics that make it especially attractive to adolescents and that encourage its use among them.[2] The unfavorable outcomes associated with increased mobile phone usage are addiction, increased chances of low self-esteem, anxiety or depression, bullying, eye strain, road traffic accidents, lack of sleep, headache and many more [4].

In India, few studies conducted among adolescents have identified mobile phone behavioral addiction as ranging from 23.4% to 31.3%.[1,5] Mobile phone dependency is being considered as a new diagnostic entity under International Classification of Diseases-10 (ICD –10) and The Diagnostic and Statistical Manual of Mental Disorders- 5 (DSM-5); taking into account its properties of excessive use, withdrawal, tolerance and negative repercussions.[4]

Though mobile phones have become an integral part of our daily life, there are very few studies on

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the prevalence of mobile phone dependency among adolescents; hence this study is designed to evaluate the prevalence of mobile phone dependence and to study the pattern of mobile phone usage among secondary school students.

## Material and Methods

A cross-sectional study was conducted among school going adolescents, who were enrolled in standard 8th, 9th and 10th standard. Two English medium private schools were selected randomly from Davanagere district, Karnataka. Institutional Ethics Committee approval was taken before initiation of the study. The study was carried out from August to December 2017. Permissions were obtained from the Head of the School. Informed consent was collected from all the students willing to participate in the study after explaining the purpose of the study. Those students who were not willing to participate in the study, who did not possess a mobile phone and those with incomplete questionnaire, were excluded the study.

The sampling frame of this study consisted of the students enrolled in 8th, 9th and 10th standard of the respective schools. The sample size was estimated by the prevalence of mobile phone dependency of the previous studies 31.3%[5]; 4pq/d[2] formula was used, p=31.3 and d=20% of p, that gave us a sample size 219. Further considering 20% non response rate, the sample size was 264.

Data was collected by interview method using a questionnaire developed by Aggarwal M[1], the type of information that had to be furnished by the students was explained. The questionnaire also included questions on socio demographic details and the pattern of mobile phone usage. ICD-10 dependence syndrome was being assessed by questions with these six criteria's one question for intense desire, four questions for impaired control, three questions for withdrawal, one question for tolerance, four questions for decreased pleasure and one question for harmful use. The students who scored a minimum of 50% or above were considered to be fulfilling the criteria for mobile phone dependency.

Data was compiled using Microsoft Excel; SPSS software (Statistical Package for Social Sciences) version 16 was used for analyzing the data. Continuous data is represented with Mean and Standard Deviation. Categorical data is represented in frequency and percentages. Chi Square test and Fischer Exact were applied and $p<0.05$ is considered to be statistically significant.

## Results

Out of the 264 students who were included in the study based on sample size estimation only 253 students were evaluated, as those who reported incomplete data were excluded from the study analysis, i.e., response rate of 95.8%.

Among the 253 study participants, there were 142(56.1%) girls and 111(43.9%) boys; their age ranged from 13-16yrs, with the mean age of 14.65yrs (SD= 0.91). Majority of them belonged to a nuclear family 202(79.8%) and 5(2%) of them belonged to a single parent family. 70(27.7%) of the respondents stated both the parents were working.

The pattern of mobile phone usage as 205(81%) of the participants possessed a smart phone and 48(19%) of the participants had a non smart phone. The average time spent on mobile per day was 101 min (SD=98.8) which varied from 5 min to 9hrs. The average duration of mobile phone usage in years 3.26 years (SD=1.4). Table 1 further summarizes mobile phone usage among students.

In this study, the prevalence of mobile phone dependency among school going adolescents was found to be 170(67.2%). The ICD-10 diagnostic criteria for dependence syndrome were maximum among respondents in impaired control 87.3%, Decreased alternate pleasure 75.4% and Withdrawal 74.3%.

Nearly half of the respondents 125(49.4%) stated that they had false perception of mobile phone ringing. 68(26.9%) of the students stated that a day without mobile phone in their life would be boring and lonely. Mobile phones also have an impact on duration and quality of sleep as 88(34.8%) of the students reported that they slept late because of mobile phone usage and 71(28.1%) of the respondents stated that they woke up from sleep to respond to mobile phone calls and messages. In this study, mobile phone dependency was found to be significantly associated with Gender (p=0.0001) and increasing duration of mobile phone usage in years (p=0.026)

## Discussion

Among the 253 study participants included in the study, there were 56.1% girls and 43.9% boys, with the mean age of 14.65± 0.9 years, a similar study conducted by Nikhita et al.[5] showed 60.48% males and 39.51% females, the mean age of the participants was 13.99 ± 0.8 years. This study showed the mean duration of time spent on mobile per day was 101min which varied from 5 min to 9hrs, other studies[1, 5] reported the mean duration 108 min, 131 min respectively.

