

THE EFFECT OF HEALTH EDUCATION AND THERAPEUTIC GROUP THERAPY TO PREVENT SMARTPHONE ADDICTION IN SCHOOL-AGE CHILDREN

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ABSTRACT

One of the products of telecommunication technology development is the smartphone. Smartphone using during the Covid-19 pandemic was increased not only in adult users but also in school-age users. Higher user's smartphone in school-age children at risk of causing the addiction. Smartphone addiction does not only cause physical problems but also social, behavioral, and affective aspects. Smartphone addiction can cause depression, neuroticism, and obsessive-compulsive behavior disorders and affect academic achievement. This study is aimed to determine the effect of health education and therapeutic group therapy to prevent smartphone addiction in school-age children. A quasi-experimental research pre-post test with a control group design was used. A total of 69 children were divided into 2 groups. Group intervention 1 consisted of 34 children receiving health education and therapeutic group therapy, assigned to 7 subgroups, whereas group intervention 2 consisted of 35 children receiving only health education and assigned to 7 subgroups. Respondent characteristic data were analyzed using descriptive statistics. The homogeneity of the two groups was tested using Chi-square, a test of the normality of the data using Kolmogorov Smirnov test and data normally distributed, the bivariate analysis using repeated ANOVA. This study found that the decrease in smartphone addiction was greater and significant in the group who received health education and therapeutic group therapy (p-value <0.05). Health education combined with therapeutic group therapy was recommended as an effective nursing intervention to prevent smartphone addiction in school-age children.



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1. Introduction

Life in the era of globalization is closely related to the use of technology in various fields, including in the field of communication. One of the products of telecommunication technology development is smartphone. A smartphone is a telephone that uses an internet connection and provides a variety of Personal Digital Assistant (PDA) features and functions such as notes, calculators, calendars, agendas, and many other applications that can help with daily activities. Not only adults, but the use of smartphones in children has also increased since 2000. In America, in 2011 as many as 52% of families with children owned a smartphone and increased to 98% of ownership smartphones in 2017 [18].

In the UK, 21% of children aged 3-4 years have a personal smartphone [23]. In America, 35% of children aged 0-8 use smartphones with an average weekly usage of 14.2 hours for children under 2 years of age, while in Australia children aged 2-5 spend 25.9 hours per week using smartphones [23], [17]. A study in 5 countries, there was in Indonesia, Japan, Egypt, Chile, and India reported that children's use of internet access for smartphones reached 54% of the five countries. Indonesia is the highest number of children using internet access smartphones (60%), followed by Egypt and Chile (54%), Japan (50%), and India (44%). Indonesia is also the highest in the number of children using social networking services, which is 63%.

The high risk of using a smartphone is causing addiction. Smartphone addiction is a form of maladaptive psychological dependence due to the use of smartphones so that it looks at the typical symptoms of addictive behavior [2]. According to Freeman (2008), smartphone addiction is a disorder due to an individual's inability to control the desire and time to use a smartphone, causing anxiety and disturbances in social relationships. Research by [10] states that as many as 17.9% of 1.63 million adolescents experience smartphone addiction, and more than 24% of children are diagnosed with internet addiction and must undergo hospital treatment. Meanwhile in Indonesia, as many as 48 adolescents and child patients were treated at Dr. Soeharto Herdjan Mental Hospital Jakarta in 2016 due to addiction to smartphones, hyperactivity, and learning disorders [20]. Another study by Dhamayanti et al (2019), which examined the effect of smartphone addiction on the mental and emotional development of children aged 11-12 years in West Java, states that as many as 80 children (44.9%) experienced a high rate of addiction to smartphones with a percentage of mental-emotional disorders borderline as much as 21.9% and abnormal at 17.4%.

Smartphone addiction does not only cause physical problems but also social, behavioral, and affective aspects. The physical impacts that often occur are visual disturbances and pain in the fingers and neck [4], while in mental health, smartphone addiction can cause depression, neuroticism, and obsessive-compulsive behavior disorders and also affect academic achievement [11]. Smartphone addiction can be triggered by various factors such as low social skills, traumatic events, and conflicts with family (Wang et al, 2011).

