

A Study on the Status and Solutions of Smartphone Overdependence among the Elderly in Korea

Woochun Jun

Seoul National University of Education, wocjun@snue.ac.kr

Date of Submission: 21st July 2022 Revised: 14th September 2022 Accepted: 05th October 2022

How to Cite: Jun, W. (2022). A Study on the Status and Solutions of Smartphone Overdependence among the Elderly in Korea. *International Journal of Applied Engineering and Technology*4(2), pp.46-51.

Abstract—The development of information technology has two-sided characteristics that cause negative phenomena as well as positive benefits for us. Representative side effects of the development of information and communication technology vary widely, such as personal information infringement, hacking, and overdependence on the Internet, and the types and risks of side effects are increasing day by day. In particular, smartphone overdependence is increasing day by day regardless of gender and age. The purpose of this study is to analyze the causes of smartphone overdependence and propose various measures to resolve smartphone overdependence among the elderly in Korea. First, in order to accurately analyze the current status and cause of smartphone dependence among the elderly, the national-level smartphone overdependence survey data over the past four years were analyzed. In addition, various measures were proposed to reduce the elderly's overdependence on smartphones. The results of this study are expected to play a role as good basic data as academic and policy references to resolve the overdependence of the elderly on smartphones in the future.

Index Terms – Smartphone overdependence, Smartphone addiction, Internet overdependence, Information and communication technology

INTRODUCTION

With the advent of the Internet in the 1990s, the rapid development of information and communication technology has caused many changes in our daily lives. The advent of the Internet and information and communication technology marked the beginning of the information society and began to benefit us a lot. The benefits of such information and communication technology have enriched the lives of modern people and at the same time have begun to cause various side effects. In other words, information and communication technology served as both sides of a coin that gave us abundance and provided a dark side. Side effects of information communication technology are diverse and the risks are increasing, and representative side effects include overdependence on the Internet, personal

information infringement, copyright infringement, and recently, fake news are becoming more diverse.

With the recent spread of smartphones and smartphones becoming a necessity for modern people, dependence on the Internet is changing to a problem of dependence on smartphones.

In particular, as the popularization of smartphones is rapidly progressing, the problem of overdependence on smartphones is now applicable to various classes of our society, regardless of gender and age. In other words, it is easy to stereotype that smartphone overdependence is often limited to adolescents and young people and does not occur in the elderly, but according to recent statistics, the proportion of smartphone overdependence among the elderly is gradually becoming serious [1].

Therefore, in addition to the youth's overdependence on smartphones, the elderly's overdependence on smartphones cannot be overlooked and is emerging as a social problem to be solved at the national level. It is very important to accurately identify and accurately analyze the status of smartphone overdependence among the elderly, and accurate cause identification is a shortcut to solving the problem of smartphone overdependence.

The purpose of this study is to identify the current status of smartphone overdependence among the elderly in Korea, analyze the cause of overdependence, and propose alternatives to solve the problem of overdependence. For this purpose, it is very important to refer to objective and accurate smartphone overdependence data. In this paper, we refer to the data on the status of overdependence on smartphones at the national level over the past four years published annually by National Information Society Agency(<http://www.nia.or.kr>). Based on this data, the cause of overdependence on smartphones was analyzed, and based on the analysis results, some plans to resolve overdependence from an educational and social perspective was proposed. In this paper, the elderly means their 60s.

The subsequent composition of this paper is as follows. Chapter 2 presents related studies to introduce the definition and user classification of overdependence on the Internet and smartphones, and also introduces previous studies related to the elderly. Chapter 3 presents statistical analysis results along with the status of overdependence on smartphones for the elderly. Chapter 4 interprets the analysis results introduced in Chapter 3 and also discusses ways to resolve overdependence on smartphones. In the last chapter 5, future research tasks are introduced along with the conclusions.

RELATED WORKS

I. Definition and User Classification of Smartphone Overdependence

The term ‘overdependence’ recently begun to be used instead of the term ‘addiction’. National Information Society Agency, which is in charge of surveying the overdependence on smartphones at the national level, has started a survey since 2004. At first, the term ‘addiction’ was used, but from the 2015 survey, the term ‘overdependence’ began to be used instead of the term ‘addiction’. Although it did not reveal the reason for changing the term, it is judged that the term overdependence is considered to be a less aggressive and soft expression than the term addiction.

Existing definitions of Internet addiction or smartphone addiction vary [2]-[6]. However, since this paper uses the term overdependence, it introduces only the definition of overdependence.

