

# Effects of Smartphone Addiction on Radiology Students' Interpersonal Satisfaction

Yuxin Huang<sup>1</sup>, Hong-Ryang Jung<sup>2</sup>, Cheong-Hwan Lim<sup>2</sup>

<sup>1</sup>Doctor, <sup>2</sup>Professor, Dept. of Health Care, Hanseo University,  
46 Hanseo 1-ro Haemimyeon Seosansi Chungcheongnamdo, 31962, Republic of Korea

## Abstract

**Background/Objectives:** Although smart phone is known for its convenient functions and portability, it is also causing smart phone addiction which is becoming a serious social issue. The objective of this study was to determine the degree of smartphone dependence in university students majoring in radiology and analyze the influence of smartphone addition on their interpersonal relationships.

**Method/Statistical Analysis:** : A questionnaire was used to survey 431 university students about the use of smartphone. The questionnaire had 26 questions. Each question was evaluated with a 5-point Likert scale. Its Cronbach's  $\alpha$  value was 0.893. Students' satisfaction for interpersonal relationship was determined according to their situation. Three additional socio-demographic characteristics (economic level, addiction, and gender) were also determined. Questions and answers were provided face-to-face.

**Findings:** Overreliance on smartphones was the highest in living standards with income at the "middle" level with 240 (55.64%) and female students at 184 (42.6%) in gender, higher than 247 (57.3%) for male students. In terms of interpersonal satisfaction, 247 (57.3%) male students showed high levels of satisfaction with each other's relationships, while in terms of smartphone overreliance, the group of people who are not satisfied ( $3.545 \pm 0.34$ ) showed high levels. Correlation analysis showed a static correlation between sex and smartphone over-dependence ( $r = .217, p < .001$ ), and there was a negative correlation between smartphone and interpersonal satisfaction ( $r = -.236, p < .001$ ).

**Improvements/Applications:** Based on results of this study, a program should be developed to prevent smartphone dependence of students and raise interpersonal satisfaction. Results of this study could be used as basic data necessary for education on smartphone dependence prevention in university students.

**Keywords:** *Smartphone, Smartphone addiction, Smartphone dependence, Radiology university student, Interpersonal satisfaction.*

## Introduction

Smartphones not only have communication and internet functions due to rapid development of IT

technology and communication systems, but also make it easy and convenient to transcend time and space. They are revolutionizing life.

Unlike mobile phones, smartphones combine the functions of digital devices as well as texts and phones, allowing users to use various convenient functions such as information search, music, media, games, and learning. In addition, it is possible to have convenient access to information and networks without being influenced by time and place, but the convenient function and portability of such smartphones can cause negative phenomena such as addictive use of smartphones. Excessive use

---

### Corresponding Author:

**Hong-Ryang Jung**

Professor, Dept. of Health Care, Hanseo University, 46 Hanseo 1-ro Haemimyeon Seosansi Chungcheongnamdo, 31962, Republic of Korea  
e-mail: hrjung@hanseo.ac.kr

of smartphones by university students can be expected to cause significant obstacles in daily life as well as psychosocial problems<sup>[1]</sup>. Smartphone overreliance can be considered an act addiction and there are no official diagnostic criteria for smartphone overreliance, so there is a mix of definition and classification.

Considering the trend in the spread and usage of smartphones, it is urgent to recognize and prevent dependence of smartphones<sup>[2]</sup>. Smartphone dependence rate in university students has been reported to be 18.1%, more than three times higher than the rate (5%) in age groups of 40s and 50s<sup>[3]</sup>. Recently, studies have been mainly focused on teenagers. There is a need to perform research on smartphone dependency in university students<sup>[4]</sup>.

Currently, smartphones are commonly used by university students in the information society. Smartphone is used as a tool for obtaining communication media and information in daily life. Unconsciously relying on smartphones while acquiring mutual information and information through smartphones can be said to be a trend of over-dependence symptoms and individualism.

