

**Smartphone Addiction – Its Determinants and Consequences among Medical Students in Central Karnataka**Vidya V. Patil<sup>1</sup>, Manu A. S.<sup>2</sup>, Preethi Rioniz<sup>3</sup>, Ranganatha S. C.<sup>4</sup><sup>1,2,4</sup>Department of Community Medicine, S. S. Institute of Medical Sciences & Research Centre, Davangere, Karnataka, India<sup>3</sup>Department of Pharmacology, Chikkamagaluru Institute of Medical Sciences, Chikkamagaluru, Karnataka, India

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**Abstract:**

**Introduction:** Globally, the prevalence of smartphone addiction ranges from 2.4% to 60.3%. Smartphone addiction has been found to pose a negative impact on one's ability to think, pay attention, remember, and regulate emotions. It can also have a negative impact on biological systems, leading to increased stress, sleep disturbances and depression. Medical college students are increasingly developing this behavioural addiction and are liable to suffer its consequences.

**Objectives:** (1) To determine the prevalence and determinants of smartphone addiction among medical students; (2) To assess the consequences of smartphone addiction among medical students.

**Methodology:** A cross-sectional questionnaire-based study was conducted among medical students in Karnataka from February to April 2023. Medical students who were present on the day of filling the questionnaire and those that gave their written consent were included in the study. A pretested questionnaire and the standardized Smartphone Addiction Scale-Short Version were employed. Data was entered in Microsoft Excel and represented as frequencies, percentages and graphs. Chi-square test was performed for association.

**Results:** A total of 521 students were included in the study. The prevalence of smartphone addiction was seen among 74.9% participants. Female students and those staying in the hostels showed a higher prevalence. 98% of the participants agreed that they constantly check their smartphones, 68% of the students reported that other people complain about their increased use of smartphone. There was a significant association seen with decreased sleep duration, sleep latency and subjective academic procrastination.

**Keywords:** smartphone addiction; prevalence study; young adults; sleep quality; sleep latency,

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**Introduction**

A smartphone is a medium of communication that integrates a cellular phone with the functions of a computer, and has seen rapid universal adoption in both developed and developing countries over the past two decades. Smartphone use irrespective of age and gender has evolved as a form of behavioural addiction and is found to be increasingly prevalent among college students as half of India's entry-level users for smartphones are between the ages of 15 and 24 years. [1]

Globally, there is a wide range of prevalence of mobile phone addiction ranging from 2.4% to 60.3%. [2] The advent of smartphones coincided with the emergence of social media. The average Indian social media user spends 17 hours a week on the available platforms, which is more than the time spent by social media users in China and the United States. [1] Excessive use of technology may put one at risk for isolation, loneliness, decline in

interpersonal relationships and social interaction. Smartphone addiction poses a negative impact on one's ability to think, remember, pay attention and regulate emotions. [3] It can also have a negative impact on biological systems, leading to increased stress, sleep disturbances and depression. [4,5]

The concept of addiction is not easy to define and is controversial. [6] Literature review suggests a correlation between smartphone addiction and compromised mental and physical health, neurological problems, tolerance, salience, withdrawals and cravings. [7–10] Smartphone addiction encourages multitasking which at the same time impairs learning among youngsters. Other adverse effects include decreased academic performance, reduced cognitive capacity and dissatisfaction towards life. [11] The World Health Organization has classified mobile phone addiction as a non-substance addiction. Excessive use of

cellular devices is an acquired compulsive behavioural pattern that consumes time and resources. [7] “Nomophobia” (no-mobile-phone phobia) described in DSM-IV, has emerged from the excessive use of mobiles. It is a psychological condition where one has an irrational fear of being away from mobile phone connectivity that may manifest as anxiety, respiratory alterations, trembling, perspiration, agitation, disorientation, and tachycardia. [12]

Smartphone usage among medical students is inevitable as they try to stay in touch with their peers and families while taking on a curriculum that entails long working hours confined to the hospital. It is also extensively used as a tool for education, with the increasing availability of e-books, medical podcasts, dosage calculators, and online lectures. The high intensity academics and overall stress can lead these well-meaning students down the path to smartphone addiction. Studies have shown that poor sleep quality in medical students is also associated with overuse of mobile phones, placing them at an increased risk of various physical ailments and mental disorders. [13] In light of this issue, we conducted a study among medical college students to estimate the prevalence of smartphone addiction, its determinants and consequences to students’ lives.

**Objectives:** The objectives of the study were:

1. To determine the prevalence and determinants of smartphone addiction, and
2. To assess the consequences of smartphone addiction among medical college students included in the study.

**Methodology:** A cross-sectional questionnaire-based study was conducted among medical students studying at a private college in Davangere, Karnataka between February and April 2023. Ethical clearance was obtained from the

Institutional Ethics Committee. The purpose of the study was explained and oral consent was obtained from the participants prior to their enrolment in the study. All students admitted to the MBBS course during the study period were eligible to participate. Medical students who were present on the day of filling the questionnaire and those that voluntarily gave their written consent were included in the study population. Students who did not own a smartphone were excluded from the study.

Data collection was done through a pretested questionnaire regarding socio-demographic characteristics and a standardized tool called the Smartphone Addiction Scale-Short Version (SAS-SV) which is a 10-item, self-reported questionnaire [14]. The effect of mobile phone usage on the 10 parameters were rated by participants on a 6-point Likert scale, with options ranging from “strongly disagree” (1 point) to “strongly agree” (6 points). A score above 34 points is indicative of a high risk of mobile addiction. Other data variables for the assessment of consequences secondary to smartphone addiction included subjective sleep quality, sleep duration, sleep latency, subjective academic performance, and subjective academic procrastination.

