Development and Evaluation of Smartphone Detox Program for University Students

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ABSTRACT

This study evaluates the effectiveness of smartphone detox program for smartphone addiction among university students. To reduce the rate of smartphone addiction and its negative effects on physical, mental and social wellness, a six-session program was applied to sixteen participants who voluntarily completed the entire program and responded to pre-post survey. Smartphone Addiction Proneness Scale (SAPS) was used for smartphone addiction assessment with Mental Health Scale, Positive Psychological Capital Scale for mental wellness and Self-Management Scale for physical and social wellness. Results received after the program indicated that, smartphone addiction and mental health scores decreased significantly while the average scores of self-management and positive psychological capital increased respectively. Furthermore, the rate of high-risk group decreased, and the participants, affirmed in their self-evaluation report that excessive use of smartphone negatively affects their body, mind and interpersonal relationship. Thus, smartphone detox program is effective in reducing smartphone addiction and improving the students' wellness.

Key words: *Smartphone Addiction, Smartphone Detox, Positive Psychology Interventions, Positive Psychological Capital.*

1. INTRODUCTION

Living in a digital world can be detrimental to health. With the continuous development of numerous digital devices such as digital cameras, portable computers, iPads and smartphones, people are hooked and are becoming dependent on them without being aware of the dark side these devices may bring into peoples' lives. Digital illnesses such as digital dementia, digital addiction, and digital stress are occurring nowadays [1]. Problematic use of mobile phones or excessive use of smartphone is considered as one of the modern behavioral addictions [1], [2]. As smartphone penetration rate has been growing steeply worldwide, smartphone addiction becomes most prevalent among adolescents and is currently observed as becoming "epidemic around the world" and considered as a "growing public health issue that needs special attention" [3]. Smartphone addiction has not been defined in the list of mental disorders in fifth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5) yet but some studies claim that it is akin to internet addiction, which is listed in DSM-5 for further study, since smartphones have internet access and features that are addictive in nature [4], [5]. When the first iPhone was introduced by Apple Company in 2007, cell phones and mobile phones were gradually replaced by smartphones which was used not only as a medium of

communication, but as an "indispensable instrument of an individual's social and work life" [6], [7]. A national survey conducted in 2016 by the [8], revealed that 81.6% of Koreans at age 6 and above owns a smartphone. In a larger survey by the [9] in the same year also manifested that 30.6% of adolescent smartphone users in South Korea were at a risk of dependency, which was 1.9 times higher than the rate among adult users (16.1%) and it was observed that since 2011, this rate increased every year [10].

Despite the advantages of providing convenient communication opportunities and information, smartphone addiction negatively affects the mental, physical and social wellness of a person [3], [11], [12]. For instance, anxiety and stress are among the negative effects of smartphone addiction. Reference [13] claimed that life stresses have big influence on the university students' smartphone addiction. In fact, a study by [14] found out that youths who are addicted to any technological gadgets tend to manifest a higher level of anxiety and stress. With regards to physical aspect, musculoskeletal disorders [15], shoulder pains [16], and neck disabilities [17] are among the major negative impacts of smartphone addiction. Previous studies also claim that prolonged duration of smartphone use is a threat to posture and respiratory function [18], [19]. Smartphone addiction has also negative impact on the interpersonal relationship or social wellness of a person. Reference [20] claimed that smartphone addicts have problems with family and friend's relationships because they tend to "pay more attention to their phones than the people around them." Moreover, [21]-[23] found out that among university students and teenagers, smartphone addiction is correlated with social

phobia or the so-called social anxiety disorder. Thus, these call for the development of an effective intervention for smartphone addiction especially among university students in order to reduce its adverse effects on mental, physical, and social wellness.

