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Smartphone Use Addiction among Kuwait University Students and its Relationship to their Academic Performance from Their Perspectives

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Abstract

This study aims to explore the relationship between smartphone addiction (SPA) and grade point average (GPA) and identify the impact of selected demographic variables on SPA. A total of 2085 undergraduate students from Kuwait University were randomly selected to participate in the current study. Data were collected using the Smartphone Addiction Scale (SAS) and analyzed by SPSS. The results revealed a negative relationship between SPA and GPA, $r = -.077$, $n = 2085$, $p = 0.000$. Another finding was that students who majored in art showed more addiction to smartphone use than students who majored in science.

Keywords: Smartphone addiction, Academic performance, Behaviorism.

Introduction

Smartphones have become part of students' daily lives. The purpose of the current research is based on the recommendation of the study "Smartphone Use and Academic Performance: Correlation or Causal Relationship?" by (Baert et al., 2018), who suggested that future work should identify the impact of smartphone overuse on academic performance. Smartphone addiction (SPA) among adolescent students has recently received research attention due to the lack of parental control and the availability of these devices. The greatest nondrug addiction of the 21st century is heavy smartphone use, according to Shambare et al.,

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(2012), who described smartphone overuse as addictive, compulsive and habitual. There has been increasing concern regarding the consequences of smartphone overuse. Heavy smartphone use can not only cause physical health-related problems, such as blurred vision and neck and wrist pain, but also behavioral problems, such as depression, anxiety, lack of energy, and low academic achievement (Alosaimi et al., 2016). The same study reported that although behavioral addiction does not involve the use of a chemical substance, the similarities between the fundamental features of substance use disorders and those of behavioral addiction disorders such as SPA are striking. College students have been the most rapid adopters of smartphones (Smith et al., 2011). A study by Lepp et al. (2014) refers to the Pew Center's Internet and American Life Project, which also suggests that college students are the most rapid adopters of smartphones, and research is emerging that suggests that heavy smartphone use may be influencing their health and behavior. There is an old Kuwaiti saying that "everything that is overused becomes negative". If students continue overusing their smartphones, the consequences will be negative.

The excessive usage of smartphones has negative effects on users, who gradually become addicted to this behavior (Arefin et al., 2017). Research states that college students are addicted to smartphone use for many reasons, such as their developmental dynamics, freedom, and lack of responsibility within society and the family (Kandell, 1998). In the classroom, students engage in web surfing, social networking, texting, and checking emails and accordingly pay less attention to their lectures (Hiscock, 2004). A study conducted by Tayseer et al. (2014) found that college students tend to use their smartphones more for social purposes than for academic reasons.

Although this case study focuses on Kuwaiti students, it is highly generalizable to similar students in other countries. The main characteristics of the students at Kuwait University (KU) are as follows. First, the average age of KU undergraduate students is between 18 and 22 years old. Second, instruction occurs in both the English and Arabic languages at KU. Third, the minimum score for acceptance at KU as a freshman is 78%, which is equivalent to a B- (2.67) on a four-point grading scale. Fourth, in general, students at KU belong to the middle-income class. Last, but not least, the sample in the present study was

selected randomly to represent all sixteen colleges at KU. Mobile service providers in Kuwait have just started providing 5G network technology. 5G is an abbreviation for fifth-generation technology and entails a high data rate, reduced latency, energy savings, cost reduction, higher system capacity and massive device connectivity (Sulaiman & Dashti, 2018). The relationships between the independent and dependent variables appear later in the Methods section.

Literature Review

SPA not only generates stress and reduces satisfaction with life but also negatively impacts academic performance (Chaudhury & Tripathy, 2018; Hawi & Samaha, 2016). Texting and surfing the Internet were found to be associated with a low self-reported grade point average (GPA) among a sample of first-year college students from the United States of America and with self-reported academic difficulty in a sample of Taiwanese female university students (Hong et al., 2012). Several studies have identified negative relationships between the use of applications such as Facebook and GPA or time spent studying (Junco, 2012; Karpinski et al., 2013; Stollak et al., 2011). Studies have suggested that the heavy use of mobile phones for entertainment purposes is highly correlated with reduced academic performance (Kubey et al., 2001; Zulkefly & Baharudin, 2009). A study by Devís-Devís et al. (2009) assessing the negative consequences of heavy Internet use in four different colleges (psychology, education, journalism and broadcasting and health studies) found that psychological distress was related to maladaptive use of the Internet and mobile phones. This study also found that females scored higher than males, showing more negative consequences of abnormal use for females. Another result stressed that journalism and broadcasting students exhibited more abnormal use of the Internet than other students in other majors. This last finding emphasizes that students who major in art are more addicted to the Internet than students who major in science. A study by Pierce and Vaca (2008) revealed that students who used entertainment apps, such as Myspace, reported lower grades than those who did not use technology while doing their homework. They also found that 28% of students “always” or “frequently” sent text messages during class lectures, and some students reported “always” or “frequently” text

