

A Study on the Smartphone Overdependence of Children from a Demographic and Sociological Perspective

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Abstract: In the modern knowledge and information society, the development of various information and communication technologies and mobile technologies has provided various abundances in our lives. In particular, the rapid spread of smartphones has provided various conveniences in our lives. However, smartphones are giving us convenience and causing various dysfunctions. The typical dysfunction is smartphone overdependence. In particular, for children with weak control, smartphone overdependence is causing various physical, social, and academic problems. In this study, the problem of smartphone overdependence of Korean children was analyzed from a demographic and sociological perspective. Specifically, the most important cause among the three factors of smartphone overdependence was identified, and the analysis was performed using national statistics of smartphone overdependence for the last 4 years by gender, age group, and parental income style. As a result of the analysis, among the three factors of smartphone overdependence, that is, self-control failure, salience, and serious consequences, the salience was the largest, and male students were more dependent on smartphones than female students, and the older the age, the more dependent on smartphones. However, there was no significant difference by type of income for parents. The results of this study are expected to be widely used in preventing and healing measures for smartphone overdependence of Korean children.

Keywords: smartphone overdependence; Korean children; information and communication technology; smart technology

1. Introduction

With the development of the modern information society, modern people are receiving various benefits. In particular, with the recent development of smart technology, the spread of smartphones increases, and as smartphones become a necessity for individuals, our lives are becoming richer. Currently, smartphones are increasingly used as a tool for social communication as well as personal problem-solving tool in the lives of modern people.

However, in addition to the benefits that smartphones give us, various side effects are also occurring. Among these, the representative side effect is the smartphone overdependence. The smartphone overdependence is causing a variety of physical and mental harm to users [1,2,3,4]. In addition, the problem of smartphone overdependence is not a problem for a specific class in our society, but a problem for all classes. In particular, according to recent statistics, children's smartphone overdependence is the second most serious after adolescents among the four age groups in Korea: children, adolescents, adults, and the elderly[4].

Children's smartphone overdependence is closely related to parents, and prevention and healing also require cooperation and help with parents. In particular, children are a period of very physical and emotional fluidity, so various efforts must be made socially and nationally to prevent and heal the problem of overdependence. From this point of view, it is necessary to pay attention to the smartphone overdependence on infants and toddlers.

In this study, we investigate and analyzes the current status of smartphone overdependence of children in Korea. In particular, from the demographic and sociological perspective of children, the current status is investigated and analyzed from the following four perspectives. First, among the three factors of smartphone overdependence, the ranking of each factor is investigated. Second, we investigate the current status of smartphone overdependence by gender. Third, we compare and analyze the current status of smartphone overdependence by age. Finally, we investigate the current status of smartphone overdependence by the type of income of parents of children.

The overall composition of this paper is as follows. First, Chapter 2 introduces the definition of smartphone overdependence and the method of measuring overdependence on children's smartphone overdependence, and also introduces related studies on the smartphone overdependence on Korean children. Chapter 3 introduces the recent status of smartphone overdependence of Korean children, and also presents a statistical analysis of the smartphone overdependence of children. Chapter 4 describes various discussions based on the analysis results of Chapter 3, and Chapter 5 describes future research tasks along with conclusions.

2. Related Research

This chapter introduces previous studies on the smartphone overdependence of Korean children as follows.

2.1. Definition and Measurement of Smartphone Overdependence

Since 2001, the Korea Information Society Agency(<http://www.nia.or.kr>) has investigated the current status of dependence on the Internet and smartphones and promulgated statistical results. From 2001 to 2016, the current status of Internet addiction was investigated and published, and after 2017, the current status of smartphone overdependence has been investigated and promulgated.

According to the Korea Intelligence Information Agency, the definition of smartphone overdependence is as follows. In other words, smartphone overdependence means "a state in which the salience of smartphones increases due to excessive use of smartphones and the control of use decreases, thereby experiencing problematic results." In addition, smartphone overdependence consists of three sub-factors: 'self-control failure', 'salience', and 'serious consequences'. The explanation for each factor is as follows.

-Self-control failure

Lack of autonomous control over smartphone use compared to the user's subjective goals

-Salience

The life pattern of using a smartphone in an individual's life is more prominent and the most important activity than other forms

-Serious Consequences

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

On the other hand, the scale of smartphone overdependence of Korean children consists of 9 questions as follows.

