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The Effect of Mobile Application-Delivered Intervention on Social Media Addiction Among Adolescents in Indonesia

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ABSTRACT

Developments in the field of technology are increasingly rapid in this millennial era makes it easy for everyone to socialize with other people from various parts of the world through a link site known as the media social. The general objective of this study is to examine the effect of mobile application on mental health among adolescents in Depok, Indonesia. Experimental design is research used to find the effect of certain treatments on others under controlled conditions. The target population in this study were adolescents aged 15-18 years, and studied in senior high school students. The social media Safe App (bilingual: Indonesia-English language) was developed as a mobile app. The instrument used in this study was DASS-21 scale. The difference between the intervention group and the control group in terms of the average scores on mental health in the control group and in the intervention, group was determined using a bivariate analysis with a paired t-test. Of 200 adolescents in the intervention group, the mean age was 16.37 (SD+2.55), 60% male, and (60%) of them used internet as a source of information. While, in the control group their mean age was 16.34 (SD=2.39), 58.5% male, and 55% of them used internet as a source of information. In the intervention group, DASS score was significantly decreased 5.26 times before intervention and after one month intervention (post-test), with pvalue=0.000. While in the control group, no significant decreased on a total score of DASS (pvalue>0.05. The results of this study can be used as a reference for other researchers who will develop research on the impact of social media use on mental health disorders. Developing a mobile application or website to measure the level of addiction on social media with usage notifications that exceed the safe duration of social media use to limit the intensity of social media use time as a preventive tool against mental health disorders.

Keywords: *Adolescent, Mobile Application, Mental Health*

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INTRODUCTION

Adolescents have seen information and communication technologies (ICTs) such as social media become integral to their education, culture, and social life. Indonesia is listed in the top 10 countries with high social media addition (Groopman dkk., 2019). A total of 168.5 million Indonesians use mobile devices, such as smartphones or tablets to access social media, with a penetration of 99% (Piva dkk., 2020). Of the total 202.6 million internet users in Indonesia, 96.4% of them use smartphones to access the internet. The average time spent by Indonesians to access the internet per day is 8 hours 52 minutes (https://internetworldstats.com/stats.htm, 2019). Based on Based on the results of Hootsuite's Wearesocial research released in January 2019, social media users in Indonesia reached 150 million or 56% of 268,2 million people of the total population, there were 150 million active internet users, meaning that 56% or 150 million of the total population of Indonesia have used the internet, and the number is up 20% from the previous survey. Meanwhile, mobile social media users (gadgets) reached 130 million or about 48% of the population. The time spent by Indonesians to access social media was 3 hours 26 minutes. This shows that the average level of dependence of the Indonesian people on the use of the internet and social media is still very high. Of the most accessed social media, applications are Youtube (88%), WhatsApp (83%), Facebook (81%), and Instagram (80%) (Cotet al., 2017).

Social networking sites (SNSs) are online communities in which users are able to create individual public profiles, communicate with friends in real life, and meet new people based on the interests they share in common (Adelantado-Renau et al, 2019). According to Boyd and

Ellison (2008), social networking sites (SNSs) are web-based services that enable individuals to (1) construct a public or semipublic profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse both their own list of connections as well as the connections made by others within the system (Liang dkk., 2020). SNSs are also able to provide users with a list of other users with whom they share a connection. Social media addiction is characterized by either addictive-like symptoms and/or reduced self-regulation, is variously referred to as social media addiction, problematic social media use, and compulsive social media use (Slivnick & Lampert, 2019). The most widely used of these words is "social media addiction," which encompasses similar concepts like "Facebook addiction," "SNS addiction," and "addictive SNS use" (Cao et al., 2020; Chen, 2019).

