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Original Research Article

A mixed-method study on prevalence, associated factors, and perception of nomophobia among undergraduate students of a medical college in Nagpur, India

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ABSTRACT

Background: Nomophobia, or "no mobile phone phobia," is an emerging behavioral problem characterized by anxiety when individuals are unable to use their mobile phones. Medical students are particularly vulnerable due to heavy academic and social reliance on smartphones. This study aimed to estimate the prevalence and identify associated factors and explore perceptions related to nomophobia among undergraduate medical students.
Methods: A mixed-method cross-sectional study was conducted among 365 MBBS students at a medical college in Central India. Data on sociodemographic profile, smartphone use, and nomophobia severity were collected using a pretested, self-administered questionnaire incorporating the 20-item nomophobia questionnaire (NMP-Q). Associations were tested using Chi-square. For the qualitative component, in-depth interviews were conducted with six students identified with severe nomophobia, and thematic content analysis was performed.
Results: Moderate nomophobia was observed in 63% of participants, mild in 23%, severe in 3%, and none in 11%. nomophobia was significantly associated with age group ($p=0.004$), place of residence ($p<0.001$), and primary purpose of smartphone use ($p<0.001$). Qualitative analysis identified five major themes: perceived necessity, emotional attachment, awareness of overuse, control versus dependence, and emerging technology-related nomophobia, with students reporting increasing reliance on AI tools such as ChatGPT for academic support.
Conclusions: Nomophobia is highly prevalent among medical undergraduates, particularly among younger students, hostel residents, and those using smartphones mainly for leisure or social networking. Targeted interventions promoting digital well-being and controlled smartphone use are needed to mitigate its potential academic and psychological impacts.

Keywords: Nomophobia, Smartphone addiction, Medical students, Mixed-methods, Mobile phone dependency

INTRODUCTION

Smartphones have revolutionized modern life by enhancing communication, learning, and access to information. However, this increased reliance has introduced a new set of psychological challenges, one of which is nomophobia an abbreviation for "no mobile phone phobia".[1] Nomophobia refers to the discomfort, anxiety, or nervousness caused by being out of contact with a mobile phone. It is not currently recognized in major psychiatric classification systems, but its prevalence is rising, especially among adolescents and

young adults who are highly dependent on smartphones for both academic and social purposes.[2] Though not formally included in the DSM-5, nomophobia is increasingly recognized as a form of behavioural addiction associated with negative emotional and physiological responses, such as anxiety, elevated heart rate, sweating, and even panic attacks.[3]

A systematic review and meta-analysis of 28 studies involving over 11,300 university students across eight countries revealed that 56% had moderate and 17% severe nomophobia, with prevalence rates remarkably consistent across genders and disciplines. This highlights that nomophobia is a global issue among young adults.[4]

India, being the second-largest smartphone market globally, is particularly vulnerable. Affordable smartphones, low-cost internet, and digital academic platforms have contributed to increased dependence among college students, especially in medical education, where information overload and stress are common. Factors associated with nomophobia include gender, duration of daily phone use, emotional dependency, and academic stress, though findings on gender remain inconsistent. Moreover, nomophobia correlates with poor sleep, decreased academic performance, social instability, and reduced life satisfaction. The behavioural paradox of smartphones are that they are both empowering and enslaving underscores their complex role in psychological well-being.[5]

Several studies have reported high prevalence rates of nomophobia in medical colleges across India. A study in Bhopal by Sethia et al found that 61.5% of students had moderate nomophobia.[6] Similarly, Jilisha et al reported high dependence on smartphones among Puducherry college students, with major impacts on mental health, academic performance, and social interaction.[7] Given this background, the current study aimed to estimate the prevalence, identify associated factors, and explore perceptions related to nomophobia among undergraduate students at a medical college in Nagpur using a mixed-method approach.

METHODS

A mixed method study was conducted in the Government Medical College, Nagpur among undergraduate medical students from month of October 2024 to December 2024.

