

## Mobile Phone Use and Nomophobia Among College Going Adolescents in a South Indian City

Sudhir Ben Nelson B T<sup>1</sup>, Saravanan M<sup>2</sup>, Sriandaal V<sup>3\*</sup>

<sup>1</sup>Department of Community Medicine, Velammal Medical College Hospital & Research Institute, Madurai, Tamil Nadu, India. <https://orcid.org/0000-0002-6165-4441>

<sup>2</sup>Department of Paediatrics, Velammal Medical College Hospital & Research Institute, Madurai, Tamil Nadu, India. <https://orcid.org/0009-0006-0862-1145>

<sup>3\*</sup>Department of Community Medicine, Velammal Medical College Hospital & Research Institute, Madurai, Tamil Nadu, India. <https://orcid.org/0000-0003-1569-022X>

**\*Corresponding Author:** Dr. Sriandaal V

\*Department of Community Medicine, Velammal Medical College Hospital & Research Institute, Madurai, Tamil Nadu, India. Email: [drsriandaalspm@gmail.com](mailto:drsriandaalspm@gmail.com)

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### Background

*When adolescents start college education, they gain unfettered access to smartphones. This can lead to unsafe and unhealthy usage, and ultimately addiction and nomophobia. Nomophobia is the fear of being out of contact with one's own mobile phone. The problem of Nomophobia is growing over the years and might need public health intervention in the near future.*

### Aim:

*The aim of this study was to examine the explore mobile phone usage and the problem of nomophobia among college-going adolescent students.*

### Methods

*A college-based cross-sectional study was carried out among adolescents in Madurai city, India. 660 first-year students, aged 17–19 years were selected by multistage random sampling. A semi-structured questionnaire including the Nomophobia Questionnaire (NMP-Q) was used. Ethical clearance was obtained before the start of the study.*

### Results

*All of the 660 adolescents were using smartphones. Students had been using smartphones for  $4.6 \pm 2.2$  years, and average usage per day was  $5.2 \pm 2.4$  hours. They were using mobiles commonly for entertainment (88%), communication (87.4%) and social media (66.5%). Males ( $4.92 \pm 2.3$ ) & urban students ( $4.88 \pm 2.2$ ) had been using phones for a longer period. Most of the college-going adolescents (98%) had nomophobia, with moderate nomophobia in the majority (60%). Severe nomophobia was more commonly found among rural adolescents and hostellers. Per-day usage & usage for social media, online shopping, and WhatsApp were significantly associated with nomophobia. Nomophobia was not associated with gender, type of family or number of years of phone usage.*

### **Conclusion**

*Smartphone use is universal, and the top reasons for usage are entertainment, communication, and social media. Males and urban adolescents get access to mobile phones earlier in their lives. The prevalence of nomophobia is alarmingly high. Nomophobia was influenced by family's locality, student's residency, daily usage, and pattern of use.*

### **INTRODUCTION:**

Human civilization is currently in the third stage of the information age,<sup>1</sup> and mobile phones are no longer just phones but are our gateway into the digital world. From the introduction of mobile phones in the late 1990s to the launch of smartphones that are more powerful than some personal computers, we have come a long way in a short time. Over the last couple of decades, mobile phones have become an essential part of our daily lives, and consequently, many of us do not go anywhere without a smartphone with us. According to a survey conducted by the Mobile Ecosystem Forum in 2019, the highest number of smartphone users was in the age group of 16 to 24 years, with 37 percent.<sup>2</sup> The majority of time on mobile phones is spent on watching videos, listening to music, browsing the internet, shopping, playing games, using social media, reading, etc.<sup>3</sup> In India, most children are used to sharing their phones with their parents. Moreover, one of the major changes brought about by the COVID-19 pandemic in our society is the increased use of mobile phones for entertainment and education purposes among teenagers. The ASER 2023 report<sup>4</sup> found that even in rural areas, 90% of children in the age group of 14 to 18 years had access to smartphones. Among college-going adolescents, the smartphone is one of the most popular electronic gadgets due to the variety of functions and features it provides.

