

Original Research Article

Prevalence of phantom sensations and its relation to smartphone use among medical students of a tertiary care centre in Central India: a cross-sectional study

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ABSTRACT

Background: Phantom sensations, such as phantom vibration (PV) and phantom ringing (PR), are perceptual phenomena where individuals feel their smartphone vibrating or ringing when it is not. These sensations are becoming increasingly common in the digital age, particularly among smartphone users. Due to their intensive use of smartphones for academic and social purposes, medical students may be at higher risk of experiencing these sensations. This study aims to assess the prevalence of phantom sensations and explore its relation to smartphone use among medical students in a tertiary care center in Central India.

Methods: A cross-sectional study was conducted among 370 medical students from a tertiary care center in Central India. Data were collected using a self-administered questionnaire, which included demographic details, patterns of smartphone use, and experiences of phantom sensations. Smartphone addiction was measured using the smartphone addiction scale-short version (SAS-SV). Descriptive statistics and chi-square tests were used to analyze the data.

Results: The prevalence of PR and vibration sensations among the participants was 40% and 39.45% respectively. A significant association was found between smartphone addiction and the occurrence of PR and vibration sensations.

Conclusions: Phantom sensations are highly prevalent among medical students, and their frequency is significantly associated with increased smartphone use. Awareness and interventions may be necessary to reduce excessive smartphone use and manage phantom sensations among medical students.

Keywords: Phantom ringing, Phantom vibration, Smartphone addiction

INTRODUCTION

Mobile phones, in the last decade, have evolved from being a primary tool of interpersonal communication to facilitating group communication, and such exponential transformation was seen further with the introduction of smartphones.¹ In recent years, smartphones evolved to be multitasking and have displaced electronic devices such as computers, cameras, and many others, making us use them more often.² Excessive use of such technologies may put one at the risk of adverse effects such as isolation and feelings of loneliness, decreased interpersonal relationships, and social interactions.^{3,4}

Although smartphone users of all age groups can be at risk of addiction, studies have reported that adolescents and young adults may be at particular risk.^{5,6} Globally, the prevalence of SA among children, adolescents, and young adults ranges from 10% to 67%.^{5,6} In India, the prevalence of SA among adolescents and young adults ranges from 24.6% to 44%.^{7,8}

In a time when notifications are the new heartbeat, it's no wonder our minds trick us into hearing phantom rings and feeling vibrations that never were. Phantom sensations, such as PV and PR, refer to the perception of phone

vibrations or ringing in the absence of actual notifications or sounds.⁹

Given that medical students are exposed to high levels of academic pressure and often use smartphones for both academic and social purposes, they may be particularly susceptible to experiencing phantom sensations. This phenomenon, however, remains underexplored, particularly in the context of medical students in India.

The present study aims to assess the prevalence of phantom sensations among medical students in a tertiary care centre in Central India and explore the potential relationship between smartphone use and the occurrence of these sensations. By investigating this, we hope to contribute to a better understanding of the psychological and behavioural impacts of smartphone overuse in a population that is both highly reliant on technology and prone to stress-related issues.

METHODS

Study design

This was a cross-sectional study conducted among undergraduate MBBS students at government medical college, Nagpur.

Study population

The study population were undergraduate MBBS medical students aged 18-30 years.

Study period

Study conducted for 3 months (From August 2024 to October 2024).

Sample size and sampling technique

A proposed sample size of 370 participants was determined for this survey. The sample size estimation was based on the statistical equation of cross-sectional surveys: initial sample size = $[(z^2 \times p \times q)] / d^2$,

Where p represents the prevalence of the PR (42%), Z corresponds to a 95% confidence interval, d signifies an allowable error margin of no more than 5%.

Inclusion criteria

Inclusion criteria were undergraduate students aged 18-30 years who have smartphones.

Data collection method

Data were collected via an online self-administered structured questionnaire prepared in English and distributed through social media platforms.

The questionnaire was designed to determine sociodemographic details, information on phantom sensations and phone usage among medical students. The overuse of phones was assessed using the SAS-SV.

The SAS-SV is a brief instrument developed to assess smartphone addiction levels. It comprises items that evaluate the extent of smartphone usage in daily life, focusing on identifying potential behavioural and psychological symptoms associated with addiction.

