ASHDIN
publishing

Research Article

Factors Related to Indonesian Version of Smartphone Addiction Scale-Short Version (SAS-SV) Among Medical Student during COVID-19 Pandemic

Elmeida Effendy*, Mustafa M. Amin, Fahrul Akhyar Nasution and Sarah A. Mardhiyah

Department of Psychiatry, Universitas Sumatera Utara, Indonesia

*Address Correspondence to Elmeida Effendy, elmedia.effendi@usu.ac.id

Abstract

Background: Smartphone has been one of the most prominent breakthroughs in not just communication but also daily function right on the tip of the fingers which is more likely to put individuals to excessive smartphone usage. Massive number of people are tend to develop dependence to smartphone usage which leads to less interpersonal relationship and decreased real social interactions that result in isolation and loneliness.

Aim: Investigating smartphone addiction among medical students in Medan, Indonesia, but also to evaluate factors and Sociodemographic characteristics that are related to smartphone addiction particularly during COVID-19 pandemic.

Method: This cross sectional multivariate study conducted in April to May 2021 involves 200 medical students and focuses on investigating the relationship between several independent variables and smartphone addiction by using Indonesian version of Smartphone Addiction Scale Short Version (SAS-SV). The questionnaire was distributed through Google Form. All data were then analyzed by means of SPSS (Statistical Package for the Social Sciences) version 22. Linear regression was used when all required condition were fulfilled.

Results: Independent factors such as age, parent's income, usage duration, sleeping duration, medical education stage and gender are found to be related to SAS-SV score with p value of less than 0.05 and adjusted R2 of 62.8% (indicating that independent factors are related to SAS-SV score for as much as 62.8%). In the other hand we found that independent factors, such as phone's operating system, parents education, internet access, kinship, and other function of smartphone are not statistically significant (p>0.05). Hence, these factors are not related to SAS-SV score.

Conclusion: From this study, we found that independent risk factors related to SAS-SV score among medical students during pandemic are as in the following; age, gender, parents income, medical education stage, usage and sleeping duration. By knowing these factors, it is hoped that clinicians and public policy regulators are able to give more attention and set up more appropriate psychotherapy or support as early as possible toward those with smartphone addiction.

Keywords: Smartphone; Addiction; SAS-SV; Student

Introduction

Smartphone has been one of the most prominent breakthrough in not just communication but also daily function right on the tip of the fingers which is more likely to put individuals to excessive smartphone usage Massive number of people are tend to develop dependence to smartphone usage which leads to less interpersonal relationship and decreased real social interactions that result in isolation and loneliness there have been a number of self-reporting questionnaires developed to evaluate smartphone addiction [1,2]. But studies investigating factors related to this phenomenon, particularly among medical students, is lacking. Therefore, the aim of this study is not only to investigate smartphone addiction among medical students in Medan, Indonesia, but also to evaluate factors and sociodemographic characteristics that are related to smartphone addiction particularly during COVID-19 pandemic.

Smartphone addiction is defined as persistent and repetitive use of smart phone. Individuals with smartphone addiction poses a compulsive behavior of smartphone usage, loose other interests in daily life, and admit to experience trouble and difficulty in their academics or job due to much less time available as most of the time is occupied by using smartphone. This individual will also experience withdrawal symptoms when being asked to stay away from their phone [3] Excessive usage of smartphone has been linked to several health issues, such as headache, tiredness, tension on the neck, sleeping difficulties, hearing problem, and even decreased concentration that may lead to decreased or impaired academic performance and social participation in real life. This kind of addiction behavior is found to be more prominent among adolescents as this age group is known to have less self-control [4] According to statistical data from Information and Communication Technology (ICT) in Indonesia, number of internet users increased significantly within the past three years which was accounted for as much as 15% in 2014 and reached 51% in 2017.

This has put Indonesia as one of the countries with highest number of internet users, even 5 times greater than average global users within 2016–2017. As Indonesia consists of approximately 260 million inhabitants, placing Indonesia as the fourth most populated country, its number of internet users have become even bigger compared to several other developed countries, such as US, France, Australia, Japan, and South Korea [5].

Smartphone addiction has also been studied in various populations, including medical students. A study from Oman in 2017 by Siddiqi, et al. [6] involving 129 medical students indicated that 100% of their respondents use smartphone for more than 4 hours daily, even during their course in university. Use of smartphone is found to be predominantly for messaging or chatting (85%), playing online games (20%) and receiving or making calls (7%). This study also showed that 70% of their respondents do not turn off their phone even during sleeping, even though 90% of them know that electromagnetic wave radiating from mobile phone is linked to health problems. There have been a number of self-reporting questionnaires developed to evaluate smartphone addiction. But studies investigating factors related to this phenomenon, particularly among medical students, is lacking. Therefore, the aim of this study is not only to investigate smartphone addiction among medical students in Medan, Indonesia, but also to evaluate factors and socio-demographic characteristics that are related to smartphone addiction particularly during COVID-19 pandemic.

