Smartphone Addiction: (Focused Depression, Aggression and Impulsion) among College Students

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Abstract

In this study, a survey was conducted to examine the relationship among smartphone addiction tendency, depression, aggression and impulsion in college students. The data were collected via structural questionnaires completed by 353 college students located in Cheonan who agreed to participate in this study. There was a statistically significant positive correlation between smartphone addiction and depression, and there were positive correlations among smartphone addiction, aggression and impulsion. Hierarchial regression analysis was used to determine the influence of smartphone addiction tendency and to identify its correlation with depression, aggression and impulsions. First step hierarchy that controlled general characteristics shows that gender (p<.001) influenced smartphone addiction. Explanatory power for explaining the smartphone addiction of the control variables is found to be 5.6%. Including independent variables Model 2 shows a significant increase and the explanatory power for explaining the smartphone addiction is 31.2% (p<.001).

Keywords: Aggression, Depression, Impulsion, Smartphone Game

1. Introduction

In 2009, the smartphone was introduced in Korea. Recently, smartphone quickly gained popularity with the rapid expansion of the mobile market. The percentage of smartphone users has more than doubled from 31% in 2011 to 63.5% in 2012. It is the world's seventh highest level and ranks as the world's highest per population ratio[1]. Society Agency in 2012, the percentage of smartphone addiction was 8.4%, which was found to be higher than the internet addiction of 7.7%[2].

Smartphone addiction is defined as a behavior addiction, loss of control by excessive immersion and obsessions to smartphone use[3], consequent daily disorder by nervousness and anxiety[4], and inclination toward virtual world that feels more enjoyable with smartphone than with friends. According to Korean Internet & Security Agency in 2012[5], 77.4% of smartphone users

answered "I frequently check smartphone without any special reason," and more than half of them (53.9%) answered "I used smartphone right before or after sleep." It was reported that the smartphone addiction rate has already exceeded the internet addiction rate[6].

Depressed people cannot control their emotions, and the symptoms last for a long time. If left untreated, depression can lead to serious incidents and fatalities[7]. Clinical factors such as anxiety, depression, and obsession are reported to have influenced on the smartphone addiction[8]. When impulsiveness and the levels of likewise personal factors are low, people or more subjective to smartphone addiction[4]. The impulsiveness was also a strong factor on internet addition[9], and Lee et al.[10] reported positive correlation between impulsiveness and the security of internet addiction.

So there is a need to identify the factors that affect smartphone addiction. Thus, the present study presents

the results of a survey conducted to identify smartphone addiction tendencies, depression, aggression and impulsion and to measure the effects of these factors on smartphone addiction among college students.

2. Methodology

2.1 Study Subjects and Ethical Considerations

This research is a descriptive correlation study designed to examine Internet game addiction among middle school students. The data was collected via structural questionnaires completed by 353 university students who agreed to participate in this study. The data was collected from September, October till November 2014 and were analyzed using Statistical Package for the Social Sciences (SPSS) 20.0 (SPSS Inc., Chicago, IL, USA). The data used were collected according to the approved guidelines and screening procedures of "N" university located in Cheonan.

2.2 Research Variables

2.2.1 Smartphone Addiction Scale

The smartphone addiction scale questionnaire was developed by National Information Society Agency[11]. For the Social Networking Sites (SNS) addiction scale questionnaire, there were 15 items with a 4-point scale. The possible scores ranged from a maximum of 60 points to a minimum of 15 points, in which higher scores indicate high smartphone game addiction. Cronbach's α was .76 in the original scale and .85 in the present study.

2.2.2 Depression

The depression scale, developed by Kim and Ann[12], was used to measure the adolescents' depression level. There were a total of 8 items, which included the feeling of sadness or hopelessness. The items were based on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree). Higher scores indicate a higher depressive level. Cronbach's α was .86 in the original scale and .90 in the present study.