The survey was administered via an online platform to enhance accessibility and participation, to reach a diverse segment of the student population at government medical college, Nagpur.

Data management

The collected data will be entered into a Microsoft excel sheet and analyzed using Jamovi software.

Data analysis

The data analysis included descriptive statistics, such as frequencies and percentages, along with analytical statistical methods. Chi-square tests were used to analyze the data. Statistical significance was set at $p < 0.05$.

RESULTS

Out of the 370 study participants, 58.1% of the study population were males and 41.9% were females. The mean age of participants is 21 years, 56.75% spent <5 hours each day on their smartphones (general characteristics, Table 1).

The 40% (n=148) of the students reported having experienced PR, and 39.45% (n=146) had experienced PV (Figure 1 and 2).

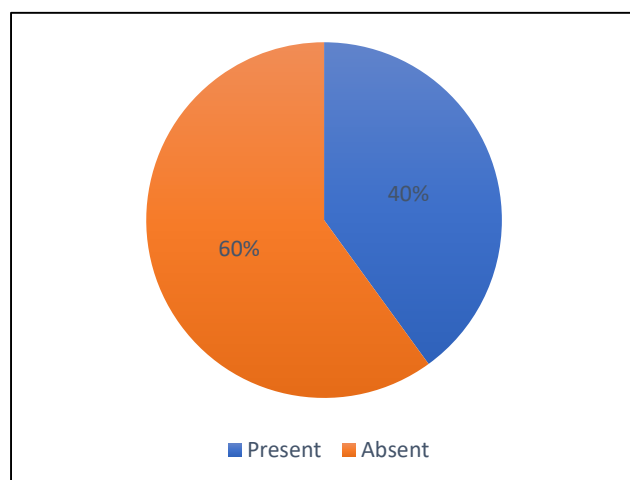
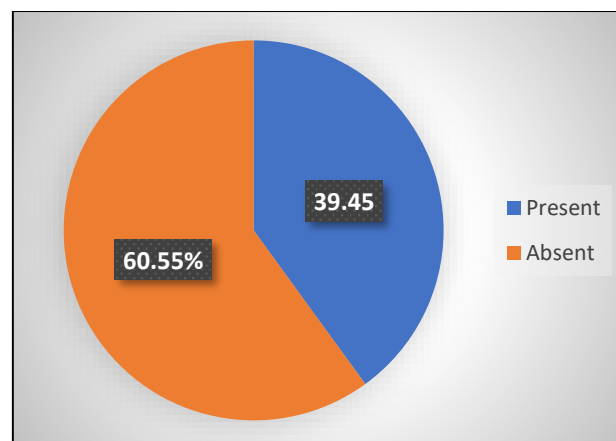
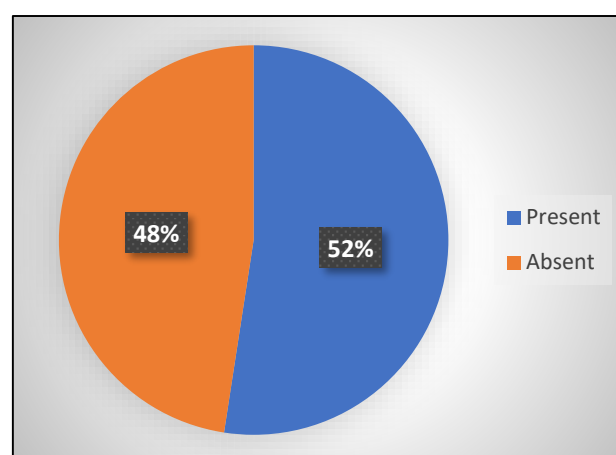
The 52.43% of the students were identified as having smartphone addiction, while 47.57% did not exhibit signs of addiction (Figure 3).

The analysis revealed a significant association between smartphone addiction and the occurrence of phantom sensations. For PV 99 students with smartphone addiction reported experiencing them, compared to 47 without addiction. The Chi-square test yielded a value of 4.716 ($p < 0.0001$), with an odds ratio of 2.86 (95% CI: 1.85-4.43), indicating that individuals with smartphone addiction were approximately 2.86 times more likely to experience PVs. Similarly, for PR, 99 students with addiction experienced it, compared to 49 without.

