

Internet Game Addiction among Middle School Students (Focusing on SNS Addiction Tendencies, Self-Esteem and Interpersonal Relationships)

Dahye Park¹ and Heejeong Kim^{2*}

¹Department of Nursing, Semyung University, Jecheon, Chungcheongbuk-do - 390-711, Korea

²Department of Nursing, Namseoul University, Cheonan, Chungcheongnam-do - 331-707, Korea;
yshbb@nsu.ac.kr

Abstract

In this study, we conducted a survey to examine the relationship among SNS addiction tendencies, self-esteem, interpersonal relationships, and internet game addiction in middle school students. The data were collected via structural questionnaires completed by 590 middle students located in Seoul who agreed to participate in this study. There was a statistically significant negative correlation between SNS addiction tendencies and self-esteem, and there were positive correlations among SNS addiction tendencies, interpersonal relationships, and internet gaming addiction. Also, there was a statistically significant positive correlation between interpersonal relationships and self-esteem and a negative correlation between internet gaming addiction and interpersonal relationships. Hierarchical regression analysis was used to determine the influence of internet game addiction and to identify its correlations with SNS addiction tendencies, self-esteem, and interpersonal relationships. Hierarchical Step 1, which controlled for general characteristics, showed that gender ($p < .001$) influenced IGA, and the explanatory power for explaining the internet game addiction of the control variables was found to be 16.0%. Including independent variables, Model 2 showed a significant increase in its explanatory power to explain internet game addiction (34.9%, $p < .001$).

Keywords: Internet Game Addiction, Interpersonal Relationship, Self-esteem, SNS Addiction Tendency

1. Introduction

The internet is a new technology that has greatly impacted the world and provided many benefits to its users, but it has led to adverse effects such as internet gaming addiction in teenagers who are stressed and lack self-control¹. Internet use is now considered to form a large part of the culture of adolescents, and thus studying internet use and its negative aspects is tremendously important to the creation of a sound youth culture.

The percentage of internet game usage in the domestic youth we investigated was 78.6%. By grade level, the survey showed that internet game usage among middle school students was 80.8%; among elementary school students, 80.0%; and among high school students, 74.6%².

Internet gaming is gaining more attention due to its negative aspects and the potentially serious pathological problems that it can cause such as promoting youth

violence, aggressiveness, physical problems, the deterioration of reality perception, social decline, and high levels of addiction³. In particular, youth internet addiction is very likely to occur in children who are dealing with serious psychological and social issues such as expulsion from school or reclusive loneliness⁴.

Many countries have investigated internet game addiction in children and adolescents, and the results show that the prevalence of internet game addiction is between 1.6% and 17.1%⁵. Internet game addiction has become a major social issue, which suggests the need for further studies. There is an active discussion on internet game addiction, especially among students.

The smartphone came out in Korea for the first time in 2009. Recently, smart phones are being popularized quickly 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 2012⁶. It is the

* Author for correspondence

world's seventh highest level and ranks as the world's highest per population ratio. Smartphones are very addictive, with more than double the addictiveness of social network services, and they have better accessibility than computers. The reality is that smartphones have become an important communication medium in our life.

Research has revealed that adolescents prefer to carry out the most important developmental tasks of identity development and social interaction through on-line, rather than off-line, interaction⁷. This social phenomenon has become so serious that it has prompted the coining of neologisms such as "Digital isolation syndrome" or "Smartphone addiction syndrome"⁸. Also, the computer and the internet have not only taken the place of simple leisure; they have become a major part of youth life. 92.6% of youths aged 7-19 use the internet⁹. Internet game playing is an especially important pastime of adolescents; 84.4% of elementary school students and 88.0% of middle school students play games¹⁰.

So there is a need to identify the factors that affect internet gaming addiction. Thus, the present study presents the results of a survey conducted to identify SNS addiction tendencies, self-esteem, and interpersonal relationships and to measure the effects of these factors on internet game addiction among middle school 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 590 middle school students who agreed to participate in this study. The data were collected from September 2014 to October 2014 and were analyzed using SPSS 20.0 (SPSS Inc., Chicago, IL, USA). The data used were collected according to the approved guidelines and screening procedures of "S" university located in Jecheon. This research (IRB No: SMU-2014-10-002) was conducted after their deliberations on the goals and methods.

