

# Factors Influencing Internet Game Addiction in Middle School Students

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## Abstract

**Background/Objectives:** The purpose of this study is to analyze the factors affecting internet game addiction in middle school students.

**Method/Statistical Analysis:** The survey was conducted among 304 middle school students in G metropolitan city of Korea. The data were analyzed using frequency and percentage, mean and standard deviation, t-test, ANOVA, and hierarchical regression analysis.

**Findings:** The results for the degree of middle school students' internet game addiction showed that 67.1% were average users, 23.4% were potential risk users, and 9.5% were high risk users. The variables affecting internet game addiction were found to be anxiety, ego-resilience and gender. These three variables explained 15.9% of the internet game addiction in middle school students.

**Improvements/Applications:** To prevent middle school students from being addicted to internet games, intervention strategies that focus on male students for reduction of anxiety and strengthening of ego-resilience are needed.

**Keywords:** *Internet gaming, Addiction, Anxiety, Ego-resilience, Middle school students.*

## Introduction

In the modern society, most of the information are collected from the internet and thus using the internet has become an essential means in all living areas. In particular, Korea emphasized the importance of building high-speed information infrastructures and informatization education at the national level. As a result, 91.5% of the citizens over the age of 3 use the internet, and among them teenagers takes 99.9% of the total internet use. Communication was the primary

purpose of internet use (94.5%) followed by data and information acquisition (93.7%) and leisure activity (92.5%), whereas leisure activity took the highest portion (99.5%) among teenagers<sup>[1]</sup>. Game, one of the teenagers most common leisure activities, has been continuously increasing with the development of internet and smart devices. A study in 2017 reported that 67.2% of the people in the age of 10~65 were using internet games, and the ratio of game users was highest in teenagers at 91.1%<sup>[2]</sup>. However, it has also been noted that various problems in academic achievement, family relationship, social relationship, and physical and mental health could occur as the result of game addiction when games were excessively used<sup>[3-4]</sup>. For instance, a shocking incident occurred that a middle school student addicted to game murdered her mother who forced to stop playing computer games and killed herself<sup>[5]</sup>. There exists another case in which a middle school student who was addicted to internet games killed his brother in order to experience murder<sup>[6]</sup>.

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To address the problems of game addiction, it is necessary to pay attention to the precedent variables affecting game addiction. For parental variables, previous studies reported that the lack of communication between parents and children as well as breaking of family could affect game addiction<sup>[7-8]</sup>. Psychological variables such as neurosis, anxiety, depression, self-efficacy, self-esteem, impulsivity, and aggressiveness are also known to affect game addiction<sup>[9-11]</sup>. Among the psychological variables, anxiety was identified one of the most important variables explaining game addiction. Prior studies for anxiety have shown that both temporary and time-varying state anxiety and relatively unchanging characteristic anxiety affected online game addiction<sup>[9]</sup>. However, although it was known that anxiety could be caused by game addiction<sup>[4]</sup>, whether anxiety is a leading factor of game addiction or not is not sufficiently researched yet.

In addition, strengthening ego-resilience was known to be important for an effective intervention on internet addiction or overuse because ego-resilience is an adaptive ability to control the individual’s emotional ability and change the situation<sup>[11]</sup>. It was further reported that strengthening ego-resilience was the most comprehensive and effective remedy to smartphone addiction<sup>[10]</sup>. Thus, ego-resilience has received much attention recently and studies have been reported on the relationship between ego-resilience and internet addiction or smartphone addiction.

In this study, the factors affecting internet game addiction were investigated, including anxiety and ego-resilience, in order to provide the basic data necessary for the development of internet game addiction prevention program of middle school students. The relationship of internet game addiction to the general characteristics of the subjects was determined. Then, the degrees of internet game addiction, anxiety, and ego-resilience of the subjects were analyzed. Lastly, the factors influencing the subject’s internet game addiction were identified.

## Method

1. **Measures:** Ego-resilience was measured using the tool developed by Block and Kremen (1996)<sup>[12]</sup> and revised by Yoo and Shim(2002)<sup>[13]</sup>. The Likert 4-point scale was adopted with scores ranging from the minimum of 14 to the maximum of 56 for which a higher score implied that the individuals had a higher ability to re-establish self-control after experiencing a stress event. The reliability of the tool as determined by Cronbach’s  $\alpha$  was .76 at the time of development and .75 at the time of this study.

Anxiety was measured using the Spielberger’s (1973) Trait Anxiety Inventory for Children (TAIC) translated by Kim and Shin(1978)<sup>[14]</sup>. The Likert 3-point scale(range 20-60) was adopted. The reliability of the tool as determined by Cronbach’s  $\alpha$  was .85 in Kim and Shin’s study and .90 in this study.

Internet game addiction was measured using a scale developed by the Korean National Information Society Agency (2006)<sup>[15]</sup>. The scale consisted of 20 items which were asking about current gaming behavior rather than self-recognition of game addiction, and score was evaluated using a 4-point scale with respect to frequency. The reliability of the tool as determined by Cronbach’s  $\alpha$  was .89 at time of its development and .94 in the present study.