messaging during an exam. Researchers examined the frequency of smartphone use during the examination period among 700 freshman undergraduate students attending universities in Ghent and Anvers. The study found that students used their smartphones on average three times per lecture and concluded that SPA in students reduced academic performance (Amez, 2018). Lee et al. (2015) conducted a study titled “Smartphone Addiction in University Students and its Implication for Learning,” in Seoul, Korea. They found that, in a sample of 210 female students, a higher level of SPA was associated with a lower level of self-regulated learning and a lower level of flow when studying. These findings indicate the important role of SPA in reducing students’ academic achievement. The researchers also conducted interviews with an SPA group and found that students are constantly interrupted by apps on their smartphone when studying and lack sufficient control over their smartphone use. A recent comparison study of Korean and Australian students conducted by Winskel et al. (2019) on the overuse of smartphones and academic performance indicated that Korean students are currently more prone to SPA than Australian students. Additionally, the more time students spend using their smartphone, the more at risk they are of engaging in problematic smartphone use and of experiencing the resulting decline in academic performance.

A few studies have examined the relationship between SPA and students’ field of study. For example, Al-Barashdi et al. (2015) found that humanities students had a higher level of SPA than natural science students. Kibona and Mgaya (2015) concluded in their study that most undergraduate students use smartphones for social rather than academic reasons, which leads them to lose focus in class when the faculty member is lecturing and causes a drop in academic performance. Tayseer et al. (2014) found a correlation between students’ GPA and their use of social networks. However, many respondents did not use social media to look for college-related information. Moreover, students tended to use social networks, such as Face-book and Twitter, for social rather than academic purposes.

Definition of Addiction

The concept of addiction has multiple definitions, but it has been described as the repeated use of a substance despite the negative

consequences suffered by the addicted individual (Alavi et al., 2012; Davey & Davey, 2014). Behavioral addictions such as SPA are “similar to drug addiction except that in the former, the individual is not addicted to a substance but the behavior brought about by the relevant action. In addition, the physical signs of drug addiction, are absent in behavioral addiction” (Alavi et al., 2012:209). The ultimate characteristics of behavioral addiction include the following: sustained engagement in a behavior despite its negative effects, decreased control over participation in the behavior, compulsive participation, and appetitive urges or cravings that instantly precede engagement in the behavior (Demirci et al., 2014). University students are addicted to using smartphones to the extent that they exhibit indications of behavioral obsession (Al-Barashdi et al., 2015). McCoy (2016) reported that some students use their smartphones over 30 times a day during class time for nonacademic reasons. It should be noted regarding SPA that students are not actually addicted to their smartphone: they are addicted to the information, entertainment, and personal connections their smartphone delivers (Emanuel et al., 2015). Thus, if students were addicted to information relevant to their studies, their outcomes would be better, while addiction to nonacademic information worsens outcomes. The next section discusses the theory behind the study of “behaviorism.”

Behaviorism

Behaviorism is a theory of learning that states that all behaviors are learned through interaction with the environment in a process called conditioning (McLeod, 2017). All behaviors are either reflexes produced by a response to certain stimuli in the environment or a consequence of the individual's history, including reinforcement and punishment, together with the individual's current motivational state and the controlling stimuli. We included behaviorism in the current study because we believe that addiction and behavior are intertwined. For example, if students overuse smart phones for nonacademic purposes, their outcomes will be negative. Behaviorism is concerned with the way that an organism is changed by its experience. Behaviorism is the study of mechanisms of behavior, where the mechanisms are whatever is operating to account for behavior and behavior is whatever can be usefully observed or measured (Baum, 2017; Staddon, 2001). Cognitivists believe that the brain is like a