2.2 Research Variables

2.2.1 SNS Addiction Tendencies

The SNS addiction tendencies questionnaire was developed by Cho and Suh¹¹. For the SNS addiction

tendencies questionnaire, there were 20 items with a 4-point scale. The possible scores ranged from a maximum of 80 points to a minimum of 20 points, in which higher scores indicate high SNS addiction. Cronbach's α was .86 in the original scale and .94 in the present study.

2.2.2 Self Esteem

The Self-esteem questionnaire was developed by Kang¹². For the Self-esteem questionnaire, there were 17 items with a 5-point scale. The possible scores ranged from a maximum of 85 points to a minimum of 17 points, in which higher scores indicate high self-esteem. Cronbach's α was .90 in the original scale and .84 in the present study.

2.2.3 Interpersonal Relationships

The Interpersonal relationships questionnaire was developed by Choi¹³. For the Interpersonal relationships questionnaire, there were 18 items with a 5-point scale. The possible scores ranged from a maximum of 90 points to a minimum of 18 points, in which higher scores indicate good interpersonal relationships. Cronbach's α was 0.92 in Choi Uni's research¹³ conducted by this measure and 0.85 in the present study.

2.2.4 Internet Gaming Addiction

The Internet gaming addiction questionnaire was developed by the Council of National Information Society Agency¹⁴. For the Internet gaming addiction questionnaire, there were 20 items with a 4-point scale. The possible scores ranged from a maximum of 80 points to a minimum of 20 points, in which higher scores indicate high SNS addiction. Cronbach's α was 0.92 in the original scale and 0.96 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 SNS addiction tendencies, self-esteem, interpersonal relationships, and internet gaming addiction) 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 internet gaming addiction with regard to SNS

addiction tendencies, self-esteem, and interpersonal relationships. Hierarchical regression analysis was used to determine the influence of internet game addiction and to identify its correlation with SNS addiction tendencies, self-esteem, and interpersonal relationships.

3. Results

3.1 General Characteristics and Differences, SNS Addiction Tendencies, Self-esteem, Interpersonal Relationships and Internet Game Addiction.

The general characteristics of the participants are shown in Table 1. The study participants included 213 males

(36.1%) and 377 females (63.9%). There were: 176 first year students (29.8%); 196 second year students (33.2%); and 218 third year students (36.9%).

The main media used to access SNS by the participants are shown in Table 1. The main media were: computers, 34 students (5.8%); smart phones, 548 students (92.9%); and tablet PCs, 8 students (1.4%). Frequency of using SNS was reported as follows: once every 30 min to 1 hr., 317 students (53.7%); once every 1-2 hrs., 85 students (14.4%); once every 2-6 hrs, 84 students (14.2%); once every 6-12 hrs, 22 students (3.7%); once every 12 hrs. to 1 day, 31 students (5.3%); and once every 1-2 days, 51 students (8.6%).

SNS usage per day was reported as follows: less than 5 minutes, 99 students (16.8%); less than 10 min, 122

Table 1. General characteristics and differences, SNS addiction tendencies, self-esteem, interpersonal relationships, and internet game addiction

