International Journal of Research in Medical Sciences
Pomal P et al. Int J Res Med Sci. 2026 Feb;14(2):591-596
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20260247

Original Research Article

A cross-sectional study to evaluate smartphone addiction among undergraduate medical students

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Received: 13 December 2025
Revised: 09 January 2026
Accepted: 12 January 2026

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ABSTRACT

Background: The rapid global proliferation of smartphones has raised concerns regarding "smartphone addiction," a behavioural condition characterized by compulsive use and functional impairment. Medical students, due to high academic demands and extensive reliance on digital platforms, may be particularly vulnerable. This study aimed to estimate the prevalence of smartphone addiction among undergraduate medical students in Kutch, Gujarat, India and to examine factors associated with addictive smartphone use.
Methods: A cross-sectional study was conducted among 195 undergraduate medical students between April 2025 and June 2025. Data were collected using a pre-designed, pre-tested structured questionnaire that included the Smartphone Addiction Scale–Short Version (SAS-SV). Smartphone addiction was determined using the established cut-off score of ≥ 33. Associations between smartphone addiction and demographic or usage-related variables were evaluated using the Chi-square test.
Results: Among the 195 participants, 51 students met criteria for smartphone addiction, yielding a prevalence of 26 percent. Participation was highest from Phase-3 Part-2 (n=58), with 11 identified as addicted, while Phase-1 showed the highest number of addicted students (n=20 out of 57). Most respondents reported average daily smartphone use of 3–6 hours (n=91), with 28 classified as addicted. Social media was the most common primary use (n=98), among whom 33 were addicted. Academic phase, daily duration of use and primary purpose of use did not show statistically significant associations with smartphone addiction. In contrast, students' self-perception of smartphone use demonstrated a highly significant association ($p<0.00001$).
Conclusions: Self-perception of excessive smartphone use emerged as the only significant predictor of smartphone addiction, underscoring the importance of subjective awareness when designing preventive or corrective strategies for medical students.

Keywords: Addiction, Behavioral addiction, Medical students, Smartphones, Surveys and questionnaires

INTRODUCTION

Human success as a species has been closely linked to our capacity for social behaviour. This social connectedness has expanded dramatically with the advent of the first smartphone in 1994 and the subsequent evolution of mobile connectivity from 3G to 5G.[1] In 2024, there were an estimated 7.21 billion smartphones globally, used by approximately 4.88 billion individuals.[2] These numbers are projected to rise to 7.43 billion smartphones and 5.28 billion users in 2025.[2] A comprehensive modular telecom survey in India reported that among individuals aged 15 to 29 years who owned a mobile phone, 95.5 percent in rural areas and 97.6 percent in urban areas possessed a smartphone.[3]

The increasing use of smartphones stems from multiple purposes, primarily social communication and

entertainment. While smartphones offer significant benefits by making information and services readily accessible, this rise in usage has also introduced several drawbacks. Excessive use has led to the emergence of terms such as "Smartphone Addiction," "Smartphone Overuse," "Problematic Mobile Phone Use," and "Mobile Phone Addiction."

Smartphone addiction is considered a behavioural and technological addiction characterized by compulsive smartphone use, preoccupation with the device, increasing tolerance, withdrawal symptoms and impairment of daily functioning.[4] Manifestations include repeatedly checking the device, checking it without notifications and prolonged night-time use. Such patterns have been associated with deteriorating mental health, sleep–wake disturbances and other physical and psychological consequences.

Medical students are similarly affected, with potential impacts on academic performance and long-term career goals. Approximately 87 percent of smartphone users check their phone within one hour of waking up or going to sleep.[5]

Descriptive research indicates that internet addiction shares several features with substance-related addictions, such as compulsive use and impaired control, although behavioural addictions do not involve ingestion of a physical substance and often lack overt physical symptoms.[6] However, prolonged, uncontrolled digital engagement may result in adverse outcomes similar to those observed in alcohol dependence, including impaired functioning and diminished self-regulation.[6]

Given these concerns, the present study was undertaken to better understand smartphone addiction among undergraduate medical students. The objectives were to estimate the prevalence of smartphone addiction among medical undergraduates in Kutch, Gujarat, India and to examine factors influencing addiction, including age, phase of learning, duration of smartphone use, primary purpose of use and self-perception regarding smartphone use.