computer and cognitive operations like programs running on that computer (Pylyshyn, 1984). Cognitivists go beyond the idea that a source of behavior, the brain, is to be thought of as a “symbol-manipulating device,” like a smartphone (Staddon, 2001). Behaviorism is a very broad educational theory, and it includes many subtypes, such as methodological behaviorism, radical behaviorism, teleological behaviorism, and psychological behaviorism. Watson, for example, proposed methodological behaviorism, stating that only individual behaviors (public events) can be observed, and therefore, thoughts and feelings (private events) should be ignored (Chiesa, 1994; Skinner, 1976). Radical behaviorism, proposed by Skinner (1976), resolved the latter issue and suggested that environmental variables control private events just as they control public events. From a psychological behaviorism perspective, humans learn repertoires that enable them to learn other things (Muckler, 1963). Similarly, if college students learn from educational apps that help them learn the content of the curricula better, they will earn better grades. Behaviorism explains technology addiction or SPA as a learned behavior that is subject to the stimulus-response-reinforcement principle; thus, like any other learned behavior, SPA can be modified (Aljomaa et al., 2016). Therefore, if college students are heavily exposed to educational apps, their educational outcomes will improve, and the negative behavioral association between smartphone overuse and academic achievement will be reduced. From a contemporary behaviorist point view, there is another way to approach teaching. Teaching is about variation, eliciting the right response or allowing the right idea to occur for the first time, not about selection and reinforcement. More clearly, creativity in teaching leads to spontaneous flowering in learning (Staddon, 2001). Thus, faculty members are responsible for improving students’ behaviors with regard to smart phone overuse by encouraging academic uses over nonacademic uses.

Statement of the Problem

While some research studies, such as Inegbenojie (2016) and Sumathi et al. (2018), refer to the positive academic outcomes of using smartphones in educational fields, most research concerns the negative educational outcomes of heavy smartphone overuse (addiction). SPA is expected to continue because the number of smartphone users around the globe continues to expand and is projected to exceed 3.8 billion in

2021 (Dea, 2020). This increase is expected to be accompanied by more negative impacts (Aljomaa et al., 2016). The current study investigates the impact of SPA on academic performance among university students in Kuwait. Few studies have articulated the impact of SPA on students' academic performance (e.g., Arefin et al., 2017; Boumosleh & Jaalouk, 2018; Chaudhury & Tripathy, 2018; Hawi & Samaha, 2016), and almost none are based on educational theories. Thus, the authors of the current study decided to establish outcomes based on behaviorism theory to enhance the research in this field.

Significance of the Study

- The findings can be cautiously generalized to similar students in other countries.
- The study encourages policymakers to shift students' focus from social apps to educational apps.
- The study contributes to a general understanding of the construct of proneness to SPA.

Research Questions

- 1 - What is the impact of SPA on academic performance among KU students?
- 2 - Are there statistically significant differences in SPA that can be attributed to demographic variables such as gender, type of college (humanities or sciences), type of major (arts or sciences), relationship status (married or unmarried), hours of daily use, and year of study?

Method

Participants

The total target population of KU according to the most recent official statistics for the 2016-2017 academic year was 36,124 students (Statistics, 2020). 2207 undergraduate participants were randomly selected for this study. This sample represented all sixteen colleges at KU: art, education, law, Sharia and Islamic studies, social sciences, and business and administration within the humanities division and public health, pharmacy, medicine, science, life sciences, allied health science,

architecture, engineering and petroleum, dentistry, and computing sciences and engineering in the science division. A total of 123 students refused to participate in the present study. Thus, in total, 1870 females and 214 males (mean age = 20.5 ± 2.44) were included. The number of females was greater because 27,139 females were registered for the 2017-2018 academic year; therefore, female students constituted the majority. The purpose of the survey was explained to the participants, and confidentiality was guaranteed.

Procedure

The comparative descriptive method was used in the present study, as it was the most appropriate, given the research problem and its variables. All participants were assessed using the Smartphone Addiction Scale (SAS). The original SAS is a 33-item scale developed by Kwon et al. (2013). The authors of the current study omitted 3 items of the original SAS due to redundancy. A cutoff point for the original scale was not reported. Data were collected during the 2018-2019 academic year.