N = 590

Variable	Characteristics	N (%)	SAT M (SD) Total M (SD)	SE M (SD) Total M (SD)	IR M (SD) Total M (SD)	IGA M (SD) Total M (SD)
			T or F(p) Post hoc	T or F(p) Post hoc	T or F(p) Post hoc	T or F(p) Post hoc
Gender	Male	213 (36.1)	36.64 (12.01)	57.16 (11.42)	61.60 (9.10)	36.29 (13.11)
	Female	377 (63.9)	42.28 (12.14)	53.35 (11.42)	64.06 (8.81)	26.57 (9.69)
Participants	1st year	176 (29.8)	40.25 (12.38)	54.73 (11.56)	63.18 (8.98)	30.15 (12.02)
	2nd year	196 (33.2)	39.94 (12.90)	56.31 (11.84)	63.51 (10.19)	28.88 (11.00)
	3rd year	218 (36.9)	39.95 (12.71)	54.59 (11.58)	63.32 (8.29)	30.74 (12.75)
Media	Computer	034 (05.8)	41.21 (11.62)	53.58 (11.21)	62.78 (8.58)	30.65 (12.13)
	Smart phone	548 (92.9)	40.25 (12.38)	54.73 (11.56)	63.18 (8.99)	30.15 (12.03)
	Tablet PC	008 (01.4)	01.127 (.325)	02.744 (.065)	0.357 (.700)	1.413 (.244)
Frequency of SNS usage	Once every 30 min to 1hr	317 (53.7)	36.71 (13.06)	51.82 (10.15)	60.38 (9.20)	39.59 (13.83)b
	Once every 1-2 hrs	085 (14.4)	40.57 (12.31)	54.86 (11.67)	63.36 (8.97)	29.50 (11.64)a
	Once every 2-6 hrs	084 (14.2)	34.25 (12.07)	57.88 (07.16)	62.63 (8.31)	34.25 (13.77)ab
	Once every 6-12 hrs	022 (03.7)	40.25 (12.38)	54.73 (11.56)	63.18 (8.99)	30.15 (12.03)
	Once every 12 hrs to 1 day	031 (05.3)	25.513 (0.082)	1.410 (0.245)	1.775 (.170)	12.172 (<.000)b>a
	Once every 1-2 days	051 (08.6)	45.39 (11.57)d	51.97 (11.38)a	63.70 (8.97)a	31.57 (12.73)b
Average SNS usage time per day	Less than 5 min	099 (16.8)	40.29 (10.59)c	57.18 (10.91)b	63.04 (8.41)b	28.59 (11.63)b
	Less than 10 min	122 (20.7)	34.64 (8.97)b	59.17 (11.63)ab	64.71 (8.49b)	26.42 (8.91)b
	Less than 30 min	164 (27.8)	33.45 (9.59)a	58.36 (13.41)b	61.82 (7.90)b	31.82 (10.72)ab
	Less than 1 hr	099 (16.8)	27.80 (9.04)a	58.81 (8.77)b	63.09 (8.58)b	27.51 (12.20)b
	More than 1 hr	106 (18.0)	27.88 (12.38)a	56.41 (10.16)b	58.27 (9.89)ab	30.92 (11.69)a
			40.25 (12.38)	54.73 (11.56.)	63.18 (8.99.)	30.14 (12.03)
			43.776 (<.000)	8.811 (<.000)a<b	3.940 (.002)a<b	3.652 (.006)a<b
			a<b<c<d			
Average SNS usage time per day	Less than 5 min	099 (16.8)	30.94 (10.29)	58.12 (10.98)	60.99 (9.74)	30.19 (10.67)
	Less than 10 min	122 (20.7)	36.39 (8.82)	56.08 (10.45)	62.94 (8.15)	28.52 (11.31)
	Less than 30 min	164 (27.8)	40.28 (10.95)	56.21 (11.33)	63.63 (8.77)	28.62 (10.98)
	Less than 1 hr	099 (16.8)	44.10 (11.83)	53.33 (11.68)	63.76 (9.48)	31.24 (11.43)
	More than 1 hr	106 (18.0)	49.75 (12.29)	49.01 (11.54)	64.23 (8.85)	33.32 (15.18)
			40.25 (12.38)	54.73 (11.56)	63.18 (8.99)	30.15 (12.03)
			45.500 (<.000)	10.744 (<.000)	2.054 (.085)	3.317 (.011)

SAT: SNS Addiction Tendencies; SE: Self-Esteem; IR: Interpersonal Relationships; IGA: Internet Game Addiction.

students (20.7%); less than 30 min, 164 students (27.8%); less than 1 hour, 99 students (16.8%); and more than 1 hour, 106 students (18%).

Degrees of SNS addiction tendencies, self-esteem, interpersonal relationships, and internet gaming addiction among male middle school students are shown in Table 1. On a five-point scale measuring perceived SNS addiction tendencies, the average score was 40.25 ± 12.38 . On a five-point scale measuring perceived self-esteem, the average score was 54.73 ± 11.56 . On a five-point scale measuring interpersonal relationships, the average score was 63.18 ± 8.98 . For internet gaming addiction, the average score was 30.15 ± 12.02 .

