Section: Community Medicine

Original Research Article

# ADDICTIVE EFFECTS OF TOUCH SCREEN DEVICE USAGE AMONG UNDERGRADUATE MEDICAL STUDENTS IN GOVERNMENT MEDICAL COLLEGE, RATLAM

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ABSTRACT

**Background:** Touchscreen devices are an unavoidable part of daily life for medical students. Touchscreen device usage has seen a swift rise in India, significantly influencing individuals across all age groups, especially college-aged adolescents. “Ringxiety” or phantom ringing, which results from the excessive use of mobile phones, has been reported recently in India. There is an increasing need for counselling and awareness of the ill effects of touch screen devices in students and help them to resolve their problems. The aim is to assess the extent and purpose of touch screen device usage

**Materials and Methods:** It was a cross-sectional study done at Government Medical College, Ratlam, M.P. among undergraduate students who were willing to participate. The calculated sample size based on prevalence of smartphone usage of a previous study by Basu et al was calculated as 277. So final sample size taken was rounded up and taken as 360, equally divided among 4 batches currently pursuing MBBS at Government Medical College, Ratlam. The data was collected through a standardised, pre-designed, pre-validated, semi-structured questionnaire using google forms, including Mobile Phone Addiction Scale (MPAS).

**Results:** A total of 360 students participated in the study, comprising 176 males (49%) and 184 females (51%). The average age was 21.38 ± 1.76 years. Based on the median MPAS score, 173 participants (48.05%) were classified as addicts, while 187 participants (51.94%) were classified as non-addicts. The primary uses of touch screen devices among the participants were for entertainment (82.7%), academic purposes (79.9%), and communication (68.2%).

**Conclusion:** Mobile phone addiction among medical students, linked to device use and data consumption, impacts well-being and calls for urgent intervention.

**Keywords:** Cell Phone Addiction, Academic, Entertainment, Ringxiety, Touch screen devices, Nomophobia, Mobile Phone Addiction.

## INTRODUCTION

In recent years, the proliferation of touchscreen devices has transformed various aspects of daily life, including education and professional practices. Among medical students, these devices have become indispensable tools for accessing information, communicating, and managing academic workloads. However, the increasing reliance on touchscreen technology has raised concerns about its potential addictive effects. Nomophobia translates to the “fear of being without mobile contact” or the “fear of not having a mobile phone.” Nomophobia is impacting the teen brain and its alteration, according to psychologists, making it a big worry among medical graduates in recent years.[1]

Touch screen devices are an unavoidable part of daily life for medical students. It allows them to be in touch

with their peers and families as their academic activities include long working hours where they are confined to the college. They are also used widely as a tool for education with the increasing availability of multimedia resources, scales and measures, and online lectures.[2]

Touch screen devices in India has been rapid, and it has penetrated all parts of society, especially the college-going adolescents.[3] "Ringxiety", a psychological problem which results from the excessive use of mobile phones, has been reported recently. It is a condition where individuals hear the phone ringing when it actually hasn't, which is also called "phantom ringing".[4] It has been reported that one-fourth of the touch screen device users in India could be suffering from Ringxiety[5] Addiction, ADHD, sleep issues, increasing malignancy risk, access to focus stealing and unnecessary information, etc, are just a few of the harmful effects of touch screen devices.

Medical students, who are often under significant academic pressure, increasingly rely on touch screen devices not only for educational purposes but also for social interactions and leisure activities the advantages of such devices are undeniable, there is growing concern about their potential for addiction. The term "addiction" in this context refers to a compulsive behaviour characterized by the inability to regulate the use of touch screen devices, despite the negative consequences on one's health, academic performance, and social relationships. This phase been particularly observed among undergraduate students who are in a critical developmental stage, both personally and professionally.[5,6]

Uncontrolled usage of touch screen devices may cause drying of eyes, digital eye strain, muscular weakness of fingers and wrist and a hoard of other physical and mental illnesses.[7] There is a wide variety of entertainment activities that drive touchscreen devices usage, which include gaming, music, and multimedia sharing on social media platforms like Snapchat, Twitter, WhatsApp, Telegram, Instagram, etc. Touch screen device usage in India is showing a rapidly rising trend, especially in college-going adolescents, with nearly 33% of mobile phone users expected to be smartphone users by 2021.[8]

There is an increasing need for college going adolescents to be counselled and made aware of the deteriorating effects of widespread use of touch screen devices and help them to resolve above listed problems.[6] Addiction to touch screen devices, characterized by excessive and compulsive use, can have significant implications for medical students, a group already facing intense academic pressure and demanding schedules. The immersive nature of these devices, with their constant notifications and engaging interfaces, may contribute to difficulties in maintaining focus, managing time effectively, and achieving a healthy balance between academic responsibilities and personal well-being.