Inclusion criteria

Quantitative

Students who had been using a mobile phone for a minimum of six months were eligible to participate.

Qualitative

students who are having severe nomophobia.

Exclusion criteria

Students were excluded from the study if they did not own a mobile phone or if they declined to give informed consent.

Sample size

The sample size for the quantitative component was calculated based on a prior study by Sethia et al. (2018)6, which reported a 61.5% prevalence of moderate nomophobia. Using an absolute precision of 5% and a 95% confidence level, the required sample size was determined to be 365 which was calculated using the Open Epi (Version 3.01).

Data collection method

Quantitative

For the quantitative part, a cross-sectional study was conducted among undergraduate medical students, from first year to final year. The participants are allocated through convenience sampling.

Data collection was done through a pretested, semi-structured, self-administered questionnaire, which captured sociodemographic variables, smartphone usage patterns, and symptoms of nomophobia using the 20-item nomophobia questionnaire (NMP-Q). The NMP-Q employs a Likert scale and categorizes nomophobia severity into mild, moderate, and severe based on total scores.

Qualitative

For the qualitative component, in-depth interviews (IDIs) were conducted among a purposive subsample of six students identified with severe nomophobia scores who also consented to be interviewed. Interviews were conducted in a private, distraction-free setting, and continued until data saturation was reached. Each IDI was audio-recorded with participant consent. The coding process involved familiarization with the data, generation of initial codes, and identification of emergent themes, which included perceptions about smartphone usage, facilitating and controlling factors for usage, and manifestations of smartphone dependency. Triangulation of qualitative insights with quantitative findings enriched the contextual understanding of nomophobic behavior in this young adult population.

Ethical approval was obtained from the institutional review board prior to data collection, and written informed consent was taken from all participants.

By adopting a mixed-methods framework, the study aimed not only to quantify the extent of nomophobia but also to gain insight into students lived experiences and perceptions through qualitative inquiry.

Data analysis

Quantitative

The quantitative data was entered in Microsoft excel and analyzed using SPSS software. Chi square test was used to assess the association between nomophobia and other variables. A p-value < 0.05 was considered statistically significant.

Qualitative

The In-depth interview (IDI) was recorded digitally, and transcripts were translated back into English. The encoded transcripts were analysed using the ATLAS.ti 8.0 trial package computer program by ATLAS.ti Scientific Software Development GmbH, Berlin, Germany. Employing a content analysis approach, we initially identified recurring codes and generated open codes through content analysis. Next, we conducted axial coding to categorize similar open codes under subthemes. Finally, through constant comparison analysis across different subthemes, we derived major themes, which served as a framework for identifying associated factors and perceptions regarding nomophobia.

RESULTS

A total of 365 undergraduate MBBS students from first to final year participated in the study. The analysis was divided into quantitative and qualitative components.

Table 1: Sociodemographic characteristics of the undergraduate students (n=365).

Sociodemographic characteristics		N (%)
Age (in years)	18	94 (25.8)
	19	92 (25.2)
	20	91 (24.9)
	More than 20	88 (24.1)
Gender	Male	190 (52)
	Female	175 (48)
Academic year	1st year MBBS	111
	2nd year MBBS	83
	3rd year MBBS	85
	Final year MBBS	86
Place of stay	Hostel	229 (62.7)
	Home	136 (37.3)
Socioeconomic status	Class I	60 (16.6)
	Class II	129(35.4)
	Class III	93(25.6)
	Class IV	77(22.3)
	Class V	6(0.1)

Table 1 summarizes the sociodemographic characteristics of the participants. The majority were in the age group of 18–22 years, with the mean age ±SD of 19.48±1.03 years. Most students resided in hostels or rented accommodations, while a smaller proportion lived at home. Gender distribution was fairly even, and most students reported belonging to middle socioeconomic status.

Table 2: Smart phone usage characteristics of the undergraduate students (n=365).