The research participants' attitudes on SNS addiction tendency showed a statistically significant difference according to frequency of SNS usage ($F = 43.776, p < .000$) and average length of SNE usage time per day ($F = 45.500, p < .000$). Self-esteem showed a statistically significant difference according to frequency of SNS usage ($F = 3.940, p = .002$) and average SNS usage time per day ($F = 10.744, p < .000$). Interpersonal relationships showed statistically significant differences with regard to the following characteristics: frequency of SNS usage ($F = 83.940, p = .002$) and average SNS usage time per day ($F = 2.054, p = .085$). Internet game addiction showed statistically significant differences with regard to the following characteristics: frequency of SNS usage ($F = 3.940, p = .002$); and average SNS usage time per day ($F = 3.317, p = .011$).

3.2 Correlations between Variables

Correlations are shown in Table 2. There was a statistically significant negative correlation between SNS addiction tendencies and self-esteem, and there were positive correlations among SNS addiction tendencies, interpersonal relationships, and internet gaming addiction. Also, there was a statistically significant positive correlation between interpersonal relationships and self-esteem and a negative correlation between internet gaming addiction and interpersonal relationships.

Table 2. Correlations between variables

Variable	SAT	Self-esteem	IR	IGA
SAT	1			
Self-esteem	-0.387***	1		
IR	0.265***	0.150***	1	
IGA	0.260***	-0.270***	-0.131**	1

SAT: SNS Addiction Tendencies; SE: Self-Esteem; IR: Interpersonal Relationships;

3.3 Hierarchical Regression

A regression model is shown in Table 3.

A regression model was used in Hierarchical regression. We performed an investigation to discover if internet game addiction affects how SNS addiction tendencies, self-esteem, and interpersonal relationships influence each other. Hierarchical Step 1 determines the influence that the independent variable has on the dependent variables such as gender and grade. In Hierarchical Step 2, SNS addiction tendencies, self-esteem, interpersonal relationships, and internet game addiction were added; the explanatory power increased by a statistically significant 18.9%.

Table 3. Hierarchical regression analysis for internet game addiction

	Model 1		Model 2	
	B	β	B	β
Constant	45.590			
Gender	-09.952	-0.397***		
Grade	00.432	0.029		
SAT			0.311	0.320***
SE			-0.216	-0.208***
IR			-0.162	-0.121**
$R^2(\Delta R^2)$	0.160		0.349 (.189**)	
F	55.946***		62.571***	

SAT: SNS Addiction Tendencies; SE: Self-Esteem; IR: Interpersonal Relationships; *** $p < .001$ ** $p < .01$ * $p < .05$

Among these factors, SNS addiction tendencies were shown to exert a significant influence on turnover intention, and as SNS addiction tendency increased ($B = .320$), it was shown to have the greatest influence on internet game addiction. The total explanatory power of these factors on internet game addiction was shown to be 34.9%.

4. Discussion

The present study presents the results of a survey conducted to identify SNS addiction tendencies, self-esteem, and interpersonal relationships and to measure the effects of these factors on internet game addiction among middle school students.

Analysis positively indicated that internet game addiction was statistically associated with the frequency and length of time spent using SNS per day. This study shows that there is a statistically significantly higher incidence of internet game addiction associated with longer and more frequent usage of SNS ($F = 3.317, p$

= .011). Kweon and Park's research on Internet game addiction studies in girls shows that time spent playing Internet games is the main predictive factor of internet game addiction¹⁵.

Yang and Oh's research on elementary school students' internet addiction also reported that internet game addiction is closely associated with internet usage¹⁶. This is similar to the results of the current study.

This study finds that there was a negative correlation between self-esteem and internet gaming addiction, which matches the results of Joo's study, "Correlations among internet games addition, self-esteem, and physical health in middle school students"¹⁷. Additionally, there was a positive correlation between SNS addiction tendencies and internet gaming addiction ($r = .260, p < .001$). This study shows that there is a statistically significant relationship between SNS usage time and internet gaming addiction ($F = 3.317, p = .001$). That matches the results of Lee et al.'s study¹⁸. This data supports the conclusion that people who have difficulty in face-to-face communication spend a lot of time using SNS, which induces SNS addiction tendencies¹⁹. The current study shows that interpersonal relationships are directly linked with SNS addiction and that youths have greater SNS addiction tendencies if they have low self-esteem and high-level tendencies to form interpersonal relationships.

The more smartphone addiction tendency increased, the greater its positive influence was on internet game addiction ($B = .311$). The more self-esteem increased, the greater its negative influence was on internet game addiction ($B = -.216$). The more interpersonal relationships increased, the greater its negative influence was on internet game addiction ($B = -.162$).

