



## Original Research Article

## An analysis of smartphone addiction among MBBS students

Muktal M Bhalerao<sup>1</sup>, Bindu Krishnan<sup>1,\*</sup>, Smita J Mokal<sup>1</sup>, R G Latti<sup>1</sup><sup>1</sup>Dept. of Physiology, Rural Medical College, Loni, Maharashtra, India

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## ABSTRACT

**Introduction:** Smartphones have become an integral part of our everyday life due to its varied and advanced functionality and easy availability. The nearly universal availability of smartphones and the close association of this with humans has led to various concerns about it becoming a part of behavioral addiction. In this study, smartphone addiction was assessed by using the short version of smartphone addiction scale (SAS-SV) and an attempt has been made to analyse the behavioral component associated with addiction.

**Materials and Methods:** Semi-structured questionnaire containing socio-demographic variables were given to 200 students. SAS-SV scale was used to assess smartphone addiction among the study sample.

**Results:** Results showed 26.9% male and 28% of female participants were addicted to smartphones according to SAS-SV scores. 43% male and 19% female participants spend > 5 hrs using smartphones per day and 8% of female participants and 6.4% of males spend > 5 hrs on social media. Withdrawal, conflict, tolerance and salience were the psychological features observed in our study sample.

**Conclusions:** In conclusion, smartphone addiction was found to be around 26.9% and 28% among the male and female respondents by using the SAS-SV scale. In our study 8% of girls and 6.4% of boys agreed that they spend more than 5 hours on social media every day. Instagram, WhatsApp and Facebook were the commonly used social media sites used by them. The findings in our study did correlate with Brown's well established framework for behavioral addiction especially behavior like withdrawal, conflict, tolerance and salience.

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## 1. Introduction

A key reason for us humans to succeed as a species is our social behavior. This social connectivity has been enhanced multiple times by smartphones. Smartphones have become an integral part of our everyday life due to its varied and advanced functionality and easy availability. A typical smartphone has a high resolution, touch screen display, Wi fi connectivity, web browsing capabilities and the ability to accept sophisticated applications. Research has shown that smartphones are making people more sociable, helping them professionally, become information savvy & sometimes help as coping strategies and as well as function as a marker of social identity.<sup>1</sup> The nearly universal availability of smartphones and the close association of this

with humans has led to various concerns about it becoming a part of behavioral addiction. In fact the wide spread use of smartphones has altered the way by which we communicate with each other, since communications are through the smartphone, that necessity of talking directly has reduced dramatically. Present generation has grown up with the internet, so they prefer to interact with others online rather than engage in interpersonal communication in the real world.<sup>2</sup> Smartphones are used for social networking like Facebook, Instagram, Whats App, Twitter and for gaming, e-mail, Slack and other work related activities. Ammati et al have shown in their study that almost 46% of the university students use the smartphone for social networking.<sup>3</sup> This social networking addiction is found to be a way of escapism from internal and external problems for few, and for some it's a major source of entertainment available 24/7. Another important issue to be addressed is how message

\* Corresponding author.

E-mail address: [drbindukrishnan@gmail.com](mailto:drbindukrishnan@gmail.com) (B. Krishnan).