Over-dependent use of smartphones can lead to interpersonal problems. Interpersonal relationship refers to the ability to interact effectively with others, including the formation and initiation of relationships with others, the assertion of one’s rights or displeasure, the opening of personal information, emotional support of others, and conflict management<sup>[5]</sup>. Failure to form a smooth interpersonal relationship results in emotional isolation and reported correlation between smartphone over dependence and interpersonal satisfaction in order to understand the relationship between loneliness, anxiety and depression, which are side effects of smartphone overreliance caused by interpersonal related factors<sup>[6]</sup>.

In recent years, smartphone dependence in university students has been increasing. Various studies have been conducted on smartphone dependence of university students. However, researches on the identification of related factors of relationship satisfaction are insufficient. In previous studies, university students are stressed by personal characteristics, interpersonal relationships, study, and careers. They feel anxiety and confusion at the same time as they worry about employment, causing psychological problems<sup>[7]</sup>. Most psychological problems are reported to arise from interpersonal satisfaction<sup>[8]</sup>. Therefore, the objective of

this study was to determine the degree of smartphone dependence in university students majoring in radiology and analyze the influence of smartphone addition on their interpersonal relationships.

### Method

- 1. Subject:** A questionnaire survey was performed to determine factors affecting interpersonal satisfaction on internet relations among Korean radiologists from March to July 2018. A total of 500 questionnaires were distributed and 431 (86.2%) copies were collected. Thus, the total number of subjects was 431 including 247 (57.3%) males and 184 (42.6%) females.
- 2. Method:** The questionnaire used in this study had 15 questions (Cronbach’s  $\alpha$  value 0.899). It was developed by the Korea Information Technology Agency<sup>[9]</sup>. Interpersonal satisfaction level was measured using the scale developed by Eun hyuk Ki (1999). The test of interpersonal relationship satisfaction was reconstructed according to university students’ condition. It had 26 items of “interpersonal satisfaction” (Cronbach’s  $\alpha$  value of 0.893) evaluated with a 5-point Likert scale<sup>[10]</sup>. The questionnaire was composed of three additional socio-demographic characteristics (economic level, addiction, and gender). Questions and answers were given face-to-face. For data analysis, frequency analysis and correlation analysis were performed using IBM SPSS Statistics version 23. Statistical significance level was set at  $p < 0.05$ .

### Result

- 1. Smartphone Dependence and Interpersonal Relationship Satisfaction Level:** [Table 1] As a result of technical statistics to find out the level of dependency on smartphones and the level of interpersonal satisfaction, the level of interdependence on smartphones was 2.64 out of 5 points, and the level of interpersonal satisfaction was 3.56 out of 5 point.

**Table 1. Smartphone Dependence Level and Interpersonal Relationship Satisfaction Level (N = 431)**

Division	Average±SD
Addiction level	2.64±0.61
Interpersonal Satisfaction	3.56±0.53

**2. Interpersonal Satisfaction According to Personal Characteristics, Dependence on Smartphone:** [Table 2] According to personal characteristics, average difference analysis was performed to identify difference between Smartphone over dependence and interpersonal satisfaction. The

difference in smartphone over dependence was found to be 2.54 for males and 2.78 for females ( $p < .001$ ), according to living standards, “Upper” is 2.78, “middle” is 2.56, “Lower” is 2.71, and there are statistically significant differences ( $p < .001$ ).

**Table 2. Difference in smartphone addiction according to personal characteristics (N = 431)**

Personal Characteristics		Smartphone Addiction		t/F value	p-value
		N	M±SD		
Gender	Male Student	247	2.54±0.62	-4.16**	0.000
	Female Student	184	2.78±0.58		
Level of Living	Lower	97	2.71±0.66	4.99**	0.007
	Middle	240	2.56±0.57		
	Upper	94	2.78±0.65		

\*  $p < .05$ , \*\*  $p < .001$

[Table 3] Regarding the level of interpersonal satisfaction, it was 3.61 for male students and 3.50 for female students, showing statistically significant difference between the two ( $p < .05$ ).