Adolescents are frequent internet users; thus, a mobile health app could address this information gap (Bányai et al., 2017). mHealth refers to using smartphones to educate adolescents about social media addiction and puberty issues. The literature is lacking on the efficacy of mobile health apps (Cao et al., 2020) and the optimal

development process (Piva dkk., 2020). Thus, To better integrate a health-related product with the customer's context, an iterative schematic design approach is required. Improving mHealth design and usability is critical in the healthcare industry (Horsky et al., 2005). We created the Social Media Safe App to help mental health professionals and the general public assess the extent of social media addiction and time management issues. The Social Media Safe App's content is based on social cognitive learning theory and the information-motivation-behavioral skills model (IBM) (Jung dkk., 2020). This research measured the effect of the Social Media Safe App and its effectiveness on reducing social media addiction among adolescent in Indonesia.

RESEARCH METHODOLOGY

Study design and Setting

The use of mobile application intervention was evaluated using quasy experiment. Experimental design is research used to find the effect of certain treatments on others under controlled conditions (Kendall, 2003). Development of quasi-experimental designs, which have a control group but cannot fully control the external variables that affect the implementation of the experiment. In this study, neither participants nor researchers were masked at group selection. Outcome measurement was not blinded.

Sample

The target population in this study were adolescents aged 15-18 years, and studied in senior high school students in sub district in Depok, West Java. The inclusion criteria in this study were respondents with student status at senior high school level, had a mobile phone at least android, and willing to be respondents in the study. The exclusion criteria in this study were respondents who did not have social media accounts, respondents who refused to join, respondents who did not fill out the questionnaire completely. Sampling in this study was convenience sampling technique.

Data collection procedure

The ethical committee of an affiliated university approved the study. A training manual for nurses and research assistants is created before research begins (RA). Adolescents recruited in school using Google Forms. After the teacher determines eligibility, the researcher and RA may ask the respondent to discuss the research. All eligible participants signed a written consent form based on inclusion and exclusion criteria before enrolling. After participant assignment to intervention and control groups, researcher assessed demographic data and social media addiction for baseline measurement. Mobile apps prevented social media addiction for the intervention group. Both groups followed them for one month. Data transfer requires an apploaded phone and a limited data plan. The smartphone app Social Media Safe (IndonesianEnglish) was created. HTTP and Web API form the server/client architecture of Social Media Safe (Application Programming Interface). Respondent requested mobile app download and installation. Fill out a questionnaire and personal details. The researcher used a handbook to conduct 30-minute application training sessions for the first group or person and the second individual. Participants called to check intervention adherence.

Respondents compensated for internet data. Training session 1 (small group or individual): Understand research specifications, know who to contact and when, and use app information. The control group taught health through an adolescent lifestyle modification module and weekly social media messages. One- and three-month post-intervention assessments for both groups.

Measures

The demographic datasheet reported age, gender, and educational level. The scale used to measure social media addiction is the Social Media Addiction ScaleStudent Form (SMAS-SF) Questionnaire scale. The SMAS-SF scale is a Likert-type scale with 5-point answer choices consisting of 29 items and 4 sub-dimensions. 1-5 items are included in the virtual tolerance subdimension; 6-14 items are in the virtual communication sub-dimension;

15-23 items are in the virtual problem sub-dimension and 24-29 items are in the virtual information sub-dimension. The highest score on the scale was 145, and the lowest was 29. A higher score indicated that the agent considered himself to be a "social media addict."

Data analysis

For both interventions, data were evaluated on a modified intention-to-treat basis, which included participants with at least one post-baseline evaluation. A summary of the characteristics of adolescents, addiction to social media in the control and intervention groups was evaluated using a descriptive statistic. The homogeneity test used the independent t test and chi-square to determine the variation between the intervention group and the control group. The difference between the intervention group and the control group in terms of the average scores on social media addiction, mental health, and academic performance in the control group and in the intervention, group was determined using a bivariate analysis with a paired t-test. All statistical analyses made using the SPSS (IBM Corporation, USA) statistical software app.

RESULT AND DISCUSSION

A total of 450 adolescents in the baseline data collection. At enrollment, approximately 400 students participate, resulting in a response rate of 72.7% at baseline. About 25 of adolescents and their parent refused to participate and 25 incomplete data. Of 200 adolescents in the intervention group, the mean age was 16.37 (SD+2.55), 60% male, and (60%) of them used internet as a source of information. While, in the control group their mean age was 16.34

(SD=2.3958.5% male, and 55% of them used internet as a source of information. No significant difference between intervention and control group in demographic characteristics (Table 1).

