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Smartphone addiction among Qatar University students: a cross-sectional study

Reem Ashour, Sana Elashie, Bayan Alkeilani, Mujahed Shraim

Background

Smartphone addiction (SPA) is an important emerging public health problem. SPA is defined as excessive smartphone use, which is associated with functional impairment in activities of daily living and substance dependence-like-symptoms.[1] A growing number of studies have shown that SPA is associated with road traffic accidents and fatalities,[2-3] higher stress scores,[4] anxiety and depression disorders,[5-6] poor social relationships,[7] sleep disturbance,[8-9] low physical activity,[10-11] and fast food consumption and weight gain.[11] Prior research suggests that adolescents and college students tend to use smartphones heavily,[5-6] and thus might be at higher risk of SPA than the general population. Prior studies have shown mixed findings with respect to the relationship between SPA and academic performance among college studies.[12-14] Other studies reported that SPA among college students was associated with higher stress scores, higher anxiety and depression scores,[15-16] inadequate sleep duration,[16-17] and negative health related behaviors, such as eating more fast food, lower levels of physical exercise, and increase in body weight.[11] This highlights the importance of research examining risk factors for SPA and the mechanisms underlying the potential relationships between SPA with negative health outcomes and lower academic achievement among college students.

In Qatar, recent estimates show that 95% of the general population and 98% of people aged 18-24 years reported using a smartphone.[18] However, the prevalence of SPA among college students in Qatar is unknown. Additionally, no prior studies have examined the potential negative effect of SPA on academic performance, health related behaviors, and psychological well-being among undergraduate students in Qatar. Identifying characteristics of students at risk of SPA and the extent of SPA impact on academic performance and health and psychological well-being may shed light on potential underlying mechanisms and targeted preventative measures.

Aim

The aims of this study were to (I) estimate the prevalence of SPA among students in Qatar University (QU); (II) assess the correlation between daily duration of smartphone use (SPU) and SPA; (III) assess the relationship between SPA with (a) current Grade point Average (GPA), (b) psychological distress, and (c) students' perceived negative impact of SPU on their learning and academic performance, sleep at night, social activity, and physical and mental health.

Methods

We used a cross-sectional study using a self-administered electronic or paper questionnaire. All undergraduate and graduate students registered in QU during Fall 2019 were included. The first part of the questionnaire collected the following information: age, gender, nationality (Qatari, non-Qatari), college, academic program (Bachelor, Master, PhD), year of study (1st to 6th year), employment status (full-time, part-time, not employed), smoking status (yes, no), moderate physical exercise of 10 minutes performed in the past week (none, 1-4 days/week, 5-7 days/week), history of doctor-diagnosed chronic diseases (yes, no), current GPA, and daily duration of smartphone use in hours.

The second part of the questionnaire measured SPA using the Smartphone Addiction Scale (SAS), which is a self-administered questionnaire that has been validated in English and Arabic.[19-20] The SAS questionnaire asks participants to indicate to what extent do they disagree or agree with the 10 statements about their current smartphone use. The SAS questionnaire uses a 6-point Likert scale (strongly disagree, disagree, weakly disagree, weakly agree, agree, strongly agree). The overall SAS score ranges between 6 and 60 (higher scores indicate higher level of SPA), and scores ≥33 in females and ≥31 in males are classified as "SPA". The third part of the questionnaire used the General health Questionnaire 28 (GHQ-28) to measure the likelihood of student having "psychological distress". The GHQ-28 has been validated in English and Arabic.[21-22] The GHQ-28 measures the frequency of experiencing 28 behavioral items using a 4-point scale (0= "not at all", 1= "no more than usual", 2= "rather more than usual", and 3= "much more than usual"). The overall GHQ-28 score ranges between 0 and 84 (higher scores indicate higher level of psychological distress), and scores ≤23 are classified as "no psychological distress" and scores ≥24 are classified as "psychological distress". The fourth part of the questionnaire asked the participants to indicate to what extent do they disagree or agree (6-point Likert scale) with 10 statements (Figure 2) about their perceived impact of smartphone use on their academic performance, learning, sleep at night, social activity, and physical and mental health.