Nomophobia, or “NO MOBILE PHONE PHOBIA” is defined as the fear of being out of contact with one's own mobile phone. Some of the characteristic features are having multiple mobile phones and chargers, frequently eyeing phones to look out for notifications, and keeping mobile phones close during sleep.<sup>5</sup> The clinical risks associated with nomophobia are tachycardia, sweating, respiratory distress, disorientation, and agitation. Studies<sup>6-8</sup> done so far in the country show that nomophobia is on the rise across India, and increasing number of people fear being without or losing their mobile phones for a day or even an hour. Even when the students are aware of problematic smartphone use and its connection to nomophobia, they are not able to control it on their own.<sup>9</sup> Hence, in the near future, intervention for smartphone addiction and nomophobia is going to be essential in our country, and therefore, more data on its prevalence and influencing factors is crucial.

The current older teens represent the generation that grew up with smartphones practically from birth. Nevertheless, a significant percentage of parents tend to limit their access. But when they start their college education, they are given more freedom, including unfettered access to their own smartphones. There is also a significant reduction in parental monitoring. This can lead to unsafe and unhealthy usage of mobile phones, including addiction to mobile phones. Although mobile addiction and nomophobia have gained the attention of researchers across the world, data during this short phase of transition from childhood to adulthood is still limited. Hence, we conducted a study among college-going adolescent students to explore their mobile phone usage and the presence of nomophobia.

### **MATERIALS & METHODS:**

A college-based cross-sectional study was carried out among college-going adolescents in a city of South India, for a period of 3 months (January 24 to March 24). Based on the sample size calculation, the minimum sample was calculated to be 613 (the prevalence of nomophobia was considered to be 39.5%,<sup>6</sup> with a relative precision of 5% and a confidence interval of 95%). 660 first-year college students of all genders, aged 17-19 in completed years, who were willing to participate, were included in the study. Those students who did not possess their own

mobile phone & those who have been at college level for more than a year (for reasons like switching of course) were excluded from the study.

A multistage random sampling was done. Four colleges within the city limits were selected randomly. From each college, a sample of 165 was selected by simple random sampling using the list of first-year adolescent students as the sampling frame. A semi-structured questionnaire was used to collect data. The questionnaire had three parts. Part A is the sociodemographic details; part B is the reasons for using mobile phones; and part C is the Nomophobia Questionnaire (NMP-Q).<sup>10</sup> The NMP-Q has 20 items, and a 7-point Likert scale was used, starting from 1 ("strongly disagree") to 7 ("strongly agree"). By adding up all the responses to each item, the total score was derived, which resulted in a nomophobia score ranging from 20 to 140, with higher scores corresponding to greater nomophobia severity. The Nomophobia Questionnaire (NMP-Q) questionnaire has good validity and reliability (Cronbach's alpha = 0.945). A score of 20 is considered to be normal. Anything above 20 was considered to be nomophobia, with 21 to 59 considered to be mild, 60 to 99 considered moderate, and 100 to 140 as severe levels of nomophobia.

Approval for the study was obtained from the Institutional Ethical Committee (VMCIEC/005/2024) prior to the start of the study. Informed written consent was obtained from each of the respondents. All collected data was entered in MS Excel® and analyzed using GNU PSPP software® version 2.0.0. Descriptive statistics were expressed in means and percentages, and for inferential statistics, the Chi-square test and ANOVA were applied. A p-value of less than 0.05 was considered statistically significant.

## RESULTS

The median age of the participants was 17 years. Among the study participants, 39.2% (259) were 17 years of age, and the rest, i.e., 60.8% (401), were 18 years old. None of the first-year students had completed 19 years of age. Among the study participants, 54.5% (360) were female and 45.5% (300) were male. Only 27.1% (179) were coming from rural populations, and the rest, 72.9% (481), were residents of urban areas. The trend of the nuclear family was more commonly observed, i.e., 84.7% (559) of the participants came from such a type of family. Only 22% (145) were hostelers, and the rest were day scholars.

### Mobile phone usage:

All of the 660 adolescents were using smartphones. On average, the respondents had been using smartphones for  $4.6 \pm 2.2$  years. The average usage per day was  $5.2 \pm 2.4$  hours. The usage ranged from 1 hour to 11 hours per day.

