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Original research article

Smartphone addiction and factors associated with it among medical students of a medical college in Chitradurga district: A cross-sectional study

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Abstract

Need: Mobile phone is considered as an important communication tool and has become the integral part of the society. Increased usage of smart phones creates addiction to it, which is associated with social and psychological disturbances.

Objectives: This study was conducted to estimate the prevalence of Smartphone addiction and to assess pattern of use of Smartphone and its association with smartphone addiction among medical students.

Methods: This was a cross-sectional study conducted among 510 medical students. A pre-designed, pre-tested structured questionnaire containing the short-version of the smart phone addiction scale (SAS-SV) was used for data collection. Data is presented in percentages and association was tested using Chi-square.

Results: Prevalence of smartphone addiction was found to be 32.4%. The most personally relevant smart phone function reported was social-media usage followed by followed by phone calls and watching videos. Students using smartphones on an average of 3-4 hours/day and >5 hours/day are more likely to be addicted to smartphones compared to the students' using smartphones on an average of 11-60 mins/day.

Conclusions: Prevalence of smartphone addiction was quite high amongst the medical students which indicates smartphone addiction as a public health issue. As such, awareness regarding this upcoming problem amongst students has to be raised.

Keywords: Smart phone, addiction, medical students

Introduction

The twenty first century is commonly described as a milestone in technology development which includes innovation mainly. The world is emerging itself to an digital economy era, where every activity, either social or economic, is majorly influenced by the technology. Worldwide technology and its changes play a major role in everybody's life. Recent decades have witnessed developments in the area of electronics, information technology and software, responsible for a complete digital transformation in which humanity lives and conducts its activities.

The current trend is to adopt every change in the field of communication technology. The mobile phones are the boon of this century. Mobile phone is not only considered as a communication device but also a necessary social accessory. People have started using mobile phones rather than the fixed telephones. The cell phone today has become a lifeline for many.

It is estimated that around 6.92 billion people use the cell phone worldwide, meaning 86.29% of the world's population owns a Smartphone [1]. And majority of them are youth. According to Telecom Regulatory Authority of India, there are about 1170.75 million telephone subscribers in India making it the world's second-largest cell phone using developing country. India is also the world's second-largest Internet user-base with 747.41 million broadband internet subscribers in the country [2].

Today, 20% of people persons in the world are adolescents, who account to 1.2 billion people worldwide. Around 253 million adolescents live in India as per the UNICEF Report [3]. Adolescents are more vulnerable for addiction which is been categorized as substance addiction, e.g. "drugs or alcohol addiction" or "behavioral addiction such as mobile phone addiction." Mobile phone addiction is one of

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the forms of compulsive use of "a mobile phone" by adolescents across the world. A new kind of health disorder in this category among adolescents, "Smartphone's addiction" is now challenging health policy makers globally to think on this rapidly emerging issue. Smartphoe addiction has significant risk on physical and mental health like depression, anxiety and sleep disturbances.
Thus this study was conducted with the objective of determining the prevalence and predictors of mobile phone addiction among medical students, in Chitradurga district.

Objectives

1. To estimate the prevalence of Smartphone addiction among medical students.
2. To assess pattern of use of Smartphone and its association with smartphone addiction among medical students.

Materials and Methods

A cross sectional study was conducted among Medical students in Basaveshwara Medical College and Hospital, Chitradurga. The study was conducted for a period from Jan 2023 to March 2023 among 510 students. The sample size was decided as 380 based on previous studies with prevalence of Smartphone addiction of 44% [4], considering a 95% confidence interval at 5% margin of error.

$Formula = z^2 \, p(1-p)/d \, 2$

The sample size was calculated to be 380. All the students including 1st year MBBS to Final yr MBBS and Interns were given the questionnaire, ie 542 out of which only 510 students responded to the study. Students whose questionnaires were incompletely filled or who did not use smart phones or who were not willing to participate in the study were not included in the study. Ethical clearance was taken from the institutional ethical committee to conduct the study. Data was collected using a pre designed pre tested questionnaire which contained age, sex, the course of study, questions related to assess smartphone usage like daily smartphone usage time, reasons for usage like watching videos and movies, listening to music, games, research, selfie, social networking etc. Smartphone addiction was assessed using short-version of the smart phone addiction scale (SAS-SV) developed by Kwon *et al*. [5]. This is a 10-item self-report instrument with 6 points Likert scale. SAS-SV address the following areas, daily life disturbance, withdrawal, cyberspace oriented relationship, overuse, and tolerance.
The Final results were analyzed using Chi-square test with p-value < 0.05 considered as significant and data were analyzed using Statistical Package for the Social Sciences (SPSS) version 22.