**Table 3. Regarding the level of interpersonal satisfaction (N = 431)**

Personal characteristics		Smartphone addiction		t/F value	p-value
		N	M±SD		
Gender	Male student	247	3.61±0.57	2.03*	0.043
	Female student	184	3.50±0.47		
Level of living	Lower	97	3.59±0.54	2.17	0.115
	Middle	240	3.59±0.53		
	Upper	94	3.46±0.50		

\* $p < .05$

**3. Interpersonal Satisfaction Differences Depending on Smartphone Dependence:** [Table 4] The t-test was performed to find out the difference in the interpersonal satisfaction level according to the dependency on the smartphone. Smartphone over dependence was 225, interpersonal satisfaction was 3.323, aesthetic dependence was 206, interpersonal satisfaction was 3.545, aesthetic dependence was high, and there was a statistically significant difference between the two groups ( $p < .001$ ).

**Table 4. Difference in self-control according to whether or not a smartphone is addictive (N = 431)**

Division		Smartphone addiction		t/F value	p-value
		N	M±SD		
Addiction	Addiction	225	3.323±0.31	46.06***	0.001
	Non-addiction	206	3.545±0.34		

\*\*\* $p < .001$

**4. Relationship between smartphone dependency and interpersonal satisfaction:** [Table 5] A correlation analysis was conducted to examine the relationship between gender, economic level, smartphone dependence, and interpersonal satisfaction. There was a positive correlation between gender and smartphone dependence ( $r = .217$ ,  $p < .001$ ). Correlation was shown.

**Table 5. Relationship between smartphone addiction and self-control (N = 431)**

	Gender	Level of living	Smartphone addiction	Self-control
Gender	1			
Level of living	.007	1		
Smartphone addiction	.217***	-.027	1	
Self-control	-.083	-.018	-.236***	1

\*\*\*p&lt;.001

## Discussion

Each country of the Organization for Economic Cooperation and Development stresses the role of the middle course that leads to a job after graduating from a university. In these days, smartphone over dependence and interpersonal relationships are the most important period as university students are developed into later adolescence as there is a growing interest and policy regarding smartphone overreliance on university students.

Existing literatures on smartphones have focused on university students, adolescents, and adults. Many studies have been conducted in Korea. This study examined smartphone dependency and interpersonal relationship satisfaction among university students majoring in radiology. Korean students are using SNS, UCC, Kakao Talk, and BAND applications without using face-to-face interactions. Griffiths (1995) has suggested that interpersonal satisfaction is a variable that has a significant effect on smartphone dependence. Therefore, the purpose of this study was to investigate the importance of interpersonal relations in university life and society by grasping the relationship between satisfaction of interpersonal relations and dependence of smartphones of university students majoring in radiology.

Kim Choon-kyung (1991) reported the result of her research that her relationship is weak because she spends a lot of time playing games using her smartphone and lacks time to hang out with her friends. Kang Yeon-dal (2010) has shown that the higher the level of smartphone game addiction, the higher the anxiety of interpersonal relations. Park Ji-hyun (2017) has shown that the relationship between university students' anxiety and smartphone dependence is the same as the result between smartphone dependency and interpersonal satisfaction.

In the study of Kim Nam-sun (2012), female university students showed higher scores for smartphone dependence than male university students<sup>[11]</sup>. Syu (2010) has also compared men and women in smartphone use and found that females use smartphones and download applications more often than men. In the present study, female students also had higher smartphone dependence than male students, consistent with results of previous studies.

University students are stressed by their new life after completing high school, such as completing credits, learning majors, relationships, careers, and employment (Baek, Hye-young et al., 2016). It has been shown to act dependently<sup>[12]</sup>. This interdependent behavior is related to interpersonal ability and smartphone dependence. It has been shown that interpersonal ability and smartphone dependence have a negative correlation<sup>[13]</sup>.

