

Subjectivity Study On Smartphone Addiction In Nursing Students

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Abstract

The purpose of this study is to identify the subjectivity of smartphone addiction recognized by nursing students, describe the characteristics of each type, and to identify the typology of smartphone addiction, and Q methodology was applied. 20 students in the department of nursing at A University were asked to classify 46 statements on smartphone addiction. Collected data were analyzed using the QUANL PC Program. In this study, the perception of smartphone addiction by nursing students were classified into 3 factors. Subjectivity types for smartphone addiction are 'cause oriented type', 'result oriented type', and 'physical harm concern type'. This study provided basic data on education related to nurses as female workers, and nursing of female patients in maternity parenting cycle.

Keywords: Cell Phone, Nurses, Students, Perception, Preventive Health Services

1. INTRODUCTION

1.1. BACKGROUND

The definition of smartphone addiction is not clear, but it is defined that the interest outside the smartphone decreases and the usage time of the smartphone increases, so that if the smartphone is not in the hands, withdrawal phenomenon occurs and people suffer insecurity, restlessness and are unable to concentrate on other things[1-2]. Appropriate use of smartphones allows for more free communication, easier access and sharing of information, and adds convenience and interest to our lives. However, the excessive use of smartphones is causing people to rely on or obsess with their smartphones, and dysfunction of smartphone is also created such as where people have to increase their smartphone usage time, or they feel uneasy when they don't use the smartphone[3].

While there is still a lack of an accurate understanding of the process and the causal factors of smartphone addiction, some researchers described the cause of smartphone addiction as negative emotions and interpersonal difficulties[4]. In addition, it is reported that smartphone addiction phenomenon causes problems in mental health,

interpersonal relationships and school life[5], and psychological and psychological factors are reported to have a significant effect on the addiction phenomenon[6]. This also causes physical problems, especially musculoskeletal disorders such as myofascial pain syndrome, epicondylitis and carpal tunnel syndrome, and while it is conveniently used in daily life, various problems are on the rise[7].

People with smartphone addiction have a harder time controlling their own feelings and have an impulsive tendency[8]. Positive sentiment is the ability to understand and control others as well as oneself, which is very important for nurses who care for their communication with their patients and their mental, physical and psychological health. People with smartphone addiction tend to weaken their communication ability because they only communicate with each other through smartphones, not through direct conversations[8]. Previous studies related to smartphone addiction of nursing students include emotional intelligence[9, 10], communication ability[11, 12], and although research on the relationship between emotional intelligence and communication ability is increasing, few studies have examined the relationship between smartphone addiction, self-

efficacy, emotional intelligence, and communication skills in nursing students.

Nursing is a study based on the understanding of emotions of oneself and others[13], and it is important for nursing students, who are prospective nurses, to understand their own emotions as well as those around them accurately with positive emotional dispositions and to understand their ability to adapt to their situation[14].

Nurses are not only the largest part of the health care scene, but also the key people with the most contact with the subjects, who must provide them with safe and high quality care within a limited time within a rapidly changing healthcare environment[15]. The subjectivity of perception in dealing with subjects in the field of nursing affects the nursing they perform. Therefore, it is important to understand the perceptions of nurses and prospective nurses.

Therefore, this study will explore and typify the awareness of smartphone addiction in nursing students who are prospective nurses. By exploring the characteristics and differences by type of recognition for smartphone addiction, the study attempts to provide basic data necessary to educate nursing students and nurses exposed to smartphone addiction risk.

1.2. PURPOSE

The purpose of this study is to investigate the subjective perception type and characteristics of smartphone addiction of nursing students by applying Q-method, and it is intended to provide basic data in presenting strategies for educating nursing students and nurses at risk of smartphone addiction. Specific research objectives for this are as follows.

- 1) Typify subjective perception of smartphone addiction in nursing students.
- 2) Analyze and describe the characteristics of types of perceptions of smartphone addiction in nursing students.

