

## Original Research Article

# Prevalence of smartphone addiction: correlates of smartphone use and its association with social phobia in post-graduate medical students in Assam

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## ABSTRACT

**Background:** Smartphone use has become pervasive in everyday lives of university students. Excessive smartphone use leads to various physical problems, as well as psychological issues like reduced academic achievement, social interactions, and leading to relationship problems. Depression, loneliness and anxiety have emerged as important predictors of smartphone addiction. Social anxiety also known as social phobia is an intense anxiety or fear of being negatively judged or rejected in a socially demanding situation. This may lead to individuals avoiding face-to-face interaction and increasingly engaging in online interaction. Medical post-graduate students are more vulnerable to stress due to the demanding nature of their course as well as extensive smartphone users. Objectives of the study were to see the socio-demographic distribution of the post-graduate medical students, to assess the pattern of smart phone use and prevalence of smartphone addiction in the post-graduate medical students, to see the association of smartphone addiction with pattern of use and to see the association of smartphone addiction with social phobia among the study participants

**Methods:** This study was cross-sectional non-interventional study. Self-reported questionnaires were used to collect information from 70 postgraduate medical students. The data was collected the smartphone addiction scale-short version and Liebowitz social anxiety scale. The data obtained was analysed using SPSS version 23.

**Results:** Majority of the participants were female, in the age group 26-30 years, single, belonging to upper middle class of an urban locality, with no past history of psychiatric illness. Most common functionality was social networking. The prevalence of smartphone addiction was 28.6% with similar gender predisposition. 37.1% of the study participants were found to have social phobia.

**Conclusions:** No association was found between smartphone addiction and social phobia. The smartphone addiction was found to have significant association with pattern of use and duration of use ( $p < 0.05$ ).

**Keywords:** Smartphone addiction, Internet use, Dependence, Post-graduate medical students, Social anxiety

## INTRODUCTION

Cellular phones have evolved into the aptly named 'smartphones' with the integration of internet based functioning and higher processing power whereby they can be used to perform computer-related functions and a variety of tasks based on number of applications.<sup>1</sup> Smartphones can be used for social and professional

networking, to play games, use messenger systems that can exchange large volume data like eBooks, images, music and video files, chat with friends, access web-based services, and search for information in addition to making phone calls or texting.<sup>2</sup> These devices have evolved beyond being just a medium of communication. Smartphone use is highest (62%) in the age group of 25-34 years. A recent study has found that 53% of

smartphone users are male and 47% are female. There has been a drastic increase in use of smartphone in the last ten years.<sup>3</sup> A 2012 study found that smartphone use had reached one billion across the world.<sup>4</sup> The rate of rise in smartphone uses from 2012 to 2013 was around 90 % in urban India. In 2013, there were around 51 million smartphone users in India alone.<sup>3</sup>

The increased popularity of smartphone use leads to many problems due to overuse. The terms 'smartphone addiction', 'problematic mobile phone use', 'mobile phone addiction', 'mobile phone dependence', 'compulsive mobile phone use', and 'mobile phone overuse' have been used to describe more or less the same phenomenon. The excessive smartphone use can cause physical difficulties, such as neck stiffness, wrist or back pain, blurred vision, and sleep disturbances. It can also reduce academic achievement, social interactions, and lead to relationship problems.<sup>5-10</sup> Griffiths defined technological addiction that is human-machine interaction as a type of behaviour addiction and is non-chemical type of addiction.<sup>11</sup> Problematic smartphone use is characterised by 1) individual is preoccupied with a specific behaviour (smartphone use), 2) the behaviour is used in order to escape reality or create euphoria, 3) tolerance develops as the behaviour continues, 4) withdrawal symptoms occur when the behaviour interfered, 5) interpersonal problems occur as consequence of continuous behaviour, and 6) experience of relapse against will.<sup>12</sup>

Smartphone addiction generally has four main components: compulsive behaviours, tolerance, withdrawal, and functional impairment.<sup>13</sup> While smartphone use has been increasing across all sectors, university students have been seen as the largest consumer group of smartphone services. Students use them for several purposes, such as to explore applications which provide new functions, communicate with others face to face instantly, enjoy different kinds of entertainment like games, and to escape from uncomfortable situation while surfing on the Internet; hence, its use has become vital to them.<sup>5,14</sup>

Previous studies also reported that depression, loneliness, and anxiety emerged as independent predictors of smartphone addiction.<sup>15-18</sup> Another US study on college undergraduates reported that although addictive activities varied by gender, time spent on social networking sites, number of texts sent, and number of phone calls made were predictors of mobile phone addiction.<sup>19</sup>

Social anxiety also known as social phobia is an intense anxiety or fear of being negatively judged or rejected in a socially demanding situation. As a result, people with social anxiety often avoid those situations; or experience significant anxiety and distress when the situations are unavoidable. It is the third most common psychiatric disorder with a lifetime prevalence of 13±3%.<sup>20</sup> Caplan found that socially anxious people experience a perceived

increase in ease of representing themselves along with a reduction in perceived threat as compared to face-to-face interaction, when interacting with others online.<sup>21</sup> A study conducted by Hardie and Tee found that social anxiety and loneliness were some of the significant predictors of problematic internet use.<sup>22,23</sup>