**Table 1: Mobile Phone Dependency Questionnaire**

| Sl no | Question | Yes Number (%) |
|---|---|---|
| Q1. | When not using the mobile, are you preoccupied with the mobile phone (Keep constantly thinking about the previous and the future uses)? | 98(38.7%) |
| Q2. | Do you need to use mobile phone for increased amounts of time in order to achieve satisfaction/ betterment? | 116(45.8%) |
| Q3. | Have you made unsuccessful efforts to control/ decrease or stop mobile phone use? | 163(64.4%) |
| Q4. | Do you get upset when attempting to cut down mobile phone use? | 169(66.8%) |
| Q5. | Has mobile phone use led to decrease in meeting the friends in person | 95(37.5%) |
| Q6. | Has mobile phone use has made you spend less time with friends/ family | 71(28.1%) |
| Q7. | Has mobile phone use has led to decrease in socialization? (meeting friends/ hanging out ) | 76(30%) |
| Q8. | Do you lose track of time after starting to use mobile phone for SMS, games, music etc? | 110(43.5) |
| Q9. | Do you lie to others to conceal the extent of your use of mobile phone? | 79(31.2%) |
| Q10. | Do you become anxious of missing something if you have to switch off your mobile phone for some reason? | 106(41.9%) |
| Q11. | Do you compulsively respond to calls/ SMSs at places which don't permit (Class, driving, group participation)? | 76(30%) |
| Q12. | Do you compulsively respond to calls/ SMSs at places where it is dangerous to do so (crossing road, driving/ working at machines)? | 63(24.9%) |
| Q13. | Do you call back to most of the missed calls? | 87(34.4%) |
| Q14. | Does using mobile phone help you to overcome the bad moods (e.g. feeling of inferiority, helplessness, guilt, anxiety, depression etc.)? | 156(61.7%) |
| Q15. | Do you feel guilty about the expenditure on (or excessive use of) mobile phone? | 107(42.3%) |
| Q16. | Do you get irritated in the morning if you are not able to locate your mobile phone? | 90(35.6%) |
| Q17. | Do your families/ friends/ colleagues complain that your mobile phone use is excessive? | 129(51%) |
| Q18. | Do you get annoyed or shout if someone asks you to decrease the use of mobile phone? | 119(47%) |
| Q19. | Do you frequently participate in SMSs or phone entry competitions? | 67(26.5%) |
| Q20. | Do you think you are getting addicted to mobile use? | 89(35.2%) |

**Table 2: Participants meeting the ICD-10 diagnostic criteria**

| Sl. No. | Variable | Number (Percentage) |
|---|---|---|
| 1 | Intense desire (Q-1) | 98(38.7%) |
| 2 | Impaired control (Q-3, Q-8, Q-11, Q-19) | 221(87.3%) |
| 3 | Withdrawal (Q-10, Q-13, Q-16) | 188(74.3%) |
| 4 | Tolerance (Q-2) | 116(48.8%) |
| 5 | Decreased alternate pleasure (Q-5, Q-6,Q-7, Q-17) | 191(75.4%) |
| 6 | Harmful use (Q-12) | 63(24.9%) |

**Table 3: Association of Mobile Phone Dependency with other Variables**

| Sl. No. | Variable | | Mobile Phone Dependency | | p value* |
|---|---|---|---|---|---|
| | | | Yes | No | |
| 1 | Gender | Male | 102 | 9 | 0.0001 |
| | | Female | 68 | 74 | |
| 2 | Type of Family | Nuclear | 133 | 69 | 0.66 |
| | | Joint/Three generation | 33 | 13 | |
| | | Single Parent | 4 | 1 | |
| 3 | Parents working | Single | 122 | 61 | 0.88 |
| | | Both | 48 | 22 | |
| 4 | Duration of mobile phone usage in years | </= 1yr | 21 | 3 | 0.026 |
| | | >1yr | 149 | 80 | |
| 5 | Average time spent on mobile phone per day | </=60 min | 142 | 67 | 0.599 |
| | | >60 min | 28 | 16 | |

*p value is reported of Chi Square Test/ Fischer exact test

The prevalence of mobile phone addiction in this study was found to be 67.2% which was very high compared to other studies as Aggarwal M[1] reported 39.6%, Nikitha et al[5] 31% and Nehra et al[7] reported 33.5% as per ICD-10 diagnostic criteria for dependence syndrome.

