

Prevalence of Smartphone Addiction Among College and University Students in Saudi Arabia: A Multicenter Study

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ABSTRACT

Objective: To find out the prevalence of smartphones addiction among college and university students in the Kingdom of Saudi Arabia (KSA) and its association with demographic variables

Methodology: A study was conducted in all provinces of KSA between December 2015 to June 2016. An electronic survey was sent to students' clubs of various universities. Smartphone Addiction Scale (SAS) was used which had 33 closed-ended questions. Total score of SAS was calculated and three categories of addiction was made: low, moderate, high. Questionnaire also included sociodemographic questions, and smartphone usage patterns and addiction behaviour.

Results: The total number of participants was 1941 (response rate of 80.9%) students representing most of the provinces of Saudi Arabia. The prevalence of smartphones addiction was found to be 19.1%. Female participants were more addicted than males ($p < 0.001$). Medical students were less smartphone-addicted than non-medical college students ($p = 0.007$). Inverse and significant relation between age onset of mobile usage with its addiction was found ($p = 0.02$).

Conclusion: Prevalence of smartphone addiction found in the present study was not high. However, female and non-medical colleges students were found to be more addicted to smartphones. Those who started using smartphones at an early age were also found to be more addicted. Less awareness about harms of smartphones addiction could be one of the reasons of having high prevalence of addiction among non-medical students and those who started using at a younger age.

Key words: Smartphones, addiction, epidemiology, Saudi Arabia, students

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INTRODUCTION

The smartphone appears to facilitate learning by increasing interactivity and providing easy access to resources and information. Enhancing communication with colleagues and teachers and sharing information, are among the key advantages or factors of smartphones^{1,2}. However, apart from its advantages, there are some disadvantages as well. Its overuse can cause memory and concentration problems, physical abnormalities, changes in eating behaviour and sleep disturbances³⁻⁵. Smartphone usage may be associated with low academic performance because it diverts from studying, exam preparation, fulfilling requirements and following planned schedules etc.⁶

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Smartphone addiction has been defined as the overuse of smartphones to the extent that it disturbs the users' daily lives⁷. Psychological impairment could be related to smartphone usage^{8,9}. Many factors play a significant role in increasing or decreasing the probability of its addiction. These factors can be age, gender, socioeconomic status, physical fitness, self-esteem, education and hobbies. Technical factors such as the availability and speed of the internet have a role in the rate of use^{9,10}.

Addictions can be classified as either substance or non-substance. Substance addiction includes drugs and alcohol, whereas non-substance abuse includes activities likes gambling, games, internet, shopping¹¹. The prevalence of smartphone addiction is higher than internet addiction due to difference between mobile phone and the internet. Furthermore, if the features of smartphones will increase, the likelihood of addiction will also increase.^{12,13}

The percentage of smartphones users is rapidly increasing in the Saudi population. Hejab et al, reported that Australia, United Kingdom, Sweden, Norway,

Saudi Arabia and the United Arab Emirates all boast of smartphone adoption rates above 50%¹³. However, among the recent studies which were published from Saudi Arabia, all were based on a single center¹³⁻¹⁶ and reported data from Riyadh, Jeddah, Najran etc. To the authors' best knowledge, this study is the first of its kind which was conducted in multiple universities across the Kingdom of Saudi Arabia. Hence, the purpose of the present study was to find the prevalence of smartphones addiction among college and university students across the Kingdom of Saudi Arabia (KSA). Furthermore, the association of demographic variables with smartphones addiction was also studied.

METHOD

This cross-sectional study was conducted in various provinces of KSA between December 2015 and June 2016 after receiving approval from Research Committee at the Saudi Council for Health Specialties of the joint programme of family medicine at the eastern province of Saudi Arabia. The study was conducted in various colleges and universities across KSA. All undergraduate students (male or female) aged from 17 to 27 years were eligible to participate in the study. Students who were either diagnosed or received any treatment for smartphone addiction were not eligible to participate. Participation was voluntary, and participants could leave the survey at any point.

The sample size was calculated by using Raosoft calculator for sample size. After allowing only a 2% chance of error, the obtained sample size was 2399. Then the survey was sent to student clubs at all colleges and universities. Simple random sampling was used to recruit study participants.

The prepared questionnaire had three sections: (1) socio-demographics, (2) smartphone usage patterns and addiction behaviour, and (3) Smartphone addiction scale (7). Sections one and two were to include background data as a determinant of smartphone addictions. The questionnaire was translated first by a certified translation office specialized in translating official governmental papers and college researches from English to Arabic, then reviewed by two consultants of family medicine to check that the words used in each question were giving the nearest meaning to the original English question. Finally, the Arabic version of the scale was retranslated to English. The 'Cronbach's Alpha was 0.967.

The survey was designed electronically, then authors started contacting the leaders of student clubs in the universities explaining about the study, objectives, approval, how to share, and ensuring confidentiality.