recipients can become obsessive about checking the screen and replying immediately, for they perceive that they might be ignored or neglected intentionally. Cyberbullying can in fact be triggered by these subtle actions. Griffith et al have mentioned how overuse of this device can lead on to maladaptive behavioral difficulties, interference with daily activities, physical health related issues like neck pain, blurred vision etc.<sup>4</sup> Of late there has been an array of research in the field of smartphone addiction from all part of the globe.<sup>5</sup> Very similar to other countries, in India, a systematic review and meta analysis study showed smartphone addiction in the range between 39 to 44%.<sup>6</sup> Tayana et al in their study have summarized the theoretical definition of addiction as the severe harm, impairment, or negative consequences and the psychological features like craving, salience and loss of control along with physical dependence, like tolerance and withdrawal that leads one to carry on the behavior.<sup>7</sup> Gambling is the first non substance related addictive disorder recognized by the American Psychiatric Association. Smartphone addiction has not been mentioned in Diagnostic and Statistical Manual of Mental Disorders (DSM-5) or in ICD 11 draft.<sup>8</sup> In a study by Lin et al, the authors have shown that smartphone addiction has lot of similarities with substances related disorders (DSM-5) especially behavioral changes like compulsive behavior, functional impairment, withdrawal and tolerance.<sup>9</sup> Different instruments in the form of self reporting questionnaire are used by various authors to access the addiction scores and they are correlated with other behavioral characteristics.<sup>10</sup> Smartphone Addiction Scale, Problematic Mobile Phone Use Questionnaire, Mobile Phone Dependence are among them. Nomophobia, Problem cell phone use, Mobile phone problematic use are the various terminologies used with respect to behavioral changes due to smartphone. Smartphone addiction in our study was assessed by using the SAS-SV developed and validated by Kwon et al.<sup>11</sup> A validated Smartphone Addiction Scale by Kwon et al had originally a set of 33 questions based on six important factors like daily life disturbances, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse and tolerance. This scale was cut down to a shorter version of 10 questions and validated in a sample of 343 boys and 197 girls from Korea. The SAS-SV addresses all the above factors except positive anticipation. Based on the results of the ROC analysis conducted by Kwon et al, a cut off value of 31 for males and 33 for females were used in our study to define addiction. The symptoms of addiction according to Brown can be measured under seven well defined symptoms which include withdrawal, tolerance, conflict, salience, relapse and reinstatement and euphoria.<sup>12</sup> In this study we have tried to investigate the extend of smartphone addiction among MBBS students by using the SAS-SV scale and tried to correlate it with the Brown's behavioral addiction criteria.

## 2. Materials and Methods

This was a descriptive cross sectional study completed at Rural medical college, PIMS, Loni over a period of six months. Institutional Ethics Committee clearance(PIMS/IEC-DR/2018/71) was obtained before the start of the study. The sample size was decided at 200 based on previous studies with prevalence of smartphone addiction between 39 to 44% considering a 95% confidence interval at 5% margin of error.

Two hundred students comprising of both sex of first MBBS were recruited for the study. Socio demographic variables were obtained by a semi structured questionnaire. The smartphone addiction was assessed using SAS-SV scale. SAS-SV scale is a validated questionnaire for smartphone addiction. The questionnaire includes 10 questions. For each item, participants expressed their opinion on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). It identifies the different range for males and females. Males are addicted to scores higher than 31, with high risk of addiction with scores between 22 and 31 and females are addicted to scores higher than 33, with high risk of addiction on scores between 22 and 33. A Semi-structured questionnaire containing socio-demographic variables like age, age at which started using smartphone, duration of smartphone use, name of the device, reason for smartphone use were also given to the respondents.

### 2.1. Statistical analysis

Descriptive statistics were used to analyse the data. Categorical variables were expressed as frequency and percentage. To compare the variables between the genders, the independent t-test were used. Pearson Spearman correlation coefficients were used to define the association between the SAS-SV score and other variables. P value < 0.05 was taken as statistically significant. Statistical analysis was done with software SPSS version 17.0.

## 3. Results

The total sample size was 200, out of which 178 were completed questionnaires and included in the study. There were 78 males (43.8%) and 100 females (56.2%). The mean age was 19.28 years (SD 0.93). Table 1 shows the percentage of male and female distribution of addiction. A cut off score of >31 for males and >33 for females were taken for defining addiction. Results showed 26.9% male participants and 28% of female participants were addicted to smartphones. The average SAS SV score was 27 among smartphone users. We found the score to be slightly more in females than males. The survey showed that 34 (43%) male participants spend more than five hours using smartphones in a day compared to 19(19%) of female participants (Figure 1). 8 (8%) female participants spend

more than five hours on social media when compared to 5(6%) male counterparts.(Figure 2)