Measures

The e-questionnaire collected information on socio-demographics (see Table 1) (age, gender, marital status, year of study, type of college, major type), cumulative grade point average (GPA), number of hours of daily smartphone use, and apps most often used daily (see Table 1). The question on GPA was as follows: "Indicate your current cumulative GPA: a. less than 2.00; b. between 2 and 2.99; c. equal to or greater than 3.00". GPA is a measure of a student's academic achievement at a university; it is calculated on a 4-point grading scale by dividing the total number of grade points earned by the total number of credits attempted, with 4 being the highest possible score. Each of the demographic variables was treated as an independent variable, and the other variables were controlled for. The second part of the e-questionnaire encompassed the 30 questions of the SAS. The amount of time required to complete the survey was approximately 7-9 minutes. The authors of the current study conducted a pilot test with 35 undergraduate students who were not part of the sample of this study. The Cronbach's alpha of the SAS indicated strong internal consistency (0.921). The SAS was used in the present study because it has been

validated in a young population. The response options for this scale are 5 (always), 4 (most likely), 3 (likely), 2 (less likely), or 1 (not likely), where higher scores indicate a higher risk of SPA.

Table 1

Characteristics of the Study Participants (n = 2084)

	n (%)	Mean ± SD (n)
Age		20.5 ± 2.44 (2084)
Gender		
Female	89.9%	
Male	10.1%	
GPA		
< 2	8.2%	
2.00 - 2.99	49.90%	
≥ 3	41.9%	41.9%
Number of hours of daily SP use		
< 2	2.6%	2.6%
2-4	11.6%	11.6%
4-6	34.1%	34.1%
Almost all day	51.7%	
Year of study		
Year one	20.9%	
Year two	27.4%	
Year three	27.4%	
Year four or higher	24.3%	
The apps most used daily		
Snapchat	30.1%	
Instagram	27.5%	
Twitter	22.9%	
Whats App	14.5%	
Other	5%	

Cont. Table 1

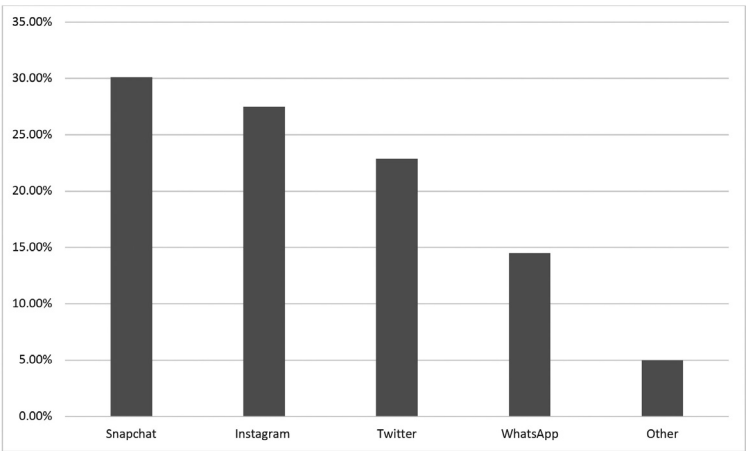
Characteristics of the Study Participants (n = 2084)

	n (%)	Mean ± SD (n)
Type of college		
Art college	66.4%	
Science college	33.6%	
Major type		
Art major	58.6%	
Science major	41.4%	
Marital status		
Married	15.2%	
Unmarried	84.8%	

Figure 1 indicates that students spent time daily on the following apps: Snapchat (30.1%), Instagram (27.5%), Twitter (22.9%), WhatsApp (14.5%), and other apps (5%). Students spent less than 5% of their smartphone time on educational apps such as MyU, Edmodo, Schoology, and YouTube watching educational materials.

Figure 1

Apps Students Spend Time on Daily



Statistical Analysis

Descriptive analyses were performed and presented as the mean, standard deviation or median using the Statistical Package for the Social Sciences (SPSS) for Windows Version 26.0. The relationship between academic performance and the categorical variables was assessed using the independent 2- sample t-test (Mann-Whitney U test) and analysis of variance (Kruskal-Wallis test). The independent t-test was used to compare the parametric variables between genders, type of college, major type, and marital status. Categorical variables were compared between groups using the chi-square test. One-way analysis of variance (ANOVA) was used to explore the significance of the differences among means. Tukey's test was performed as a post hoc test to determine the significance of the results. The Shapiro-Wilk test was also performed to examine the normality of the distribution in each group. The homogeneity of the population variances (homoscedasticity) in different groups was inspected using Levine's test. The level of statistical significance for all tests was set at $p < 0.05$ and $p < 0.01$. The results of these analyses are next discussed in detail.

Results

The sample included 2084 undergraduate university students (89.7% female) (mean age = 20.5 ± 2.44). Approximately 58.1% reported having a GPA of < 3 . Approximately 85.8% of the participants used a smartphone for a minimum of 5 hours daily. The apps most often used daily were Snapchat, Instagram, Twitter, and WhatsApp, in that order. Fewer than 3% of respondents reported using educational apps, such as Edmodo, MyU, and Schoology.