There is a variety of interventions suggested to treat smartphone addiction. Others adopt "non-technical interventions, such as digital detoxes and digital interventions, including apps to help people control their smartphone use but none of these has proven to work yet [24]." Nevertheless, [1] thinks that there is a growing interest in digital detox for smartphone use because people suffered severely from the digital illnesses mentioned earlier. Detox is a process of removing toxins and body wastes through fasting. Digital detox is a kind of therapy refraining from the use of any digital devices. It is among the most highly recommended, modern and relatively expensive intervention program to combat digital addiction [25]-[28]. In most cases, during a digital detox, people go to a boot camp for a number of days or weeks where they will be put into a digital diet – no TV, no internet connection, and they will be deprived from using their personal phones. However, its effectiveness brings an issue since digital detox approach is not holistic in nature and it only utilizes the traditional way of solving the problem such as motivational interviews and cognitive behavioral therapies [28]. The problem with this traditional approach of digital detox (abstinence from smartphone use) is the possibility of relapse when people go back to their original world – the digital world where the use of technological gadgets especially smartphone is a necessity. In fact, this deprives the main purpose of digital detox which is not to prohibit the use of digital devices but to live a well-balanced, healthier life while enjoying the benefit of living in a digital world [1], [29]. Thus, there is a need of developing a more holistic approach to digital detox that helps young people recognize the importance of living a balance life despite the disturbances the technology may bring into people's lives.

In relation to the concept of digital detox, smartphone detox can be defined as a way of removing digital toxins from the body through limiting its excessive use in order to avoid its negative effect and that smartphones can be used in a healthy way. Thus, in this study, we developed a modern approach to digital detox by introducing a more holistic intervention program called Smartphone Detox Program with the purpose of reducing the adverse effects of the problematic use of smartphone on mental, physical, and social wellnesses among university students as well as decreasing the severity of smartphone addiction by adopting a healthy well-being. In this intervention program, we don't discourage the use of smartphones but emphasize to the participants the healthy way of using them instead. This intervention program is distinct from the other program in a way that it is a friendlier approach to treat a modern addiction in a more holistic way.

Our program addresses the three most important aspects in a person's well-being – physical, mental, and social wellness. In this study, we use the word "wellness" to indicate emphasis on the three major aspects of a person's "well-being" – mental wellness, physical wellness and social wellness. To address the physical wellness, our intervention program includes some of the important components of a healthy living considered as Adventist lifestyle which include Nutrition, Exercise, Water, Sunlight, Temperance, Air, Rest and Trust [30] as well as the faith-based wellness plan by Adventist Health System which features Choice, Rest, Environment, Activity, Trust, Interpersonal Relationship, Outlook and Nutrition established by Florida Hospital Mission Integration and Culture [31]. As for social wellness, various activities were introduced each session that involved active interaction and participation among the participants for the purpose of promoting socialization which [32] believed that it could help heal the defected social adjustment of an internet addict. For mental wellness, we based our intervention program on the positive psychological capital which is under the paradigm of positive psychology. Positive psychology intervention helps an individual motivate to achieve the goal of improving one's overall health [32] such as strengthening an individual's physical and mental health, and improve social relationships [33], [34]. Psychological capital refers to one's positive psychological resources, which consist of self-efficacy, hope, optimism, and resilience [32]. It has been recognized as an important resource for innovative thinking and behavior derived from positive psychological strengths within the environment [32]. In the same vein, [33] define positive psychological capital as "an individual's positive psychological state of development that is characterized by: (1) Having confidence(self- efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) Making a positive attribution (optimism) about succeeding now and in the future; (3) Persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) When beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success." Reference [34] made an acronym out of these four psychological resources and called it HERO (Hope, Efficacy, Resilience, and Optimism).

Our Smartphone Detox Program was composed of six sessions. During the first session, the whole program was introduced and pretest was administered. In session 2, Optimism, Water and Air were emphasized. During session 3, Resilience, Exercise, Social Phobia and Communication Anxiety were tackled. Choice and Self-control were addressed during session 4. In session 5, Hope, Mindfulness and Rest were the subjects and during session 6, summary of the whole program was presented and feedbacks were gathered and lastly, posttest was administered (see Table 1).

We propose that with this Smartphone Detox Program the severity of smartphone use will be reduced and the mental, physical, and social wellness will be improved. In this regard, four hypotheses are presented:

1. There will be a significant decrease in smartphone addiction scores among students after the smartphone detox program.
2. There will be a significant increase in mental wellness among the students after the smartphone detox program.
3. There will be a significant increase in physical wellness among the students after the smartphone detox program.
4. There will be a significant increase in social wellness among the students after the smartphone detox program.