Table 1. Demographic comparison between intervention and control group (N=400)

Variables	Intervention group n=200 (%)	Control group n=200 (%)	p-value
Age, Mean ± SD	16.37±2.55	16.34±2.39	0.256
Gender Male	120 (60)	110 (55)	0.129
Female	80 (40)	90 (45)	
Education level Grade 1	120 (60)	110 (55)	0.076
Grade 2	60 (30)	75 (37.5)	
Grade 3	20 (10)	15 (7.5)	

Table 2 shows the difference of social media dependency score among adolescents before and after intervention in both groups. In the intervention group, social media dependency score was significantly decreased 7.33 times before intervention and after one month intervention with and p-value=0.000. While in the control group, no significant increase of social media dependency score before intervention and after one month intervention (p-value=0.156).

Table 2. Score difference of social media dependency among adolescents before and after intervention in both groups (N=400)

Variables	Pre-test Mean ± SD		Post-test Mean ± SD		Mean difference	t	p-value
Intervention group	88.43±24.53	35-105	82.04±21.01	35-105	5.35	-7.33	0.000***

Control group	88.03±33.51	38-104	89.77±30.57	40-105	1.31	1.74	0.221

Note: p-value obtained from paired t test; ***p-value <0.001

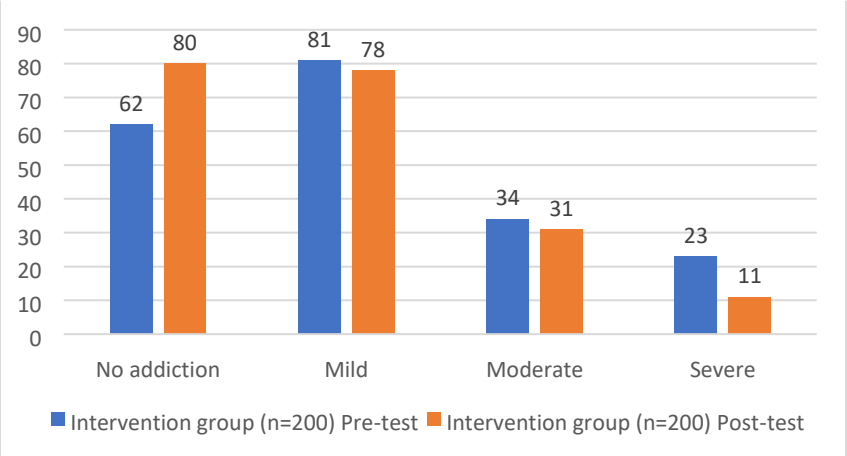

Figure 1. Social media dependency level before and after intervention (n=200)

Figure 1 showed that there was increased frequency of social media dependency level after intervention. About 31 (n=62) adolescent with no addition increased to 39%% (n=78) and those with mild addiction decreased from 40.5% to 39%.

Discussion

In the intervention group, social media dependency score was significantly decreased

7.33 times before intervention and after one month intervention compare to the control group. Prior research has demonstrated that smartphone applications have a positive impact on education, particularly because of rapid access to appropriate online resources (Li et al., 2019). The usage of smart phones as a learning tool effective to treat mental health problmes (Nicholas et al., 2015). The students' usage of smartphones in the context of professionalism led to the conclusion that smartphones are a potent instrument that can be used to enhance the health care system. However, these devices have been discovered to be associated with a number of difficulties. There is an immediate need to design and execute laws for a technologically advanced, health-focused, and secure global medical education system (Tarafdar, et al., 2020).