## MATERIALS AND METHODS

**Study Design:** A cross-sectional study.
**Study Place:** Government Medical College, Ratlam (M.P.), India.
**Study Duration:** June 2023 to November 2023.
**Sample Size:** Based on a previous study by Basu et al., the sample size was calculated as 277. The final sample size was rounded up to 360, equally divided among 4 batches of MBBS students at GMC Ratlam.
**Inclusion Criteria**
MBBS undergraduate students enrolled at GMC Ratlam, M.P., who were willing to participate, gave written informed consent, and used touch screen devices.
**Exclusion Criteria**
Students whose touch screen device usage duration was less than 1 month.
**Statistical Analysis:** Data were analysed using MS Excel© and EPI Info™ software. Categorical data were expressed as frequencies and proportions; quantitative data as medians. The Chi-square test was used for associations between categorical variables, with $P < 0.05$ considered significant. Fisher's exact test was applied where more than 20% of cells had values <5.
**Procedure Planned:** Data was collected via Google Forms using a standardised, pre-designed, pre-validated semi-structured questionnaire that included the Mobile Phone Addiction Scale (MPAS). Responses were recorded on a 6-point Likert scale (1 = strongly disagree to 6 = strongly agree). Students were informed about the study purpose, and written informed consent was obtained. No personally identifiable data was collected. After data collection, participants received health education on the risks of excessive mobile phone use, behaviour reduction strategies, and guidance on when to seek help. The study was approved by the Institutional Ethics Committee as per approval number GMC/RATLAM/2023/IEC/Approval/12.

## RESULTS

A total of 360 students participated in the study out of which 176 (49%) were males and 184 (51%) were females. The mean age in years was 21.38±1.76.

Using the median score of MPAS, out of 360 participants, 173 (48.05%) were categorised as addicts and 187 (51.94%) were categorised as non-addicts. Age, Gender, Residents, Batch and duration of usage came out to be non-significant and no. of devices used and mobile data usage were the significant factors.

**Table 1: Distribution of Medical Students' Responses on the Mobile Phone Addiction Scale (n=360)**

| Item | Question | Median |
|---|---|---|
| Q1 | Usually, check your WhatsApp/Facebook/SMS notifications as soon as you receive them during the day | 4 |
| Q2 | Usually, check your WhatsApp/Facebook/SMS notifications received while resting in light sleep? | 2 |
| Q3 | Usually impulsively check for WhatsApp/Facebook/SMS notifications while attending classes or studying at home? | 3 |
| Q4 | Usually, check your mobile phone for messages/gaming/surfing while attending classes? | 2 |
| Q5 | Usually, check your mobile phone for new messages or notifications right after waking up from sleep? | 4 |
| Q6 | Constantly check my mobile phone so as not to miss conversations with my friends/other people on Twitter/FB/WhatsApp? | 3 |
| Q7 | Having a hard time concentrating in class, while doing assignments, or while working due to mobile use? | 3 |
| Q8 | I prefer talking with my smartphone buddies to hanging out with my real-life friends or with other members of my family? | 2 |
| Q9 | Usually, check your mobile phone even while engaged in group participation. | 3 |
| Q10 | Using your mobile phone longer than you had intended to | 4 |
| Q11 | Always thinking that you should shorten your mobile phone usage | 5 |
| Q12 | The people around you complain that you do not pay attention to them due to mobile phone use | 2.5 |
| Q13 | Get annoyed or shout if someone asks you to decrease the use of mobile phone | 2 |
| Q14 | Feeling impatient and fretful when you are not holding your mobile phone | 2 |
| Q15 | Experience stress when not using your mobile phone | 2 |
| Q16 | Experiencing light-headedness or blurred vision due to excessive mobile phone use | 3 |
| Q17 | Feeling pain in the wrists or at the back of the neck while using a mobile phone | 3 |
| Q18 | Feeling tired and lacking adequate sleep due to excessive mobile phone use | 3 |
| Q19 | Cannot imagine living without my mobile phone | 4 |
| Q20 | Compulsively respond to calls or messages at places where it is dangerous to do so, like driving or crossing the road. | 2 |
| Median = 3 | | |

The major purposes of touch screen devices among the participants were entertainment (82.7%), academic (79.9%) and communication (68.2%).