Descriptive statistics were used to summarize the data. Multivariable logistic and linear regression analyses were performed to examine the relationships between the predictor and the outcome variables. We also performed sensitivity analyses according to survey completion method (paper and electronic) to assess for potential selection, response, and social acceptability biases. All analyses were performed using IBM SPSS statistics V26.

Results

Seven hundred and seventeen students participated in the study, 383 of them (53.4%) were form 15 classes, which were randomly selected from the nine Colleges, and completed the paper survey. The mean age of the participants was 22.2 years (standard deviation (SD)= 5.3). About 76.8% and 52.6% of the participants were females and non-Qataris, respectively. The majority of students were from the Colleges of Business and Economics, Education, and Arts and Science. The majority of students (90.5%) are enrolled in a Bachelor study program, 8.4% in the Master's study program, and 1.1% of students are enrolled in a PhD program. About 12.1% and 11.3% of students are employed part-time and full-time, respectively. Around 8.2% of students reported that they smoke cigarettes. Around 11.2% of students indicated that they have at least one chronic disease diagnosed by a medical practitioner. Only 36.0% and 7.4% reported performing moderate physical exercise of 10 minutes 1-4 days and 5-7 days in the previous week, respectively. The mean daily duration of SPU among students was 6.5 hours per day (SD= 3.7).

The mean SPA score among students was 34.6 (SD 10.6) with a median of 35 (IQR= 15). The prevalence of SPA among students was 59.8%. There was a weak and positive correlation between daily duration of SPU in hours and SPA score (r=0.282, p= <0.001). The prevalence of psychological distress among students was 51.0%. As shown in Table 1, increase in daily duration of SPU, male gender, presence of psychological stress, not having a chronic disease, and not performing physical exercise in the previous week were independently associated with increased odds of SPA. We found a significant interaction between gender and psychological distress with SPA. Male students with psychological distress were at lower odds of SPA than female students with psychological distress (OR= 0.39; 95% CI 0.17, 0.87).

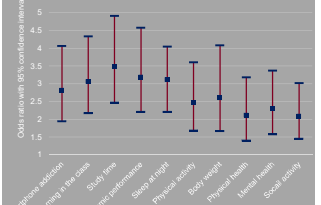
Table 1. Factors associated* with smartphone addiction

Variable	B	SE	P-value	OR (95% CI)
Daily duration of SPU (hours)	0.157	0.03	<0.001	1.17 (1.11, 1.23)
PDS				
No	Ref			
Yes	0.908	0.19	<0.001	2.48 (1.71, 3.59)
Gender				
Female	Ref			
Male	1.008	0.28	<0.001	2.74 (1.58, 4.76)
Gender*PDS				
Female*PDS (yes)	Ref			
Male*PDS (yes)	-0.942	0.41	0.022	0.39 (0.17, 0.87)
Physical exercise in previous week				
None	Ref			
1-4 days	-0.162	0.18	0.365	0.85 (0.60, 1.21)
5-7 days	-0.777	0.34	0.021	0.46 (0.24, 0.89)
Chronic disease status				
No	Ref			
Yes	-0.574	0.26	0.030	0.56 (0.34, 0.95)

SPU, smartphone use; PDS, psychological distress status; Ref, reference category; *Adjusted for age, employment status, year in the program, and college.

SPA was a statistically significant and independent predictor of all included domains of perceived negative impact of SPU (Figure 2). After adjustment for significant variables, students with no SPA had higher odds of increase in current GPA category by 2.04 times (1.05, 3.95) than students with SPA.

Figure 2. The relationship between SPA with domains of perceived negative impact of SPU



The characteristics of students did not vary significantly according to survey completion method. The sensitivity analyses showed similar findings between the predictors and the outcome variables in all analyses. Therefore, our sensitivity analyses suggest that our findings are unlikely to have been affected by selection bias, response bias, or social acceptability bias.

Conclusion

SPA is highly prevalent among QU students. SPA or longer duration of SPU have negative impact on academic performance, psychological distress, and perceived physical and mental health, and social activity. The mechanisms underlying these findings are still not clear. Further longitudinal research with mixed designs is required to examine the direction of associations and identify potential causing mechanisms. Such information could be used to design and test intervention to prevent or minimize the negative impact of SPA and excessive SPU.

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