Method

This cross sectional multivariate study conducted in April to May 2021 involves 200 medical students and focuses on investigating the relationship between several independent variables and smartphone addiction by using Indonesian version of Smartphone Addiction Scale Short Version (SAS-SV). SAS-SV was developed and has been validated in Korea by Kwon et al. [7] consisting of 33 questions to evaluate smartphone addiction. In Indonesia, a study from Arty et al. 33 has validated the original SAS-SV questionnaire in Indonesian language and has evaluated cut off point of the questionnaire resulting. From the study, it was found that Indonesian version of SAS-SV has cut off point of less than 32 and Cronbach alpha of 0.740.

This study has gained approval of Health and Medical Research committee (Number 853/TGL/KEP USU-RSUPHAM/2021) before being proceeded further involving 200 medical students from Universities Sumatera Utara that are as in the following; (1) medical student that are 18 years-24 years of age, (2) owning personal smartphone, (3) using smartphone for at least 3 hours daily (online course excluded). Respondents that do not completely fulfill the questionnaire are excluded from the study. Respondents were given written informed consent and only those who gave the consent that will be required to fill SAS-SV questionnaire. The questionnaire was distributed through Google Form. Respondents contact information was also required, and those with total score of SAS-SV which indicated smartphone addiction would be contacted and per-suaded to engage in psychiatry consultation.

Beside SAS-SV score, this study also evaluates several independent variables proposed as associated factors related to SAS-SV score as in the following; age, gender, medical education stage (pre-clinical or on clinical rotation), parents education, parents income, Kinship (emotional attachment with family), internet access, usage duration, operating system (Android or iOs), and other function of smartphone (social networking/sites/recreational), and sleeping duration [8].

All data were then analyzed by means of SPSS (Statistical Package for the Social Sciences) version 22. Linear regression was used when all required condition were fulfilled, as in the following; normal residue (as shown in histogram graph), residual mean is zero (as shown descriptively), no outlier (as shown in Case Wise Diagnostic), constant (as shown in scatter), there is no multi collinearity (as shown in Pearson and tolerance test). Kolmogorov-Smirnov test was used initially to test the normality of the data. When the data is normally distributed, Pearson test will be used, while in the other hand, Spearmen test is used when the data is not normally distributed. Only independent variables with p value of less than 0.25 are analyzed further [9].

Results

Categorical data as in the following; operating system, parent's education, internet access, kinship, other function of smartphone are presented in percentage (%). Numerical data such as age, parent's income, usage duration, and sleeping duration are presented in median and maximum and minimum value as the data is not normally distributed.

In this study we found that 117 (58.5%) of our respondents are female 18 to 24 years of age. Most of our respondents (n=181, 90.5%) are now on pre-clinical course and mostly use Android operating system (n=127, 63.5%) with post-paid internet access (n=122, 61.0%) for 3 to 8 hours daily. Smartphone is mostly used for social networking (n=189, 94.5%) and our respondents admitted that their sleeping duration is around 4 hours daily. We also found that most of our respondents kinship is with their parents and that most of respondents parents graduated from university (n=155, 77.5%) with median monthly income of 20 million Rupiah (approximately around 1405 US dollar).

After conducting bivariate analysis, multivariate analysis was preceded further by using backward method in which data that is indicated for any autocorrelation is filtered until the fittest determinant coefficient can be yielded.

As shown in Tables 1 and 2, after repeating linear regression for three times, we finally found the third model as the fittest as there was no autocorrelation and tolerance value was found less than 0.4. By using backward method, we also found that all required conditions (linearity, normality, zero residue, no outlier, constant) of conducting linear regression were met, thus all independent variables that were proposed earlier were allowed to be analyzed further. Independent factors such as age, parent's income, usage duration, sleeping duration, medical education stage and gender

are found to be related to SAS-SV score with p value of less than 0.05 and adjusted R2 of 62.8% (indicating that independent factors are related to SAS-SV score for as much as 62.8%) as shown in Table 3.