The median responses to the questions indicate varying levels of mobile phone use and its impact on daily life. For example, frequent checking of notifications during the day and right after waking up (Q1 and Q5) suggests that many individuals are closely tied to their mobile devices, reflecting a significant integration of phones into daily routines. The tendency to use mobile phones longer than intended and the belief that they should reduce their usage (Q10 and Q11) highlight a common awareness of potential overuse. However, the lower medians for checking phones while in light sleep, during classes, or in dangerous situations (Q2, Q4, and Q20) suggest that these behaviours are less prevalent. The overall pattern suggests that while mobile phones play a central role in many people's lives, there is a conscious effort to balance usage, particularly in situations where it might be disruptive or unsafe. Additionally, the median responses to questions related to physical discomfort (Q16, Q17, and Q18) indicate that some individuals experience negative physical effects from excessive use, as shown in [Table 1].

[Figure 1] shows that 48% of the respondents are categorized as "Addicted," while 52% are "non-addicted." This indicates a nearly even split, with slightly more individuals not being classified as addicted to the behaviour or substance in question.

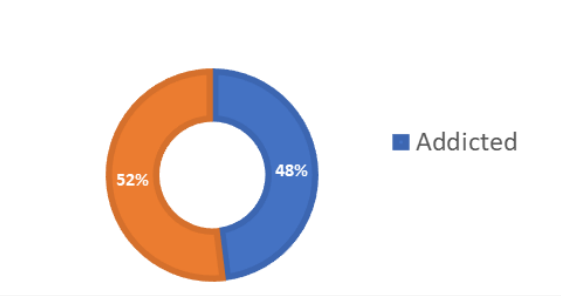


**Figure 1: Distribution of Addiction to Touch Screen Device Usage Among Medical Students.**

In our study, Determinants of addictive effects of touch screen device usage in Medical Students (n=360) illustrates that there is a generally balanced distribution between "Addicted" and "Non-Addicted" groups across different demographic and usage categories. However, certain trends can be observed, such as a slightly higher addiction rate among hostel residents, those with longer durations of device use, and those with higher mobile data usage. Males appear to have a higher addiction rate than females, and there is a notable variation in addiction rates across different batches and numbers of devices used.

**Table 2: Determinants of addictive effects of touch screen device usage in Medical Students. (n=360)**

| Variable | | Addicted | Non-Addicted |
|---|---|---|---|
| Age in years | Age< 21 | 54 | 57 |
| | Age>= 21 | 119 | 130 |
| Gender | Male | 91 | 85 |
| | Female | 82 | 102 |
| Residence | Hostel | 164 | 171 |
| | Day scholar | 9 | 16 |
| Batch | 2019-20 | 37 | 53 |

| | | | |
|---|---|---|---|
| | 2020-21 | 46 | 44 |
| | 2021-22 | 43 | 47 |
| | 2022-23 | 47 | 43 |
| No. of devices used | 1 | 91 | 121 |
| | 2 | 77 | 57 |
| | 3 | 5 | 7 |
| | 4 | 0 | 2 |
| Duration of usage | <1year | 32 | 39 |
| | 1 -2 year | 31 | 45 |
| | 2-3 year | 54 | 45 |
| | >3 year | 56 | 58 |
| Mobile data usage | <=1.5 GB/day | 103 | 131 |
| | >1.5 Gb/day | 70 | 56 |

[Table 3] depicts the results of Chi-square tests to examine the relationship between different variables and mobile phone addiction. Each variable is analysed to determine if there is a statistically significant association with being "Addicted" or "Non-Addicted." The p-values indicate the likelihood that any observed association is due to chance. A p-value less than 0.05 is typically considered statistically significant. It also suggests that most demographic variables (age, gender, residence, batch, and duration of usage) do not have a statistically significant association with mobile phone addiction. However, the number of devices used and the amount of mobile data consumed do show significant relationships with addiction, implying that these factors may play a more important role in influencing whether an individual becomes addicted to their mobile phone.

**Table 3: Chi-Square Analysis of Variables associated with touch screen device usage in Medical Students**

| Variables | Chi-square (p-value) |
|---|---|
| Age (in years) | 0.02 (0.88) |
| Gender | 1.84 (0.18) |
| Residence | 1.56 (0.21) |
| Batch | 2.08 (0.4395) |
| No. of devices used | 0.021+Cramer's V= 0.158 |
| Duration of usage | 3.58 (0.3101) |
| Mobile data usage | 4.37 (0.0366)* |

+Indicates Fisher's exact test as more than 20% cells having <5 value.