Analysis of SAS-SV score for various questions showed us that conflict, tolerance, salience and withdrawal were the behavioral components of Browns criteria which were seen among the users. Around 2.8% of the study population reported indications of withdrawal (eg., 2.8% strongly agreed feeling impatient and fretful when not holding their smartphone) Another 3.9% of the participants reported indications of salience. (eg., 3.9% strongly agreed having a hard time concentrating in class, while doing assignments, or while working due to smartphone use. There were another 6.2% of the study sample who reported indications of conflict. (eg., 6.2% strongly agreed that people around them tell that they use their smartphone too much. 5.6% of the study population reported indications of tolerance. (eg., 5.6% strongly agreed using their smartphone longer than they had intended. (Table 3) There was a weak positive correlation which was statistically significant ( $p < 0.05$ ) between the SAS-SV scores and daily usage of smartphones (hours /day)and the use of social media by the participants.(Table 4)

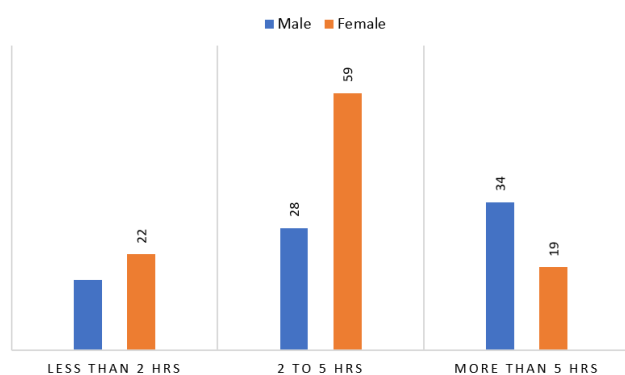


Fig. 1: Depicts the daily use of smartphones by the participants(n)

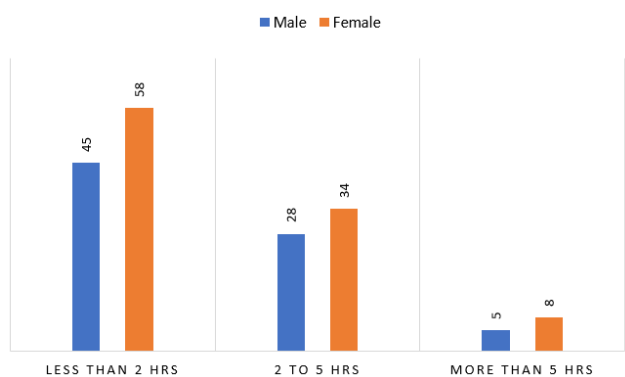


Fig. 2: Depicts the use of social media by the participants (n)

#### 4. Discussion

In our study, results showed 26.9% male and 28% of female participants addicted to smartphones. 43% of male participants by self reported time, spend more than five hours on the smartphone. Female students spend more time on social media than their male counterparts. There was a weak positive correlation between the SAS-SV score and number of hours per day the smartphone was used. Social media viewing daily also correlated with the SAS-SV scores. Withdrawal, conflict, tolerance and salience were the psychological features observed in our study sample.

Salience is a feature where an activity dominates our thought and behavior.<sup>13</sup> In our study about 1.3% of the study population strongly agreed that they were pre occupied with their smartphones (Q 6) while 3.9% said that they were having a hard time concentrating in class, while doing assignments, or while working due to smartphone use (Q 2). Authors have argued that smartphone becoming an integrated part of our daily life, with so much of personal, professional data incorporated into it, it becomes reasonable from the users perception to let the smartphone dominate their thoughts.<sup>8</sup>

Withdrawal means experiencing negative emotions when an individual is not able to engage in that particular activity. In this study, 2.8% of the sample experienced withdrawal symptoms. (Q 4,5) In a study by Li et al, it was observed that to prevent the unpleasant feeling associated with a battery not charged, participants carry their own power bank.<sup>14</sup> Many authors like Lin et al, Kim et al have observed this withdrawal phenomenon in their studies through different questionnaires used.<sup>15</sup> But in a study by Thomee et al, the authors have argued that the majority of young adults were expected to be reachable via mobile phones around the clock(both personal and professional reasons) and they did not consider this accessibility stressful.<sup>16</sup> In our study the average age being 19 years and comprising of university students, constantly checking their smartphone so as not to miss conversations between other people and being connected on Twitter or Facebook or other social media (Q8) may be one reason for them experiencing withdrawal symptoms. Almost 60% of a study subject agreed that they constantly check their phones so as not to miss conversations among other people.<sup>17</sup>

Tolerance is known to occur when any activity involves spending more time to obtain positive feeling. Cholz et al in 2010 defined tolerance with respect to mobile phone as a gradual increase in mobile phone use to obtain the same level of satisfaction, as well as the need to substitute operative devices with the new models that appeared on the market.<sup>18</sup> In this study 5.6% strongly agreed (Q 9) that they used their smartphone longer than they had intended. Is it the immediate gratification due to our dopamine driven desire for social validation which leads to this behavioral pattern needs to be further studied.