METHODS

This cross-sectional study was conducted from April 2025 to June 2025 at Gujarat Adani Institute of Medical Science, Bhuj. Ethical approval was obtained from the Institutional Ethics Committee prior to data collection. All undergraduate medical students who voluntarily participated in the study were included, while non-respondents were excluded. A total of 195 students constituted the final sample.

Questionnaire used

A pre-validated questionnaire captured sociodemographic details, academic phase, primary purpose of smartphone use, average daily duration of smartphone use and students' self-perception of their smartphone usage. Smartphone addiction was assessed using the Smartphone Addiction Scale–Short Version (SAS-SV) validated by Kwon et al which consists of 10 items rated on a 6-point Likert scale, each weighted equally. Since gender-specific cut-off scores were not applicable in this dataset, a uniform cut-off score of 33 was used to classify smartphone addiction.[11] Students scoring ≥33 was categorized as addicted.

The survey link was disseminated to students as a google form via WhatsApp. Responses from google forms were downloaded and organized into tabular format using Microsoft excel. Statistical analysis was performed using the Chi-square test to evaluate associations between smartphone addiction and selected variables. A p value of <0.05 was considered statistically significant, while values ≥ 0.05 were interpreted as not statistically significant.

RESULTS

The present study included 195 undergraduate medical students from Gujarat Adani Institute of Medical Sciences (GAIMS), Bhuj, aged 17–25 years, representing both male and female students. Participants were enrolled across all phases of the MBBS curriculum, from Phase 1 to Phase 3, Part 2. Table 1 summarizes the age and phase-wise distribution of students. The highest participation was from Phase 3, Part 2 (n=58), while the lowest was from Phase 2 (n=35).

Table 2 depicts the average daily duration of smartphone use. The majority of students (n=91) reported using their smartphones for 3–6 hours per day, while 25 students reported using them for more than six hours daily. Only two students reported using their smartphones for less than one hour per day.

Table 3 outlines the primary purpose of smartphone use. Social media emerged as the predominant purpose (n=98), followed by academic use (n=83). Gaming and mixed-use categories accounted for a small proportion of the cohort (n=7 each).

Self-perception of smartphone use is detailed in table 4. Of the 195 students, 83 stated that they were not addicted to smartphones, whereas 41 acknowledged being addicted. An additional 67 students responded with "maybe," and 4 were uncertain.

Table 5 presents the association between smartphone addiction (as assessed by SAS-SV, cut-off≥33) and selected variables. Overall, 51 out of 195 students were classified as addicted.

In phase-wise distribution, Phase-1 had the highest number of addicted students (20 out of 57), whereas Phase 3 Part 1 had the lowest (7 out of 45). However, the association between academic phase and addiction was not statistically significant (p=0.1644).

Regarding duration of use, among the 91 students using smartphones for 3–6 hours daily, 28 were addicted. Among those using smartphones for more than 6 hours per day (n=25), 10 were addicted. This association was not statistically significant (p=1.7098). When categorized by purpose of use, 33 of 98 social media users and 15 of 83 students using smartphones for academics were found to be addicted; this association was also not significant (p=0.2978).

In contrast, self-perception of addiction showed a highly significant association with SAS-SV outcomes (p<0.00001). Among the 41 students who believed they were addicted, 26 actually met SAS criteria for addiction. Among the 83 students who believed they were not addicted, only 3 were found to be addicted.

Based on these findings, self-perception of addiction emerged as the only variable with a highly significant association with smartphone addiction.