[Figure 2] depicts a grouped bar chart between the number of devices owned and mobile phone addiction status (addicts vs. non-addicts). The chart indicates that both addicts and non-addicts are more likely to own only one device. However, addiction prevalence appears consistent across participants regardless of the number of devices owned, suggesting that the number of devices may not strongly influence addiction tendencies.

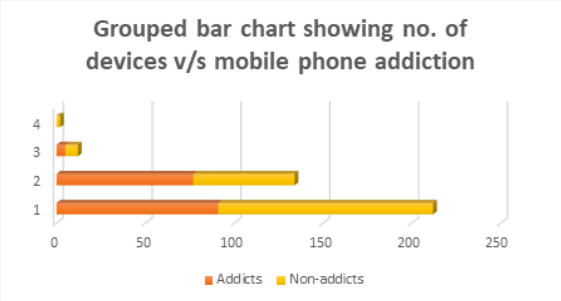


**Figure 2: Grouped bar chart showing no. of devices used v/s mobile phone addiction**

## DISCUSSION

Addiction to mobile phones, characterized by compulsive usage and inability to regulate screen time, has become a growing public health concern, especially among young adults and students. The current study at Government Medical College, Ratlam, M.P., aimed to reveal that nearly 48% of undergraduate medical students exhibited addictive patterns of touchscreen device usage. This prevalence is comparable to the 42.6% reported by Dasgupta et al,[10] in Kolkata, using the NMP-Q questionnaire. However, Prasad et al,[11] observed a lower prevalence (24.7%) among dental students in Uttar Pradesh, underscoring significant variability across studies. Methodological differences, such as varying tools and definitions of addiction, likely contribute to these discrepancies.

The prevalence reported in this study highlights the rapidly increasing rates of mobile phone addiction over the last decade. For instance, Dixit et al,[12] (2010) reported an addiction prevalence of only 18.5% among medical students before the widespread availability of smartphones. This sharp rise aligns with the growing integration of mobile phones into daily life for both academic and personal purposes, reflecting the technological evolution that has transformed these devices into indispensable tools for modern living.

Interestingly, our study challenges some previously established gender-related findings. Earlier studies, such as those by Yildirim et al,[13] Sharma et al,[14] and Nikhita et al,[15] indicated a higher prevalence of mobile phone addiction among female students. However, the current study found no significant gender differences in overall addiction rates. Instead, male students were more likely to report specific

negative behaviours, such as difficulties concentrating during classes and impulsive phone use while driving, which compromises road safety. These findings suggest nuanced gender-specific patterns of mobile phone use, rather than differences in overall addiction prevalence.

Age has traditionally been considered a significant factor influencing addiction risk. Younger individuals, due to their affinity for technology and frequent use of social media, have been identified as more vulnerable in previous studies (e.g., Gezgin et al 2018).[16] However, our findings did not observe significant differences in addiction rates between adolescent (18–19 years) and non-adolescent groups. Interestingly, younger students were less likely to report intense cravings or impaired control compared to their older counterparts. This could be attributed to differences in their usage patterns or external factors such as academic demands and social obligations, which vary with age.

Comparisons across studies also reveal varying impacts of mobile phone addiction. For instance, Kaur et al,[17] highlighted the association of mobile phone addiction with reduced academic performance and interpersonal relationships, while Demirci et al,[18] (2015) identified significant links between addiction and mental health issues, including anxiety and depression. These psychological consequences were not explicitly measured in the current study but remain critical for future research.

The pervasive and detrimental effects of mobile phone addiction call for comprehensive interventions. Awareness campaigns and educational programs targeting medical students could help reduce dependency by promoting self-regulation strategies. Studies such as those by Pavia et al,[19] suggest the importance of mindfulness-based interventions in mitigating mobile phone addiction, which could be explored further in the medical student population. Additionally, institutional measures, such as the promotion of healthy digital habits and integration of technology use guidelines in academic curriculums, could address this rising concern.

Finally, the study highlights the urgent need for uniform and standardized methodologies to assess mobile phone addiction. Differences in tools, sample populations, and definitions have resulted in varying prevalence rates, complicating comparisons across studies. Future research should aim to adopt universally accepted assessment tools and longitudinal designs to better understand the long-term implications of mobile phone addiction on physical and mental well-being.

## CONCLUSION

Medical students exhibit a noteworthy burden of mobile phone addiction and a tendency towards impaired control, impacting their health and well-being. Number of devices used and data usage per day showed statistically significant correlation with mobile phone addiction. It is imperative to implement measures addressing this challenge, considering the prevalent era of expanding information technology.

**Recommendation:** Subsequent studies should focus on developing and testing interventions to tackle this emerging public health issue.

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