Variables		N (%)
Duration of smartphone use per day (hours)	2 and less	21 (5.7)
	3-6	232 (63.6)
	7 and more	112 (30.7)
The frequency of checking smartphone per hour	Three times and less	148 (40.6)
	4-6 times	94 (25.7)
	Seven times and more	123 (33.7)
Purpose of maximum usage	Calls	33 (9.1)
	Social Networking	298 (81.7)
	Music	5 (1.4)
	Video	18 (4.8)
	Browsing the Internet	8 (2.2)
	Camera	3 (0.8)
Time of maximum usage	Leisure time	272 (74.5)
	Before sleeping	64 (17.5)
	In the bus	6 (1.7)
	At college	11 (3.1)
	While walking	7 (1.9)
	While eating	5 (1.3)
Checking the phone without any reason	Never	37 (10.1)
	Sometimes	243 (66.6)
	Always	85 (23.3)
Perception of ill health due to smartphone usage	Headache	94 (25.8)
	Eyestrain	66 (18.1)
	Neck pain	57 (15.6)
	Disturbed sleep	52 (14.2)
	Fatigue	25 (6.8)
	No perceived ill health	71 (19.5)
Perception of phone use hampering academic performance	Yes	123 (33.7)
	No	242 (66.3)
Checking smartphone first thing in the morning	Yes	233 (63.8)
	No	132 (36.2)

Table 2 outlines the smartphone usage characteristics of participants. A significant number of students reported using their smartphones for more than 4–6 hours per day, and the most common purpose of usage was social networking and entertainment. More than half the students acknowledged checking their phones multiple times per hour, often without any specific reason. A substantial proportion admitted to checking their phones immediately after waking up, and many reported

perceived health effects such as eye strain, headache, and disturbed sleep. Furthermore, around 38% believed that smartphone overuse negatively affected their academic performance.

Figure 1 depicted the prevalence of nomophobia among the study population. It revealed that Moderate nomophobia was the most common, seen in 63% of students, mild nomophobia in 23% and severe in 3%. 11% of the participants had no nomophobia.

Table 3 presented the association of various factors with nomophobia levels. Statistically significant associations were found between nomophobia and the place of residence, age group, and primary purpose of smartphone use. Students residing in hostels showed higher nomophobia levels, likely due to fewer social controls and increased unsupervised access to the internet. Additionally, students using smartphones primarily for social media or leisure (rather than academics or communication) were more prone to moderate and severe nomophobia.

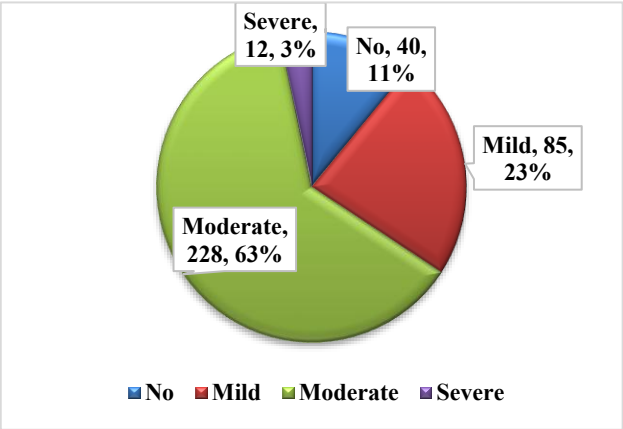

Figure 1: Prevalence of nomophobia among undergraduate students

Table 3: Association of factors with nomophobia (n=365).