Mobile application-learning is a frequently used word in the literature and is defined as

"learning across different contexts, through social interactions, using personal electronic devices" (Bell et al, 2015). According to relevant surveys, the majority of students use smart phones for education (62.7%), communication (81.7%), and recreation (82.5%) (Brailovskaia et al., 2017). Literature has highlighted many learning philosophies surrounding social networks, including motivation through social connections, teaching by cooperation, and enhancement in learning through rapid and frequent feedback and involvement. The "social constructivism theory" discusses the

use of social media for educational purposes, based on the concept that interaction and socializing can help students learn and construct their knowledge and personal learning processes. Social media enables participatory learning and functions as a set of constructivist teaching and learning tools (Gloria et al., 2019). Mobile apps-learning provides a stimulating environment that improves the quality of teaching and learning and fosters students' critical thinking skills. Moreover, learning environments that foster engagement, motivation, collaboration, and goal achievement are beneficial (Gloria et al., 2019). Among college students, the usage of personal smartphones for clinical work is widespread and expanding daily. There are numerous benefits, including adequate involvement, teamwork, and supportive learning activities, but it is imperative to resolve issues pertaining to patient confidentiality (Miralles et al., 2020). There has been a progressive increase in the successful usage of smart phones and social media in higher education over the past decade (Okyeadie et al., 2016). The time has come for medical institutions to consider these devices as a supplement to conventional instruction and ensure their use to enhance learning experiences.

Digital technology makes evidence-based treatments more accessible (Pennant et al., 2015). However, technology is evolving rapidly, and mobile technologies are becoming widespread; by 2020, there will be 6.1 billion mobile phone users worldwide (Cerwall et al.,

2015). Today, the majority of toddlers and teenagers have a mobile phone (72% of children aged 0–11 and 96% of those aged 12–17) and seven out of ten (51%), or more, children aged 5 to 15 now have access to a tablet computer at home (Ofcom, 2021). Mobile health (mHealth) is a powerful and widespread platform for adolescent mental health therapies. mHealth uses mobile device characteristics, most often mobile apps, to deliver health care (Price et al., 1997). At least 29% of more than 15,000 health care applications were for mental health and few developed to facilited an adolescent received information and train them regarding addiction (Emily, 2016). However, the adoption of novel technologies into existing health care systems requires the compilation of sufficient evidence confirming the efficacy and cost-effectiveness of these technologies. Expanding educational initiatives for young people to prevent social media addiction and mental health issues will increase their academic performance. Legislators and healthcare experts should collaborate to create educational initiatives that may be easily implemented in communities with a low level of literacy. The results of this study can be used as a reference for other researchers who will develop research on the impact of a mobile application or website on social media addiction with usage notifications that exceed the safe duration of social media use to limit the intensity of social media use time as a preventive tool against mental health disorders. To evaluate the efficacy of new interventions with that of established programs, additional research should be conducted using more stringent procedures, and sample sizes should be expanded.

CONCLUSION

The current study demonstrates that social media dependency has negative impact on mental health, and academic performance among adolescents in Indonesia. Interventions for mental health promotion and prevention attempt to improve an individual's ability to regulate emotions, increase alternatives to risk-taking behaviors, foster resilience for coping with challenging events and adversity, and foster supportive social contexts and social networks. These programs require a multi-level strategy with diverse delivery platforms – such as digital media, health or social care settings, schools, and the community – and diverse ways to reach adolescents, especially the most vulnerable.

REFERENCES

Adams, J. G., & Walls, R. M. (2020). Supporting the Health Care Workforce During the COVID-19 Global Epidemic. *JAMA*, *323*(15), 1439. https://doi.org/10.1001/jama.2020.3972

Al-Ansi, A., Olya, H. G. T., & Han, H. (2019). Effect of general risk on trust, satisfaction, and recommendation intention for halal food. *International Journal of Hospitality Management*, *83*, 210–219. https://doi.org/10.1016/j.ijhm.2018.10.017

Alatab, S., Sepanlou, S. G., Ikuta, K., Vahedi, H., Bisignano, C., Safiri, S., Sadeghi, A., Nixon, M. R., Abdoli, A., Abolhassani, H., Alipour, V., Almadi, M. A. H., Almasi-Hashiani, A., Anushiravani, A., Arabloo, J., Atique, S., Awasthi, A., Badawi, A., Baig, A. A. A., … Naghavi, M. (2020). The global, regional, and national burden of inflammatory bowel disease in 195 countries and territories, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. *The Lancet Gastroenterology & Hepatology*, *5*(1), 17–30. https://doi.org/10.1016/S2468-1253(19)30333-4