Self-control failure

- ①Follow parents' guidance on smartphone use well
- ②They finish using the smartphone well in time for the set usage time
- ③They don't have to take away your smartphone, but they quit it yourself

Salience

- ④They always want to play with smartphone
- ⑤They like to play with my smartphone more than anything else
- ⑥They try to use smartphone from time to time every day

Serious Consequences

- ⑦I often fight with my child because of the use of smartphones
- ⑧Because they use smartphone, they can't play or learn anything else
- ⑨The use of smartphones causes poor vision and posture

After calculating the total score for the scale, the level of dependence on the smartphone is classified into three types: high-risk group, potential risk group, and general user group. Among them, the high-risk group and the potential risk group are classified into the smartphone overdependence risk group.

The description of the three levels of overdependence is as follows.

- a high-risk group

A state in which interpersonal conflicts, daily role problems, health problems, etc. have occurred seriously due to the loss of control over the use of smartphones

-Potential risk group

A stage in which interpersonal conflicts or problems with daily roles begin to occur while the control over smartphone use is weakened

- General user group

A form of using a smartphone in a controlled form

2.2. Related Works

In the study of Kim and Yun, the mediating effect of mothers' smartphone addiction was analyzed on the relationship between mothers' parenting stress and infants' smartphone addiction [5]. This study compared and analyzed the complete and partial mediating models using structural equations. As a result of the study,

first, mothers' smartphone addiction played a partial mediating role in the relationship between mothers' parenting stress and infants' smartphone addiction. In other words, mothers' parenting stress and mothers' smartphone addiction were important variables in infants' smartphone addiction.

Ma and Jeong's study examined the relationship between mothers' smartphone addiction tendency, mothers' participation in play, and infants' immersion in smart devices [6]. The main research results are as follows. First, there was a statistically significant difference in the infant's immersion in smart devices depending on the frequency of the mother's use of media, the method of restricting the child's use of digital media, and whether the mother uses digital media with her child. Second, the higher the mother's smartphone addiction tendency is, the higher the infant's level of immersion in smart devices, and the mother's participation in play partially mediated the relationship between the mother's smartphone addiction tendency and the infant's smart device immersion tendency. This study suggested an alternative that lowering the mother's smart device addiction tendency can lower the infant's smart device immersion tendency.

Park's research analyzed the trends of research related to infant smartphone addiction published in Korea and suggested the direction of future research [7]. To this end, a total of 160 papers published in Korea from 2012 to 2021 were analyzed. As a result of the study, first, research on smartphone addiction for infants conducted in Korea showed a rapid increase from 2014, starting with one in 2012. Second, by research method, regression analysis was the main quantitative research. Third, it was confirmed that the cause of smartphone addiction is children's personal, psychological, and emotional factors, such as self-control and negative emotions, and parents' psychological and emotional factors are important variables that influence them. The results of smartphone addiction were personal-related factors, and externalization and problem behavior were the most common.

Jung and Choi's study investigated the effects of mothers' parenting attitudes and smartphone addiction tendencies on infants' smartphone overdependence [8]. As a result of the study, first, there were statistically significant differences in parenting attitude, smartphone addiction tendency, and smartphone dependence according to the infant's age, mother's educational background, occupation, and average monthly income among the general characteristics of the study. Second, looking at the relationship between parenting attitude, smartphone addiction tendency, and smartphone dependence, affectionate and autonomous attitudes among parenting attitudes were negatively correlated with smartphone dependence, and there was a significant positive correlation with rejection attitude. In addition, among smartphone addiction tendencies, daily life disorders, virtual world orientation, and withdrawal were positively correlated with smartphone dependence, and negatively correlated with introspection. Smartphone dependence was positively correlated with salience and problem, and it was negatively correlated with the impulse, withdrawal, and tolerance. Third, the variable that has the greatest influence on infants' smartphone overdependence was the daily life disorder among their mothers' smartphone addiction tendencies.

Meanwhile, Choi and Kim's research recognized the increasing social problems of smartphone-addicted infants and developed a smartphone addiction prevention education program for parents and infants to verify their effectiveness [9]. As a result of the study, first, in the case of the experimental group who received smartphone addiction prevention education in the overall score of smartphone addiction, anxiety, and pathological commitment of parents, the score was statistically significantly lower in the post-test than in the pre-test. Second, in the

case of the overall score and interpersonal conflict in children's smartphone addiction, the experimental group in which parents and children received smartphone education at the same time and the comparative group in which only children received smartphone education were statistically significantly lower in the post-test than in the pre-test. The results of this study suggest that the smartphone addiction prevention education program has a positive effect on smartphone addiction of parents and infants.