Table 1. Summary of the Smartphone Detox Program.

Sessions	Outline of Activities
Session 1 Program Introduction	- Self- Introduction, Create a Group - Understanding Smartphone Addiction and Smartphone Detox
Session 2 Optimism	**- Mental Wellness**: Sunglasses of my Heart
	- Physical Wellness: Water, Air
	- Social Wellness: The Power of Praise
Session 3 Resilience	**- Mental Wellness**: "Tang-Tang" Ball Activity
	- Physical Wellness: Hand and Finger Exercises
	- Social Wellness: The Power of Empathy and Listening
Session 4 Self-Efficacy	**- Mental Wellness**: The power of Choice
	- Physical Wellness: The Frontal Lobe of the Brain
	- Social Wellness: Self-Control
Session 5 Hope	**- Mental Wellness**: SMART Aim
	- Physical Wellness: Rest
	- Social Wellness: Together
Session 6 Summary	- My Past, Present, Future - Feedbacks

2. METHODS

2.1 Research Method, Population and Samples

This is a cross-sectional and descriptive research and the study population consisted of undergraduate students in Seoul, Korea. Data were collected from October 27 to November 10, 2017. A total of 19 students (male 7, female 12) who understood the purpose of this study and agreed to participate were examined using self-report questionnaires.

The study population was identified and then people who felt to have symptoms of smartphone addiction were invited to participate in the study via notification on the board. During the first session of the intervention program, pretest was administered to the samples (n=19). They all received the proposed intervention program but for some reasons, only 16 samples made until the last session. Posttest was also administered to the samples then the data were analyzed.

2.2 Instruments

The intervention program conducted a pretest and posttest survey before and after the program. Instruments employed consisted of self-report scales such as Positive Psychological Capital Scale, Mental Health Scale, Self-Management Scale, Smartphone Addiction Proneness Scale and a formulated demographic questionnaire.

2.2.1 Demographic and Smartphone Usage Questionnaire:
This questionnaire includes demographic information such as age, education, gender, as well as smartphone usage which takes approximately 20 minutes to complete for each pretest and posttest. It was distributed to those who agreed to participate. In total, 19 survey questionnaires were distributed to participants. Among the 19 questionnaires, 3 were excluded because of incomplete responses, leaving 16 survey questionnaires for final analysis.

2.2.2 Positive Psychological Capital Scale: We employed the Positive Psychological Capital Scale which was developed in 2004 by [35]. This instrument contains 24 items in 4 subdomains: self-efficacy, hope, resilience, and optimism. Responses are provided using a 5-point Likert scale ranging from 1 (not at all) to 5 (always). Higher scores indicate greater positive psychological capital.

2.2.3 Mental Health Scale: Developed by [36], Mental Health Scale measures with anxiety (8 items), depression (8 items), impulsivity (8 items), and aggression (8 items) related to smartphone addiction for adolescents on the Neo personality assessment system (NEO-PAS). Responses are provided using 4-point Likert scale ranging from 1 (not at all) to 4 (highly).

2.2.4 Self-Management Scale (Physical, Social Wellness):
Self-Management Scale was originally developed by [37] in 2009. This instrument originally consists of 37 items but in this study we employed the 35-item questionnaires developed in 2016 by [38] containing 5 subdomains: Lifestyle Habit Management, Health Management, Interpersonal Relationship Management, Academic Management, and Money Management. Responses are provided using a 5-point Likert scale ranging from 1 (not at all) to 5 (always). Higher scores indicate greater self-management.

2.2.5 Smartphone Addiction Proneness Scale: Smartphone addiction rate was determined using the Korean Smartphone Addiction Proneness Scale developed in 2011 by [39]. It is a 15-item questionnaire consisting of four subdomains: disturbance of adaptive functioning (5 items), virtual life orientation (2 items), withdrawal (4 items), and tolerance (4 items). Each item was scored on a 4-point Likert scale. A higher score represented an increased severity of smartphone addiction proneness.

2.3 Data Analysis

Both qualitative and quantitative data were collected in this study for analysis.

2.3.1 Qualitative Data: Each session we collected the self-evaluation reports among the participants and were used to analyze the effect on the participants' well-being.