After the leaders received official approvals from their respective universities, the weblink was emailed to students who were participating in the study with instruction on how to fill the self-administered questionnaire after giving online consent.

Smartphone addiction scale (SAS) is a scale to analyze smartphone addiction having 33 questions with six-point Likert scale ranging from '1=strongly disagree' to '6=strongly agree'. Higher scores indicate the higher risk of smartphone addiction. A total score for each participant was calculated by adding scores of all questions. Smartphone addiction was categorized as low if total score of a participant was between 33 and 87, intermediate if it was between 88 and 142, and high if score was between 143 and 198. Those who were under the third category were considered as smartphone addicts.

Statistical Package of Social Sciences (SPSS V.23) was used for data entry and analysis. Independent variables, which included age, gender, marital status, GPA, medical and non-medical students, years since using smartphones and its daily usage, were used for descriptive and inferential analysis. Due to the categorical nature of independent (gender, marital status, type of college--medical or non-medical, etc) and dependent variables, Chi-square test was used. However, only significant results were presented in the tables. Level of significance used for p-values was 0.05.

RESULTS

After inviting 2399 students from twenty different universities in KSA, 1941, students sent their feedback by filling the questionnaire. Hence the response rate was 80.9 percent. Evaluation of the responses revealed that there were 874 (55.3%) male and 707 (44.7%) of female participants in the study. Majority of these were single (n=1360, 86%) and only 14% (n=221) were married. Minimum age of a respondent was 17 years, and the oldest ones were 27 years old, the average age was 21.5(±2.68). It was found from further assessment of demographic variables that the number of medical college students in the study was 467 (29.5 %) and the rest were from non-medical colleges (n=1114, 70.5%). Total 58 percent of the participants belonged to the 1st to the 3rd year of college, and 42 percent were from 4th to 7th-year students. Approximately 70 percent of the participants started using smartphones when they were less than 18 years old.

Evaluation of SAS score revealed that prevalence of smartphone addiction among university students in the Kingdom of Saudi Arabia was 19.1%, low-risk group

Table 1: Smartphone addiction in relation to gender and students

		Score Group SAS			P-value
		Low	Intermediate	High	
Gender	Male	170(19.5)	565(64.9)	136(15.6)	<0.001*
	Female	108(15.3)	433(61.3)	165(23.4)	
I am a student at medical school	Yes	95(20.5)	301(64.9)	68(14.7)	0.007*
	No	183(16.4)	697(62.9)	233(20.9)	

*Statistically significant at 0.05 level of significance

Table 2: Participants' perception and age onset of usage of smartphones in relation with SAS score

		Score Group SAS			P-value
		Low	Intermediate	High	
Do you feel addicted to your smartphone?	No	115(52.5)	99(45.2)	5(2.3)	<0.001*
	Mild	98(21.2)	334(72.3)	30(6.5)	
	Moderate	58(9.6)	438(72.5)	108(17.9)	
	Severe	7(2.3)	133(44.5)	159(53.2)	
	< 15 years	49(14.0)	214(61.0)	88(25.1)	
When did you start using smartphone? (age of onset)	15-18 years	121(17.1)	463(65.3)	125(17.6)	0.02*
	18-22 years	82(20.4)	249(61.9)	71(17.7)	
	22-24 years	13(18.8)	45(65.2)	11(15.9)	
	> 24 years	13(29.5)	25(56.8)	6(13.6)	

*Statistically significant at 0.05 level of significance

Table 3: Smartphone addiction concerning its usage

		Score Group SAS			P-value
		Low	Intermediate	High	
How many hours per day are you using smartphones (hours/day)?	< 1 hour	11(57.9)	7(36.8)	1(5.3)	<0.001*
	1 hour	23(45.1)	23(45.1)	5(9.8)	
	1-3 hours	97(34.5)	166(59.1)	18(6.4)	
	3-5 hours	93(19.0)	332(67.8)	65(13.3)	
	> 5 hours	54(7.4)	468(63.8)	212(28.9)	

of smartphones addiction included 17.6% of students out of whom the majority of students (63.4%) were in moderate risk group. Apart from SAS score, students were also asked 'whether they feel they are addicted to smartphones'. Only 220 (13.9%) stated 'not addicted', the rest agreed that they were addicted and their addiction level was varying from mild to severe.

Through the comparison of demographic variables with SAS score, it was found that female students were highly addicted to smartphones compared to male students (Table 1). In addition, students from non-medical colleges (20.9%) were more addicted to the smartphone than the medical students (14.7%) with p-value 0.007 (Table 1).

When students were asked 'do you feel addicted to smartphones?', their responses were following the SAS score (Table 2). As many as 115 (52.5%) out of 219 said that they were not addicted to low SAS score, 334 (72.5) and 438 (72.5) thought addiction level was mild and moderate respectively while their SAS score was intermediate and 159 (53.2) said addiction level was severe while having high SAS scores.

Furthermore, daily usage of smartphones also got significant p-value when tested with SAS score. The trend was increasing and statistically significant, with p-value <0.001 (Table 3).