Medical profession is quite challenging and places heavy demand on the students' mental resources; increasing their psychological distress and making them more vulnerable to negative affective states. In fact, many studies have revealed a progressive increase in stress-related illnesses like anxiety and depression among this population.<sup>24-27</sup>

Considering the enormous use of smartphone by medical post-graduate students which is a vulnerable group on account of the time they spend on smartphones and its effects on health, it is important to study smartphone use in this subset of population. This study is unique in the sense that it aims to find an association between problematic smartphone use and social anxiety among the at-risk group of postgraduate medical students. To the best of our knowledge, this is the first study of its kind in our region.

The objectives of our study were to see the socio-demographic distribution of the post-graduate medical students, to assess their pattern of smartphone use and prevalence of smartphone addiction in them, to assess if there is any association of smartphone addiction with pattern of use, to check the association of smartphone addiction with social phobia among the study participants.

## METHODS

The study was a cross-sectional non-interventional study conducted for a period of 6 months from June 2019 to December 2019. Data was collected from a total of 70 consecutive postgraduate medical students from Silchar medical college in North East India who have given informed consent using predesigned, pretested, self-administered, structured questionnaires. A standard proforma for entering the sociodemographic variables and pattern of smartphone use was utilised which was designed and standardized in the department of psychiatry. The smartphone addiction was assessed using the SAS-SV scale and the social anxiety was quantified using the LSAS scale.

### *The smartphone addiction scale-short version (SAS-SV)*

This scale contains only 10 questions for easy smartphone addiction screening. This scale also provides a cut-off value to evaluate the level of addiction, to evaluate the treatment effect and to provide evidence of interventions different from those in the conventional scales. This scale has a high value as a screening tool because gender differences can be reflected in the results by providing a

cut-off value for both genders (31 for males, 33 for females).<sup>28</sup>

### The Liebowitz social anxiety scale (LSAS)

Short questionnaire to assess the range of social interaction and performance situations feared by a patient in order to assist in the diagnosis of social anxiety disorder. The scale features 24 items, which are divided into two subscales. 13 questions relate to performance anxiety and 11 concern social situations. The LSAS was originally conceptualized as a clinician-administered rating scale, but has since been validated as a self-report scale.<sup>29</sup>

### Statistical analysis

The analysis was done by descriptive and inferential statistics using chi-square test, with  $p < 0.05$  considered as significant. Data were analysed using SPSS version 23.0.

## RESULTS

A total of 70 students were selected in the present study. There were 32 (45.7%) males and 38 (54.3%) females. Most of the participants (85.7%) were in the age range of 26-30 years. Most of them were single (82.9%). Majority of them belonged to the upper middle class (78.6%) and hailed from an urban locality (87.1%). Majority of did not have any past history of psychiatric illness (87.1%).

**Table 1: Socio-demographic distribution of the postgraduate medical students.**

Variables	Number (n=70)	Percentage (%)
<b>Age (years)</b>		
20-25	4	5.7
26-30	60	85.7
31-35	5	7.1
>35	1	1.4
<b>Gender</b>		
Male	32	45.7
Female	38	54.3
<b>Religion</b>		
Hindu	55	78.6
Muslim	10	14.3
Others	5	7.2
<b>Type of family</b>		
Nuclear	57	81.4
Extended	12	17.1
Joint	1	1.4
<b>Relationship status</b>		
Single	58	82.9
Married	11	15.7
Widow/widower	0	0.0
Separated/divorced	1	1.4
<b>Socioeconomic status</b>		
Lower	0	0.0
Upper lower	1	1.4
Lower middle	9	12.9
Upper middle	55	78.6
Upper	5	7.1
<b>Locality</b>		
Urban	61	87.1
Rural	9	12.9
<b>History of psychiatric illness</b>		
Present	9	12.9
Absent	61	87.1

Majority of the participants in the study were using the smartphone for one to two hours (40.1%), followed closely by three to four hours (31.4%), on a typical day.

The most common functional use was social networking (51.4%), followed by phone calls (21.4%).

**Table 2: Distribution of pattern of use among the study participants.**

Variable	Number (n=70)	Percentage (%)
<b>Duration of smartphone use in a typical day (hour)</b>		
<1	13	18.6
1-2	28	40.0
3-4	22	31.4
5-6	4	5.7
>6	3	4.3
<b>Most commonly used smartphone functions</b>		
Social network	36	51.4
Phone calls	15	21.4
Gaming	4	5.7
Text messages	4	5.7
Email	3	4.3
Watching videos	2	2.9
Listening to music	4	5.7
Reading news	2	2.9
Others	0	0.0

The prevalence of smartphone addiction was 28.6% with similar risk of smartphone addiction among males, 14.3% and females, 14.3% (Table 3).

26 study participants out of 70 (37.1%) were found to have social phobia, of them 15 (21.5%) had significant (marked to very severe) social phobia.