Results

Table 1: Sociodemographic profile of study participants

Variables		Number (n)	Percentage (%)
Age (years)		20.5±0.6	
Gender	Male	248	48.6
	Female	262	51.4
Duration of smartphone use (years)	1-3	301	59
	4-6	167	32.8
	>6	42	8.2
Duration of smartphone use on a typical day	<1hr	21	4.1
	1-3 hrs	175	34.3
	4-6 hrs	201	39.4
	7-9 hrs	98	19.2
	>9 hrs	15	2.9
Purpose of mobile phone use (multiple response)	Phone calls	367	72
	Gaming	57	11.2
	Social networking (Whats app, Instagram)	480	94.3
	Watching videos on you tube/similar apps	352	69.1
	Listening to music	277	54.3
	Chatting/video calling	103	20.3
	Research/Homework	153	30.1
	For all above	258	50.6
Do you check your phones at night when you get up from sleep?	Yes	232	45.5
	No	278	54.5
Do you feel distressed when you forget your phone elsewhere?	Yes	348	68.2
	NO	162	31.8

A total 510 out of 542 students participated in the study. There were 248 (48.6%) males and 262 (51.4%) females with mean age of 20.5±0.6 years. Majority of the students were using the smartphone for one to three years (59%). Around 39.4% of them were using the smartphone for four to six hours on a typical day and the most personally relevant functional use was social networking (94.3%) followed by watching

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videos (69.1%).
About 45.5% of the students reported that they would check the phone at night when they got up from sleep. About 68.2% students reported that they would feel distressed at work if they forgot to bring along their phone.

Table 2: Self-reported Awareness of Symptoms to Mobile Phone Overuse and Precautions Used

Variables	n (%) n= 510
Awareness of Symptoms to mobile over use	402 (78.8%)
Precautions and Actions	
Reduced hours of use	215 (42.2%)
Reduced unwanted use	116 (22.8%)
Modify pattern and style of mobile use	154 (30.2%)

*Multiple responses

Participant's awareness to symptoms induced by over use of mobile phones and the precautions or actions commonly employed by them to overcome these symptoms are shown in Table 2. About 78.8% students were aware of the symptoms caused due to overuse of their phones and 42.2% and 22.8% of them were aware that reduction in the hours of use and reduction of unwanted use of phone would alleviate the symptoms.

Table 3: SAS-SV scores among the study participants

Participants (n=510)	Non-addicted students (score <30)	Addicted students (score >30)
Males	158 (30.9%)	90 (17.7%)
Females	187 (36.7%)	75 (14.7%)
Total	345 (67.65%)	165 (32.35%)

The prevalence of smartphone addiction was 32.35% with high risk of smartphone addiction among males (17.7%) and among females (14.7%).

Table 4: Responses to the questions of SAS-SV

	Items	Strongly disagree 1 n(%)	Disagree 2 n(%)	Weakly disagree 3 n(%)	Weakly agree 4 n(%)	Agree 5 n(%)	Strongly agree 6 n(%)
1.	Missing planned work due to smart phone use	60 (11.8%)	144 (28.3%)	52 (10.2%)	93 (18.3%)	104 (20.3%)	57 (11.1%)
2.	Having a hard time concentrating in class, while doing assignments, or while working due to smart phone use	73 (14.2%)	148 (29%)	59 (11.6%)	87 (17.1%)	115 (22.6%)	28 (5.5%)
3.	Feeling pain in the wrists or at the back of the neck while using a smart phone	182 (35.6%)	128 (25.1%)	78 (15.3%)	76 (15%)	35 (6.8%)	11 (2.2%)
4.	Won't be able to stand not having a smart phone	154 (30.1%)	137 (26.8%)	70 (13.8%)	63 (12.3%)	71 (14%)	15 (3%)
5.	Feeling impatient and fretful when I am not holding my smart phone	142 (27.8%)	182 (35.6%)	83 (16.2%)	58 (11.3%)	40 (8%)	5 (1.1%)
6.	Having my smart phone in my mind even when I am not using it	206 (40.4%)	159 (31.1%)	87 (17%)	31 (6.1%)	15 (3%)	12 (2.4%)
7.	I will never give up using my smart phone even when my daily life is already greatly affected by it.	134 (26.2%)	165 (32.4%)	98 (19.2%)	65 (12.8%)	35 (7.1%)	13 (2.6%)
8.	Constantly checking my smart phone so as not to miss conversations between other people on Twitter or Face book	124 (24.3%)	113 (22.1%)	75 (14.7%)	80 (15.6%)	97 (19.1%)	21 (4.2%)
9.	Using my smart phone longer than I had intended	57 (11.2%)	47 (9.2%)	66 (13%)	134 (26.2%)	127 (24.9%)	79 (15.5%)
10.	The people around me tell me that I use my smart phone too much.	93 (18.3%)	118 (23.2%)	55 (10.8%)	95 (18.6%)	84 (16.4%)	65 (12.7%)

The responses to smartphone addiction scale short version SAS-SV is shown in [Table 4].