The interventions that have been carried out so far in the prevention and management of addiction to the smartphone are interventions in the form of adult-centered programs with parents or family as the main targets [5]. On the other side, according to Sasson & Mesch (2014), norms and peer behavior are very influential in the use of information media, including smartphones. Therapeutic group therapy is a type of group therapy where members can share experiences, help each other find ways of solving problems, and anticipate problems to be faced by teaching effective ways to manage stress [24]. Based on this description, the researchers believe that the therapeutic group therapy approach is an effective strategy in preventing smartphone addiction in school-age children. This study aims to obtain an overview of the effect of health and physical education and therapeutic group therapy on addiction to smartphone school-age children.

2. OBJECTIVE

The present study aimed to determine the effect of health education and therapeutic group therapy on preventing smartphone addiction in school-aged children.

3. METHODS

3.1 Research design and sample

This study was a quasi-experimental pre-post test with a control group design which was conducted in April-June 2020. The population of the study is students of elementary school who meet the criteria inclusion are aged 8-12 years old, willing and obtain permission from the parent to be a respondent of the study, and have smartphone addiction scores ≤ 54 based on the results of measurement using a questionnaire Smartphone Addiction Scale (SAS). Purposive sampling technique was used to recruit subjects who meet the inclusion and exclusion criteria, a total of 69 children were divided into 2 groups. Group intervention 1 consisted of 34 children receiving health education and therapeutic group therapy, assigned to 7 subgroups, whereas group intervention 2 consisted of 35 children receiving only health education and assigned to 7 subgroups. The respondents' flowchart in this study was presented in Figure 1.

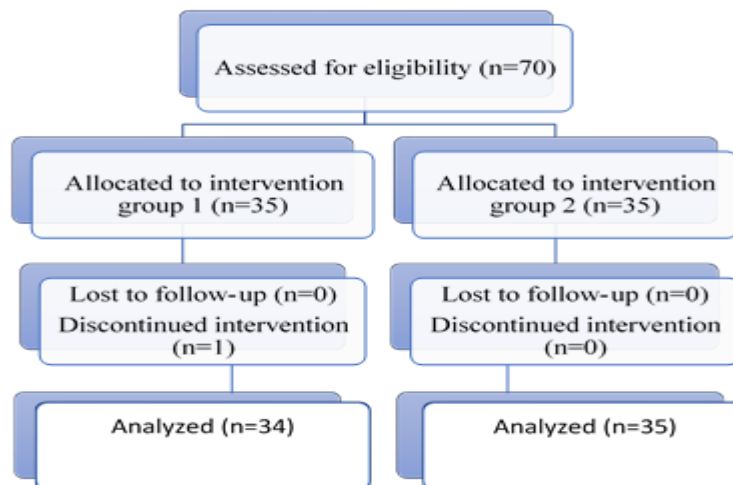


Figure 1. Respondents flowchart

3.2 Measurement

Data collection using questionnaires data demographics of respondents which include age, gender, number of siblings, parent's education level, have own smartphone, times of smartphones using, as well as participation in an extracurricular activity. Measurement of addiction using a Smartphone Addiction Scale (SAS). Researchers first measure the validity and reliability of the instrument SAS before being used in the study. The test results show that all questions in this questionnaire have a value of $r_{count} >$ from the value of $r_{table} = 0.361$ and the value of Cronbach alpha $>$ from the value of r_{table} so that it can be concluded that this questionnaire is valid and reliable used in this study. Measurements were carried out as much as three times that before health education (pre-test), after health education (post-test 1), and the last after health education and therapeutic group therapy (post-test 2).