2.2.3 Aggression

The aggression questionnaire was developed by Kim and Ann[12]. For the aggression questionnaire, there were

8 items with a 4-point scale. The possible scores ranged from a maximum of 24 points to a minimum of 8 points, in which higher scores indicate very aggressive person. Cronbach's α was .87 in the original scale and .88 in the present study.

2.2.4 Impulsion

The impulsion questionnaire was developed by was developed by Kim and Ann[12]. For the impulsion questionnaire, there were 8 items with a 4-point scale. The possible scores ranged from a maximum of 32 points to a minimum of 8 points, in which higher scores indicate high impulsion. Cronbach's α was .78 in the original scale and .80 in the present study.

2.3 Method of Data Analysis

The collected data were analyzed using SPSS 20.0 (SPSS Inc., Chicago, IL, USA). The general characteristics of the middle school students were analyzed using descriptive statistics, including the means, standard deviations, frequencies, and percentages. Patterns in the differences among study participants (according to general characteristics regarding smartphone game addiction tendencies, depression, aggression, and impulsion were analyzed with t-test and ANOVA, and post hoc analysis was conducted with Duncan's. Pearson's correlation coefficient analysis was used to identify the effect of smartphone game addiction scale with regard to depression, aggression, and impulsion. Hierarchical regression analysis was used to determine the influence of smartphone game addiction scale and to identify its correlation with depression, aggression, and impulsion.

3. Results

3.1 General Characteristics and Differences, Smartphone Addiction, Depression, Aggression, and Implusion of General Characteristics

The general characteristics of the participants are shown in Table 1. The study participants included 109males (30.9%) and 244 females (69.1%). There were: 144 first year students (40.8%); 88 second year students (33.2%), 218 third year students (36.9%), and 61 fourth year students (17.3%). The majors of the students were as followers: Health, 144(40.8%); humanities and welfare,

Table 1. General characteristics and differences, SNS addiction tendencies, self-esteem, interpersonal relationships, and internet game addiction of general characteristics   N = 353

Variable	Characteristics	Mean (SD)or N (%)	SA M(SD) Total M(SD)T or F(p)Post hoc	depression M(SD) Total M(SD) T or F(p) Post hoc	aggression M(SD) Total M(SD) T or F(p)Post hoc	impulsion M(SD) Total M(SD) T or F(p) Post hoc
Age		20.27(3.94)				
Gender	Male	109(30.9)	1.85(.45)	1.52(.51)	1.74(.60)	1.92(.50)
	Female	244(69.1)	2.00(.41)	1.60(.50)	1.76(.50)	1.99(.47)
			1.96(.43)	1.58(.51)	1.76(.54)	1.97(.48)
			-3.171(.002)	-1.371(.171)	-0.380(.704)	-1.256(.210)
Participants	1st year	144(40.8)	1.86(.43)[a]	1.56(.49)	1.70 (.52)	1.95(.47))
	2nd year	088(24.9)	2.03(.41)[b]	1.62(.50)	1.88(.57)	2.07(.44)
	3rd year	056(15.9)	2.05(.46)[b]	1.58(.48)	1.76(.54)	1.96(.52)
	4th year	061(17.3)	2.01(.41)[b]	1.53(.49)	1.68(.48)	1.89(.53)
			4.713(.003)a<b	0.442(.723)	2.518(.058)	1.915(.127)
Major	Health	187 (53.0)	1.97(.41)	1.58(.48)	1.73(.51)	1.97(.45)
	Humanities and welfare	042(11.9)	2.00(.47)	1.64(.50)	1.75(.53)	2.00.(.51)
	Business and manage	033 (09.3)	1.89(.47)	1.49(.49)	1.76(.56)	1.98(.52)
	Engineering	067(19.0)	1.89(.43)	1.51(.50)	1.73(.57)	1.96(.51)
	Art and Physical	019(05,4)	1.96(.40)	1.67(.51)	1.80(.59)	2.01(.59)
			0.897(.466)	0.946(.437)	0.077(.989)	0.086(.987)
Smartphone game	Nearly not	215(60.9)	1.93(.44))	1.53(.49)	1.75(.56)	1.96(.49)
	Once per month	019(05.4)	1.98(.39)	1.62(.55)	1.75(.54)	2.01(.49)
	Once per week	028(07.9)	2.03(.40)	1.73(.48)	1.86(.35)	2.14(.32)
	3 to 4 times per week	040(11.3)	1.96(.44)	1.61(.46)	1.70(.52)	1.94(.48)
	Daily	044(12.5)	2.07(.39)	1.60(.50)	1.85(.52)	1.99(.50)
			1.245(.292)	1.172(.323)	0.732(.572)	1.022(.396)
Average drink per week	Nearly not	090(25.5)	1.85(.42)	1.52(.49)	1.67(.56)	1.89(.52)
	Less than Once per week	145(41.1)	2.02(.41)	1.66(.52)	1.79(.49)	1.99(.42)
	Once per week	066(18.7)	2.05(.38)	1.55(.49)	1.12(.56)	2.09(.49)
	2 to 3 times per week	042(11.9)	1.78(.46)	1.43(.49)	1.70(.64)	1.90(.54)
	More than 4 times per week	006(01.7)	1.99(.59)	1.77(.61)	1.94(.61)	1.88(.59)
			4.755(.001)	2.457(.045)	1.275(.279)	1.984(.097)
Average internet by smartphone usage time of per day	1 to 3 hrs.	188(53.3)	1.85(.42)[ab]	1.55(.48)	1.73(.53)	1.91(.47)
	4 to 5 hrs.	086(24.4)	2.02(.41) [abc]	1.63(.53)	1.88(.56)	2.06(.48)
	6 to 7 hrs.	048(13.6)	2.20(.34) [bc]	1.56(.46)	1.72(.50)	2.05(.49)
	8 to 10 hrs.	022(06.2)	2.08(.44) [abc]	1.46(.59)	1.62(.52)	2.01(.43)
	More than 10 hrs.	004(01.1)	2.33(.43)[c]	1.63(.67)	1.68(.62)	1.94(.88)
			7.927(<.000) ab,bc,abc<c	.550(.738)	1.458(.230)	1.501(.189)