Alola, U. V., Olugbade, O. A., Avci, T., & Öztüren, A. (2019). Customer incivility and employees' outcomes in the hotel: Testing the mediating role of emotional exhaustion. *Tourism Management Perspectives*, *29*, 9–17. https://doi.org/10.1016/j.tmp.2018.10.004

Baabdullah, A. M., Alalwan, A. A., Rana, N. P., Kizgin, H., & Patil, P. (2019). Consumer use of mobile banking (M-Banking) in Saudi Arabia: Towards an integrated model. *International Journal of Information Management*, *44*, 38–52. https://doi.org/10.1016/j.ijinfomgt.2018.09.002

Bojanic, D. C., & Warnick, R. B. (2020). The Relationship between a Country's Level of Tourism and Environmental Performance. *Journal of Travel Research*, *59*(2), 220–230. https://doi.org/10.1177/0047287519827394

Carr, A. C., & Rowe, S. (2020). The Emerging Role of Vitamin C in the Prevention and Treatment of COVID-19. *Nutrients*, *12*(11), 3286. https://doi.org/10.3390/nu12113286

Egan, B. M., Kjeldsen, S. E., Grassi, G., Esler, M., & Mancia, G. (2019). The global burden of hypertension exceeds 1.4 billion people: Should a systolic blood pressure target below 130 become the universal standard? *Journal of Hypertension*, *37*(6), 1148–1153. https://doi.org/10.1097/HJH.0000000000002021

Groopman, E. E., Marasa, M., Cameron-Christie, S., Petrovski, S., Aggarwal, V. S., Milo-Rasouly, H., Li, Y., Zhang, J., Nestor, J., Krithivasan, P., Lam, W. Y., Mitrotti, A., Piva, S., Kil, B. H., Chatterjee, D., Reingold, R., Bradbury, D., DiVecchia, M., Snyder, H., … Gharavi, A. G. (2019). Diagnostic Utility of Exome Sequencing for Kidney Disease. *New England Journal of Medicine*, *380*(2), 142–151. https://doi.org/10.1056/NEJMoa1806891

Guan, W., Ni, Z., Hu, Y., Liang, W., Ou, C., He, J., Liu, L., Shan, H., Lei, C., Hui, D. S. C., Du, B., Li, L., Zeng, G., Yuen, K.-Y., Chen, R., Tang, C., Wang, T., Chen, P., Xiang, J., … Zhong, N. (2020). Clinical Characteristics of Coronavirus Disease 2019 in China. *New England Journal of Medicine*, *382*(18), 1708–1720. https://doi.org/10.1056/NEJMoa2002032

Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., Gu, X., Cheng, Z., Yu, T., Xia, J., Wei, Y., Wu, W., Xie, X., Yin, W., Li, H., Liu, M., … Cao, B. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*, *395*(10223), 497–506. https://doi.org/10.1016/S0140-6736(20)30183-5

Hult, G. T. M., Sharma, P. N., Morgeson, F. V., & Zhang, Y. (2019). Antecedents and Consequences of Customer Satisfaction: Do They Differ Across Online and Offline Purchases? *Journal of Retailing*, *95*(1), 10–23. https://doi.org/10.1016/j.jretai.2018.10.003

Jung, S.-Y., Choi, J. C., You, S.-H., & Kim, W.-Y. (2020). Association of Renin-angiotensin-aldosterone System Inhibitors With Coronavirus Disease 2019 (COVID-19)- Related Outcomes in Korea: A Nationwide Population-based Cohort Study. *Clinical Infectious Diseases*, *71*(16), 2121–2128. https://doi.org/10.1093/cid/ciaa624

Korfiatis, N., Stamolampros, P., Kourouthanassis, P., & Sagiadinos, V. (2019). Measuring service quality from unstructured data: A topic modeling application on airline passengers' online reviews. *Expert Systems with Applications*, *116*, 472–486. https://doi.org/10.1016/j.eswa.2018.09.037