One-way ANOVA was conducted to compare the effect of SPA on academic performance (GPA of less than 2, 2 to 2.99, and ≥ 3) (see Table 2). There was a significant effect of addiction level on academic performance at the $p < .05$ level for the three conditions [$F(2, 2082) = 7.601, p = 0.001$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for students who reported a GPA < 2 ($M = 3.03, SD = .78600$) was significantly different than that for students who reported a GPA of 2 to 2.99 and ≥ 3 . ($M = 2.83, SD = .79312$; $M = 2.77, SD = .78855$). However, students who reported a GPA between 2 and 2.99 ($M = 2.83, SD = .79312$) did not significantly differ from the students who reported a GPA ≥ 3 .

Taken together, these results suggest that the SPA level does have an effect on academic performance. Specifically, our results suggest that the more addicted students are to their smartphone, the lower their reported GPA (see Table 3).

Table 2

Indices for the Significance Level of the Relationship between SPA and GPA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.503	2	4.751	7.601	.001
Within Groups	1301.424	2082	.625		
Total	1310.927	2084			

Table 3

Post Hoc Tests for Multiple Comparisons of GPA

(I) GPA	(J) GPA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
< 2	2 to 2.99	.19542*	0.06476	.007*	0.0435	0.3473
	≥ 3	.25406*	0.06565	.000**	0.1001	0.408
2 to 2.99	< 2	-.19542*	0.06476	.007*	-0.3473	-0.0435
	≥ 3	0.05864	0.03631	0.239	-0.0265	0.1438
≥ 3	< 2	-.25406*	0.06565	.000**	-0.408	-0.1001
	2 to 2.99	-0.05864	0.03631	0.239	-0.1438	0.0265

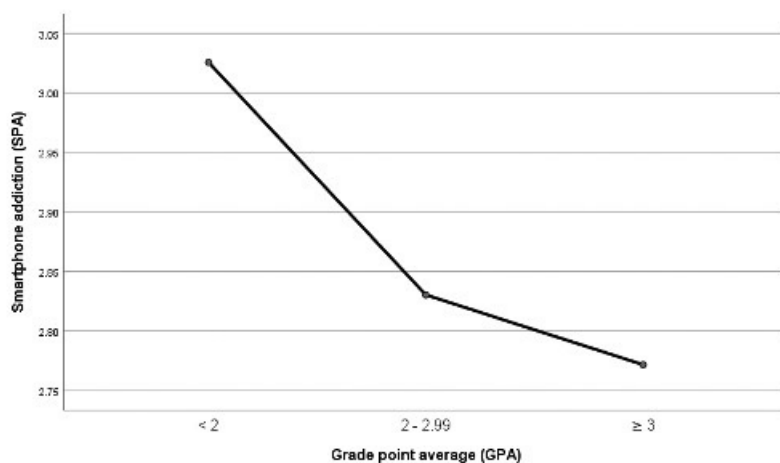
*p < 0.05 level, **p < 0.01 level

Pearson's correlation coefficient was computed to assess the relationship between SPA and academic performance, and the two variables were found to have a statistically significant negative correlation, $r = -.077$, $n = 2085$, $p = 0.000$. A scatter plot summarizes the results

(Figure 2). Overall, there was a strong negative correlation between SPA and academic performance: indicating increases in SPA correlated with decreases in academic performance.

Figure 2

The Relationship between SPA and GPA



One-way ANOVA and a t-test were used to answer the second research question. The results indicated that there were no significant differences between female and male students in terms of SPA ($F = .404$, $df = 2083$, $p = .638$). In terms of the type of college and relationship status, the results also showed that there were no significant differences between students in the College of Arts and those in the College of Science or between married and unmarried students with respect to SPA ($F = 1.997$, $df = 2083$, $p = .176$; $F = 6.387$, $df = 2083$, $p = .390$). A significant difference, however, was found between art majors ($M = 2.87$, $SD = 0.8034$) and science majors ($M = 2.76$, $SD = 0.774$) ($F = 2.970$, $df = 2083$, $p = .001$). These results suggest that the type of major does have an effect on SPA and that this effect is more prominent for art majors. Specifically, the results suggest that art majors experience more addiction than science majors when using their smartphones.