Students who believed they were addicted were substantially more likely to meet SAS-SV criteria, indicating that subjective self-awareness is a strong predictor of actual smartphone addiction. In contrast, academic phase, duration of smartphone use and primary purpose of use did not demonstrate statistically significant associations.

Table 1: Phase-wise distribution of students.

Age (in years)	Number of students				
	Phase 1	Phase 2	Phase 3 Part 1	Phase 3 Part 2	Total
17	2	0	0	0	2
18	23	0	0	0	23
19	23	9	0	0	32
20	8	19	10	3	40
21	0	6	25	17	48
22	1	1	10	23	35
23	0	0	0	12	12
24	0	0	0	2	2
25	0	0	0	1	1
Total	57	35	45	58	195

Table 2: Duration of smartphone usage.

Duration of smartphone use	Number of students
Less than 1 hour	2
1 to 3 hours	77
3 to 6 hours	91
More than 6 hours	25
Total	195

Table 3: Purpose of smartphone use.

Primary purpose	Number of students
Gaming	7
Social media	98
Studies	83
Mixed response	7
Total	195

Table 4: Self-perception regarding smartphone use.

Self-perception	Number of students
Yes	41
No	83
Maybe	67
Don’t know	4
Total	195

Table 5: Smartphone addiction (SAS-SV score≥33) across variables.

Variable	Category	Number of students	Addiction (n)	P value
Phase	Phase 1	57	20	0.1644
	Phase 2	35	13	
	Phase 3 Part 1	45	7	
	Phase 3 Part 2	58	11	
Duration of smartphone use	<1 hour	2	1	1.7098
	1–3 hours	77	12	
	3–6 hours	91	28	
	>6 hours	25	10	
Purpose of use	Gaming	7	1	0.2978
	Social media	98	33	
	Studies	83	15	
	Mixed	7	2	
Self-perception of addiction	Yes	41	26	<0.00001
	No	83	3	
	Maybe	67	20	
	Don't know	4	2	

DISCUSSION

Smartphone use, like any technological advancement, carries both advantages and disadvantages. Smartphones provide instant access to information through internet browsing, support academic learning and facilitate preparation for competitive examinations such as NEET through dedicated educational applications. They also serve as communication tools, enabling rapid connectivity, identity expression and professional networking through social media platforms. However, excessive smartphone use often described as "problematic mobile phone use" or "smartphone addiction" has been associated with several adverse outcomes, including stress, depression, sleep disturbances, reduced academic performance, impaired cognitive function and decreased life satisfaction.[7-10] The Smartphone Addiction Scale–Short Version (SAS-SV), developed by Kwon et al was used in the present study and has demonstrated strong reliability and validity for assessing smartphone addiction.[11]

In this study, 51 out of 195 participants met the SAS-SV criteria for addiction, yielding a prevalence of 26 percent. This finding aligns with previous research conducted in India and elsewhere, though slight variations exist. Ammati et al, reported a prevalence of 36 percent among students in South India, while Soni et al found a prevalence of 33.3 percent in Rajasthan.[12,13] The prevalence observed in our study is also comparable to international reports from China, Switzerland, Spain and France.[14-16]

Although earlier studies have explored gender-based differences with mixed results, the present study did not stratify participants by sex.[15,17,18] Contrary to several studies that identified a positive association between smartphone addiction and duration of use such as those by Haug et al in Switzerland, Cha et al in Korea and Indian studies by Phukan et al and Geetha et al the current study found no association.[14,19-21] This suggests that smartphone addiction may not be determined solely by the number of hours spent on the device. Factors such as compulsive checking, loss of control, interference with daily activities, purpose of use and functional impairment may play more central roles. This implies that subjective experiences of dependency may not directly correlate with time spent on smartphones.