Variables		Nomophobia		Chi -square	P value
		Yes	No		
Gender	Male	173	17	1.643	0.199
	Female	152	23		
Age (in years)	<20	174	12	7.89	0.004
	>20	151	28		
Place of stay	Hostel	220	9	23.864	<0.001
	Home	105	31		
Socio economic status	Upper	263	19	0.702	0.402
	lower	62	21		
Duration of smartphone use per day (hours)	<6	231	22	2.017	0.364
	≥6	94	18		
Purpose of maximum usage	Social media	273	25	10.98	<0.001
	others	52	15		
Checking the phone without any reason	Never	35	2	2.017	0.364
	Sometimes	225	18		
	Always	75	10		
Checking smartphone first thing in the morning	Yes	203	30	2.42	0.119
	No	122	10		

Table 4: Thematic analysis of in-depth interviews on perception of smartphone usage among MBBS students.

Theme	Sub-theme	Code (Verbatim Quotes)
Perceived necessity	Academic utility	- *"All my notes, PDFs, and class updates are in WhatsApp or Google Drive."* -2nd year MBBS student - *"We use apps for anatomy diagrams to study."* -1st year MBBS student - *"Most of my learning happens through YouTube and e-books."* — 3rd year MBBS student
	Daily life integration	- *"It's not just a phone anymore. It's my alarm, calendar, and even my planner."* -3rd year MBBS student - *"Without my phone, I forget half of my tasks."* — 4th year MBBS student - *"From waking up to going to sleep, it's always there."* — 2nd year MBBS student
	Study support	- *"Sometimes I feel it's more of a study device than a phone."* — 1st year MBBS student - *" Question banks are very helpful."* — 2nd year MBBS student - *"Phone-based apps make revision easier during breaks."* — 4th year MBBS student

Continued.

Theme	Sub-theme	Code (Verbatim Quotes)
	Coordination tool	- *"Even group studies and assignments are all managed through the phone."*- 2nd year MBBS student - *"We plan our postings and rotations through WhatsApp groups."* -4th year MBBS student - *"No one reads notice boards now; everything is on the phone."*-1st year MBBS student
Emotional attachment	Anxiety when separated	- *"I feel very uneasy when my phone isn't with me. It's like something is missing."* -4th year MBBS student - *"If my phone is not nearby, I feel disconnected."* - 3rd year MBBS student - *"Even during classes, I keep checking if it's in my pocket."* -1st year MBBS student
	Constant urge to check	- *"Even if I leave my phone for 5 minutes, I keep thinking – did I get any message?"* - 1st year MBBS student - *"I refresh WhatsApp unnecessarily even if no one texts."* - 3rd year MBBS student - *"I check it every few minutes without reason."* — 2nd year MBBS student
	Dependency	- *"When my battery dies, I get very anxious. It feels like I've lost something important."* - 3rd year MBBS student - *"Even during hospital rounds, I feel uneasy if my phone isn't with me."* -4th year MBBS student - *"I use it while eating, studying, even while brushing."* -1st year MBBS student
	Fear of missing out	- *"I panic if I can't find my phone, even though I just used it a minute ago."* - 2nd year MBBS student - *"If I'm offline for a while, I feel I've missed something big."* -3rd year MBBS student - *"All my friends post stories. If I miss them, I feel left out."* -1st year MBBS student
Awareness of overuse	Unintentional time use	- *"I plan to use it for 10 minutes, but then an hour passes watching reels."* - 3rd year MBBS student - *"Time just flies when I start scrolling."* - 2nd year MBBS student - *"Even toilet breaks turn into screen time now."* - 4th year MBBS student
	Distraction from studies	- *"I feel guilty sometimes. I know I should study but end up on Instagram instead."* — 4th year MBBS student - *"My phone always distracts me from my timetable."* - 2nd year MBBS student - *"I study for 10 minutes and check my phone for 30."* - 1st year MBBS student
	Mindless scrolling	- *"I start checking one notification and then get stuck scrolling."* - 1st year MBBS - *"It's like muscle memory—Instagram opens on its own."* - 3rd year MBBS student - *"I scroll till I get bored and then scroll more."* - 4th year MBBS student
	Self-blame	- *"Even though I know it's wasting time, I just can't stop using it."* - 2nd year MBBS student - *"I hate how it consumes me, but I still use it."* - 4th year MBBS student - *"I uninstall apps, but they come back soon."* - 3rd year MBBS student
Control vs dependence	Failed attempts to limit usage	- *"I've deleted social media before exams, but I end up reinstalling it."* - 2nd year MBBS student - *"I've tried locking apps, but always unlock them."* - 3rd year MBBS student - *"I use screen limit apps, but ignore the warnings."* 4th year MBBS student
	Perceived lack of control	- *"I feel like it controls me, not the other way around."* - 4th year MBBS student - *"Even if I want to stop, I just can't."* -2nd year MBBS student - *"Sometimes I feel I'm addicted."* - 1st year MBBS student
	Short-lived self-regulation	- *"Sometimes I switch off my phone to focus, but I can't go more than an hour."* - 3rd year MBBS student - *"I try airplane mode, but end up turning it off."* - 2nd year MBBS student - *"I start strong, but give up quickly."* — 1st year MBBS student
	Habitual checking	- *"I try to control it, but after a few hours I'm back to checking notifications."* - 1st year MBBS student - *"I don't even know why I check sometimes."* - 2nd year MBBS student - *"I check it even when there's no notification."* - 4th year MBBS student
Emerging technology-related nomophobia	ChatGPT dependence & anxiety	- *"I ask ChatGPT everything now. Without it, I feel lost."* -2nd year MBBS student - *"Even for simple answers, I rely on AI tools like ChatGPT."* -3rd year MBBS student - *"It's my go-to for all doubts. I can't study without it now."* -4th year MBBS student