2.3.2 Quantitative Data: The data collected from administering questionnaires in the pre-intervention and post-intervention were analyzed using SPSS 23 software. Frequencies, percentages, means, and standard deviations were computed to examine participants' general characteristics, smartphone addiction, psychological capital, self-management, and mental health. In addition, Wilcoxon was performed to examine differences in pretest and posttest because this study does not assume normality in the data because of its small sample size (n=16). Pearson's correlation coefficients were also calculated to explore correlations between the main study variables.

2.4 Reliability Score and Internal Consistency

For internal consistency and reliability scores of this current study, Cronbach's alphas (α) of each scale was measured and results revealed .87 for smartphone addiction proneness scale, .89 for self-management, .88 for mental health, and .87 for positive psychological capital.

3. RESULTS

3.1 Participants' General Characteristics and Smartphone Usage

The demographic characteristics in this study revealed that the participants' mean age was 22.5. No Freshmen (0%) participated in this study but the proportion for Juniors (50%, n = 8) was the highest, followed by the Sophomores (38%, n = 6) and the Seniors (12%, n = 2). The proportion for female participants (63%, n = 10) was higher than the male participants (37%, n = 6). Most of the participants in this study are enrolled in Health and Welfare department (50%, n = 8) followed by Science and Technology (31%, n = 5), Social Science and Humanity (13%, n = 2) and Theology department (6%, n = 1). Moreover, the main functions that the participants use in their smartphones were messenger (56%), internet (25%), games (6%), music (6%), and phone (6%) for calling. Results also showed that the smartphone usage has significantly decreased after the intervention (pretest = 5.31±2.24, posttest =3.81±1.51, z = -2.550, p=.011).

3.2 Participants' Classification

In this study, the participants were classified into three: normal users, potential risk users, and high-risk users, according to the scores they got after answering the Smartphone Addiction Proneness Scale (SAPS) during pretest and posttest. Participants who were classified as normal users are those who got the score of 39, potential risk users are those who got the score of 40-43 and the high risk users are those who got 44 points and above [39]. After the Smartphone Detox Program, the rate of normal smartphone users group before the program was introduced was increased from 62.5% (n=10) to 87.5% (n=14). The potential risk group remained the same after the intervention program (6.3%, n=1) while the high-risk group was decreased from 31.3% (n=5) to 6.3% (n=1) (See Fig. 1).
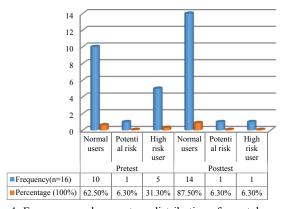

Fig. 1. Frequency and percentage distribution of smartphone normal users, potential risk users and high-risk users

3.3 Smartphone Addiction, Self-Management, Mental-Health and Positive Psychological Capital

According to the results, Smartphone Addiction, and Mental Health scores were significantly decreased while the average scores of Self-Management and Positive Psychological Capital were increased after the Smartphone Detox Program. Smartphone addiction score before the intervention as shown in table 2 was 35.00±8.10 and after the intervention was 30.31±6.94 indicating a significant reduction of Smartphone Addiction rates (z = 2.389, p = .017). Regarding self-management, results show a significant increase after the intervention program (pretest = 3.43±0.49, posttest = 4.63±0.49, z = -2.588, p = .010). For mental wellness, a significant decrease was manifested after the intervention program (pretest = 2.02±0.54, posttest = 1.87±.55, z = -2.202, p = .028). Finally, results revealed that the average scores of positive psychological capital has increased after the intervention program (pretest = 3.73±0.55, posttest = 3.93±0.52, z = -1.455, p=.146).