A one-way ANOVA was conducted to compare SPA by year of study. Results indicated a significant effect as of SPA related to the year of study at the $p < .05$ level for the two conditions, $F(3, 2081) = 5.887$, $p = 0.001$. Post hoc comparisons using the Tukey HSD test indicated

that the mean score for year 1 ($M = 2.9010$, $SD = .776$) was significantly different from that for year 4 ($M = 2.71$, $SD = 0.779$). In addition, the mean score for year 2 ($M = 2.88$, $SD = 0.828$) was significantly different than that for year 4 ($M = 2.71$, $SD = 0.779$). However, year 3 ($M = 2.80$, $SD = 0.772$) was not significantly different from year 1, year 2, or year 4. Taken together, these results suggest that the year of the study does have an effect on SPA. Specifically, our results suggest that students in year one and year two were more addicted to their smartphones than those in year three or year four (see Table 4).

Table 4

Post Hoc Tests for Year of Study Multiple Comparisons

(I) Year of Study	(J) Year of Study	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
year 1	year 2	.01883	.05027	.982	-.1104	.1481
	year 3	.10333	.05025	.168	-.0259	.2325
	year 4	.18704*	.05164	.002**	.0543	.3198
year 2	year 1	-.01883	.05027	.982	-.1481	.1104
	year 3	.08449	.04675	.270	-.0357	.2047
	year 4	.16820*	.04825	.003**	.0441	.2923
year 3	year 1	-.10333	.05025	.168	-.2325	.0259
	year 2	-.08449	.04675	.270	-.2047	.0357
	year 4	.08371	.04823	.305	-.0403	.2077
year 4	year 1	-.18704*	.05164	.002**	-.3198	-.0543
	year 2	-.16820*	.04825	.003**	-.2923	-.0441
	year 3	-.08371	.04823	.305	-.2077	.0403

** The mean difference is significant at the $p < 0.01$ level.

ANOVA was conducted to explore the impact of SPA on hours of daily use. The results revealed a significant effect of SPA on hours of

daily use at the $p < .05$ level for the three conditions, $F(3, 2081) = 131.030$, $p = 0.000$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for students who use their smart phone almost all day ($M = 3.11$, $SD = 0.721$) was significantly different from students who use their smart phone between 4 and 6 hours, 2 and 4 hours, and fewer than two hours per day ($M = 2.62$, $SD = 0.711$; $M = 2.27$, $SD = 0.772$; $M = 2.32$, $SD = 0.876$). However, students who spend fewer than two hours do not significantly differ from the students who spend from 2 to 4 hours per day on their smartphones. Taken together, these results suggest that the amount of daily use does have an effect on SPA. Specifically, our results suggest that the more time students spend on their smartphones, the more addicted they are (see Table 5).

Table 5

Post Hoc Tests for Number of Hours of Daily Smartphone Use Multiple Comparisons

(I) Number of hours of daily smartphone use	(J) Number of hours of daily smartphone use	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
< 2 hours	2 - 4 hours	.05503	.10794	.957	-.2225	.3326
	4 - 6 hours	-.29375*	.10104	.019*	-.5535	-.0340
	almost all day	-.78832*	.09977	.000**	-1.0448	-.5318
2 - 4 hours	< 2 hours	-.05503	.10794	.957	-.3326	.2225
	4 - 6 hours	-.34879*	.05418	.000**	-.4881	-.2095
	almost all day	-.84336*	.05178	.000**	-.9765	-.7102
4 - 6 hours	< 2 hours	.29375*	.10104	.019*	.0340	.5535
	2 - 4 hours	.34879*	.05418	.000**	.2095	.4881
	almost all day	.49457*	.03519	.000**	-.5850	-.4041
almost all day	< 2 hours	.78832*	.09977	.000**	.5318	1.0448
	2 - 4 hours	.84336*	.05178	.000**	.7102	.9765
	4 - 6 hours	.49457*	.03519	.000**	.4041	.5850

* $P < .05$, ** $P < .01$.

Table 6 indicates that the majority of participants who reported a GPA of less than 2 (56.1) reported spending almost all day on their smartphone on average, which is too much time for undergraduate students to spend on social media apps, such as Snapchat, Instagram, Twitter, and WhatsApp, rather than on academic pursuits that will ultimately improve their academic performance. The time needed by students to concentrate on their studies should be occupied by academic interactions such as searching online materials, working on educational apps, or working on online problem solving activities. The majority of students who reported a GPA between 2 and 2.99 (51.2) also reported spending almost all day on their phones, and almost identical results were found for those students who reported a GPA above 3 (51.4). Students who reported a GPA of less than 2 were more vulnerable to effects on their academic performance than other students.