**Table 1:** Gender distribution of smartphone addiction and their average SAS-SV score

Gender (cut off value)	N	Percentage	Mean SAS-SV score	P value
Male (>31)	21	26.9%	26.82(10.11)	0.652
Female (>33)	28	28%	27.48(9.30)	
Total	49	27.52%		

**Table 2:** Prevalence of smartphone addiction (SAS-SV) symptoms among participants

Items	Strongly disagree n(%)	Disagree n(%)	Weakly disagree n(%)	Weakly agree n(%)	Agree n(%)	Strongly agree n(%)
1 Missing planned work due to smartphone use	30(16.9)	24(13.5)	31(17.4)	41(23.0)	44(24.7)	8(4.5)
2 Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use	31(17.4)	45(25.3)	23(12.9)	47(26.4)	25(14.0)	7(3.9)
3 Feeling pain in the wrists or at the back of the neck while using a smartphone	60(33.7)	41(23)	16(9)	34(19.1)	21(11.8)	6(3.4)
4 Won't be able to stand not having a smartphone	70(39.3)	46(25.8)	21(11.8)	20(11.2)	16(9)	5(2.8)
5 Feeling impatient and fretful when I am not holding my smartphone	72(40.4)	45(25.3)	29(16.3)	13(7.3)	14(7.9)	5(2.8)
6 Having my smartphone in my mind even when I am not using it	71(39.9)	60(33.7)	17(9.6)	18(10.1)	9(5.1)	3(1.7)
7 I will never give up using my smartphone even when my daily life is already greatly affected by it.	65(36.5)	51(28.7)	28(15.7)	24(13.5)	6(3.4)	4(2.2)
8 Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook	46(25.8)	38(21.3)	29(16.3)	27(15.2)	34(19.1)	4(2.2)
9 Using my smartphone longer than I had intended	18(10.1)	26(14.6)	34(19.1)	40(22.5)	50(28.1)	10(5.6)
10 The people around me tell me that I use my smartphone too much.	60(33.7)	47(26.4)	23(12.9)	22(12.4)	15(8.4)	11(6.2)

**Table 3:** Relation between questions in SAS-SV score and Brown's criteria for technological addiction

S.No	Brown's criteria	Corresponding questions in SAS-SV score	% of participants who strongly agreed (scale of 6)
1	Withdrawal	Q 4,5	2.8%, 2.8%
2	Salience	Q 2,6,8	3.9%, 1.7%, 2.2%
3	Conflict	Q 10,1	6.2%, 4.5%
4.	Tolerance	Q 9	5.6%

**Table 4:** Correlation of SAS-SV Score with other variables

Correlation of SAS- SV Score with	Spearman's Correlation Coefficient (rho)	p value	Interpretation
No of years using the smartphone	0.062	0.410	No correlation
Daily use of smartphones	0.191*	0.011*	Weak positive correlation
Sex	0.051	0.499	No correlation
Social media use daily	0.162*	0.031*	Weak positive correlation

\* P value <0.05 significant

**Table 5:** Correlation of SAS-SV Score with other variables

Correlation of SAS- SV Score with	Spearman's Correlation Coefficient (rho)	p value	Interpretation
No of years using the smartphone	0.062	0.410	No correlation
Daily use of smartphones	0.191*	0.011*	Weak positive correlation
Sex	0.051	0.499	No correlation
Social media use daily	0.162*	0.031*	Weak positive correlation