**Statistical analysis:** Data entry was done on Microsoft Excel and results were represented as frequencies, percentages and graphs. Chi-squared test was used to determine association for the categorical data.

#### Results:

The results of the study showed a prevalence of 74.9% smartphone addiction among 521 medical students enrolled in the study. The predicament was noted to be higher among the participants aged 18–21 years. Its prevalence was significantly greater among female students, those staying at hostels, and those studying in III<sup>rd</sup> year MBBS.

**Table 1: Prevalence of smartphone addiction in study population and its determinants**

Characteristics	No. of students N (%)	Smartphone addiction N (%)	$\chi^2$	p value
Age (in years)				
18-21	365 (70)	269 (69)	0.86	0.35
22-25	156 (30)	121 (31)		
Gender			4.21	< 0.040
Male	227 (44)	180 (46)		
Female	294 (56)	210 (54)		
Residence			28.34	< 0.00001
Hostel	399 (77)	321 (82)		
Day Scholar	122 (23)	69 (18)		
MBBS Year			25.68	< 0.00001
I <sup>st</sup>	160 (31)	102 (26)		
II <sup>nd</sup>	136 (26)	108 (28)		
III <sup>rd</sup>	132 (25)	116 (30)		
IV <sup>th</sup>	93 (18)	64 (16)		
Total	521	390		

98% of the students with an SAS-SV score >34 confirmed that they were prone to constantly checking their smartphones so as not to miss out on updates or conversations between other people on social media platforms. Around 76% of the participants strongly agreed that they use their smartphones for extended durations, followed by

the people around them complaining that they use their smartphones too much. Nearly two-thirds of these students reported that they would not be able to survive without their mobile devices. Despite this, only 11% of the with smartphone addiction believed that it was greatly affecting their daily lives (see Table 2).

**Table 2: Smartphone addiction behaviour among study participants**

SAS-SV Domains	Number* (N)	Percentage (%)
Missing planned work	108	28
Difficulty in concentrating	206	53
Feeling pain while using a smartphone	45	12
Won't be able to survive without a smartphone	265	68
Impatient without smartphone	217	56
Always on the mind	192	50
Daily life is greatly affected	43	11
Constantly checking smartphone	381	98
Using smartphone for longer durations	297	76
People complain respondent uses smartphone too much	265	68

\*Multiple choices can be true for individual respondents. Some of the consequences of smartphone addiction such as the effect on students' sleep pattern as well as academic performance, and academic procrastination were assessed. The results were highly significant with respect to lesser sleep duration; increased sleep latency and subjective academic procrastination (see Table 3).

**Table 3: Consequences of smartphone addiction among study participants**

Characteristics	Smartphone addiction	No Addiction	$\chi^2$	p value
Sleep duration (< 5 hrs)	312 (80)	42 (32)	103.47	<b>0.0001</b>
Sleep latency (> 30 mins)	369 (95)	74 (56)	111.9	<b>0.0001</b>
Subjective low sleep quality	65 (17)	19 (15)	0.3392	0.560
Subjective academic procrastination	197 (51)	41 (31)	14.59	<b>0.0001</b>
Subjective low academic performance	112 (29)	39 (30)	0.0528	0.818
Total	<b>390*</b>	<b>131*</b>		

\*Multiple choices can be true for individual respondents

### Discussion:

The estimated prevalence of smartphone addiction was 74.8% among medical students in our study. Similar studies conducted in Telangana, Maharashtra, Assam, Uttarakhand and Delhi between the years 2018 and 2022 found smartphone addiction prevalence among medical undergraduates to be lower at 52.7%, 46.2%, 44%, 43.8% and 39.9% respectively [11–13,15,16]. On the other hand, Sethuraman et al. found 85.4% of medical students in Andaman and Nicobar Islands were addicted to smartphones upon evaluation through the SAS tool. [17,19,20,21] Our study showed the prevalence of smartphone addiction was significantly greater among female students and third-year MBBS students.

These findings were corroborated by Awasthi et al. (2020) that concluded first- and fourth-year MBBS students were less addicted to smartphone use when compared to other students, and a few other studies that have reported a higher prevalence among females. [18–20] Nearly all the students in our study population (98%) agreed that they constantly check their smartphones so as not to

miss out on any social media content. Around 76% of the students strongly agreed that they use their smartphones for unduly long durations. The majority of the students (84%) used their smartphones for social media applications and around 31% used them for gaming, which is similar to the findings of a study conducted by Tang et al. [21] 63% of respondents were in agreement that friends and family complain that their smartphone usage is too high, while Agarwal et al. reported the same in only 20% of their study group. [22]

Smartphone addiction was seen to be significantly associated with consequences such as decreased sleep duration, increased sleep latency and subjective academic procrastination. Jahagirdar et al. (2021) established that 66% medical college students reported facing difficulty in concentrating while studying [12], while Basu et al. reported that 26% of their participants had a hard time concentrating in class and doing assignments due to smartphone use [13]. Around 53% of students in our study admitted that they would never give up using smartphones even at the cost of the severe negative effects it could have on their daily lives. The same response to this question was seen among

83% medical student participants in a similar study conducted by Dixit et al. [23]

### Conclusion and Recommendation:

The present study showed a very high prevalence of smartphone addiction among medical students which has led to decreased sleep duration, increased sleep latency, and academic procrastination. Selfcare models and strategies to tackle the issue must be devised and taught to students so as to improve their quality of life.

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