In [1], smartphone overdependence is defined as a state in which excessive smartphone use increases the salience of smartphones and decreases the self-control ability, thereby experiencing serious consequences. Specifically, 3 elements of smartphone overdependence are defined as follows.

-Salience

The life pattern of using smartphones in an individual's life is more prominent than other behaviors and becomes the most important activity

-Self-control Failure

The user's ability to self-regulate smartphone use is inferior to the subjective goal

-Serious Consequence

Continuous use of smartphones despite experiencing negative psychological, physical, and social consequences due to smartphone use.

Meanwhile, smartphone users can be classified into the following three groups according to the degree of overdependence [1].

-High risk groups

Interpersonal conflicts, daily role problems, health problems, etc. have occurred seriously in the state of losing control over smartphone use

-Potential risk groups

Interpersonal problems in daily roles began to arise over smartphone use

-General group

Smartphone is used in a controlled form

II. Previous Works

Existing studies on smartphone addiction or overdependence of the elderly in Korea are as follows.

In the study of Yang and Lim, the factors affecting smartphone addiction were analyzed from the perspective of the cognitive-behavioral model for smartphone users of the elderly [7]. The main findings are as follows. The elderly's tendency to smartphone addiction was the highest in their 70s, and men were higher than women. In the psychopathic factor, depression shows a positive influence on helplessness, but does not show an influence on smartphone addiction tendency. It was also found that the higher the helplessness and the higher the social support among the social solidarity factors, the higher the tendency to smartphone addiction.

In the study of Bae and Koh, demographic variables, smartphone usage amount, smartphone usage type, and psychological and emotional variables were considered to explore variables related to smartphone overdependence for the elderly and older people [8]. As a result of the analysis, smartphone overdependence was higher as the number of smartphone use during the week, the number of weekend use, and the time spent during the week increased, and the use of smartphones for information and games increased. On the other hand, entertainment pursuit and communication type did not affect smartphone overdependence. In addition, as loneliness and anxiety increase, dependence on smartphones increases, while the greater the social capital, the lower the dependence on smartphones.

THE CURRENT STATUS AND ANALYSIS OF SMARTPHONE OVERDEPENDENCE OF THE ELDERLY

In this chapter, we introduce the current status of smartphone overdependence and statistical processing for analyzing the causes of overdependence in the elderly in Korea. For accurate and objective analysis, data from the state-level smartphone overdependence survey report for the past four years from 2018 to 2021 were referred [1][9]-[11].

I. The Current Status of Smartphone Overdependence

First, Table 1 shows the ratio of the elderly smartphone overdependence risk group over the past four years from 2018 to 2021. The overdependence risk group refers to the high-risk group and the potential risk group. As shown in

Table 1, the ratio of the risk group of overdependence is continuously increasing. As of 2021, the risk groups for overdependence are infants (28.4%), adolescents (37.0%), and adults (23.3%), which have a lower risk group ratio than other ages, but the risk group ratio of the elderly continues to increase.

Table 1
Changes in the Proportion of Elderly Smartphone Overdependence Risk Groups

	High Risk Group	Potential Risk Group	Total
2018	2.4	11.8	14.2
2019	2.5	12.4	14.9
2020	3.2	13.6	16.8
2021	3.7	13.8	17.5

(unit: %)

Table 2 shows the scores (out of 4) of the three major factors of smartphone overdependence of the elderly overdependence risk group.

Table 2
3 Elements of Smartphone Overdependence

	Self-control Failure	Saliience	Serious Consequence
2018	2.65	2.67	2.57
2019	2.67	2.63	2.52
2020	2.71	2.68	2.54
2021	2.98	2.95	2.26

(unit: 4-point scale)

Meanwhile, Table 3 shows the proportion of causes of smartphone overdependence.

Table 3
Proportion of Causes in Smartphone Overdependence

	Individual	Sociocultural characteristics	Company	Government
2018	53.7	17.9	20.1	8.4
2019	51.5	24.1	17.6	6.8
2020	50.1	27.2	14.4	8.3
2021	54.4	23.0	15.7	6.8

(unit: %)

Table 4 shows the ratio of countermeasures to relieve smartphone overdependence of the elderly.

Table 4
The Ratio of Countermeasure to Overdependence

Countermeasure	2018	2019	2020	2021
A	39.7	48.2	54.7	55.0
B	19.1	19.4	15.3	19.0

C	17.5	13.4	16.7	12.7
D	10.0	5.9	3.9	3.8
E	10.1	9.9	7.1	5.7
F	3.6	3.2	2.3	3.7

(unit: %) where A: strengthening self-regulation, B: development of usage control app, C: more time with family, D: expansion of preventive education, E: improvement of laws and systems, F: strengthen awareness campaigns, respectively.