Table 2. Descriptive summary of the variables

	Variables	Tests	M	SD	Z	p
S U	Total	Pre	5.31	2.24	-2.550[b]	.011[*]
		Post	3.81	1.51		
S A P S	Total	Pre	35.00	8.10	-2.389[b]	.017[*]
		Post	30.31	6.94		
	Disturbance of Adaptive Functioning	Pre	11.62	3.20	-2.072[b]	.038[*]
		Post	10.06	2.64		
	Virtual Life Orientation	Pre	1.59	0.58	-0.144[c]	.886
		Post	1.59	0.52		
	Withdrawal	Pre	10.25	2.62	-2.529[b]	.011[*]
		Post	8.43	2.36		
	Tolerance	Pre	9.93	2.81	-2.011[b]	.044[*]
		Post	8.62	2.50		
S M	Total	Pre	3.43	.49	-2.588[b]	.010[*]
		Post	4.63	.49		
	Lifestyle Habit Management	Pre	3.76	.61	-1.435[b]	.151
		Post	3.88	.46		
	Health management	Pre	3.38	.69	-1.607[b]	.108
		Post	3.59	.62		
	Academic Management	Pre	3.37	.55	-1.295[b]	.195
		Post	3.56	.82		
	Interpersonal Relationship Management	Pre	3.74	.89	-0.031[b]	.975
		Post	3.81	.64		
	Money Management	Pre	2.70	.98	-2.766[b]	.006[*]
		Post	3.23	.90		
MH	Total	Pre	2.02	.54	-2.202[b]	.028[*]
		Post	1.87	.55		
	Anxiety	Pre	2.44	.73	-2.143[c]	.032[*]
		Post	2.15	.74		
	Depression	Pre	1.78	.49	-2.490[c]	.013[*]
		Post	1.60	.49		
	Aggression	Pre	2.10	.57	-1.396[c]	.163
		Post	2.01	.71		
	Impulsivity	Pre	1.78	.65	-.523[c]	.601
		Post	1.74	.67		
P P	Total	Pre	3.73	.55	-1.455[c]	.146
		Post	3.93	.52		
	Self-efficacy	Pre	3.82	.56	-1.242[b]	.214

C		Post	3.93	.49	
	Hope	Pre	3.78	.88	-1.931^b	.054
		Post	4.13	.76		
	Optimism	Pre	3.66	.83	-0.458^c	.647
		Post	3.68	.53		
	Resilience	Pre	3.60	.77	-1.104^b	.270
		Post	3.84	.76		

* *p<0.05, **p<0.01, ***p<0.001
*Smartphone Addiction Proneness Scale (SAPS)
*Self- Management (SM) *Mental Health (MH)
*Positive Psychological Capital (PPC)

3.4 Relationship between Smartphone Addiction, Self-Management, Mental-Health, and Positive Psychological Capital

This study also examines the relationship between the main variables. The results of Pearson Correlation analysis as shown in Table 3. manifested that smartphone addiction was significantly correlated with mental health ($r = .436$; $p < .05$) and self-management ($r = -.607$; $p < .01$) but negatively correlated with Positive Psychological Capital ($r = -0.33$; $p > .05$). Mental health was also found to be significantly correlated with self-management ($r = -0.572$; $p < .01$) and Positive Psychological Capital ($r = -0.457$; $p < .01$). Lastly, self-management was significantly correlated with smartphone Positive Psychological Capital ($r = -0.489$; $p < .01$).

Table 3. Summary of Pearson Correlation Analysis.

	SAPS	MH	SM	PPC
SAPS	-			
MH	.436*	-		
SM	-.607**	-.572**	-	
PPC	-0.33	-.457**	-.489**	-

* *p<0.05, **p<0.01, ***p<0.001

3.5 Self-evaluation Report

After the self-evaluation reports were collected, the data was analyzed accordingly. The following statements related to physical, mental, and social wellnesses are some of the reports given by the selected participants:

3.5.1 Physical Wellness:

▶ *I learned that hand and finger exercises can be effective way of avoiding physical injuries for modern people who frequently use smartphones.*

▶ *I found that if the function of the frontal lobe is weakened, people become sluggish and their rational judgment is affected. I realized the need to improve my lifestyle to activate frontal functions.*

▶ *I thought using a smartphone was a way of taking a break, but I learned that I have to turn off my smartphone to make my health and my brain feel more relax and comfortable.*

3.5.2 Mental Wellness:

▶ *I learned that resilience is a force that helps a person recover quickly from a collapsing experience. I think I should try to cultivate a positive mind and a sound interpersonal ability to develop resilience.*

▶ *I definitely need to use smartphones. However, I need to practice the proper use of smartphone in a positive way.*