2. MATERIALS AND MEHTODS

2.1. STUDY DESIGN

In order to achieve the purpose of the study, after reviewing the literature, media materials and previous studies on smartphone addiction, the study aimed to find subjectivity exploring the types of subjective perception of smartphone addiction in nursing students who have experienced smartphone addiction.

2.2. Q-POPULATION AND Q-SAMPLING SELECTION

The Q population was drawn through domestic and international literature reviews, open questionnaires, and in-depth interviews to extract comprehensive statements on the effects of smartphone addiction, focusing on current nursing students. Through this process, around 200 Q populations were derived from 3 domains, and in addition, a total of 100 Q populations were extracted by integrating the literatures collected through relevant domestic and international literature studies. After reviewing and revising the extracted Q sample of this study, the final 46 samples with high discrimination were selected.

2.3. P-SAMPLE SELECTION METHOD

Q-methodology is a qualitative research that emphasizes individual inertia by focusing on differences in meaning or importance within an individual, not on individual differences and it is based on the small sample doctrine that the larger the P sample is, the more people are biased in one factor and the characteristics are not clearly revealed[16]. The P sample of this study selected were total of 20 people who were fully explained the purpose of the study who were students in a nursing department and agreed to participate in the study through voluntary consent.

2.4. Q-CLASSIFICATION AND DATA ANALYSIS METHODS

The Q classification process is a process by which individuals selected as P-samples make a voluntary definition of smartphone addiction by classifying the Q-sample statements into a forced normal distribution method. The study collected data using Q card for 20 students in the department of nursing at OO University. The length of time for each subject to complete the Q-classification was

mostly 30-45 minutes. The distribution of Q samples categorized the statements selected by the study subjects as Q samples from strong positive to strong negative according to the importance of their opinion. Statement on smartphone addiction (Q1) was classified on a 12-point scale. Subsequently, further interviews were conducted with the subject regarding the statements classified at both ends. Q factor analysis was based on Principle Component Factor Analysis (varimax). The classification of the type was selected in consideration of the result calculated by inputting the number of factors based on Eigen value 1.0 or higher and the total explanatory variable. The collected data were scored by converting points assigned to each of 1~12 points, centered on the cards forcibly distributed in the Q sample distribution table. The assigned conversion scores were coded in the order of Q sample number and processed by principal factor analysis by QUANL PC Program[17-19].

2.5. ETHICAL CONSIDERATION FOR RESEARCH SUBJECTS

It was explained to the subjects that they can stop at any time during the study, after seeking voluntary consent from the subjects before the study. In order to respect the rights of the subjects and to ensure the privacy and confidentiality of the subjects, all information collected through this study was treated anonymously throughout the data analysis, and it was coded and Q sorted to ensure confidentiality.

To ensure the autonomy of participants, the purpose of the research, the method of research, and the recording of the interview contents were explained first before the meeting. Then, the ethical aspects of the box were considered by obtaining verbal consent, receiving consent, and making compensation commensurate with participation in the research. As a measure not to violate the privacy of participants according to the principle of bad behavior, It was informed that the interview would be used only for research purposes, and personal situations were kept secret while ensuring anonymity. Also, It was informed that the research results would be published and the participants could stop participating in the research anytime they want. In order to avoid revealing the identity of research participant, the computer file was assigned a unique password for the researcher and all

information that could identify the participant was deleted.

3. RESULTS

3.1. STRUCTURE OF Q TYPE

Of the 20 subjects in total, 5 were considered to be factor 1, 8 were factor 2, and 7 were factor 3. People in each factor represent groups that have a similar response to smartphone addiction. Q-factor analysis of subjectivity on smartphone addiction by nursing students using QUANL pc program revealed 3 types.

Participants in this research conveniently were extracted from 20 nursing college students who were found to have experienced more than one clinical practice in the fourth grade of the nursing department in S. The general characteristics of the research subjects are as shown in [Table 1]. The total number of people surveyed totaled 20 with the average age being 22.25 ± 0.85 , and 5.0% for boys and 95.0% for girls. Among them, 90.0 % did not have a religion and 10.0% had a religion, and the number of weeks was 11.25 ± 1.02 weeks.