DISCUSSION

The current study measured and classified smartphone addiction into three categories: high, moderate and low. The high-risk group was considered as smartphone-addicted. The prevalence of smartphone addiction in the present study was found at 19.1 %. However, variation in prevalence was observed when the literature was reviewed. Some studies reported high while some reported average or low prevalence of mobile phone addiction among university students. A study from Riyadh (KSA) got 48% prevalence of mobile phones addiction among university students¹⁷. An Indian study published in 2014 stated the smartphone addiction was ranging from 39-44% among adolescents¹⁸. In contrast, studies from Korea, the United Kingdom, Spain, and Switzerland reported prevalence of less than 20% among the studied population¹⁹⁻²².

Female students were found to be more prone to mobile phone addiction than male students, and it was statistically significant too. This finding is in line with a study published from Turkey where authors found the prevalence was 21% in boys and 39% in girls²³. Similarly, in Korea, it was 10% in male and 39% in females²⁴. Hegazy AA et al. found that girls were 16-18% more prone to be addicted than boys¹⁵. While many studies did not find any correlation between the gender of the participants and prevalence of smartphones addiction^{16,25}. Females use phones to sustain social relationships and to express their emotions²⁶. Level of dependency was found to be related to many factors like personality differences between males and females, phone-related behaviours, types of applications favoured by males or females, impulsiveness, cultural and usage pattern or purpose^{27,28}.

In our study, no relationship between academic grades and the level of risk of smartphone overuse was found. In Riyadh, study showed the academic performance affected by using smartphones¹⁶ and it was supported by a lot of studies²⁹⁻³¹. High frequency of smartphone usage can cause distractions, impulsivity, passivity and little intellectual effort³². Smartphone usage may divert student from studying, exam preparation, completion of assignments, follow the planned schedules and lead them to spend more time in amusement⁶.

Daily usage of smartphones was found to be an essential factor which had a significant association with addiction, and this association can be studied repeatedly in the literature. Studies from Riyadh¹⁶, Najran¹³, Jeddah¹⁵, South Africa³³, and Korea²⁴ also showed the same relation between the two variables. In our study, high-risk group spent around 5 hours on their smartphones daily. The Najran²¹ and South African³³ study found

the same result. In Korea²⁴, it was noticed that 7 hours was the average time of daily use while James et al, found the students spent nearly 9 hours per day on their mobile phones³⁴.

Generally, there was an increasing trend of the prevalence of smartphone addiction towards the youngest ages. This is a well-established phenomenon of smartphones addiction and can be found in many previous studies^{16,21,22}. In this study, the prevalence of smartphone addiction was the highest among the youngest students and followed the downward trend as age increased. Hence, the early start of smartphone usage could lead to addiction.

In the present study, smartphone addiction was higher among non-medical student compared to medical students. In a Jordanian study³⁵, they found a significant difference relative to the specialty: humanities students had a double risk of addiction (16%) than natural sciences students (9%). These findings were corroborated by Iranian³⁶ and Australian³⁷ studies, and the speciality was found to be playing a major role on other addiction types besides the smartphones addiction, for example gambling addiction in science students or shopping addiction in Art students³⁸.

Furthermore, there was a significant relation of smartphone addictions objectively to subjectively measuring by SAS survey. Students' perception about addiction was entirely in line with their SAS score. Table 2 shows that those who categorized themselves as not addicted had low SAS scores. Similarly, those who thought they were severely addicted to smartphones had high SAS scores. This showed that students were aware that they were suffering from smartphone addiction. It was important to study how close the relationship between conception and reality is. Realization is the first step towards solving any problem, hence it was a positive indicator that students were admitting their smartphone addiction.

Study limitations: Lifestyle might affect the addiction as the study was conducted in various cities of Saudi Arabia. Possibility of reporting bias cannot be ignored because data was self-reported. The study was done on a specific age group. This study did not include factors related to lifestyle and daily activities which could be affected due to smartphones addiction.

CONCLUSION

Although the prevalence of smartphone addiction was 19.1% which was not as high as reported in literature. However, a large proportion of students had moderate level of addiction and that was the point of concern

because that moderate level could increase to high in future which can increase the prevalence of addiction. Furthermore, female and non-medical college students were found to be more addicted to smartphones. However, students were accepting that they were overusing smartphones, and it was a positive attitude. Steps need to be taken in order to minimize and to prevent its increase. It is required to educate them about the consequences of addiction and how to overcome this problem. Furthermore, smartphones should not be given at a younger age, and only be given when a child can differentiate its healthy and productive use from addiction. Less awareness about harms of smartphones addiction could be one of the reasons of having high prevalence of addiction among non-medical students and those who start using at a younger age.

Authors' Contribution:

Name	Contribution
Rashed Al Boali, Abdulrahman Fouad ALkhateeb	Methodology, Data collection and Analysis
Dr. Waleed Alharbi Dr. Olfat Saleh	Article writing

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