The respondents were asked an open question about their reasons for using mobile phones, and they were informed that they could give more than one answer. Using mobiles for watching movies, anime, YouTube, etc. was classified as entertainment; usage of Facebook, Instagram, Snapchat, TikTok, etc. was classified as social media use; e-book reading and usage of mobiles for content preparation were classified as educational use; and using mobiles for Whatsapp, email, Telegram, SMS, etc. were classified as communication. The most common reason for the usage of smartphones was entertainment, i.e., 88% (581 students) in the form of watching movies, anime videos, Youtube videos, etc. (Table 1)

**Table 1: Various reasons for mobile phone usage\* among the study participants (n=660)**

Reasons for using mobile phone	Males n (% of 300)	Females n (% of 360)	Total N (% of 660)
Entertainment	267 (89%)	314 (87.2%)	581 (88%)
Gaming	91 (30.3%)	16 (4.4%)	107 (16.2%)
Social media	241 (80.3%)	198 (55%)	439 (66.5%)
Shopping	118 (40%)	144 (40%)	262 (39.7%)
Educational purpose	75 (25%)	81 (22.5%)	156 (23.6%)
Communication	253 (84.3%)	324 (90%)	577 (87.4%)
<i>* Open question asked for which respondents could give more than one answer</i>			

### Sociodemographic Factors & Phone usage

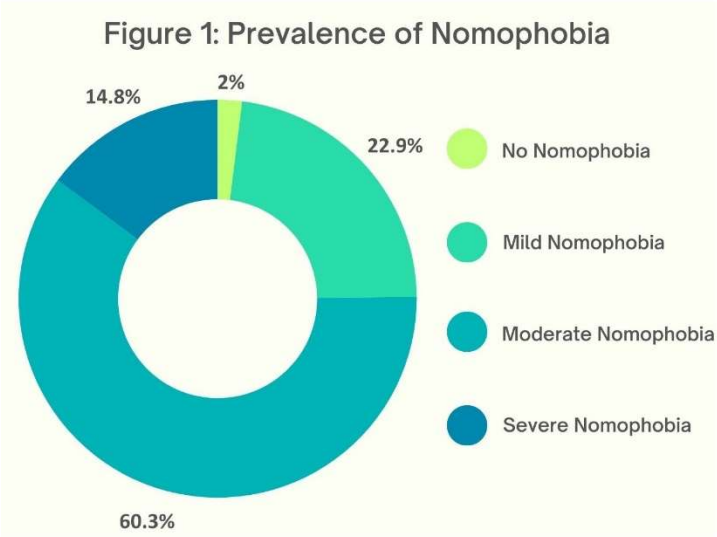
Males had been using phones for a longer period ( $4.92 \pm 2.3$  years) compared to females ( $4.34 \pm 2.1$  years), and the difference was significant ( $p < 0.05$ ). There was not much difference between the sexes in terms of daily use. Among females, the most common reason for using mobile phones was communication (90%), followed by entertainment (87.2%) and social media. Conversely among males, entertainment (89%), followed by communication (84.3%) and social media (80.3%), were the major reasons for using a mobile phone. The usage of phones for gaming, social media, and reading was significantly higher in males compared to females. (Table 1)

Students from urban areas had access to phones for a significantly ( $p < 0.001$ ) longer time ( $4.88 \pm 2.2$  years) compared to those coming from a rural area ( $3.87 \pm 2.1$  years). There was not much difference between students from rural and urban areas in terms of daily use. The usage of phones for entertainment, social media, online shopping, and reading was significantly higher among adolescents from urban areas compared to those hailing from rural areas. Usage of mobile gaming was higher among urban students, although the difference was not significant ( $p = 0.09$ ). Communication was the only reason that was common for both rural and urban adolescent students.

The type of family did not have any influence on the reason for using mobile phones. Using phones for entertainment and social media access was significantly higher ( $p$  value = 0.01 & 0.007 respectively) among adolescents who were day-scholars compared to hostelers. Gaming as a reason for mobile use was also higher among day-scholars, although the difference was not significant ( $p = 0.06$ ). Communication as a major use was seen more commonly among hostelers ( $p = 0.04$ ).

### Prevalence of Nomophobia:

According to our study most of the college-going adolescents (98%) had nomophobia, with moderate nomophobia in the majority (60%) and severe nomophobia the least common (15%). (Figure 1)



**Sociodemographic Factors & Nomophobia:**

The relationship between all sociodemographic features and nomophobia is depicted in Table 2. Our study showed a positive association between nomophobia, the location of the family (rural or urban), and the residency of students (day scholar or hosteler). Severe nomophobia was more commonly found among adolescents from rural areas and those who were staying in hostels away from their families. Conversely, nomophobia was not associated with the gender of the user or the type of family.