Table I . General Characteristics

Type	No	Age	Gender	Grade	Religion	Number of Practices(by the week)	FWS*
Type 1	3	24	F	4	No	12	1.2427
	10	22	F	4	No	12	1.6659
	11	22	F	4	No	12	2.7472
	12	22	F	4	No	12	5.2691
	13	22	F	4	No	12	3.6880
Type 2	5	22	F	4	No	12	1.1530
	7	22	F	4	No	12	.7580
	9	22	F	4	No	12	1.1179
	14	22	F	4	No	10	.9411
	15	23	F	4	No	9	.4227
	16	24	M	4	Christian	10	.8653
	17	21	F	4	No	10	.7920
	19	21	F	4	No	11	.7889
Type 3	1	23	F	4	No	12	.3671
	2	22	F	4	No	10	.6182

	4	23	F	4	Christian	12	1.0334
	6	23	F	4	No	10	.5794
	8	22	F	4	No	12	.9071
	18	21	F	4	No	11	.2511
	20	22	F	4	No	12	.3247

*FWS: factor weight score

3.2. TYPE SPECIFIC CHARACTERISTICS IN SMARTPHONE ADDICTION

To analyze by subjectivity of the smartphone addiction of nursing students by type, first, the characteristics of each type were described based on the statements belonging to each type. The Q response of the P sample (study subjects) was divided into upper and lower items, and 3 factors were extracted. In Q methodology, one of each type of person has a high factor weight indicating that he or she is a typical or ideal person representing that type [20, 21].

In order to analyze the characteristics of each type of smartphone addiction, the meanings were interpreted based on the statements with standard score (z-score) of ± 1.00 or more among the classified statements. In this study, there were 5 people in type 1, 8 in type 2, and 7 in type 3 who had factor weight greater than 1.0.

The subjectivity analysis of smartphone addiction using PC QUANL program showed three factors which accounted for 44.76% of the total variance. Factor 1 was 25.20%, factor 2 was 13.37%, and factor 3 was 6.19%. Since factor 1 has 25.20% explanatory power, it is the factor that explains smartphone addiction the most [Table 2].

Table II. Life Eigen Value, Variance, and Cumulative Percentage

Hospitals	Type I	Type II	Type III
Eigen Value	5.0396	2.6746	1.2380
Variance(%)	.2520	.1337	.0619
Cumulative(%)	.2520	.3857	.4476

3.2. ANALYSIS BY TYPE

The subjectivity types for smartphone addiction derived from the type analysis method are as follows.

- Cause Oriented Type: The subjects of type 1 consisted of 5 persons. Statements with strong

positive response in type 1 subjects were, 'I feel a sense of belonging in interpersonal relationship through smartphone SNS.(Z=1.85)', 'Pleasure is met through using a smartphone.(Z=1.73)', and 'Using smartphones became a habit.(Z=1.69)' [Table 3]. In type 1, the subject with the highest factor weight was 12 (5.2691), and the most agreed on statement were, 45 and 44. Statements with strong negative response in type 1 subjects were, 'Smartphone addiction leads to more involvement in antisocial and illegal activities.(Z=-2.05)', 'Smartphone addiction reduces career worries.(Z=-1.88)', and 'Smartphone addiction makes me more satisfied with virtual worlds than with real life.(Z=-1.75)' [Table 3]. In type 1, the subject with the lowest factor weight was 3 (1.2427), and the most disagreed on statements were, 11 and 15. The characteristics of type 1 is to focus on the causes that become smartphone addiction. They think that smartphone addiction occurs because it meets insufficient needs of individuals through smartphone or escape to virtual space, and think removing the cause is a way to prevent smartphone addiction. They believe that smartphone addiction will be inevitable because it can satisfy unmet needs in real human relationships. Therefore, type 1 was named 'cause oriented type'.