Table 5 shows the ratio of solving subjects to resolve the elderly smartphone overdependence.

Table 5
The Ratio of the Solving Subjects

	Individual	Company	Government
2018	62.6	20.7	16.7
2019	59.5	22.2	18.3
2020	57.6	21.2	21.2
2021	58.3	21.4	20.3

(unit: %)

Table 6 shows the ratio of measures to resolve the elderly smartphone overdependence.

Table 6
The Ratio of Measures to Overdependence

	A	B	C	D
2018	38.7	29.3	20.8	11.2
2019	42.6	24.5	21.0	11.9
2020	39.7	24.9	23.1	12.2
2021	48.9	24.2	17.8	9.2

(unit: %) where A: alternative leisure activities, B: advice and help from family and friends, C: individual's willingness to regulate use, D: technical support such as usage control apps, respectively.

Table 7 shows the ratio of obstacles to resolving the elderly smartphone overdependence.

Table 7
The Ratio of Obstacles to Overdependence

	A	B	C	D
2018	54.6	19.4	21.0	5.0
2019	41.0	36.4	10.6	12.9
2020	29.5	50.6	8.3	11.4
2021	42.5	37.5	9.5	10.5

(unit: %) where A; fun with smartphones, B: habitual smartphone use, C: inevitable use of learning or work, D: communication with friends and acquaintances, respectively.

II. Statistical Analysis of Smartphone Overdependence

In this section, we show various analyses based on the data on the status of smartphone overdependence for the elderly introduced in Section 3.1.

First, the results of examining the three major factors of the elderly smart phone overdependence are shown in Table 8.

Table 8
Analysis Results of 3 Elements of Overdependence

Elements	Mean	SD	F	P
Self-control Failure	2.75	0.15	4.46*	0.045
Saliency	2.73	0.15		
Serious Consequence	2.47	0.14		

* $p < 0.05$

Looking at the average value of the three major factors of smartphone overdependence for the elderly, self-control failure was the highest at 2.75, followed by saliency 2.73, serious consequence 2.47 and statistically significant difference ($F=4.46$ and $p < 0.05$). Therefore, we can conclude that the biggest factor of the elderly's smartphone overdependence is self-control failure.

Table 9 shows the results of examining the causes of smartphone overdependence among the elderly. Looking at the causes of the elderly's smartphone overdependence, individuals were the highest at 52.43 based on the average value, followed by sociocultural characteristics 23.05, company 16.95, and the government 7.58, showing statistically significant differences ($F=232.26$, $p < 0.001$). Therefore, it can be seen that the biggest cause of the elderly's smartphone overdependence is individuals.

Table 9
Analysis Results of Causes of Overdependence

Elements	Mean	SD	F	P
Individual	52.43	1.98	232.26***	0.000
Sociocultural Characteristics	23.05	3.87		
Company	16.95	2.48		
Government	7.58	0.90		

*** $p < 0.001$

Meanwhile, the results of examining the countermeasures to resolve the elderly smartphone overdependence are shown in Table 10.

Table 10
Analysis Results of Countermeasures to Overdependence

Elements	Mean	SD	F	P
A	49.40	7.19	93.06***	0.000
B	18.20	1.94		
C	15.08	2.38		
D	5.90	2.90		
E	8.20	2.16		
F	3.20	0.64		

* $p < 0.001$, where A: strengthening self-regulation, B: development of usage control app, C: more time with family, D: expansion of preventive education, E: improvement of laws and systems, F: strengthen awareness campaigns, respectively.

According to the countermeasures to resolve the elderly smartphone overdependence, 'strengthening self-regulation' was the highest at 49.40 based on average, followed by 'development of usage control app' 18.20, 'more time with family' 15.08, 'improvement of laws and systems' 8.20, 'expansion of prevention education' 5.90 and 'strengthen awareness campaign' 3.20, showing statistically significant differences ($F=93.06$, $p < 0.001$). Therefore, it can be seen that the biggest countermeasure for resolving the dependence of the elderly on smartphones is 'strengthening self-regulation'.

Table 11 shows the results of examining the solving subjects of the elderly's smartphone overdependence.