SA: Smartphone Addiction

88(24.9%); business and manage, 33(9.3%); Art and Physical, 19(5.4%).

Frequency of smartphone game by the participants are shown in Table 1. Nearly not, 215 students (60.9%); once per month, 19 students (5.4%); once per week, 28 students (7.9%); 3 to 4 times per week, 40 students (11.3%); and daily 44 (12.5%) students.

Average drink per week by the participants are shown in Table 1. Nearly not, 90 students (25.5%); less than once per week, 145 students (41.1%); once per week, 66 students (18.7%); 2 to 3 times per week, 42 students (11.9%); and more than 4 times per week 6 (1.7%) students

Average internet by smartphone usage time of per day was reported as follows: 1 to 3 hrs. 188 students (53.3%); 4 to 5 hrs., 86 students (24.4%); 6 to 7 hrs. 48 students (13.6%); 8 to 10 hrs. 22 students (6.2%); and more than 10 hours, 4 students (1.1%).

Degrees of smartphone addiction, depression, aggression, and impulsion among college students are shown in Table 1. On a four-point scale measuring perceived smartphone addiction, the average score was $1.96\pm.43$. On a four-point scale measuring perceived depression, the average score was $1.58\pm.51$. On a four-point scale measuring aggression, the average score was $1.76\pm.54$. For impulsion, the average score was $1.97\pm.48$.

The research participants' attitudes on smartphone addiction showed a statistically significant difference according to grade ($F = 4.713$, $p = .003$), average drink per week ($F = 4.755$, $p = .001$) and average internet by smartphone usage time of per day ($F = 7.927$, $p =< .000$).

3.2 Correlations between Variables

Correlations are shown in Table 2. There was a statistically significant positive correlation between smartphone addiction and depression, and there were positive correlations among smartphone addiction and aggression, and impulsion. Also, there was a statistically significant positive correlation between depression and aggression, impulsion. Also there was a positive correlation between aggression and impulsion.