Choi and Ha's study verified the sequential mediating effect of mother's smartphone addiction tendency and smart media intervention in the effect of mother's depressive symptoms on infants' dependence on smart media [10]. The results of the study are as follows. First, as a result of verifying the sequential mediating effect of mother's smartphone addiction tendency and smart media intervention in the effect of mother's depressive symptoms on infants' smart media dependence, the mother's smartphone addiction tendency, the total score of smart media intervention, and the sequential mediating effect of limited intervention were significant. Second, the mother's smartphone addiction tendency and the sequential mediating effect of active intervention were not significant in the influence of mother depressive symptoms on infants' dependence on smart media. The results of this study imply that the mother's severe smartphone addiction tendency and low restrictive intervention can be a risk factor for infants' dependence on smart media through mother's smartphone addiction tendency and smart media intervention.

3. The Status and Analysis of Smartphone Overdependence

3.1. The Status of Smartphone Overdependence

The current status of children's smartphone overdependence for the past four years from 2021 to 2024 by the Korea Information Society Agency is as follows. The statistics below all show the current status of smartphone overdependence risk groups (high-risk and potential risk groups for smartphones).

First, Table 1 shows the status of smartphone overdependence by three factors of smartphone dependence.

Table 1. The Status of Smartphone Overdependence by 3 Sub-factors

Year	Self-control failure	Salience	Serious Consequences
2021	3.05	3.14	2.74
2022	2.71	3.06	2.75
2023	2.77	3.18	2.71
2024	2.78	3.10	2.65

(Unit: 4-point scale)

Table 2 shows the status of smartphone overdependence by gender.

Table 2. The Status of Smartphone Overdependence by Gender

Year	Boys	Girls
2021	32.0	24.5
2022	29.3	24.0
2023	25.2	24.7
2024	28.3	23.4

(Unit: %)

Table 3 shows the status of smartphone overdependence by age.

Table 3. The Status of Smartphone Overdependence by Age

Year	3~5 Years Old	6~9 Years Old
2021	24.6	30.3
2022	25.6	27.8
2023	24.8	25.1
2024	23.7	27.2

(Unit: %)

Finally, Table 4 shows the status of smartphone overdependence by parents' income type.

Table 4. The Status of Smartphone Overdependence by Parents' Income Type

Year	Double Income	Single Income
2021	31.8	24.6
2022	30.3	23.4
2023	23.3	27.3
2024	24.9	27.7

(Unit: %)

Based on the above statistical status, the following four hypotheses are established in this study.

Hypothesis 1) The order of great influence on smartphone overdependence by 3 sub-factor is salience, self-control failure, and serious consequences.

Hypothesis 2) Boys are more dependent on smartphones than girls.

Hypothesis 3) The high age (6-9 years old) has a higher rate of oversmartphone overdependence than the low age (3-5 years old).

Hypothesis 4) There is no difference in the rate of overdependence on the smartphone between double-income and single-income families.

3.2. Smartphone Overdependence Analysis

Statistical data were analyzed using the SPSS (Statistical Package for the Social Science) WIN 27.0 program. One-way ANOVA and t-test were performed as analysis techniques. In addition, Scheffe verification was performed as a post-test.

The analysis results are as follows.

First, the results of analyzing each of the 3 sub-factors of children's smartphone overdependence are shown in Table 5.

Table 5. Analysis Results by Subfactors of Smartphone Overdependence

Subfactor	Mean	Standard Deviation	F	p	Scheffe
Self-control Failure ^a	2.83	0.15	19.16***	0.001	b>a,c
Salience	3.12	0.05			
Serious Consequences	2.71	0.04			

** p<0.01

As a result of analyzing children's smartphone overdependence by 3 sub-factors, the average of salience was the highest at 3.12, followed by self-control failure of 2.83 and serious consequences of 2.71, showing a statistically significant difference ($F=19.61$, $p<0.01$). In addition, as a result of post-verification, there were significant differences in self-control failure, salience, and serious consequences. Therefore, it can be seen that salience is the highest among the factors of children's smartphone overdependence.

In addition, the results of examining smartphone overdependence according to the gender of children are shown in Table 6.

Table 6. Analysis Results of Smartphone Overdependence by Gender

Gender	Mean	Standard Deviation	F	p
Boys	28.70	2.81	3.17*	0.045
Girls	24.15	0.58		

* p<0.05

By gender, the average of boys was 28.70, higher than the average of 24.25 for girls, and there was also a statistically significant difference ($t=3.17$, $p<0.05$). Therefore, it can be seen that boys are more dependent on smartphones than girls.