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

Variables	Normal students (n=345)	Addicted students (n=165)	$\chi 2$	P value
Gender				
Male	158 (45.8%)	90 (54.5%)	3.42	0.06
Female	187 (54.2%)	75 (45.5%)		
Duration of Smartphone use (years)				
1-3	214 (62.02%)	68 (41.2%)	19.63	<0.01
4-6	105 (30.4%)	79 (47.9%)		
>6	26 (7.5%)	18 (10.9%)		
Duration of smartphone use on a typical day				
<1hr	18 (5.2%)	9 (5.5%)	10.1758	0.04
1-3 hrs	104 (30.1%)	31 (18.8%)		
4-6 hrs	132 (38.3%)	65 (39.4%)		
7-9 hrs	67 (19.4%)	40 (24.2%)		
>9 hrs	24 (6.9%)	20 (12.1%)		
Purpose of mobile phone				
Phone calls	52 (15.1%)	19 (11.5%)	33.7206	0.001
Gaming	15 (4.3%)	5 (3%)		
Social networking	102 (29.6%)	88 (53.3%)		
Watching videos	92 (26.6%)	28 (17%)		
Listening to music	34 (9.9%)	8 (4.9%)		
Research/Homework	20 (5.8%)	1 (0.6%)		
Others	30 (8.7%)	16 (9.7%)		

The duration of smartphone, its duration of use on a typical day and relevant smartphone function had significant association with smartphone addiction (p0.05) (Table 4), whereas gender was not significantly associated (p>0.05).

Discussion

The present study was conducted to know the prevalence of smartphone addiction among medical students. The mean age of the students was 20.5±0.6 with 48.6% being boys and 51.4% girls similar to a study conducted by Ishan Phukan *et al*. [4] in Assam with 51.97% boys and 48.03% girls. In our study 59% of them had their mobile phones with them since 1-3 yrs and 32.8% since 4-6 yrs. In a similar study by Jain *et al.* [6] in central India, 55.47% had their mobile phones since 1-3 yrs and 37.67% used their mobile phones since 4-6 yrs.

Around 39.4% of the students used their mobile phones for 4-6 hrs per day and 34.3% students used mobile phones for 1-3 hrs per day in our study whereas in a study by Ammati *et al*. [7] in south India 46% used mobile phones for 4-6 hrs and 32% of the subjects for 1-3 hrs.

In this study 94.3% students used mobile phones for social networking like facebook, Instagram, Whats App and Twitter etc., followed by 69.1% who used mobile phones for watching videos, only 11.2 % used mobile phones for gaming purpose. A study by Tang *et al*. [8] studied the addiction pattern among students in United States, China and Singapore, showed that students from China and Singapore were more addicted to Internet and Social networking and few were addicted for Games when compared to United States.

In our study about 78.8% students were aware of the symptoms caused due to overuse of their phones whereas in a study by Murugan *et al*. [9] 66% students were aware of the symptoms.

In the present study, prevalence of smartphone addiction was found to be 32.35% higher compared to previous studies by Jain *et al*. in central India and Haug *et al*. in Switzerland [6,10]. Our prevalence had huge difference compared to the study by Sethuraman *et al*. in Andaman [11] where the prevalence of smartphone addiction was 85.4%. The prevalence of addiction in present study was higher to that in a study among university students and staff of Spain (12.8%) and Belgium (21.5%) respectively [12]. In another study conducted on Turkish university students, 39.8% had smartphone addiction [13]. A study in Lebanon reported 44.6% of university students had smartphone addiction which was higher than the present study [14].

In this study the risk of addiction was more among males (17.7%) than females (14.7%). This study shows no significant association between gender and prevalence of smartphone addiction. However, a study by Takao *et al*. showed no significant association between gender and prevalence of smartphone addiction [15]. In a study on Turkish university students the SAS scores were significantly higher in females than males and had a prevalence of 39.8% which was higher compared to our study [13].

Our study also showed positive association between the average duration of mobile use per day and presence of smartphone addiction similar to a study by Suliman *et al*. in Saudi Arabia where increased duration of smartphone use on a typical day was significantly associated with smartphone addiction. This shows that students are spending more time in their smartphones and becoming more dependent on technology for day to day activities which has a negative physical and psychological effects.

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The purpose of mobile phone usage was significantly associated with smartphone addiction in our study. Similar study by Salehan *et al*. and Lee *et al*. showed that the addicted students most frequently used their smartphones for social networking [16, 17]. In a study by Chen in China [18] playing games on smartphones predicted addiction for male students whereas use of social networking applications were predictors for females. In another study by Dharmadhikari, *et al*. text messaging was the most common purpose of using the smartphone (57.14%) followed by internet browsing (10.86%) [19].

Conclusion

The study found high prevalence of smartphone addiction amongst the medical college students, which shows that smartphone addiction has become a public health issue. It has been seen that smartphone addiction has a significant impact on physical and psychological health like anxiety and depression among young adults especially in developing countries.

Awareness regarding prevention of this growing problem among students has to be raised and various interventional strategies need to be planned.

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