Table 11
Analysis Results of Solving Subjects of Overdependence

Elements	Mean	SD	F	P
Individual	59.50	2.21	660.10***	0.000
Company	21.38	0.62		
Government	19.13	2.02		

*** $p < 0.001$

Looking at the subjects of resolving the elderly smartphone overdependence, individuals 59.50, companies 21.38 and the government 19.13 based on the average value, showing statistically significant differences ($F=660.10$, $p < 0.001$). Therefore, we can conclude that individuals are the biggest resolving agent of the elderly's smartphone overdependence.

Table 12 shows the results of examining the ways to resolve the elderly smartphone overdependence. Looking at the ways to resolve the smartphone overdependence of the elderly, 'alternative leisure activities' were the highest at 42.48 based on average, followed by 'advice and help from family and friends' 25.73, 'individual's willingness to regulate use' 20.68, and 'technical support' 11.13, showing statistically significant differences ($F=82.52$, $p < 0.001$). Therefore, it can be seen that the most important solution to the elderly smartphone dependence is alternative leisure activities.

elderly in Chapter 3 and various measures are proposed to resolve the overdependence.

First, as can be seen from Table 1, the risk group of the elderly's overdependence on smartphones is increasing day by day. The ratio and number of the risk group for overdependence of the elderly are relatively small compared to other age groups, but the problem of overdependence on smartphones of the elderly can be seen as serious.

In other words, the elderly often should abandon the stereotype that it has nothing to do with smartphone overdependence, and as the proportion of the overdependence risk group gradually increases, they should actively respond to the overdependence problem.

On the other hand, as shown in Table 2, 'self-control failure' was the largest among the three factors of the elderly's overdependence on smartphones. This means that it is very difficult to autonomously control the use of smartphones in the risk group of overdependence. In addition, the analysis results from Table 3 to Table 7 can be interpreted as follows. Overdependence on smartphones is the greatest responsibility of individuals belonging to the risk group, and in order to solve overdependence, it can be seen that the individual's self-control ability is developed above all. In other words, in order to solve the overdependence on smartphones, it is most important to develop individual control ability rather than technical support such as providing apps or compulsory control through laws and systems. In addition, in order to solve overdependence, it is necessary to participate in alternative leisure activities such as exercise and hobbies or develop new leisure activities instead of using smartphones. In the meanwhile, the major obstacles to resolving smartphone overdependence are 'fun with smartphones' and 'habitual smartphone use'. In other words, in order to relieve overdependence on smartphones, it is necessary to gain fun through objects or activities other than smartphones. In the end, it can be said that the most important thing is to engage in alternative leisure activities other than smartphones to resolve overdependence on smartphones.

According to the analysis results of Chapter 3, it is difficult for users belonging to the smartphone overdependence risk group to escape from smartphone overdependence on their own. In other words, it can be seen that the bad habit of getting fun through smartphones is continuously repeated whenever there is leisure time while the ability to control smartphone use is insufficient, and it is difficult to escape this vicious cycle. Currently, in Korea, the 'Internet Addiction Prevention Centre' (<http://www.iapc.or.kr>) is being operated to cope with the problem of smartphone overdependence at the national level. The centre is conducting various activities such as diagnosis, prevention, healing, and counselling on smartphone overdependence. More publicity is needed so that the elderly can use the centre more actively and actively in the future, and more opportunities for home visits should be expanded and supported to operate 24/7 for the elderly with mobility difficulties.

Table 12
Analysis Results of Ways to Resolve Overdependence

Elements	Mean	SD	F	P
Alternative Leisure Activities	42.48	4.59	80.52***	0.000
Advice and Help from Family and Friends	25.73	2.40		
Individual's Willingness to Regulate Use'	20.68	2.18		
Technical Support such as Usage Control Apps	11.13	1.35		

*** $p < 0.001$

Table 12 shows the results of examining the obstacles to resolving the elderly smartphone overdependence. Looking at the obstacles to the elderly's smartphone overdependence, based on average 41.90 was 'fun with smartphones', followed by 35.98 for 'habitual smartphone use', 12.35 for 'inevitable use of learning or work', and 9.98 for 'communication with friends and acquaintances' (F=13.40, $p < 0.001$). Therefore, we can conclude that the biggest obstacle to the elderly smartphone overdependence is 'the fun with smartphones'.