**Table 2: Relationship between sociodemographic features and nomophobia (n=660)**

Sl. no.	Sociodemographic factor		Nomophobia				X <sup>2</sup>	P value
			Absent	Mild	Moderate	Severe		
1	Gender	Female	5 (1.4%)	79 (21.9%)	215 (59.7%)	61 (16.9%)	4.06	0.25
		Male	8 (2.7%)	72 (24%)	183 (61%)	37 (12.3%)		
2	Area	Rural	7 (3.9%)	27 (15.1%)	105 (58.7%)	40 (22.3%)	20.63	< 0.05
		Urban	6 (1.2%)	124 (25.8%)	293 (60.9%)	58 (12.1%)		
3	Type of family	Joint	5 (5%)	25 (24.8%)	53 (52.3%)	18 (17.8%)	7.17	0.06
		Nuclear	8 (1.4%)	126 (22.5%)	345 (61.7%)	80 (14.3%)		
4	Residency	Day scholar	10 (1.9%)	130 (25.2%)	312 (60.6%)	63 (12.2%)	16.59	< 0.05

		Hostel	3 (2.1%)	21 (14.5%)	86 (59.3%)	35 (24.1%)		
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### Phone usage and nomophobia:

The number of years of phone usage did not have any significant relationship with nomophobia. Nevertheless, the use of a phone per day was directly related to different types of nomophobia (ANOVA,  $F = 8.76$  and  $p < 0.001$ ). The use of phones for social media, online shopping, and communication (mainly WhatsApp) was significantly associated with different types of nomophobia. Usage for entertainment, gaming, and reading did not have any relationship with the type of nomophobia. (Table 3)

**Table 3: Relationship between various reason of phone usage and Nomophobia (n= 660)**

Sl.no.	Usage of mobile phone		Nomophobia				Df	P value
			Absent	Mild	Moderate	Severe		
1	Entertainment	Yes	10 (1.7%)	133 (22.9%)	352 (60.5%)	87 (14.9%)	1.59	0.66
		No	3 (3.8%)	18 (22.8%)	47 (59.5%)	11 (13.9%)		
2	Gaming	Yes	3 (2.8%)	20 (18.7%)	67 (62.6%)	17 (15.9%)	1.63	0.65
		No	10 (1.8%)	131 (23.7%)	331 (59.9%)	81 (14.6%)		
3	Social media	Yes	6 (1.4%)	86 (19.6%)	272 (62%)	75 (17%)	13.69	< 0.05
		No	7 (3.2%)	65 (29.4%)	126 (57%)	23 (10.4%)		
4	Shopping	Yes	4 (1.5%)	54 (20.6%)	153 (58.4%)	51 (19.5%)	7.9	< 0.05
		No	9 (2.3%)	97 (24.4%)	245 (61.6%)	47 (11.8%)		
5	Reading	Yes	3 (1.9%)	32 (20.5%)	95 (60.9%)	26 (16.7%)	0.96	0.81
		No	10 (2%)	119 (23.6%)	303 (60.1%)	72 (14.3%)		
6	Communication	Yes	7 (1.2%)	131 (22.7%)	347 (60.1%)	92 (15.9%)	17.14	< 0.05
		No	6 (7.2%)	20 (24.1%)	51 (61.4%)	6 (7.2%)		



## DISCUSSION

### Mobile Phone usage

All of the 660 adolescents were using smartphones. On average, the respondents had been using smartphones for  $4.6 \pm 2.2$  years. The average usage of smartphone per day was  $5.2 \pm 2.4$  hours. This was significantly higher compared to students in state of Gujarat, in eastern India according to Mahalakshmi et al.<sup>11</sup> However, a study by Zulkefly and Baharudin<sup>12</sup> among Malaysian students showed a higher average use of 6 hours. The usage pattern tends to vary according to a wide variety of factors, such as restrictions on use at college, home, or hostel, time spent traveling each day, an active in-person social network, etc., and hence will be different in different social settings, apart from individual differences.

Entertainment was the most common reason for the usage of smartphones (581 students, 88%). Similarly, Machado et al.<sup>13</sup> found that entertainment is the most common reason (79%) for the use of smartphones. A different type of smartphone usage pattern was reported among college students in north India by Bartwal and Nath<sup>14</sup>, with communication and listening to music as the most common reasons (92%), followed by social media and internet use (around 87%). Other studies, like those done by Sinha & Patel<sup>15</sup> and Thapa et al.<sup>16</sup>, also found music to be a major reason for using phones. Surprisingly, in our study, even though the participants were given an open question not limited to a single answer, none of them gave "listening to music" as a reason for using smartphones. This might be due to not actually listening to music through smartphones, or it might be because they consider listening to music as a basic function like making a call, which is also not mentioned. The usage of mobiles for educational purposes was low, and this might be because of the low usage of electronic gadgets in education or separate dedicated gadgets like computers, laptops, or tablets used for education rather than mobiles.