3.3 Intervention

The intervention began with a pre-test, furthermore conducted intervention health education in both groups. Health education was given about the readiness to increase the development of school-age children and smartphone addiction. After the entire group was given health education, a post-test 1 was carried out to measure changes in the smartphone addiction score. Furthermore, group intervention 1 followed by

therapeutic group therapy that consists of 6 sessions of therapy that were stimulation of the motoric development, cognitive and language development, emotional and personality development, moral and spiritual development, psychosocial development, and session evaluations benefit of practice. Furthermore, the smartphone addiction scores in the two groups were measured in the post-test 2.

3.4 Data analysis

Respondent characteristic data were analyzed using descriptive statistics. The homogeneity of the two groups was tested using Chi-square, a test of the normality of the data using Kolmogorov Smirnov test and data normally distributed, the analysis of bivariate using repeated ANOVA to determine differences in smartphone addiction scores between the two groups of intervention.

3.5 Ethical consideration

This study was approved by the Research Ethics Committee Faculty of Nursing Universitas Indonesia with ethical review number SK-47/UN2.F12.D1.2/ ETIK.FIK.2020. Informed consent was obtained from all respondents and their parents. Important information related to the purpose of the study, procedures, risks, and benefits of the study were explained to the respondents. The confidentiality of the respondents was also maintained throughout the study.

4. RESULT

4.1 Characteristics of the respondents

The ages of children were in the range of 9-12 years with an average age of 10.65 years old. The intervention group 1 was dominated by female, while the group intervention 2 were dominated by male students. Most of them are were the oldest child's in the family or have 0-2 siblings, the whole parent has a job with average income per month is 1-2 million, most parents education level was senior high school. The demographic data analysis is described in Table 1.

Table 1. Demographic characteristics of respondents (n = 69)

Variable	Category	Intervention Group 1 (n = 34)		Intervention Group 2 (n = 35)		Total	
		n	%	n	%	n	%
Gender	Male	18	52.9	26	74.3	44	63.8
	Female	16	47.1	9	25.7	25	36.2
Number of Sibling	0-2	33	97.1	29	82.8	62	89.9
	3-4	1	2.9	4	11.5	5	7.3
	> 4	0	0	2	5.72	2	2.8
Parents Education Level	Elementary school	5	14.7	0	0	5	7,2
	Junior High School	14	41.2	16	45.7	30	43.5
	Senior High school	15	44.1	16	45.7	31	44.9
	Univeristy	0	0	3	8.6	3	4,4
Parents Income	<1 million	6	17.6	2	5.7	8	11.6
	1-2 million	17	50	18	51.4	35	50.7
	3-4 million	8	23.5	12	34.3	20	28.9
	> 4 million	3	8.8	3	8.6	6	8.8

Have own Smartphone	Yes	18	52.9	15	42.9	33	47.8
	Not	16	47.1	20	57.1	36	52.2
Duration of using Smartphone	<2 hours	16	47.1	22	62.9	38	55.1
	2-4 hours	11	32.4	6	17.1	17	24.6
	> 4 hours	7	20.6	7	20	14	20.3
Extracurricular Activities	Yes	10	29.4	21	60	31	44.9
	No	24	70.6	14	40	38	55.1

Differences in the smartphone addiction score before and after intervention

Table 2. Smartphone addiction score in group Intervention 1 (Health Education and Therapeutic Group Therapy) and Group Intervention 2 (Health Education) (n = 69)

Variable	Group	N	Mean Pretest	Mean Post 1	Mean Post 2	SD Difference	95% CI	P Value
Smartphone Addiction	Intervention 1	3	31.50	31.23	27.29	1.72	0.05-2,217	0.040
	Intervention 2	4	31.94	30.22	28.43	1.25		

The results of measurement of addiction to the smartphone in school-age children used the SAS questionnaire. The score for smartphone addiction in the intervention group 2 after health education and independent training decreased from 31.94 to 28.43 with a difference of 3.51. Meanwhile, there was a greater decrease in smartphone addiction scores in intervention group 1 with a difference in the average score of 4.21 from 31.50 to 27.29 after health education and therapeutic group therapy. Based on the results of the analysis, we may conclude that (1) there was a significant decrease in the score on smartphone addiction after health education in the intervention group 2 (p -value <0.05) and (2) the decrease in addiction to the smartphone was greater and significant in the intervention group 1 after health education and therapeutic group therapy (p -value <0.05).