Table 4 presents the thematic analysis of the qualitative data. Thematic content analysis revealed four core themes:

Perceived necessity

Students widely considered smartphones crucial for academic activities such as accessing notes, diagrams, e-books, and coordinating study groups or clinical postings. Beyond academics, phones were integrated into their daily routines as planners, alarms, and task reminders, making them integral to both academic and personal functioning.

Emotional attachment

Many students reported a strong emotional dependence on their smartphones. Feelings of anxiety, unease, or incompleteness were common when separated from their devices. Fear of missing out on social interactions or updates contributed to compulsive checking behaviors, even in the absence of notifications.

Awareness of overuse

Despite recognizing the benefits, students were aware of excessive and often unintentional use. Many described how short phone use would turn into extended periods of scrolling, especially on social media. This led to distraction from studies, guilt, and frustration over lost time and productivity.

Control vs. dependence

Participants frequently described failed attempts to limit usage through app restrictions or uninstalling platforms. A recurring theme was the perceived lack of control, with some acknowledging habitual or addictive behavior. Efforts at self-regulation were often short-lived, reflecting internal struggles with digital dependency.

Emerging technology-related nomophobia

A newer pattern of reliance emerged around AI tools like ChatGPT. Students expressed growing dependence on such platforms for academic help and admitted to feeling lost without them. This reflects a shifting dimension of nomophobia from device attachment to dependence on digital content and intelligent tools.

DISCUSSION

The study found that 63% of the students exhibited moderate nomophobia, 23% had mild nomophobia, 3% had severe nomophobia, and 11% showed no nomophobia. These findings align closely with previous research in India, such as Sethia et al who reported a 61.5% prevalence of moderate nomophobia among medical students in Bhopal, with 6.1% having severe nomophobia.[6] Similarly, Devi et al found 99.56% prevalence of nomophobia among medical students in Bhopal, with 55.65% moderate and 20% severe cases, indicating a slightly higher burden of severe nomophobia compared to our study.[8] Globally, Marcos Kubrusly et al reported a 99.7% prevalence among Brazilian medical students, with 64.5% at moderate or severe levels, and Anusuya et al noted a 99% prevalence in Chennai, with 56.3% moderate and 17.5% severe nomophobia.[9,12] The consistency of moderate nomophobia prevalence across these studies underscores its widespread presence among medical students, likely driven by their reliance on smartphones for academic and social purposes. The lower prevalence of severe nomophobia in our study (3%) compared to other studies may reflect regional differences in smartphone usage patterns or access to digital infrastructure.