Table 7 shows the results of analyzing smartphone overdependence according to the age of children.

Table 7. Analysis Results of Smartphone Overdependence by Age

Age	Mean	Standard Deviation	F	p
3~5	24.68	0.78	-2.57*	0.042
6~9	27.60	2.14		

*** p<0.001

By age, the average of 6-9 years old was 27.60, higher than the average of 24.68 for 3-5 years old, and there was also a statistically significant difference ($t=-2.57$, $p<0.05$). Therefore, it can be seen that children aged 6 to 9 are more dependent on smartphones than children aged 3 to 5.

Table 8 shows the results of examining smartphone overdependence of children according to the type of parents' income.

Table 8. Analysis Results of Smartphone Overdependence by Parents' Income Type

Income Type	Mean	Standard Deviation	F	p
Double Income	27.58	4.11		
Single Income	25.75	2.09	0.79	0.459

*** p<0.001

By type of parents' income, the average of children with double-income parents was 27.58, higher than the average of 25.75 for children with single-income parent, but there was no statistically significant difference. Therefore, it can be seen that children are not dependent on smartphones according to their parents' income type.

4. Discussions

This chapter describes the interpretation and discussion of the analysis results in Chapter 3.

First, as a result of analyzing the cause of smartphone overdependence of Korean children from the results of Table 5, among the three factors of smartphone overdependence: self-control failure, salience, and serious consequences, the salience is the largest, followed by self-control failure and serious consequences. The analysis result shows that the use of smartphones is the most remarkable and important activity in the life of children. It can be seen that parents often use smartphones as children's play tools rather than children's own will. Therefore, parents need to develop activities that can replace smartphone use as children's play tools or learning tools.

In addition, as shown in the results of Table 6, it can be seen that boys' smartphone overdependence is higher than that of girls. This can be interpreted as because boys were more active and curious in childhood, so they were more interested in smartphones than girls and preferred them as their own rides, and parents also allowed boys to use smartphones more as a play tool. Therefore, parents need to reduce smartphone usage time for boys more.

In addition, as shown in Table 7, it can be seen that smartphone overdependence for older ages (6-9 years old) is more serious than for younger ages (3-5 years old) in the age group of children. This can be interpreted as becoming more physically and mentally active as the age increases, and the use of smartphones for one's own play and learning as well as leisure activities increases. Therefore, it is necessary to reduce the use of smartphones for older children at home and at school.

On the other hand, as the results of Table 8 show, there is no difference by type of income of parents. In other words, there was no difference in the smartphone overdependence of children from double-income families or single-income families. It can be seen that interest in children is more important than the absolute time of parents'

child-rearing. Therefore, parents should pay more attention to how they spend time with their children than they do with their children.

5. Conclusions and Further Research Works

Smartphones provide various benefits and richness of life to modern people, but they cause various side effects. The representative side effect is the smartphone overdependence, and smartphone overdependence is no longer a problem for a specific class, but a problem for all classes. This is because the spread of smartphones is increasing day by day and the dependence of our lives on smartphones is increasing day by day. Currently, children's smartphone overdependence is second only to the youth [1]. Therefore, preventing smartphone overdependence on children and providing appropriate healing measures will be a good means for them to control smartphone use as they grow.

In this study, the current status of smartphone overdependence of children in Korea was analyzed from a demographic and social perspective. To this end, first, the influence of each factor was analyzed among the three factors of smartphone overdependence. Second, we analyzed the smartphone overdependence by gender of children. Third, we analyzed the smartphone overdependence by age of children, and finally, we analyzed the smartphone overdependence by parents' income types. As a result of the analysis, first, among the three factors of smartphone overdependence, the influence was significant in the order of salience, self-control failure, and serious consequences. Second, it was analyzed that it was statistically significant that boys were more dependent on smartphones than girls. Third, it was analyzed statistically significantly that the older age was more dependent on smartphones than the younger age. Finally, there was no statistically significant difference by type of income of parents.

The future research works of this study are as follows. First, it is to understand the smartphone overdependence in a relationship with their parents. In other words, previous studies have suggested that children's smartphone overdependence is closely related to their home environment. Therefore, to solve the problem of smartphone overdependence on children, a solution must be prepared in an interrelationship with their parents. Second, it is to identify various factors that affect the smartphone overdependence of children. In other words, it is necessary to analyze the problem of smartphone overdependence on children from various perspectives, such as the number of family members, the income level and educational level of parents, in addition to gender, age, and income type of parents.

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