Table 2. Correlation between Variables

Variable	SA	Depression	Aggression	Impulsion
SAT	1			
Depression	0.383***	1		
Aggression	0.367***	0.584***	1	
impulsion	0.467***	0.464***	0.640***	1

SA: Smartphone Addiction

3.3 Hierarchical Regression

A regression model is shown in Table 3.

Table 3. Hierarchical Regression Analysis for Smartphone Addiction scale

	Model 1		Model 2	
	B	β	B	β
Constant	1.547			
Gender	0.166	0.180**		
Grade	0.063	0.167**		
Depression			0.196	0.225***
Aggression			0.016	0.020***
Impulsion			0.306	0.344***
$R^2(\Delta R^2)$	0.056		0.312(.257***)	
F	10.119***		42.463***	

*** p<.001 ** p<.01 * p<.05

A regression model was used in hierarchical regression. We performed an investigation to discover if smartphone game addiction effect on how depression, aggression and impulsion influence. In Hierarchical Step 1, which determines the influence that the independent variable has on the dependent variable such as gender and grade. In Hierarchical Step 2, depression, aggression and impulsion were added, and the explanatory power increased by a statistically significant 25.7%.

The more depression increased, the greater its positive influence was on smartphone addiction (B = .196). The more aggression increased, the greater its positive influence was on smartphone addiction (B = -.016). The more impulsion increased, the greater its positive influence was on smartphone addiction (B = -.306).

Among these factors, impulsion was shown to exert a significant influence on smartphone game addiction, and as impulsion increased (B = .344), it was shown to have the greatest influence on smartphone game addiction. The total explanatory power of these factors on smartphone game addiction was shown to be 31.2%.

4. Discussion

In this study, we conducted a survey to examine the relationship among Smartphone addiction tendency, depression, aggression and impulsion in college students.

In this study, the smartphone addiction was more severe in men than in women with statistical significance. This result is in opposition with the study by Hwang, Yoo

& Cho[13] which reported higher smartphone addiction in women.

We found the positive correlation between the time of smartphone use and the addiction severity, same as in Hwang , Yoo & Cho[13]. However, Kim SM et al.[4] reported that the smartphone addiction is not directly related with the use time. Therefore, the use time is not enough to determine smartphone addiction, and further break-down of use time by content and its analysis is necessary to identify the boundary of smartphone addiction.

This study finds that there was a positive correlation between smartphone addiction and depression, which parallels the results of Kimberly's study[14]. Hwang, Yoo & Cho[13] also reported that high smartphone addiction comes with high depression. A study with teenage subjects[15] also reported positive correlation between smartphone addiction and depressions.

In this study, depression was the influencing factor on smartphone addiction tendency, which is similar to the study in[16] that reported that depression is the highest factor among the predicting factors of addictive smartphone use. As smartphone addiction shows negative impact on mental health such as obsession, depression, anxiety, psychosis, and social phobia[4], it is necessary to strengthen its perception and countermeasure.

In this study there is a positive correlation between smartphone addiction tendency and aggression, impulsion.

In addition, we found impulsion was the strongest factor on smartphone addiction. Kang & Park[4] identified the effect of depression and aggression on smartphone addiction, which is also supported by this study. This study also parallels with the results by[17], which reported that self-control as well as depression affects smartphone addiction for college students.

Kim SM et al.[14] reported that higher impulsion was observed in smartphone users with high risk of addiction than those with normal use,[18] reported that high impulsion can lead to internet addiction as it is difficult to control internet use, and[19] reported that impulsion was the most important factor in internet addiction. These results implies that the use of cyber media such as smartphone is related with personal characteristics of the user, suggesting that appropriate intervention should consider these results.

5. Conclusion

This study found that smartphone addiction tendency is influenced by the psychosocial factors such as depression and aggression. Therefore, a proper guideline is needed to promote the beneficial use of smartphone by college students for their social health. Also multi-dimensional intervention programs for smartphone users should be developed.

6. Acknowledgment

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