The present study did not find association between smartphone addiction and the primary purpose of smartphone usage. Although most students used smartphones primarily for social media-consistent with previous studies identifying social networking, messaging applications and entertainment apps as predictors of addiction, our findings reveal that students using smartphones for academic purposes may also demonstrate addictive behaviours.[11,15,22] Prior Indian literature supports social media usage as a significant predictor of smartphone addiction, yet our results indicate that addiction patterns cannot be explained solely based on purpose of use.[20,23] Collectively, existing evidence confirms that excessive dependence on smartphones is associated with negative physical, psychological, social, familial and academic consequences.[24-26]

A significant finding from this study was the strong association between students' self-perception of smartphone addiction and actual SAS-SV scores. Students who believed they were addicted were far more likely to meet objective diagnostic criteria. This alignment suggests that self-perception may serve as a practical screening tool for identifying individuals at risk. Prior studies have similarly emphasized the value of integrating self-perception into diagnostic evaluation to improve accuracy in identifying true cases of smartphone addiction.[27,28]

Limitations

This study relied on self-reported data, which carries the inherent risk of response biases, including exaggeration, underreporting and recall bias. As the study was conducted in a single medical institution in Gujarat with a relatively modest sample size, generalizability to medical students across India or to students from other academic disciplines is limited. Additionally, gender was not considered while calculating smartphone addiction scores, which may have influenced observed patterns. Future multicentric studies across diverse regions and larger populations are recommended to provide a more comprehensive and representative understanding of smartphone addiction among undergraduate students.

CONCLUSION

The study identified a 26 percent prevalence of smartphone addiction among medical undergraduates. A key finding is that self-perception emerged as a critical indicator of smartphone addiction, suggesting that subjective awareness of dependency may be more informative than objective variables such as the student's academic phase, average daily screen time or primary purpose of smartphone use. These findings underscore the need to promote awareness regarding balanced smartphone use and encourage students to self-monitor their digital behaviour. The study also highlights the importance of conducting larger, multicentric investigations to enhance generalizability and better understand the determinants and consequences of smartphone addiction in medical training environments.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Paavola A. Smartphone history: a complete timeline. San Francisco: Textline. 2022. Available at: https://www.textline.com/blog/smartphone-history. Accessed on 21 August 2025.
2. Turner A. How many people have smartphones worldwide. 2024. Available at: https://www.bankmycell.com/blog/how-many-phones-are-in-the-world. Accessed on 25 September 2025.
3. Hamatake J. The Complexity of Choosing Sustainable Smartphone Options in the Face of Planned Obsolescence: An Exploratory Study of Smartphone Consumer Behaviour. 2024.
4. Kim E, Koh E. Avoidant attachment and smartphone addiction in college students: the mediating effects of anxiety and self-esteem. Comput Hum Behav. 2018;84:264–71.
5. Shoukat S. Cell phone addiction and psychological and physiological health in adolescents. EXCLI J. 2019;4;18:47–50.
6. Alavi SS, Ferdosi M, Jannatifard F, Eslami M, Alaghemandan H, Setare M. Behavioral addiction versus substance addiction: correspondence of psychiatric and psychological views. Int J Prev Med. 2012;3:290–4.
7. Wallace P. Internet addiction disorder and youth. EMBO Rep. 2014;7;15(1):12–6.
8. Samaha M, Hawi NS. Relationships among smartphone addiction, stress, academic performance and satisfaction with life. Comput Hum Behav. 2016;57:321–5.
9. Tao S, Wu X, Zhang S, Tong S, Hao J, Tao F. Association of alcohol use with problematic mobile phone use and depressive symptoms among college students in Anhui, China. J Public Health. 2017;25:103–12.
10. Ward AF, Duke K, Gneezy A, Bos MW. Brain drain: the mere presence of one's own smartphone reduces available cognitive capacity. J Assoc Consum Res. 2017;2:140–54.
11. Kwon M, Kim DJ, Cho H, Yang S. The Smartphone Addiction Scale: development and validation of a short version for adolescents. PLoS One. 2013;8(12):83558.
12. Ammati R, Kakunje A, Karkal R, Nafisa D, Kini G, Chandrashekaran P. Smartphone Addiction among Students of Medical University In South India: A Cross-Sectional Study. Ann Int Med Den Res. 2018;4(2):1-4.
13. Soni R, Upadhyay R, Jain M. Prevalence of smartphone addiction, sleep quality and associated behavior problems in adolescents. Int J Res Med Sci. 2017;5(2):515-9.
14. Haug S, Castro R, Kwon M, Filler A, Kowatsch T, Schaub M. Smartphone use and smartphone addiction among young people in Switzerland. J Behav Addict. 2015;4(4):299–307.
15. Chen B, Liu F, Ding S, Ying X, Wang L, Wen Y. Gender differences in factors associated with smartphone addiction: a cross-sectional study among medical college students. BMC Psych. 2017;17(1):341.
16. Lopez-Fernandez O. Short version of the Smartphone Addiction Scale adapted to Spanish and French: towards a cross-cultural research in problematic mobile phone use. Addict Behav. 2017;64:275–80.
17. Nikolic A, Bukurov B, Kocic I, Vukovic M, Ladjevic N, Vrhovac M, et al. Smartphone addiction, sleep quality, depression, anxiety and stress among medical students. Front Public Health. 2023;6;11:1252371.
18. Kumar VA, Chandrasekaran V, Brahadeeswari H. Prevalence of smartphone addiction and its effects on sleep quality: a cross-sectional study among medical students. Ind Psychiatry J. 2019;28(1):82–5.
19. Cha SS, Seo BK. Smartphone use and smartphone addiction in middle school students in Korea:

prevalence, social networking service and game use. Health Psychol Open. 2018;5(1):55046.
20. Phukan I, Chetia A, Mahanta B. Smartphone addiction and associated risk factors amongst undergraduate medical students in a medical college of Assam: a cross-sectional study. Int J Community Med Public Health. 2022;9:2085–9.
21. Geetha M, Singh RP, Kumar R. Dependence on smartphone: a cross-sectional study among undergraduate medical students in a tertiary care teaching hospital in Bareilly. Int J Adv Community Med. 2025;8(3):116–20.
22. Park J, Jeong JE, Rho MJ. Predictors of habitual and addictive smartphone behavior in problematic smartphone use. Psychiatry Investig. 2021;18(2):118–25.
23. Zeerak Q, Imran M, Azeez K. The effects of smartphone addiction on academic performance among undergraduate medical students in Karnataka, India: a multi-centric study. Cureus. 2024;16(6):62796.
24. Aljomaa S, Al-Qudah M, Albursan I, Bakhiet S, Abduljabbar A. Smartphone addiction among university students in the light of some variables. Comput Hum Behav. 2016;61:155–64.
25. Lepp A, Barkley J, Karpinski A. The relationship between cell phone use, academic performance, anxiety and satisfaction with life in college students. Comput Hum Behav. 2014;31:343–50.
26. Javid M, Malik MA, Gujjar AA. Mobile phone culture and its psychological impacts on students' learning at the university level. Language in India. 2011;11(2):415.
27. Ballestar-Tarín ML, Simó-Sanz C, Chover-Sierra E, Saus-Ortega C, Casal-Angulo C, Martínez-Sabater A. Self-perception of dependence as an indicator of smartphone addiction: establishment of a cutoff point in the SPAI–Spain inventory. Int J Environ Res Public Health. 2020;17:3838.
28. Erez S, Ağırkan M. A model for explaining digital addiction in adolescents: the role of self-perception, social-emotional learning, adolescent-parent relationship and peer relationships. Bagimlilik Derg. 2024;25(2):180–90.

Cite this article as: Pomal P, Khilnani AK, Gala V. A cross-sectional study to evaluate smartphone addiction among undergraduate medical students. Int J Res Med Sci 2026;14:591-6.