In the relationship between smartphone over dependence and interpersonal satisfaction, Kim Sa-ri (2002) has shown a significant correlation between interpersonal satisfaction and smartphone dependence<sup>[14,15]</sup>. Results of the present study showed that interpersonal satisfaction was low in university students, consistent with results of previous studies. In addition, the higher the smartphone dependency, the lower the interpersonal satisfaction, resulting in inadequate correlation.

When university students become radiographers and come into contact with many people, they should always be wary that they can become addicted by adjusting their use of smartphones on their own to ensure proper interpersonal relationships.

## Conclusion

This study analyzed the factors affecting the interpersonal satisfaction level according to the dependency of smartphones.

First, the level of dependency on smartphones was 2.64, and interpersonal satisfaction was 3.56. The female students showed high dependence on smartphones, and the level of living was high in the “medium”.

Second, interpersonal satisfaction was found to be high among male students, and high degree of dependency on smartphone aesthetics.

Third, the correlation analysis showed a positive correlation between gender and smartphone dependence, and there was a negative correlation between smartphone and interpersonal satisfaction.

This study grasped the degree of dependence on smartphones among university students in radiology, analyzed the effect of smartphone dependence on interpersonal satisfaction, and suggested ways to satisfy interpersonal relationship in smartphone use of all university students in the future. Results of this study could be used as basic data for education on smartphone dependence prevention in university students.

**Ethical Clearance:** Not required

**Source of Funding:** Self

**Conflict of Interest:** Nil

### References

1. Kim NS. Effects of self-control and life stress on college students' addiction to smartphones, The Korean Statistical Society of Health Statistics. 2012;37(2);72-83.
2. Kim BY, Ko EJ, Choi HG. A study on factors affecting smart-phone addiction in university students: A focus on differences in classifying risk groups. *Studies on Korean Youth*. 2013;24(3):67-98.
3. Future of Creation Science, 2013 Internet Addiction Survey (2014).
4. Yu PS. A Study of the Relationship among Academic records, Parents-children Communication, and Cellular Phone Addiction in Middle School Students. 2010;17(1);33-51.
5. Han NR. A Study on the Interpersonal Relevance Scale Validation of Korean University Students, Korean Psychological Association, 2010;22(1):137-156.
6. Lim KH. Effects of interpersonal competence and self-control on college students' addiction to smartphones, *Korean Journal of Addiction and Crime*, 2017;7(2):634-643
7. Park YM. A Study on Adults' Smartphone Addiction and Mental Health, Sangji University Peace Security, Graduate School of Counseling Psychology, Master Thesis. 2011.
8. Kang JY. The effect of stress and the way of stress coping, impulsivity of employees on smart-phone addiction[mater's thesis]. Seoul: The Catholic University. 2012.
9. Sheldon Cohen, Psychological Stress and Susceptibility to Upper Respiratory Infections, *Am J Respir Crit Care Med*, 1995;152(2):53-58.
10. Eun HG. Does Self-Regulatory Group Improve Adolescents' Interpersonal Abilities : Self-Awareness, Other-Awareness, Interpersonal Skills and Interpersonal Satisfaction ?[mater's thesis]. Seoul: Sung Kyun Kwan University. 2012.
11. Kim NS, Lee KU. “Effects of self-control and life stress on smart phone addiction of university students”, *Journal of the Korea Society of Health Informatics and Statistics*. 2012;37(2):72-83.
12. Kim IK, Park SW, H. Choi M, “The Relationship among Smartphone addiction, Communication ability, Loneliness and Interpersonal relationship for university students”, *Journal of the Korea Academia-Industrial cooperation Society*. 2017; 18(1):637-648.
13. Park JH. Relationship between Nursing Students' Interpersonal Relationship Anxiety, College Life Adjustment, Self-Control and Smartphone Addiction, *Journal of the Korean Data & Information Science Society*. 2017;28(1):185–194.
14. Kim SR. “Effects of behavioral inhibition training on executive function of ADHD children”, *Korean Psychological Association*, 2002;7(3):429-445.
15. Kim MS, Sohn SK. Relationships between Self-Control and Addictive Mobile Phone Use by Nursing Students. 2014;15(11):6719-6727.