This study we have accorded with ICD-10 Classification of Mental and Behavioral Disorders Criteria of substance dependence syndrome[6], i.e., a study participant would be considered to have mobile phone dependency only if showed a minimum of 50% of the below criteria present at some time during the previous year, a strong desire to take the substance; difficulties in controlling its use; withdrawal; tolerance; neglect of alternative pleasures or interests; and persistent use despite evidence of harmful consequences.

In this study, as reported in table 2. Participants meeting the ICD-10 diagnostic criteria, the maximum response from the participants was received to Impaired control 87%, followed by Decreased alternate pleasure 75% and withdrawal 74%. Another study by Nehra et al[7] reported maximum response to intense desire 56.6% followed by withdrawal 42.9%.

In this study, more than half of the respondents reported that, using mobile phones helps them to overcome bad moods 61.7%, 64.4% of them have made unsuccessful attempts to control mobile phone usage and 66.8% of them stated attempting to cut down mobile phone usage. Similar studies, Nehra et al (66%)and Nikitha et al (65%) reported that maximum response was received to the question, Does using mobile phones helps them to overcome bad moods like feeling of inferiority, helplessness, guilt, anxiety, depression etc. In this study we observed that 41.9% of the students stated that became anxious if they had switched off their mobile phone for some or the other reason, a study conducted by Aggarwal M[1] reported 50% and stated that this can have derogatory effects on their training and health.

"Ringxiety" is a condition where individuals hear the phone ringing when it actually hasn't, which is also called "phantom ringing"[8]. In our study nearly half of the respondents 125(49.4%) stated that they had false perception of their mobile phone ringing. A similar study reported by Subba SH et al in 2013 stated Ringxiety was experienced by 34.5% of the students and it was associated with increased duration of mobile phone usage and adversely affected their academic performances

In this study 26.9% of the students stated that a day without mobile phone in their life would be boring and lonely. This could be attributed to the social connectivity, internet connection facilities on the mobile phones that help us to connect to our dear ones living away but it also make us lonely in a crowd.

In this study we also observed that Mobile phones also have an impact on duration and quality of sleep as 34.8% of them stated decreased sleep and 28.1% of them reported disturbed sleep. A study conducted Sahin S et al[10] on mobile phone addiction and sleep quality concluded that sleep quality worsens with increasing addiction level. Another study conducted among university students in Saudi Arabia by Alosaimi F D et.al.[11] reported that smart phone addiction had negative effects on sleep.

In our study we found statistically significant association of Mobile Phone Dependency with Increased duration of mobile phone usage (p=0.026)

similar to findings reported by other studies[1,5] and Gender (p= 0.0001), which was similar to the findings reported by Nikitha et al.[5] and George S et al.[12] However, many other studies have concluded that mobile phones and gender association is not conclusive[11,13,14]. As both the genders have equal chances of exposure and development of dependency.

This study has many limitations, some of them are the school going adolescents were hesitant to answer the questions as they had a fear of being judged. The data collected by subjective feeling of the participants, a better method can be developed for objectively collecting data by using mobile phone applications. We did not evaluate the mental health condition of the students as depression, anxiety, stress levels or personality types; which would have a huge impact on the pattern of mobile phone usage. This study had a relatively small study sample and there is a need for multicentre studies to understand the mobile phone dependency among adolescents that is emerging as a public health problem.

## Conclusion

In this study we found high prevalence of mobile phone dependency among adolescents associated with other factors as false perception of mobile phone ringing decreased and disturbed sleep. Mobile phone dependency is a new emerging public health concern, due to the ill effects it predisposes on the younger generation. But, mobile phones can act as a boon, when used effectively; hence adolescents need right motivation for the better usage of mobile phones. Current need of the hour is the awareness regarding this dependency behavior and appropriate information, education and interventions. There is also necessity to keep a check on these growing trends of mobile phone usage in early stage to prevent detrimental outcomes.

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