2. **Data Collection:** The survey was carried out at two middle schools in G city. The purpose of the study was first explained to the principals and teachers and the questionnaires were completed by students who agreed to participate. Specifically, a pre-trained research assistant explained the purpose and method of the study, distributed the questionnaires to students, and requested the students to complete the questionnaires immediately. The questionnaire was completed with anonymity and the students were informed that the questionnaires were to be used only for the purpose of present study.

**Table 1: Internet game addiction with respect to general characteristics of the subjects**

	Variables	n(%)	M±SD	t or F	p
Gender	Male	150(49.3)	31.65±11.57	2.983	.003
	Female	154(50.7)	28.00± 9.62		
Class year	1st	91(29.9)	30.35±12.17	1.779	.171
	2nd	107(35.2)	30.88±10.11		
	3rd	106(34.9)	28.24±10.02		

	Variables	n(%)	M±SD	t or F	p
Communication with parents	Difficult	10(3.3)	29.80±12.12	.289	.749
	Normal	122(40.1)	29.23±10.08		
	Comfortable	172(56.6)	30.20±11.19		
Satisfaction with school life	Satisfied	208(68.4)	29.30± 9.98	1.372	.255
	Average	86(28.3)	30.40±11.16		
	Dissatisfied	10(3.3)	34.60± 19.97		
School grade	High	70(23.0)	29.68± 9.92	.246	.782
	Middle	189(62.2)	29.60± 0.45		
	Low	45(14.8)	30.84±13.26		
Economic status	High	29(9.5)	28.13± 9.88	.720	.488
	Middle	259(85.2)	29.84±10.76		
	Low	16(5.3)	32.12±12.43		
Parents living together	Both parents	277(91.1)	29.53±10.68	-1.39	.165
	Other	37(8.9)	32.55±11.48		

**3. Data Analysis:** The collected data were analyzed using SPSS Ver. 20.0. General characteristics of the subjects, ego-resilience, anxiety, and internet game addiction level were analyzed by frequency, percentage, means and standard deviation. The degree of internet game addiction with respect to general characteristics of the subjects were analyzed using the t/F test. Hierarchical regression analysis was used to find the cause of internet game addiction. The analyses were performed in two steps. First, the effects of general characteristics on the degree of internet game addiction were analyzed (Model 1). Then, the analysis was repeated after adding psychological factors to the general characteristics (Model 2).

## Results

**1. General Characteristics:** Among general characteristics, gender ( $p = .003$ ) was the primary factor revealing statistically significant difference in internet game addiction level. Especially, male students showed a higher degree of internet game addiction [Table 1].

**2. Internet game addiction, ego-resilience and anxiety:** The analyses of the subject's ego-resilience,

anxiety and internet game addiction showed that the ego-resilience score was  $40.57 \pm 6.05$ , anxiety was  $32.66 \pm 7.63$ , and internet game addiction was  $29.81 \pm 10.77$ . The results for anxiety level of the students revealed that slightly high 13.2%, fairly high 6.3%, and very high 4.6%. Also, the analysis of the subjects' internet game addiction showed that the ratio under potential risk was 23.4% and high risk was 9.5% [Table 2].

**Table 2. Internet game addiction, ego-resilience and anxiety**

Variables	n(%)	M±SD
Ego-resilience		40.57±6.05
Anxiety		32.66±7.63
Normal	231(76.0)	
Slightly high	40(13.2)	
Fairly high	19(6.3)	
Very high	14(4.6)	
Internet game addiction		29.81±10.77
Normal	204(67.1)	
Potential risk	71(23.4)	
High risk	29(9.5)	

**Table 3: Factors influencing internet game addiction**

	Variables	B	SE	$\beta$	t	p	Tolerance	VIF
Model 1	(constant)	23.654	6.370		3.714	.000		
	Gender	-3.769	1.215	-0.175	-3.102	.002	0.998	1.002
	Class year	-0.953	.765	-0.071	-1.246	.214	0.975	1.026
	Communication with parents	1.613	1.165	0.084	1.385	.167	0.863	1.159
	Satisfaction with school life	1.852	1.180	0.093	1.569	.118	0.903	1.108
	School grade	0.099	1.018	0.006	0.097	.923	0.957	1.045
	Economic status	2.166	1.688	0.077	1.283	.200	0.884	1.131
	Parents living together	2.547	2.196	0.067	1.16	.247	0.943	1.060
		R2 =.058, Adj R2 =.035, F=2.581(p=.013)						
Model 2	(constant)	30.782	7.946		3.874	.000		
	Gender	-4.292	1.144	-0.200	-3.75	.000	0.980	1.020
	Class year	-1.099	.718	-0.082	-1.531	.127	0.964	1.038
	Communication with parents	1.79	1.089	0.093	1.643	.101	0.859	1.163
	Satisfaction with school life	0.523	1.119	0.026	0.467	.641	0.875	1.143
	School grade	-0.274	.952	-0.016	-0.288	.774	0.954	1.049
	Economic status	2.224	1.579	0.079	1.408	.160	0.880	1.136
	Parents living together	2.329	2.056	0.062	1.133	.258	0.938	1.066
	Anxiety	0.345	.080	0.244	4.314	.000	0.865	1.157
	Ego-resilience	-0.373	.099	-0.209	-3.766	.000	0.897	1.114
		R2 =.184, Adj R2 =.159, F=22.76(p<.001)						