### Sociodemographic Factors & Mobile Phone usage

Males had been using phones for a longer period ( $4.92 \pm 2.3$  years) compared to females ( $4.34 \pm 2.1$  years), and the difference was significant ( $p < 0.05$ ). This is consistent with the ASER 2023 finding that males are more likely to have their own mobiles at 18 compared to females (80% vs. 40%).<sup>4</sup> There was not much difference between students from rural and urban areas in terms of daily use. Thus, the locality does not influence the access to smartphones among college students.

There was a difference between the two genders in terms of smartphone use. Among female students, communication (90%) was slightly more common than entertainment (87.2%) as a reason. The usage of phones for gaming, social media, and reading was significantly higher in males compared to females. The 2023 ASER report<sup>4</sup> also showed that males are more likely to use mobile devices for entertainment.

There is also an urban/rural divide among adolescent college students, with usage of phones for entertainment, social media, online shopping, and reading being significantly higher ( $p < 0.05$ ) among urban adolescents. Also, using phones for entertainment, social media access, and gaming was higher among day-scholars. This might be because the hostellers can get-together as a social group in their hostel and are more likely to have in person interactions and activities after their college hours.

### Nomophobia

Most adolescents have been shown to have nomophobia (98%), with moderate nomophobia in the majority (60%). Similar high prevalence (approximately 99%) of nomophobia was observed in college students in various parts of the country in the past five years.<sup>7,8,17</sup> Similar high prevalence is seen in students in other countries also.<sup>18,19</sup> Studies done a few years back have shown a lower prevalence of Nomophobia. For example, Pavithra et al.<sup>6</sup> and Dasgupta et al.<sup>20</sup> reported around 40% of nomophobia among college students in studies done around 2015. Salloju V<sup>21</sup> reported that 65% of first year pharmacy students had nomophobia in 2016. Myakal & Vedpathak<sup>22</sup> reported 70% prevalence of Nomophobia among adolescent college students in 2017-18. Thus, there is trend of seemingly increasing nomophobia over the years.

### **Sociodemographic Factors & Nomophobia:**

Severe nomophobia was more commonly found among adolescents from rural areas and those who were staying in hostels. Dasgupta et al. also found staying in the hostel to be associated with nomophobia. In our study, nomophobia was not associated with the gender of the user. Some studies show a significant relationship between the female gender and nomophobia,<sup>20</sup> between the male gender and nomophobia,<sup>17</sup> while others show no such relationship.<sup>7,14</sup> Thus, the influence of gender on the occurrence of nomophobia is not uniform.

### **Phone usage and nomophobia:**

The number of years of phone usage did not have any significant relationship with nomophobia. Conversely, some studies, like Dasgupta et al.<sup>20</sup>, showed a relationship between nomophobia and smartphone usage. Moreover, the usage of phones per day was directly related to types of nomophobia. This finding is congruent with those of studies by Bartwal & Nath, Anusuya et al., and Dasgupta et al.<sup>7,14,20</sup> Certain usages like social media, online shopping, and WhatsApp were significantly associated with types of nomophobia, as reported by other studies as well.<sup>14,17</sup> Thus, modifying the usage pattern might also contribute to controlling nomophobia.

### **Limitation**

The study was conducted in a single city and might not be extrapolated to the entire country. The questionnaire was self-administered and is based on self-reporting, and it might not have captured the actual usage by the students.

### **Conclusion**

Smartphone use is universal, and the top reasons for usage are entertainment, communication, and social media. Males and students from urban areas get access to mobile phones earlier in their lives. The prevalence of nomophobia is alarmingly high and is seen to be increasing over the years. Family locality, residency of the student, daily usage, social media use, shopping, and WhatsApp usage were all associated with different types of nomophobia.

### **Recommendation**

As mobile phone addiction and nomophobia is becoming universal among college students, interventions focusing on their control should be instituted in colleges, particularly among the first-year students who are more vulnerable. Also, effort should be made to increase in-person interaction among these people on the cusp of adulthood, in the form of sports, cultural and similar healthy social activities and thus reduce the time spent on a phone.

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