- Result Oriented Type: The subjects of type 2 consisted of 8 persons. Statements with strong positive response in type 2 subjects were, 'Using smartphones became a habit.(Z=2.23)', 'Carpal tunnel syndrome occurs due to smartphone addiction.(Z=1.97)', and 'Smartphone addiction causes sleep deprivation.(Z=1.94)' [Table 3]. In type 2, the subject with the highest factor weight was 5 (1.1530), and the most agreed on statement were 46 and 24. Statements with strong negative response in type 2 subjects were, 'Smartphone addiction may lead to involvement in crime.(Z=-2.19)', 'Smartphone addiction reduces career worries.(Z=-1.86)', and 'Smartphone addiction makes me more satisfied with virtual worlds than with real life.(Z=-1.56)' [Table 3]. In type 2, the subject with the lowest factor weight was 15 (0.4227), and the most disagreed on statements were 32 and 15. The characteristics of type 2 is that they focus on the physical, mental and social side effects that can be caused by smartphone addiction. carpal tunnel syndrome, They were concerned about lack of sleep, dry eyes, decreased eyesight, and deterioration of interpersonal belonging. They thought, however, that the drawbacks of

smartphone addiction were not linked to felony level crimes that would cause social strain. Therefore, they said that such side effects can be easily overcome and recovered. Therefore, type 2 was named ‘result oriented type’.

- Physical Harm Concern Type: The subjects of type 3 consisted of 7 persons. Statements with strong positive response in type 3 subjects were, ‘Carpal tunnel syndrome occurs due to smartphone addiction.(Z=2.03)’, ‘Smartphone addiction causes dry eye and decreased vision.(Z=1.80)’, and ‘Due to overuse of smartphones, brain cell damage may occur.(Z=1.37)’ [Table 3]. In type 3, the subject with the highest factor weight was 4 (1.0334), and the most agreed on statement were 24 and 37. Statements with strong negative response in type 3 subjects were, ‘Smartphone addiction reduces career worries.(Z=-2.31)’, ‘Pleasure is met through using a smartphone.(Z=-1.83)’, and ‘I am aware of the smartphone addiction but cannot fix it.(Z=-1.62)’ [Table 3]. In type 3, the subject with the lowest factor weight was 18 (0.2511), and the most disagreed on statements were 15 and 44. The characteristics of type 3 was that they were concerned about the physical side effects that smartphone addiction could bring, and thought that it was difficult to reverse the physical harm that occurred. carpal tunnel syndrome, They believed that it could lead to dry eyes and poor vision, as well as permanent brain cell damage. Furthermore, they judged that smartphone addiction would become more and more serious and that normal life would not be easy. They were concerned that various harms caused by smartphone addiction would make daily life difficult. Therefore, type 3 was named ‘physical harm concern type’.

Table III. Representative items on smartphone addiction and Z-score (N=20)

Representative items of type					
Factor	Type	No	Representative items	Mean(SD)	Z-score
Factor1 (N=5)	Type1	45	I feel a sense of belonging in interpersonal relationship through smartphone SNS.	10.60(2.608)	1.85

Type2	44	Pleasure is met through using a smartphone.	10.60(1.517)	1.73	
	46	Using smartphones became a habit.	10.20(2.490)	1.69	
	43	Smartphone addiction causes decreased interest in daily life.	9.40(2.191)	1.33	
	16	I flee to virtual space to escape from anxiety and dissatisfaction with reality.	9.60(1.673)	1.24	
	11	Smartphone addiction leads to more involvement in antisocial and illegal activities.	1.60(1.342)	- 2.05	
	15	Smartphone addiction reduces career worries.	1.60(1.673)	- 1.88	
	20	Smartphone addiction makes me more satisfied with virtual worlds than with real life.	2.00(0.707)	- 1.75	
Type3	17	I feel withdrawal and dependence while using a smartphone.	2.60(2.074)	- 1.75	
	21	I suffer from obstacles in my daily life due to smartphone addiction.	2.20(0.837)	- 1.67	
	46	Using smartphones became a habit.	10.75(2.435)	2.23	
Factor2 (N=8)	Type3	24	Carpal tunnel syndrome occurs due to smartphone addiction.	9.75(2.550)	1.97