5. DISCUSSION

Addiction is included in the category of primary and chronic neurological disorders and is characterized by failure to control or the appearance of compulsive behavior despite the impact of this behavior is known to be dangerous [7]. On the other side, smartphone addiction is a psychological dependence that displays symptoms of addictive behavior to a certain degree [2]. Symptoms of typical addictive behavior include anxiety, nervousness, and difficulties in everyday life as a result of smartphone *over-immersion* [5]. The inclusion criteria in this study were respondents who had smartphone addiction scores <54 based on the *Smartphone Addiction Scale* (SAS) questionnaire. Before the intervention, the addiction score was in the range 25-39 from the SAS score range 18-72. This condition indicates that school-age children in this study reached 54.1% of the total addiction score. The mean score for smartphone addiction decreased significantly after being given health education and therapeutic group therapy (p -value <0.05).

Through health education, respondents learn to get to know more about smartphone addiction, starting from understanding the characteristics of people who experience addiction to the *smartphone*, the causes or risk factors for the addiction, the impact as well as the prevention efforts that are associated with optimizing the ability to achieve child development tasks. The health education provided in this study can build children's

perceptions, form correct understanding and strengthen self-confidence towards the expected healthy behavior, which is avoiding smartphone addiction. In addition, school-age children are at the stage when children begin to compare themselves with their peers so they are vulnerable to fear of failure. Peer relationships and acceptance are important at this age. If during this period the child often fails and feels anxious, then a sense of inferiority will grow. However, if the child is able to know how and what needs to be done in facing the demands of his environment and he succeeds in overcoming problems in peer relations and academic performance at school, then there will be high motivation for the challenges of the next life so that the development of "*industry*" can be achieved [8].

Stimulation in the developmental aspects provided in therapeutic group therapy can improve children's skills in establishing relationships with peers and provide space for children to train them through a process of interaction and group dynamics. Through this, it is hoped that children can improve relationships with peers and achieve satisfaction in friendship relationships. Peer relationships and satisfaction in friendship are important factors in preventing children and adolescents from engaging in deviant activities [26]. A study proves that satisfaction in friendship is negatively correlated with the occurrence of smartphone addiction [1].

The implications of this research include the need for intervention efforts to prevent addiction to smartphones in school-age children that can be implemented through promotive and preventive efforts in mental health service programs by health centers as primary health facilities. Promotional and preventive efforts towards smartphone addiction in school-age children are important to consider the real impact of smartphone addiction on children. The impact of smartphone addiction on children includes troubling sleep patterns, increasing blood pressure, and triggering anxiety to depression [27]. In addition, addiction to the smartphone in children can also affect academic achievement, depression, and increased suicidal ideation [22].

Anxiety resulted from addiction to smartphones is related to the use of social media and online games. This makes children tend to spend time using smartphones so that it affects the efficiency of children's learning time [14], [21]. A phenomenon that often occurs in the use of social media is the risk of cyberbullying. A meta-analysis study revealed that the impact of cyberbullying is related to stress, depression, substance abuse, and suicide attempts [3]. Furthermore, cyberbullying can have an impact on children's lives in the future. Children or adolescents who have been victims of cyberbullying tend to behave aggressively or engage in violence when they are adults; it is possible as long as they indirectly become victims they also learn to behave aggressively [9].

Symptoms of depression in children include an excessive attachment to parents and phobias at school. Meanwhile, in adolescents, depressive symptoms tend to lead to avoidance behavior, low academic performance, anti-social behavior, and substance abuse [19]. Another study suggests that there is a two-way relationship between depression and smartphone addiction. Smartphones can be a coping medium to avoid negative emotions and create psychological comfort. However, on the other hand, the use of smartphones can exacerbate depression, cause stress, irritability, and sleep disorders [6].