**Table 5: Association of smartphone addiction with pattern of use among the study participants.**

Variable	Normal students (n=50)	Addicted students (n=20)	$\chi^2$	Df	P value
<b>Duration of smartphone use in atypical day (hours)</b>					
<1	13	0	43.941	4	<0.001*
1-2	28	0			
3-4	9	13			
5-6	0	4			
>6	0	3			
<b>Most commonly used smartphone functions</b>					
Social network	26	10	15.093	7	0.035*
Phone calls	13	2			
Gaming	3	1			
Text messages	2	2			
Email	3	0			
Watching videos	1	1			
Listening to music	0	4			
Reading news	2	0			
Others					

**Table 6: Association of smartphone addiction with social phobia among study participants (as per LSAS score).**

Variable	Normal Students (n=50)	Addicted Students (n=20)	$\chi^2$	Df	P value
No social phobia	35	9	4.407	4	0.354
Moderate social phobia	6	5			
Marked social phobia	3	3			
Severe social phobia	4	2			
Very severe social phobia	2	1			

The smartphone use duration on a typical day was found to have significant association with addiction ( $p<0.05$ ), frequency of use, and relevant smartphone function had significant association with addiction ( $p<0.05$ ).

**Table 3: Prevalence of smartphone addiction among the study participants (according to SAS-SV scores).**

Participants (n=70)	Non-addicted students (score<31 for males, <33 for females) (%)	Addicted students (score>31 for males, >33 for females) (%)
Male	22 (31.4)	10 (14.3)
Female	28 (40.0)	10 (14.3)

**Table 4: Prevalence of social phobia among the study participants (n=70) according to LSAS.**

Variables	Number	Percentage (%)
No social phobia (<50)	44	62.9
Moderate social phobia (50-65)	11	15.7
Marked social phobia (65-80)	6	8.6
Severe social phobia (80-95)	6	8.6
Very severe social phobia (>95)	3	4.3

No significant association was found between smartphone addiction and social phobia among the study participants.

## DISCUSSION

A total of 70 students were selected in the present study. Among the respondents, there were 32 (45.7%) males and 38 (54.3%) females. Most of the participants (85.7%) were found in the age range of 26-30 years. Most of them were single (82.9%). Majority of them belonged to the upper middle class (78.6%) and hailed from an urban locality (87.1%). Majority of them did not have any past history of psychiatric illness (87.1%).

Most of the students were using the smartphone for one to two hours (40%) to three to four hours (31.4%) on a typical day, similar to a study in Maharashtra which found that most students were using the smartphone for one to two hours (32.9%) to three to four hours (36.3%).<sup>30</sup>

The most common functional use was social networking (51.4%) and phone calls (21.4%). This was in line with a study in which found the most personally relevant functional use to be social networking (51.4%). Chen et al, in his study showed that males were more likely to play games, listen to music, and watch videos whereas females were more inclined to use smartphone for communication and social networking services.<sup>31</sup>

Prevalence of smartphone addiction was found to be 28.6% with the risk of addiction being similar among females (14.3%) and males (14.3%). This was similar to that medical students of a medical college in Maharashtra (24.65%), while it was higher than the prevalence rates of smartphone addiction in university students and staff of Spain (12.8%) and Belgium (21.5%) respectively.<sup>32,33</sup> And lower than in university students in Turkey (39.8%) and Lebanon (44.6%).<sup>34,35</sup>

37.1% of the participants were found to have social phobia, 19.5% of them being significant (marked to very severe social phobia). This is like a study in Kolhapur where, among 46% of medical students having social anxiety disorder, 19% of students were having significant social anxiety disorder.<sup>20</sup>

We did not find any significant association between social anxiety and smartphone addiction among our study population. This might be due to the small sample size and multiple other causes that may contribute to the anxiety in this subpopulation.

The smartphone use duration on a typical day and most commonly used smartphone function had significant association with smartphone addiction ( $p < 0.05$ ). This matches the findings of a study done in Maharashtra which showed significant association of frequency, smartphone use duration on typical day, and most personally relevant function with smartphone addiction.<sup>30</sup> Haug et al demonstrated that duration of smartphone use, time until first use in the morning, lowest age group,

immigrant background with both parents born outside, and high perceived stress were significant predictors of smartphone addiction.<sup>36</sup> Chen et al showed that playing smartphone games, multimedia and social networking applications were predictors of smartphone addiction.<sup>31</sup>

## Limitations

The sample size is small as compared to previous literature. The results cannot be generalised because study was conducted in only one medical college.

## CONCLUSION

The present study found higher prevalence of smartphone addiction among medical students in comparison to previous literature. Social networking being the most prominent smartphone functionality and increased duration of daily use were found to be significantly associated with smartphone addiction. No significant association was found between smartphone addiction and social phobia. However, further studies must be undertaken to shed light on this association. Since the postgraduate medical students constitute a subgroup that is uniquely vulnerable to stress and anxiety as well as problematic smartphone use; their family members, colleagues, faculty, and mental health professionals in close contact should be constantly vigilant regarding smartphone addiction or harmful use among them.

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