3.5.3 Social Wellness:

▶ *While talking to other people, I look at my smartphone instead of listening attentively. I deeply understood that when I talk to others, I need to listen carefully in order to practice sympathy.*

▶ *In order to escape from being addicted to smartphone, I learned the importance of increasing communication ability and being an activity-oriented person.*

3.6 Feedbacks (Past, Present and Future)

During the last session, we concluded with an activity called "My past, present and future with my smartphone" (see Tab. 4). As a result, students have acknowledged that they have not been conscious of their smartphone usage and that smartphones were more important than friends, school, and family in the past. They also admitted during the detox program that smartphone use is a necessity in life but they need to be mindful on how to use it in a proper way. In addition, students reported that they were trying to keep their smartphones away far from them especially when they learned that using smartphones is not only a contributing factor to physical stress but also to mental stress. They confirmed that in the future, they won't be obsessed with smartphone use so that it can be used as effective tools in life.

Consequently, even while the program was in progress, the use of smartphones has been decreased, and a healthy body, positive spirit, and dynamic interpersonal relationships have been experienced. It was confirmed that smartphones can be used in a healthy way.

Table 4. Past, Present and Future with Smartphone

Past	▶ *I used my smartphone 8 hours a day and always had a smartphone with me.* ▶ *I felt very nervous when I couldn't access my phone. Even when I stayed home, I used my smartphone all day.* ▶ *Before participating in this program, I used my smartphone for about 4 hours a day. I spent every break time with my smartphone.* ▶ *I used too much time on smartphone before sleeping and had a severe sleep disorder.*
Present	▶ *I spend lesser time using my smartphones than in the past. I only use my smartphone for the purpose of studying and learning some new information.* ▶ *I can focus on something other than smartphone. I am learning how to use smartphone with proper planning.* ▶ *In my leisure time, I have a conversation with my family or finish the task that I put off. By doing these, I am not too attached to my smartphone.* ▶ *During recess, I develop the habit of reading books. My sleeping disorder gets better.*
Future	▶ *Smartphones are essential in everyday life. From now on, I will use my smartphone in a healthy way for my own benefit.* ▶ *I will be doing other active activities instead of using a smartphone to make use of my time.* ▶ *I will try to avoid unnecessary use of smartphones.* ▶ *I will escape from my obsession with smartphones so that I will not be anxious without it.* ▶ *I will not use my smartphone as much as 2 hours before sleeping. I will never use my smartphone when I walk around.*

4. DISCUSSION

The goal of the present study was to evaluate the effectiveness of Smartphone Detox Program for the treatment of smartphone addiction. Reductions of smartphone usage and smartphone addiction proneness were examined and also improvement of mental, physical, and social wellnesses was

measured as indicators of the intervention's effectiveness. For this purpose, 16 university students concerned with smartphone addiction were assigned to the program and research hypotheses were analyzed.

According to the results, the smartphone usage among the participants and the smartphone addiction proneness scale revealed a significant decrease after the Smartphone Detox Program. This indicates that the smartphone addiction rate has reduced significantly which supports our first hypothesis. Also, this finding implies that Smartphone Detox Program based on positive psychology can be an effective approach to smartphone addiction as was proven to reduce internet addiction in a previous study [32].

Moreover, it was found out that after the Smartphone Detox Program, the severity of smartphone addiction has decreased. Normal smartphone users group was increased from 62.5% to 87.5%. Potential risk group remained the same (6.3%) while the high-risk group was decreased from 31.3% to 6.3%. This indicates that our program was effective in reducing the severity or risk of smartphone addiction which is consistent to [32]'s finding that positive psychology intervention reduces the severity of internet addiction and lowers the addiction rate.

Mental Health Scale which measured the mental wellness of the participants revealed a significant decrease of the average scores. This indicates that after the Smartphone Detox Program, mental wellness of the participants has improved. To be specific, the level of anxiety and depression, which [40] found them to be predicting factors for smartphone addiction among university students, have significantly reduced after the intervention program. Thus, our second hypothesis stating that there will be a significant increase in mental wellness among the students after the Smartphone Detox Program is supported. This finding is consistent with previous studies [41]-[43] claiming that positive psychology intervention is effective for increasing happiness and reducing depressive symptoms. Similarly, reference[44]'s findings on their review of 15 studies on positive psychology interventions as stress, depression and anxiety diminishing approach are consistent with this current study's finding.