		28	Smartphone addiction causes sleep deprivation.	10.13(0.991)	1.94
		37	Smartphone addiction causes dry eye and decreased vision.	9.75(2.053)	1.75
		45	I feel a sense of belonging in interpersonal relationship through smartphone SNS.	8.63(2.435)	1.18
	Type4	32	Smartphone addiction may lead to involvement in crime.	2.25(1.669)	- 2.19
		15	Smartphone addiction reduces career worries.	3.50(3.546)	- 1.86
		20	Smartphone addiction makes me more satisfied with virtual worlds than with real life.	3.25(1.488)	- 1.56
		11	Smartphone addiction leads to more involvement in antisocial and illegal activities.	3.50(1.414)	- 1.53
		39	People with low self-esteem are easily addicted to smartphones.	4.63(2.504)	- 1.23
		24	Carpal tunnel syndrome occurs due to smartphone addiction.	9.43(2.760)	2.03
	Factor3 (N=7)	Type5	37	Smartphone addiction causes dry eye and decreased vision.	8.86(2.340)

		36	Due to overuse of smartphones, brain cell damage may occur.	8.43(1.988)	1.37
		19	I use SNS rather than smartphone features.	8.57(2.370)	1.36
		6	People who lack social support are more likely to fall for smartphone addiction.	8.57(1.272)	1.17
	Type6	15	Smartphone addiction reduces career worries.	2.43(1.134)	- 2.31
		44	Pleasure is met through using a smartphone.	3.86(2.734)	- 1.83
		34	I am aware of the smartphone addiction but cannot fix it.	4.14(2.193)	- 1.62
		21	I suffer from obstacles in my daily life due to smartphone addiction.	4.43(2.637)	- 1.48
		11	Smartphone addiction leads to more involvement in antisocial and illegal activities.	3.86(2.193)	- 1.38

4. DISCUSSION

As a result of this study, the subjectivity types of smartphone addiction recognized by nursing students were found to be type 1 ‘cause oriented type’, type 2 ‘result oriented type’, and type 3 ‘physical harm concern type’, and the study will discuss the characteristics of each type accordingly.

Type 1 in this study was ‘cause oriented type’. They focus on the cause of the smartphone addiction. They believe that smartphone addiction is refuge due to lack of something or difficulty in life.

College students occupy the largest age group among smartphone users, and most Korean college students possess smartphones. In addition, the smartphone overuse rate of college students is 29%, higher than 27.5% of high school students, and in fact, 73% of college students have some kind of withdrawal symptoms that make them feel anxious or frustrated when they cannot use the smartphone [22], and effective approaches and interventions are needed for healthy smartphone use by college students.

In a study of smartphone overuse factors in college students, some personal factors such as mental health related factors such as stress, depression and anxiety, concentration, impulse, self-control, and self-efficacy were involved in and influenced by smartphone addiction [3,23,24]. In addition, previous studies deal with the effects of psychological characteristics of college students related to interpersonal relationships such as interpersonal anxiety, loneliness, and alienation and the addictive use of smartphones [3,23], and psychological factors, such as stress, have been reported to play a significant role in smartphone addiction.[25].

In the relationship between stress coping style and smartphone addiction, it was reported that college students have more time and physical access to smartphones than in middle and high school periods, so that they can immerse themselves in smartphones in an attempt to avoid stress caused by psychological conflicts and troubles such as career and employment [26]. Also, in terms of development theory, although it is important for college students in early adulthood to develop a good personal relationship with their friends and colleagues[27], in case of difficulties in interpersonal relationships, it was stated that it is highly likely for them use a mobile phone selectively to alleviate loneliness [28].

Type 2 was ‘result oriented type’. Subjects of this type were concerned about side effects in various areas that result from smartphone addiction. However, these subjects did not think that these side effects would make their daily lives impossible and that they would be able to recover if they were removed from the smartphone addiction.