According to [15], prevention efforts must have started at the initial education level. School-based educational programs using visual media have been proven effective in preventing addiction to the smartphone in children. This is supported by other research through a randomized controlled trial study involving 1,843 students who report that school-based educational strategies and group interventions were proven to significantly reduce addiction to smartphones [25]. Based on the results of this study, the

researchers concluded that health education and therapeutic group therapy for school-age children can be used as a preventive intervention that can be applied to prevent smartphone addiction in school-age children.

6. CONCLUSION

There was a greater and significant decrease in smartphone addiction scores in school-age children who receive health education and therapeutic group therapy, compared to school-age children who receive only health education. Health education and therapeutic group therapy for school-age children can be an effective intervention to prevent smartphone addiction in school-age children.

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7. REFERENCES

- [1] Bae, SM (2015). The relationships between perceived parenting style, learning motivation, friendship satisfaction, and the addictive use of smartphones with elementary school students of South Korea: Using multivariate latent growth modeling. *School Psychology International*, 36 (5), 513–531. DOI: 10.1177/0143034315604017.
- [2] Bernoider , EWN, Krumay , B., Margiol , S. (2014). Not without my smartphone! Impacts of smartphone addiction on smartphone usage (pp. 1-11). Vienna, Austria: ResearchGate.
- [3] Bottino , SMB, Bottino , CMC, Regina, CG, Correia, AVL & Ribeiro, WS (2015). Cyberbullying and adolescent mental health: Systematic review. *Cad. Saúde Pública* , 31 (3): 463-475. <http://dx.doi.org/10.1590/0102-311X00036114>.
- [4] Chen, L., Yan, Z., Tang, W., Yang, F., Xie, X., & He, J. (2016) Mobile phone addiction levels and negative emotions among Chinese young adults: The mediating role of interpersonal problems. *Computers in Human Behavior*, 34, 49-57. <https://doi.org/10.1016/j.chb.2014.01.024>
- [5] Choi, HY, Kim, DJ, & Park, JW (2017). Stress and adult smartphone addiction. Mediation by self-control, neuroticism, and extraversion. *Stress and Health*. <https://doi.org/10.1002/smi.2749>
- [6] Elhai, JD, Dvorak, RD, Levine, JC and Hall, BJ (2016) 'Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology', *Journal of Affective Disorders*. Elsevier.
- [7] Fenton, MC, Aivadyan, C. and Hasin, D. (2013) 'Epidemiology of Addiction', in Miller, P. (ed.) *Principles of Addiction, Comprehensive Addictive Behaviors, and Disorders*. First Edit. London: Elsevier Inc., pp. 23–40.
- [8] Gunarsa, S. (2006). *Developmental Psychology of Children and Adults*. Jakarta: Gunung Mulia
- [9] Hinduja, S. & Patchin, JW (2010). Bullying, Cyberbullying, and Suicide. *Archives of Suicide Research*, 14 (3), 206-221.

[10] Kim, YJ, Jang, HM, Lee, Y., Lee, D., & Kim, DJ (2018). Effects of internet and Smartphone addictions on depression and anxiety based on propensity score matching analysis. *International Journal of Environmental Research and Public Health*, 15 (5), 1–11. <https://doi.org/10.3390/ijerph15050859>

[11] Kwon, M., Lee, JY, Won, WY, Park, JW, Min, JA, Hahn, C., & Kim, DJ (2013). Developmental and validation of a smartphone addiction scale (SAS). *PLoS ONE*, 8 (2), 1-7. <https://doi.org/10.1371/journal.pone.0056936>

[12] Lau, JTF, Gross, DL, Wu, AMS, Cheng, K. man, & Lau, MMC (2017). Incidence and predictive factors of Internet addiction among Chinese secondary school students in Hong Kong: a longitudinal study. *Social Psychiatry and Psychiatric Epidemiology*, 52 (6), 657–667. <https://doi.org/10.1007/s00127-017-1356-2>