The Chi-square value was 2.70 ($p < 0.0001$), with an odds ratio of 2.70 (95% CI: 1.75-4.17), further supporting a strong association between smartphone addiction and the occurrence of PR (Table 2).

Table 1: Characteristics of the study population.

Variables	N (%)
Age (in years)	
<22	219 (59.18)
≥22	151 (40.82)
Gender	
Male	215 (58.10)
Female	155 (41.90)
Residence	
Hostel	273 (73.78)
Day scholar	97 (26.22)
Time spent on mobile phone in a day (hours)	
≤5	210 (56.75)
>5	160 (43.25)

**Figure 1: Prevalence of the PR among medical student.****Figure 2: Prevalence of PV among medical student.****Figure 3: Prevalence of smartphone addiction among medical student.****Table 2: Factors associated with PR and PV syndrome.**

Variables		PV, N (%)		Chi square	P value	Odd ratio (CI)
		Yes	No			
Smartphone addiction	Yes	99 (51.03)	95 (48.96)	4.716	<0.0001	2.86 (1.85-4.43)
	No	47 (26.70)	129 (73.30)			
	Total	146 (39.45)	224 (60.54)			
PR, N (%)						
		Yes	No			
Smartphone addiction	Yes	99 (51.03)	95 (48.96)	2.70	<0.0001	2.70 (1.75-4.17)
	No	49 (27.85)	127(72.15)			
	Total	148 (40)	222 (60)			

DISCUSSION

The present study explored the prevalence of phantom sensations (ringing, vibrations, or tactile perceptions in the absence of actual smartphone notifications) and their relation with smartphone use among medical students of a tertiary care center in Central India. The findings revealed a significant proportion of students experiencing phantom sensations, with variations in prevalence linked to smartphone usage pattern and duration of use.

In the present study, 52.43% of medical students were found to have smartphone addiction. Comparatively, Jain et al observed 24.65%, Ammati et al reported a prevalence of 36.8%, Awasthi et al found 43.8%, and Phukan et al reported 44.07% among medical students.^{8,10-12} The higher prevalence observed in our study could be linked to increased reliance on smartphones for academic activities, social interactions, and entertainment, reflecting changing patterns of smartphone use among medical students.

In the present study, 40% (n=148) of students reported experiencing PR, while 39.45% (n=146) reported PV. Charulatha et al reported 74% of the study population experienced PV syndrome.¹³

Similarly, Mangot et al observed 60% of students experienced PV and 42% reported PR.¹⁴ In a foreign study, Mohammadbeigi et al noted the prevalence of both PV syndrome and PR syndrome among medical students to be approximately 50%.¹⁵

Our study found that PV and PR were significantly associated to smartphone addiction. It was similarly reported in Sebastian et al and Ramasubramani et al.^{16,17}

Limitation

The cross-sectional design limits causality assessment between smartphone uses and phantom sensations. Self-reported data may introduce recall bias or underreporting of smartphone usage. Future studies with longitudinal designs, objective measures of smartphone activity, and larger sample sizes are recommended to validate these findings and explore underlying mechanisms.

CONCLUSION

In this cross-sectional study, we found a significant prevalence of phantom sensations, including PVs and PR, among medical students at a tertiary care center in Central India. The high frequency of these sensations correlated positively with increased smartphone use, especially among those engaging in prolonged screen time and frequent social media interaction. These findings suggest a growing concern regarding the psychological and sensory effects of extensive smartphone use among medical students, which may contribute to stress and distractions. Further research is needed to explore the long-term implications of phantom sensations on mental health and academic performance, as well as strategies to mitigate their impact.

Recommendations

The high prevalence of phantom sensations raises concerns about the potential for digital device overuse to affect mental well-being and productivity. Awareness campaigns on mindful smartphone usage and digital hygiene are crucial to mitigate these effects.

Additionally, incorporating behavioural interventions such as scheduled breaks, notification management, and fostering in-person interactions may help students reduce their dependence on smartphones.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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