Kumar, V., Rajan, B., Gupta, S., & Pozza, I. D. (2019). Customer engagement in service. *Journal of the Academy of Marketing Science*, *47*(1), 138–160. https://doi.org/10.1007/s11747-017-0565-2

Li, F., Lu, H., Hou, M., Cui, K., & Darbandi, M. (2021). Customer satisfaction with bank services: The role of cloud services, security, e-learning and service quality. *Technology in Society*, *64*, 101487. https://doi.org/10.1016/j.techsoc.2020.101487

Liang, W., Liang, H., Ou, L., Chen, B., Chen, A., Li, C., Li, Y., Guan, W., Sang, L., Lu, J., Xu, Y., Chen, G., Guo, H., Guo, J., Chen, Z., Zhao, Y., Li, S., Zhang, N., Zhong, N., … for the China Medical Treatment Expert Group for COVID-19. (2020). Development and Validation of a Clinical Risk Score to Predict the Occurrence of Critical Illness in Hospitalized Patients With COVID-19. *JAMA Internal Medicine*, *180*(8), 1081. https://doi.org/10.1001/jamainternmed.2020.2033

Lippi, G., Wong, J., & Henry, B. M. (2020). Hypertension and its severity or mortality in Coronavirus Disease 2019 (COVID-19): A pooled analysis. *Polish Archives of Internal Medicine*. https://doi.org/10.20452/pamw.15272

Pfefferbaum, B., & North, C. S. (2020). Mental Health and the Covid-19 Pandemic. *New England Journal of Medicine*, *383*(6), 510–512. https://doi.org/10.1056/NEJMp2008017

Pierce, M., Hope, H., Ford, T., Hatch, S., Hotopf, M., John, A., Kontopantelis, E., Webb, R., Wessely, S., McManus, S., & Abel, K. M. (2020). Mental health before and during the COVID-19 pandemic: A longitudinal probability sample survey of the UK population. *The Lancet Psychiatry*, *7*(10), 883–892. https://doi.org/10.1016/S2215-0366(20)30308-4

Piva, S., Filippini, M., Turla, F., Cattaneo, S., Margola, A., De Fulviis, S., Nardiello, I., Beretta, A., Ferrari, L., Trotta, R., Erbici, G., Focà, E., Castelli, F., Rasulo, F., Lanspa, M. J., & Latronico, N. (2020). Clinical presentation and initial management critically ill patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in Brescia, Italy. *Journal of Critical Care*, *58*, 29–33. https://doi.org/10.1016/j.jcrc.2020.04.004

Ren, L.-L., Wang, Y.-M., Wu, Z.-Q., Xiang, Z.-C., Guo, L., Xu, T., Jiang, Y.-Z., Xiong, Y., Li, Y.-J., Li, X.-W., Li, H., Fan, G.-H., Gu, X.-Y., Xiao, Y., Gao, H., Xu, J.-Y., Yang, F., Wang, X.-M., Wu, C., … Wang, J.-W. (2020). Identification of a novel coronavirus causing severe pneumonia in human: A descriptive study. *Chinese Medical Journal*, *133*(9), 1015–1024. https://doi.org/10.1097/CM9.0000000000000722

Saha, V., Mani, V., & Goyal, P. (2020). Emerging trends in the literature of value co-creation: A bibliometric analysis. *Benchmarking: An International Journal*, *27*(3), 981–1002. https://doi.org/10.1108/BIJ-07-2019-0342

Slivnick, J., & Lampert, B. C. (2019). Hypertension and Heart Failure. *Heart Failure Clinics*, *15*(4), 531–541. https://doi.org/10.1016/j.hfc.2019.06.007

Yao, H., Chen, J.-H., & Xu, Y.-F. (2020). Patients with mental health disorders in the COVID-19 epidemic. *The Lancet Psychiatry*, *7*(4), e21. https://doi.org/10.1016/S2215-0366(20)30090-0