[13] Lee, SY, Park, EC, Han, KT, Kim, SJ, Chun, SY, & Park, S. (2016). The association of level of internet use with suicidal ideation and suicide attempts in South Korean adolescents: A focus on family structure and household economic status. *Canadian Journal of Psychiatry*, 61 (4), 243–251. <https://doi.org/10.1177/0706743716635550>

[14] Lee, S.-Y., Kim, MS, & Lee, HK (2019). Prevention Strategies and Interventions for Internet Use Disorders Due to Addictive Behaviors Based on an Integrative Conceptual Model. *Current Addiction Reports*, 6 (3), 303–312. <https://doi.org/10.1007/s40429-019-00265-z>

[15] Mun SY, Lee BS. Effects of an integrated Internet addiction prevention program on elementary students' self-regulation and Internet addiction. *J Korean Acad Nurs*. 2015; 45 (2): 251–61.

[16] Neophytou, E., Manwell, LA, & Eikelboom, R. (2019). Effects of Excessive Screen Time on Neurodevelopment, Learning, Memory, Mental Health, and Neurodegeneration: a Scoping Review. *International Journal of Mental Health and Addiction*. <https://doi.org/10.1007/s11469-019-00182-2>

[17] Rhodes A. Screen time and kids: what's happening in our homes? Detailed report. Melbourne (VIC): The Royal Children's Hospital Melbourne; 2017.

[18] Rideout, V. The common sense census: media use by kids age zero to eight. San Francisco (CA): Common Sense Media; 2017.

[19] Sadock, BJ, Ruiz, P. and Sadock, VA (2015) Kaplan and Sadock's Synopsis of Psychiatry - Behavioral Sciences / Clinical Psychiatry. 11th ed. Lippincott William & Wilkins.

[20] Selviani, W., & Solicha. (2019). Predictors of smartphone addiction in adolescents in DKI Jakarta. Syarif Hidayatullah State Islamic University , Jakarta.

[21] Sinkkonen , H., Puhakka , H., & Meriläinen , M. (2014). Internet use and addiction among Finnish adolescents (15–19 years). *Journal of Adolescence*, 37 (2), 123-131. DOI: 10.1016 / h. adolescence. 2013.11.008.

[22] Sohn, S., Rees, P., Wildridge, B., Kalk, NJ, & Carter, B. (2019). Correction to: Prevalence of problematic smartphone usage and associated mental health outcomes amongst children and young people:

A systematic review, meta-analysis, and GRADE of the evidence (BMC Psychiatry (2019) 19 (356) DOI: 10.1186 / s12888-019-2350 -x). BMC Psychiatry, 19 (1), 1–10. <https://doi.org/10.1186/s12888-019-2393-z>

[23] Straker L, Abbott R, Collins R, Campbell A. Evidence-based guidelines for wise use of electronic games by children. *Ergonomics* 2014; 57: 47189.

[24] Townsend, Mary C. (2014). *Essentials of Psychiatric Mental Health Nursing*. 6th ed. Philadelphia: Davis Company.

[25] Walther B, Hanewinkel R, Morgenstern M. Effects of a brief school-based media literacy intervention on digital media use in adolescents: cluster randomized controlled trial. *Cyberpsychology, Behavior, and Social Networking*. 2014; 17 (9): 616–23. This is one of the largest and most robust empirical studies of prevention conducted outside of East Asia.

[26] Wang, P., Zhao, M., Wang, X., Xie, X., Wang, Y., Lei, LI (2017) Peer relationship and adolescent smartphone addiction: The mediating role of self-esteem and the moderating role of the need to belong, 6 (59), 708-717. <https://doi.org/10.1556/2006.6.2017.079>

[27] Zou, Y., Xia, N., Zou, Y., Chen, Z., & Wen, Y. (2019). Smartphone addiction may be associated with adolescent hypertension: A cross-sectional study among junior school students in China. *BMC Pediatrics*, 19 (1), 1–9. <https://doi.org/10.1186/s12887-019-1699-9>.