These results support the explanation that people who have low self-esteem try to connect with social resources by using SNS and that they want to overcome low self-esteem and improve life satisfaction²⁰. However, since this research only considers a small sample of middle school students, it will be difficult to extend the results of this study to other analyses; thus, follow-up studies must be carried out.

5. Conclusion

This study shows that there are statistically significant correlations among SNS addiction tendencies, self-esteem, interpersonal relationships, and internet gaming addiction. These results imply that the level

of interpersonal relationships needs to be considered when counseling adolescents with low self-esteem, SNS addiction tendencies, or internet gaming addictions. Furthermore, it implies that exploration of various ways to satisfy motivations for interpersonal relationships would be helpful to reduce the SNS addiction tendencies of adolescents with self-esteem problems. Finally, the limitations of the present study and suggestions for further research were discussed.

However, since this research only considers a small sample of male middle school students, it will be difficult to extend the results of this study to other analyses; thus, follow-up studies must be carried out.

6. Acknowledgment

This study was supported by the research program funded by Namseoul University.

7. References

1. Park DH, Kim HJ. Factors affecting internet gaming addiction: SNS addiction tendencies, self-esteem, and interpersonal relationships among male middle students. *Indian J Sci and Technol*. 2015; 8(s8): 212–8.
2. Research of internet addiction family counsel program development. Korea Agency for Digital Opportunity and Promotion (KR) (NIA publication; no. NIA IV -RER-1208). 2012; p. 72.
3. Kwak KJ. A review of researches of the impact of computer game and children's and adolescent's development. *Korean J Psych and Soc Issues*. 2004; 10:147–75.
4. Livingstone S, Haddon L. Risky experiences for children online: Charting European research on children and the internet. *Child and Soc*. 2008; 22(4):314–23.
5. Kim K, Ryu E, Chon MY, et al. Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: A questionnaire survey. *Int J Nurs Stud*. 2006; 43: 185–92.
6. Survey of information and culture. National Information Society Agency. Seoul, Korea; 2012.
7. Leung L. Loneliness, social support, and preference for online social interaction: The mediating effects of identity experimentation online among children and adolescents. *Chinese Journal of Communication*. 2005; 4(4): 381–99.
8. Available from: www.sisafocus.co.kr/news/articleVIEW.HTML?idxno=65491
9. A study on developing the game addiction scale and operating of clinic for games addiction. Korea Game Industry Agency; 2005 Feb.
10. A survey of adolescent's internet use. National Youth Commission Seoul; 2004 Feb.

11. Cho SH, Suh KH. An exploratory study on factors related with SNS addiction proneness: Focus on covert narcissism, self-presentational motivation, and sense of alienation. *J Health Psychol.* 2013; 18(2):236–50.
12. Kang YS. Effect of the body satisfaction and self respect for the job selection of the university students. Gyeongbuk, Korea: Graduate School of Daegu Haanng University; 2007.
13. Choi YN. The mediating effect of maladaptive schema on interpersonal relationship need and peer attachment in Adolescent. Seoul: Graduate School of Konkuk University; 2013.
14. A Study of the Development of Internet Game Addiction Scale for Children and Adolescents. Council of National Information Society Agency; 2006 Nov.
15. Kweon YR, Park MS. Effects of school adjustment on higher grade elementary school students' internet game addiction: Focused on gender difference. *J Korean Acad Psychiatr Ment Health Nurs.* 2006; 21(2):99–107.
16. Yang MK, Oh WO. Effects of the internet game addiction prevention educational program on self-control and time spent on internet games by elementary school students. *J Korean Acad Child Health Nurs.* 2007; 13(3):282–90.
17. Joo AR. Correlations among internet games addiction, self-esteem and physical health in middle school students. *J Korean Acad Community Health Nurs.* 2006; 18(2):331–9.
18. Lee HB, Kim DW, Choi JY, Shin MH. A study on Teenager's SNS use features and addiction-focus on middle school student of Gyegggi-do & Gangwon-do. *Gyenggi Research Institute.* 2014; 16(1):365–91.
19. Kuss DJ, Griffiths MD. Social Networking on the Internet: From pastime to excess and addiction. *Mental notes.* 2012; 6(3):26–8.
20. Nicole BE, Charles S, Cliff L. The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *J Comput Mediat Commun.* 2007; 12(4):1143–68.