Table 13
Analysis Results of Obstacles to Overdependence

Elements	Mean	SD	F	P
Fun with Smartphones'	41.90	10.27	13.40***	0.000
Habitual Smartphone Use'	35.98	12.79		
Inevitable Use of Learning or Work'	12.35	5.84		
Communication with Friends and Acquaintances'	9.98	3.46		

*** $p < 0.001$

DISCUSSION

In this chapter, various interpretations of the status and analysis results of the smartphone overdependence on

CONCLUSIONS AND FURTHER RESEARCH WORKS

The development of information technology in the current society provides many benefits to modern people, and due to these benefits, the lives of modern people are becoming richer day by day. However, information technology, which provides us with many benefits, is benefiting us, like both sides of a coin, while causing various side effects.

The side effects of information technology are more diverse and seriously threaten our lives as the development and use of information technology increases. Representative side effects are various, such as personal information infringement, copyright violations, overdependence on the Internet and smartphones, and hacking. Failure to properly cope with these side effects can cause serious losses not only to individuals but also to our society.

With the rapid spread of smartphones since the mid-2000s, smartphones have now become a necessity for modern people, and their use in everyday life is rapidly increasing. The use of smartphones is causing us the problem of overdependence on smartphones. Smartphones are becoming a necessity for both men and women of all ages, and the spread to the elderly is increasing. The rapid spread and use of smartphones to the elderly has caused the problem of overdependence on smartphones.

This paper deals with the problem of smartphone overdependence among the elderly in Korea. Specifically, the status of overdependence on smartphones of the elderly was introduced and the causes of overdependence were analysed. The analysis results are as follows. Among the three factors of overdependence on smartphones, "self-control failure" is the highest, followed by "salience" and "serious consequence." In addition, there is a high awareness that the solving subject of smartphone overdependence is an individual, and the main cause of overdependence is the lack of alternative leisure activities other than smartphones. In the future, the elderly should be encouraged to enjoy leisure activities other than smartphones in their spare time, and it is also necessary to develop their control over smartphone use.

The future research tasks of this study are as follows. First, various demographic and sociological factors are considered to analyse the causes of smartphone overdependence. In other words, the causes of overdependence are analysed more accurately and in detail in consideration of various factors such as economic level, family relations, and residential area.

Second, it is to propose educational plans in more detail to resolve the overdependence on smartphones. Educational measures should be developed focusing on the prevention of smartphone overdependence above all else.

REFERENCES

- [1] 2021 Smartphone Overdependence Survey Report https://www.nia.or.kr/site/nia_kor/ex/bbs/View.do?cbIdx=65914&bcIdx=24288&parentSeq=24288 (accessed on July 19 2022)
- [2] What Does Internet Addiction Mean? What is Internet Addiction? - Definition from Techopedia (accessed on July 19 2022)
- [3] What Is Internet Addiction? <https://thriveworks.com/blog/internet-addiction/> (accessed on July 19 2022)
- [4] Internet addiction <https://www.oxfordclinicalpsych.com/view/10.1093/med-psych/9780199928163.001.0001/med-9780199928163-chapter-28> (accessed on July 19 2022)
- [5] Smartphone Addiction <https://www.techtarget.com/whatis/definition/smartphone-addiction-cell-phone-addiction> (accessed on July 19 2022)
- [6] What is smartphone addiction? <https://www.helpguide.org/articles/addictions/smartphone-addiction.htm> (accessed on July 19 2022)
- [7] Yang, S.M., Lim, J.S. "Factors Affecting on the Tendency of the Elderly's Smartphone Addiction: Exploratory research based on a cognitive-behavioral model", *Journal of Public Policy Studies*, Vol. 36, No. 1, 2019, pp. 207-230, <http://dx.doi.org/10.33471/ILA.36.1.9>
- [8] Bae, S.M., Koh, Y.S. "A Exploratory Study for Influential Factors of Smartphone Over-dependence in Elder and Older Group", *Journal of Digital Convergence*, Vol. 15, No. 7, 2017, pp. 111-121, <https://doi.org/10.14400/JDC.2017.15.7.111>
- [9] 2018 Smartphone Overdependence Survey Report https://www.nia.or.kr/site/nia_kor/ex/bbs/View.do?cbIdx=65914&bcIdx=20876&parentSeq=20876 (accessed on July 20 2022)
- [10] 2019 Smartphone Overdependence Survey Report https://www.nia.or.kr/site/nia_kor/ex/bbs/View.do?cbIdx=65914&bcIdx=21939&parentSeq=21939 (accessed on July 20 2022)
2020 Smartphone Overdependence Survey Report https://www.nia.or.kr/site/nia_kor/ex/bbs/View.do?cbIdx=65914&bcIdx=23109&parentSeq=23109 (accessed on July 20 2022)