\*P value <0.05 significant

3.2% of our study sample experienced pain in the wrists or at the back of the neck while using a smartphone. (Q 7 strongly agreed). Other physical symptoms like lightheadedness, blurred vision, mild tendinitis have been reported by other researchers.<sup>19</sup> In Al EE et al have shown how overuse of smartphone can actually impair hand function by causing pain in the thumb and reduces pinch strength.<sup>20</sup>

Instagram, Facebook, Twitter, Skype, WhatsApp are the various social applications that help share ideas, opinions, feelings, experiences among people. Other factors for which social networking is used is for online shopping, dating and gaming. The number of internet users in the world is about 4.021 billion and among them people using social network on a regular basis is 3.196 billion.<sup>21</sup> In our study 8% of girls and 6.4% of boys agreed that they spend more than 5 hours on social media every day. Instagram, WhatsApp, Facebook were the most popular and commonly used virtual social network sites in our study. Social networking has to its advantage sharing of information among larger groups, providing opportunities on a larger platform and making communications across globe very easy. But when not utilized wisely, consequences can be disastrous. So, the availability of a smartphone with internet connection 24/7 is leading on to physical, psychological and behavioral problems among its users.

#### 4.1. Other problems due to overuse of smartphones

Reduced academic performance is a frequently observed finding among university students with smartphone addiction. Results of a study on Qatari students showed that students who were addicted to social networking addiction had a reduced Grade Point Average (GPA).<sup>22</sup> Many studies have proven that depression and anxiety having a positive independent association with smartphone addiction.<sup>23</sup> A

study comprising of 126 Japanese medical university students, showed depression as an independent predictor for internet addiction.<sup>24</sup> An Austrian study showed chronic stress, low emotional stability, female gender, young age and depression were associated with problematic mobile usage.<sup>25</sup> Aljohara A et al in their study had concluded that the relationship between depression and smartphone addiction is an escalating global concern.<sup>26</sup> Qualitative and quantitative sleep problems have been observed in technologically advanced societies.<sup>27</sup> Demirci et al in their study have shown a positive correlation between SAS scores and subjective sleep quality, sleep disturbances, daytime dysfunctions and PSQI global scores.<sup>28</sup> All components of sleep like reduced REM sleep, slow wave sleep, sleep efficiency, delayed onset of sleep are reported to be affected by smartphone addiction. Young adults are known to have a higher risk of smartphone addiction, as they can imbibe new technologies much faster than the older generation.<sup>29</sup>

An important aspect which should be taken into consideration while studying smartphone addiction is the manner in which smartphone is used with relevance to professional, social and academic needs of the individual. Panova and Carbonell have pointed out that the problems arising from smartphone use are not due to the smartphone itself, but due to the problematic internet viewing for various reasons.<sup>30</sup> The problem which needs to be addressed will be the addiction to the activity which they are viewing and which is giving them instant gratification, or escape from their internal and external problems in real life. Any technology overuse can also be a symptom of an underlying mental disorder and a way to cope with emotional distress. So an in depth psychiatric evaluation will be required to understand the magnitude and veracity of this technology overuse among university students.

## 5. Limitations

The study being cross sectional is one of the major limitation of our study, for an observational longitudinal study is the need of the hour. Results from a small sample size comprising of university students cannot be generalized with respect to general population. The university being in a rural area, the only mode of entertainment being smartphones, the results can be on the higher side. While using Self reported smartphone addiction measures (questionnaire based data collection) it is known that people always underestimate their actual smartphone usage.

## 6. Conclusion

In conclusion, smartphone addiction was found to be around 26.9% and 28% among the male and female respondents by using the SAS-SV scale. In our study 8% of girls and 6.4% of boys agreed that they spend more than 5 hours on social media every day. Instagram, WhatsApp and Facebook were the commonly used social media sites used by them. The findings in our study did correlate with Brown's well established framework for behavioral addiction especially behavior like withdrawal, conflict, tolerance and salience. It is very important to identify the students who fall in this domain and offer counselling, cognitive behavior therapy and if required to be treated effectively with drugs.

## 7. Source of Funding

None.

## 8. Conflict of Interest

None.

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**Author biography**

**R G Latti** Professor

**Muktpal M Bhalerao** Assistant Professor

**Bindu Krishnan** Assistant Professor

**Smita J Mokal** Assistant Professor

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