Table 6

Frequency: Average Hours Spent on Smartphone per Day

GPA		Frequency	Percent	Valid Percent	Cumulative Percent
Less than 2	less than 2 hours	7	4.0	4.0	4.0
	2 to 4 hours	17	9.8	9.8	13.9
	4 to 6 hours	52	30.1	30.1	43.9
	Almost all day	97	56.1	56.1	100.0
	Total	173	100.0	100.0	
2 to 2.99	less than 2 hours	22	2.1	2.1	2.1
	2 to 4 hours	110	10.6	10.6	12.7
	4 to 6 hours	375	36.1	36.1	48.8
	Almost all day	532	51.2	51.2	100.0
	Total	1039	100.0	100.0	
3 and above	less than 2 hours	26	3.0	3.0	3.0
	2 to 4 hours	115	13.2	13.2	16.2
	4 to 6 hours	283	32.5	32.5	48.6
	Almost all day	448	51.4	51.4	100.0
	Total	872	100.0	100.0	

Discussion

The study heads to examine the relationship between SPA and

academic performance among undergraduate students at KU based on behaviorism theory and to explore the impact of selected demographic variables such as gender, relationship status, type of college (art or science), type of major (arts or sciences), hours of smartphone use, and year of study on SPA. Robust regression results indicate a negative relationship between SPA and academic performance. Statistically significant differences exist in SPA among students with a GPA of less than 2, from 2 to 2.99, and of 3 points and above ($f = 7.521$, $p < .01$; $f = -5.645$, $p < .01$; $f = -7.345$, $p < .001$). These findings point to potential academic risks and behaviors that hurt students' future careers. Thus, according to behaviorism theory, students' behaviors could be modified through the use of reinforcement (Skinner, 1953). The desired behavior, which would be heavy exposure to educational apps, would be rewarded, while the undesired behavior would be punished. The preferable reward for students is earning better grades, while the punishment is poor academic performance. Implementing behaviorism in the classroom would allow instructors to help their students excel both academically and personally. These findings are congruent with those of previous studies (Chaudhury & Tripathy, 2018; Giunchiglia et al., 2017; Hawi & Samaha, 2016; Jacobsen & Forste, 2011; Kibona & Mgaya, 2015; Lepp et al., 2015; Rozgonjuk et al., 2018; Winskel et al., 2019) that found a negative relationship between SPA and academic performance. On the other hand, the results of the current study contradict the results of studies conducted by Sumathi et al. (2018) and Boumosleh and Jaalouk (2018). The latter researchers conducted a study titled "Smartphone Addiction among University Students and Its Relationship with Academic Performance" with a sample of 688 undergraduate students and did not find the SPA score to have an association with academic performance (GPA). The former researchers concluded in their study, titled "Reviewing the Impact of Smartphone Usage on Academic Performance Among Students of Higher Learning", that overusing smartphones has no significant relationship with the academic performance of students.

In terms of demographic variables, the results of the current research indicated that there were no statistically significant gender differences between male and female students in terms of smartphone overuse. This finding might be due to the differences in sample size

between the female (89.9%) and male students. The results showed that male and female university students were equally susceptible to SPA. This finding is congruent with the results of a study by Hawi and Samaha (2016), who found no gender differences in smartphone overuse, but it controverts the results of studies by Sumathi et al. (2018), North et al. (2014), Kibona and Mgaya (2015), and Aljomaa et al. (2016), who found gender difference in favor of female students being more addicted to smartphones than male students. Interestingly, another study found gender differences in favor of male students (Aljomaa et al., 2016). We must conclude that there is no agreement regarding gender differences in SPA studies.

Regarding the type of college and marital status, the present study found no significant difference between students from humanities versus science colleges or between married versus unmarried students in terms of smartphone overuse. This result contradicts the result of Aljomaa et al. (2016), who found a statistically significant difference in SPA in favor of unmarried students. The current study showed a statistically significant difference across years of study with respect to SPA. Regardless of the students' year of study-freshman, sophomore, junior or senior class-they are all addicted to smartphones. However, freshman students are more addicted to smartphones than other students, which might be due to the transition from high school, which commonly has more restrictions on smartphone use, to the college environment, which is more flexible in terms of smartphone use. To date, no research studies have been conducted on these issues.