**3. Factors influencing internet game addiction:**

The results of hierarchical regression analysis to determine the variables effective in predicting internet game addiction are summarized in Table 3. In the first step analysis in which only the general characteristics were utilized as the independent variables, gender appeared as the influencing factor, explaining 3.5% (F = 2.581, p = .013, R 2 = .058) of internet game addiction, such that male students were -3.769 (B = -3.769) higher than female students. As the next step, when the analysis was repeated after including psychological factors (anxiety and ego-resilience) as well as the general characteristics, the variables affecting internet game addiction were found to be anxiety ( $\beta = .244$ , p = .002) ego-resilience ( $\beta = -.209$ , p <.001) and gender ( $\beta = -.200$ , p <.001). These three variables explained 15.9% of the internet game addiction in middle school students (F = 22.76, p<.001). Since the variation inflation factor (VIF) was found to be 1.00-1.99, tolerance limit to be 0.50-0.99, and the Durbin-Watson value to be 2.089, there was no problem of multi-collinearity.

**Discussion**

This study was performed to find the degree of internet game addiction of middle school students and to identify the factors that influence internet game addiction. The internet game addiction level of the subjects were found that 23.4% were potential risk users, and 9.5% were high risk users. A survey carried out in 2009 using the same tool among 6,499 middle and high school students reported that only 7.1% were potential risk users and 5.6% were high risk users<sup>[16]</sup>. Accordingly, it is understood that the results of the present study signify that adolescents' game addiction problem became more serious than the past. According to previous studies, internet game addiction causes deterioration of family and friend relationship, maladjustment of school life, health and mental problems such as impulsiveness, aggression, depression, and violence<sup>[4,9,10]</sup>. Therefore, to preempt problems caused by game addiction, it is necessary to correctly diagnose the current state of internet game addiction among adolescents and prepare appropriate mediation alternatives.

Through hierarchical regression analysis, the variables that affect internet game addiction in middle school students were confirmed to be gender, anxiety and ego-resilience. Male students had significantly higher scores of internet game addiction than female students. This result is consistent with the previous results of a survey in 674 Korean secondary school students in which male students were 2.22 times higher in the risk of internet game addiction than female students<sup>[17]</sup>. A recent study also reported that the game utilization rate of teenage male students was 94.9%, whereas that of teenage female students was 88.6%<sup>[2]</sup>. Thus, for the prevention of internet game addition in middle school students, the priority should be placed on male students.

The conversation with parents and cohabitation did not show a difference in the degree of internet game addiction, which agrees with the results of previous studies in which dysfunctional communication with parents did not show a difference between high-risk users and general users<sup>[16,18]</sup>. However, there also exists studies that reported a direct influence of the quality of family relationships on game addiction<sup>[19]</sup>, implying the necessity of further investigation for the relationship between parental variables and internet game addiction.

Besides gender, anxiety appeared to be a significant factor affecting internet game addiction. This finding was consistent with the result of a survey of university students in the United Kingdom<sup>[9]</sup>. The subjects' anxiety score in this study was 32.66 points for which the anxiety level of 76.0% was normal, 13.2% was slightly high, 6.3% was fairly high, and 4.6% was very high. The average anxiety score from a survey of elementary school students in grades 4, 5, and 6 in 2016 was 27.91, implying that the anxiety level of middle school students is higher<sup>[20]</sup>. Ego-resilience also appeared to be a variable affecting internet game addiction. The score for ego-resilience was 40.57 which was higher than the ego-resilience of 38.03 reported in a previous study<sup>[13]</sup>. Although the relationship between ego-resilience and internet game addiction was little investigated previously, there exist studies that reported that ego-resilience of middle school students had a statistically significant negative influence on the dependence of mobile phones<sup>[11]</sup> or ego-resilience of college students influenced internet addiction<sup>[10]</sup>. Thus, it is considered that further research on the relationship between ego-resilience and internet game addiction is necessary.

## Conclusion

In this study, it was found that about two-thirds of the middle school students had problems with internet game addiction. These findings suggest that it is necessary to mediate the strategies to reduce middle school students' anxiety and strengthen their ego-resilience in order to prevent middle school students' addiction to internet games.

The increase of game addiction among teenagers and related problems have emerged as a social issue recently but research for this issue is not sufficient. This study was conducted to address the factors affecting internet game addiction among middle school students. Although the survey was carried out among the middle school students in one area only, the results from this study are considered to be meaningful in understanding and elucidating the factors related to internet game addiction. Further study is necessary to develop an effective program to prevent internet game addiction of middle school students.

**Ethical Clearance:** Not required

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**Conflict of Interest:** Nil

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