In previous studies on smartphone addiction of college students, smartphone addiction of college students was mainly related to internal factors and

the relationship to such things as stress [29], depression and impulsiveness [30], self-efficacy [31], and self-control [32]. Among them, Y. M. Lee [33] reported that the mobile phone addiction group had the characteristics of trying to fill the loneliness of low personal trust and unstable psychological state with mobile phones and suggested various social support as a way to solve their loneliness. Despite the importance of college students adapting to college life before the start of full scale social life, they are suffering from many adaptation problems such as experiencing wider human relations and gaining autonomy, as well as responsibility in a changed lifestyle [34]. At this time, social support acts as a positive resource from surrounding human relationships, which helps psychological and social problem solving in college students [35]. In a study of nurses in which nursing students will become after graduation [36], social support was also a factor in improving nursing performance. Therefore, nursing students who will be engaged in the health care field can be inferred that they can be helped with the adaptation problem of the university life through social support. Looking at the results above, exploring the smartphone addiction of nursing students and the social support that can have a mediating effect on college adaptation is an important task.

Type 3 was ‘physical harm concern type’. They thought that the physical side effects caused by smartphone addiction could be irreparable and cause serious damage. Therefore, they think that smartphone addiction should be dealt with carefully, prevented, and educated about physical side effects.

There are some differences depending on the individual, but excessive use of smartphones result in physical symptoms such as turtle neck syndrome, carpal tunnel syndrome, eye fatigue, headaches, and mental symptoms such as anxiety, depression, obsessive compulsive disorder, and anthropophobia [37-40] which cause significant obstacles in daily living. Appropriate control and management of smartphone use is required to prevent side effects from overuse of the smartphone.

Excessive use of the smartphone has a negative impact on physical and mental health. Physical symptoms include shoulder and finger pain [41], musculoskeletal symptoms and eye problems such as eye fatigue and dry eyes [36] and mental

problems such as depression and anxiety [42]. In addition, there was a significant correlation between adolescents' mobile phone usage hours, monthly self-reported headaches, dizziness, and sleep problems [43], which indicates that various approaches are needed to prevent smartphone addiction.

This study explored the nursing students' subjective perception of smartphone addiction, and then analyzed it by dividing it into three types. Based on the characteristics of each type, it was divided into 'cause-emphasis type' preferentially considering the causes for smartphone addiction, 'result-emphasis type' considering such minor and recoverable side effects shown after smartphone addiction, and 'physical damage concern type' worrying about unrecoverable physical side effects caused by smartphone addiction. This study on the subjectivity would be used as the basic data for the development of smartphone preventative programs that have recently grabbed attention. Moreover, it would be possible to apply the effective education methods suitable for each type in case when new and experienced nurses provide the education to smartphone addicts in the future.

However, this study just targeted a university and did not consider the factors having effects on the perception of smartphone addiction when selecting the subjects, so that it would be limited to generalize the results of this study. Therefore, the follow-up researches need to additionally verify the types by composing the Q sample with diverse backgrounds[44].

5. CONCLUSION

The study explored subjective perceptions of smartphone addiction of nursing students and through the analyzed subjective data, an attempt was made to apply the Q methodology to prepare the basic data necessary to develop a training program for the prevention of smartphone addiction of nursing students and the management of the subjects of clinical nurses. The result of the study showed 3 types. Types of smartphone addiction recognized by nursing students were 'cause oriented type', 'result oriented type', and 'physical harm concern type'.

This study provided the basic data for developing the prevention and improvement program for smartphone addiction of nursing students by

categorizing the subjectivity of smartphone addiction of nursing students. It could also provide a theoretical framework for new nurses and nurses to clinically developing individualized educational plans for smartphone addiction subjects.

Further research on the development of smartphone addiction intervention program for nursing students will be needed based on this study. In addition, follow-up studies on the subjectivity of smartphone addiction perceived by nursing students are needed, and education program development according to this is required.

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