The data revealed statistically significant differences in SPA in favor of participants who used smartphones almost all day. This finding is very important because the more time individuals spend on their smartphone, the more likely they are to become smartphone addicts. Overuse creates a negative habit because participants spend a large proportion of their time on social media. Studies have stated that individuals using smartphones for long time periods are more likely to experience SPA, (Aljomaa et al., 2016; Hawi & Samaha, 2016). Previous researchers found that addictive smartphone usage behavior also impedes students' concentration on their studies.

Implications of the Study

This study has both theoretical and practical implications. From a theoretical perspective, this is the first study using behaviorism to investigate the relationship between SPA and academic performance. It has been shown that SPA is associated with poor academic performance. Specifically, students on average spent less than 3% of their time on academic pursuits. Furthermore, these findings linking SPA with academic outcomes can be explained by students engaging in greater social media use. One important implication of the current study is that university administrators, policymakers, faculty members, academics, and lecturers might consider exposing students to more educational apps to sharpen their cognitive skills instead of restricting their smartphone use, potentially leading to better academic outcomes. Developing approaches to teaching and learning in a digital age using smartphones has become essential, as it can help students gain constructivist skills and knowledge. Most research on SPA has concluded that students should limit their smartphone use. However, in practice, this may be an impossible goal, especially for college students, for many reasons-they have just become independent, they are experiencing fewer restrictions from their family, and digital devices are affordable. Students are already using their smartphones almost all day, so policymakers and academics should develop a strategy to shift their focus from social media to educational apps. According to behaviorism, when students shift their focus to educational apps, their behavior with regard to educational outcomes will improve.

Conclusion, Limitations, and Future Recommendations

In conclusion, this study explored the relationship between SPA and academic performance among KU undergraduate students based on behaviorism. A strong negative relationship between SPA use and academic performance was found. The results suggest that the more addicted students are to their smartphone, the lower their reported GPA. Furthermore, art majors seemed to experience more addiction than science majors when using their smartphones. This study has a major strength in its large sample size, which provided sufficient statistical power. In addition, the results of the current study can be generalized, with caution, to similar students in other countries.

Furthermore, this study is the first to use behaviorism theory to assess the relationship between SPA and academic achievement. As smartphone diffusion rates are increasing rapidly worldwide, SPA in adolescence is becoming a potentially serious issue. Heavy exposure of adolescents to selective educational apps available on smartphones, iPods, personal computers and other digital devices would change their behavior over time and improve their academic performance. Policy-makers and academics should develop and validate ways to shift smartphone use from a social to an educational focus.

One limitation of the current study is that the number of females surpassed the number of males. Even though the sample size in this study is relatively large, it should be noted that one must interpret the results with caution, as the sample was not initially gender balanced. Another limitation is that this study is restricted to only undergraduate students at a public university. Future research should target different populations. In addition, it is recommended that a longitudinal design be adopted to analyze screen time over time. Screen time provides statistical information on how students use their smartphone on a weekly or daily basis, which would allow the causal relationship between university students' SPA level and their academic performance to be specified.

إدمان استخدام الهواتف الذكية بين طلاب جامعة الكويت وعلاقتها بأدائهم الأكاديمي من وجهة نظرهم

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ملخص

تهدف هذه الدراسة إلى الكشف عن العلاقة بين إدمان الطلبة على استخدام الهواتف الذكية ومخرجات العملية التعليمية (المعدل التراكمي) بالإضافة إلى تأثير بعض المتغيرات الديموغرافية على ذلك الإدمان. أُختيرت العينة العشوائية المكونة من 2085 طالبًا وطالبة من جامعة الكويت لهذه الدراسة، وجمعت البيانات باستخدام مقياس إدمان الهواتف الذكية (SAS) وتحليلها بواسطة الحزمة الإحصائية للعلوم الاجتماعية (SPSS). أظهرت نتائج الدراسة وجود علاقة سلبية بين إدمان الطلاب على الهواتف الذكية والمعدل التراكمي ($r = -0.077$ ، $p = 0.000$)، وكذلك أشارت إلى أن الطلاب الذين تخصصوا في العلوم الاجتماعية أظهروا إدمانًا على استخدام الهواتف الذكية أكثر من الطلاب الذين تخصصوا بالعلوم.

الكلمات المفتاحية: الإدمان، الهواتف الذكية، المعدل التراكمي، النظرية السلوكية.

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