Significant associations were found between nomophobia and factors such as place of residence, age group, and primary purpose of smartphone use in current study. Students residing in hostels exhibited higher nomophobia levels, potentially due to fewer social controls and greater unsupervised internet access, a finding consistent with Jilisha et al who identified frequent smartphone usage and social networking as significant factors.[7] The study also noted that students using smartphones primarily for social media or leisure, rather than academics, were more prone to moderate and severe nomophobia, corroborating Devi et al who reported a significant association between nomophobia and daily smartphone usage duration ($p=0.000$).[8] Additionally, Anusuya GS et al found that severe nomophobia was linked to mobile usage exceeding five hours daily ($p=0.013$), aligning with our observation of increased nomophobia with prolonged leisure-based usage.[10]

Gender differences were not significant in our study, contrasting with Jilisha et al and Sharma M et al, who reported higher nomophobia among males.[7,11] These inconsistencies suggest that contextual factors, such as cultural norms or academic pressures, may influence gender-based differences in nomophobia prevalence.

The qualitative component, revealed five core themes: perception about smartphone usage, facilitating factors, controlling factors, nomophobia and addiction and emerging technology-related nomophobia. Students perceived smartphones as essential for daily life, providing stress relief, social belonging, and a sense of identity, yet expressed embarrassment when using non-smartphones, reflecting social pressures. Facilitating factors included internet availability and compulsive checking of notifications, consistent with Jilisha et al.'s findings of dependency and compulsive behaviour.[7] Controlling factors, such as parental restrictions and awareness of overuse, were noted as mitigating nomophobia, aligning with Devi et al who highlighted usage duration as a modifiable factor.[8]

Students described anxiety, frustration, and loss of control when separated from their phones, with some interrupting tasks or returning home for forgotten devices, mirroring Jilisha et al observations of addiction-like behaviours.[7] Theme of emerging technology-related nomophobia highlighted a growing dependence on AI tools like ChatGPT for academic assistance, with students reporting feelings of disorientation when unable to access these platforms. This finding extends Jilisha et al observations of dependency by suggesting that nomophobia is evolving beyond device attachment to include reliance on specific digital content and intelligent tools, reflecting the increasing integration of AI in educational settings.[7]

Limitations

The cross-sectional design limits the ability to establish causal relationships between associated factors and nomophobia. The use of convenience sampling may limit the generalizability of findings beyond the study setting. Self-reported data are subject to recall and social desirability bias

CONCLUSION

Nomophobia is highly prevalent among undergraduate medical students in this study, with the majority exhibiting moderate dependence and a smaller proportion having severe dependence. Younger students, those residing in hostels, and those using smartphones primarily for social networking were more likely to exhibit higher levels of nomophobia. Qualitative findings revealed that smartphones are perceived as indispensable for academic and personal tasks but are also a source of distraction, emotional dependence, and anxiety when unavailable. The emerging reliance on AI-based tools such as ChatGPT indicates a shift from device attachment towards dependence on specific digital platforms. These findings highlight the need for targeted interventions to promote healthy digital habits among medical students.

Recommendations

Implement structured digital well-being programs focusing on balanced smartphone use, time management, and awareness of the risks of overdependence.

Provide counseling and psychological support services for students exhibiting signs of smartphone overuse or dependency.

Develop institutional guidelines to regulate smartphone use during lectures, practical sessions, and clinical postings.

Encourage the use of offline academic resources such as printed study material, group discussions, and skill-based practical learning.

Involve parents and peers in promoting healthy usage patterns and in early identification of problematic use.

Undertake multicentric longitudinal and interventional studies to assess the long-term impact of nomophobia and the effectiveness of preventive strategies.

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