Self-management Scale which measured the physical and the social wellness of the participants in this study reveal an increase in average scores after the intervention program. This indicates that our Smartphone Detox Program has a positive effect on the lifestyle, health management as well as the interpersonal relationship of the participants. According to [45], positive psychology interventions may work for some patients with physical pain which implies that not all positive psychology interventions are effective. In addition, [46] pointed out that the application of positive psychology intervention to physical health needs much harder work in order to get a satisfactory result. Thus, the impact of any positive intervention program depends on the structure and how is it being implemented. Furthermore, this finding is consistent with previous studies' finding that positive interventions can possibly enhance social relationship of an individual [47]-[49] especially internet addiction treatment [32].

Correlation matrix showed a significant correlation between smartphone addiction, mental health and self-management. The significant relationship between smartphone addiction and mental health confirms with the previous studies among university students claiming that smartphone addiction is positively related to perceived stress [8], depression and anxiety levels [5]. Similarly, [50] who found out that smartphone addiction is significantly correlated with depression, aggression and impulsion confirms with this current study's finding.

Regarding self-management, its significant correlation with smartphone addiction implies that the participants' problematic use of smartphone is directly associated with their lifestyle habit, interpersonal relationship, academic and financial aspects. Fortunately, after the Smartphone Detox Program these aspects have increased indicating that the program helps the participants improve their self-management skill. Reference [39] confirms to this observation in his study with high school students involved in smartphone game addiction that prevention program to help improve the self-management skills among adolescents can be effective. They suggested in their study that in order to achieve better in self-management, it is necessary to train in self-efficacy and internal locus of control. Therefore, exploring the positive psychological capital as essential internal resources to measure students' self-management abilities can be appropriate. Reference [39] further emphasized that the students' underlying ability to enhance self-management abilities starts with the role of a mother or a family member as a supporter.

This current study's finding revealing a negative correlation between positive psychological capital and smartphone addiction is inconsistent to [51], [52]'s studies expressing an association between psychological capital and smartphone addiction. This also indicates that when hope, self-efficacy, resilience and optimism increase the rate of smartphone addiction also decrease and vice versa.

5. CONCLUSION

After our Smartphone Detox Program, it was found out that smartphone addiction proneness as well as smartphone usage was significantly reduced. In addition, the number of high risk users was decreased at the end of the intervention program implying a positive result. Mental wellness has significantly increased by decreasing the level of anxiety and depression which also indicates a positive effect from the intervention program. Regarding physical and social wellness, it was discussed that the intervention program had a positive effect on lifestyle and health management as well as the interpersonal relationship of the participants. Therefore, based on the findings of this current study, we conclude that the Smartphone Detox Program we introduced to the university students with smartphone addiction was generally effective in reducing the addiction rate and improving the students' well-being (physical wellness, mental wellness and social wellness).

This research has a number of limitations. First, the sample size is small. It is recommended that a much larger sample size should be employed to get a more accurate and reliable results. Second, there was no follow-up test after the program ended. After six months or one year, it is necessary to reexamine the students' smartphone addiction rate as well as

the mental, physical, and social wellness to check whether the effects of the program are maintained. Third, the cross-sectional design used in the study may contaminate the results with temporary psychological or physiological conditions of the participants. To increase the validity of this study's findings, a random sampling or a longitudinal study including various specialties and settings is recommended. Fourth, in this study we did not have any control group. With a control group, it is easier to find out how the intervention program works for the experimental group and evaluate its efficacy. Finally, we used only a self-report measure of general health perceptions. Although its relationships with positive psychological capital, mental health, self-management abilities, and smartphone addiction are an important finding, we do not know the extent to which those self-ratings of health are accurate. Thus, we suggest for future research to measure multi-item measures of health including rated by doctors or family members. Moreover, since myriads of recent studies indicate suppression of the frontal lobe of a human brain as one of the most common symptoms of all kinds of addiction, smartphone addiction treatments based on enhancing the frontal lobe functioning can be the subject of future studies.

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