Table 1: Demographic characteristics of respondents

Demographic characteristics	Median (min-max)	n (%)
Age (years)	21 (18 – 24)	
Gender -Male -Female		83 (41.5) 117 (58.5)
Stage of medical education -Pre-clinical -Clinical Rotation		181 (90.5) 19 (9.5)
Monthly parents income (in million Rupiah)	20 (10 – 50)	
Parents education -Highschool or less -University		19 (9.5) 181 (90.5)
Kinship -Siblings -Parents		76 (38.0) 124 (62.0)
Phones's operating system -Android -iOS		127 (63.5) 73 (36.5)
Internet Access -Pre-paid -Post-paid		78 (39.0) 122 (61.0)
Usage Duration (hours daily)	5 (3–8)	
Other function of smartphone -Recreational -Social Networking		11 (5.5) 189 (94.5)
Sleeping Duration	4 (1–8)	

Table 2: Summary model of SAS-SV on the third multivariate analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.805[a]	0.647	0.629	4.937	
2	.804[b]	0.647	0.63	4.926	
3	.804[c]	0.646	0.632	4.917	
4	.802[d]	0.644	0.631	4.921	
5	.800[e]	0.639	0.628	4.941	1.984

Table 3: Multivariate analysis of independent factors related to SAS-SV score

SAS-SV	Correlation Coefficients	Regresi Multivariat β	p
Constant		20.81	<0,001
Age	-0.374	1.81	<0,001
Parents Income	0.42	0.36	<0.001
Usage Duration	0.389	1.81	<0.001
Sleeping Duration	-0.268	1.28	<0.001
Medical Education Stage	0.117	3.22	0.011
Gender	0.126	2.1	0.006
Adjusted R^2=62.8%			

In the other hand we found that independent factors, such as phone's operating system, parents education, internet access, kinship, and other function of smartphone are not statistically significant (p>0.05). Hence, these factors are not related to SAS-SV score

Discussion

In this study we found that age is related to SAS-SV score as vast majority of our respondents are adolescents as this age group is linked to less self-control. Our study is in line with a study from Zencirici, et al. which also found that age is negatively correlated with smartphone addiction among medical students. This means that SAS-SV score will be less in individuals with older age [4] moreover, gender was shown to be related to SAS-SV score but with weak correlation strength. Gender difference has always been an intriguing issue, but there still has not been any studies concluding which specific gender that is more likely to develop addiction, including smartphone addiction. A study from Turner, et al. [10] indicated that both genders are different

in the context of behavioral aspect of smartphone usage. Pawloska, et al. [11] highlighted in their study that women typically use smartphone not only to maintain their social relationship, but also to express their emotion. They also engage in more voice calls compared to men, who particularly engage more in playing games or any other entertainment purpose. Our study is also in line with another study from Hadi, et al. [12] which found that among medical students; higher medical education stage correlates positively to SAS-SV score.

Smartphone usage has been linked to disturbed circadian rhythm due to continuous light exposure as the users continues using their phone even during the night [13] This extended and continuous light exposure, along with continuous electromagnetic radiation, result in impaired melatonin rhythm and blood flow to the brain, leading to headache, muscle pain and body discomfort which finally impair sleep duration and quality [14] This has also been shown in our study that found negative correlation between sleeping duration and SAS-SV score which translates to higher SAS-SV score is linked to less sleeping duration.

One of important predictors in whether or not to use smartphone is income which corresponds to individual's availability of accessing smartphone. Therefore, there is general assumption that individuals with higher income will adopt even more advance type of smartphone with more features, leading to more time spent on their phones.11 we found that parent's income is positively correlated with medium strength to smartphone usage. This is also shown in a Study from Malaysia by Tan, et al. [15] (p<0.001). We also found that usage duration is weakly correlated with SAS-SV score which was also shown in a study from Turkey in 2016 by Kahyaoglu, et al. [16]. Which found that usage duration of smartphone is positively correlated with SAS-SV score (r=0.374, p<0.001).

Conclusion

From this study, we found that independent risk factors related to SAS-SV score among medical students during pandemic are as in the following; age, gender, parents income, medical education stage, usage and sleeping duration. By knowing these factors, it is hoped that clinicians and public policy regulators are able to give more attention and set up more appropriate psychotherapy or support as early as possible toward those with smartphone addiction.

Study Limitation

This study used a self-reporting questionnaire that unfortunately allows subject to probably not to report the most accurate information.

Conflict of Interest

Authors declare no conflict of interest.

Acknowledgement

References

1. A. Davoudi-Kiakalayeh, R. Mohammadi, A. A. Pourfathollah, Z. Siery, S. Davoudi-Kiakalayeh, Alloimmunization in thalassemia patients: New insight for healthcare, Int J Prev Med, 8 (2017), 1-5.

2. S. Karki, J. P. Singh, G. Paudel, S. Khatiwada, S. Timilsina, How addicted are newly admitted undergraduate medical students to smartphones? A cross-sectional study from Chitwan medical college, BMC Psychiatry, 20 (2020), 1-7.

3. E. Effendy, M. Amin Mustafa, F. Nasution Ahyar, Correlation between depressive syndrome and Dopamine Transporter (DAT) Serum Level with Smartphone Addiction Among Medical Students of Universitas Sumatera Utara, J Drug & Alcohol , 10 (2021), 5.

4. S. Akbulut Zencirci, H. Aygar, S. Göktaş, M. F. Önsüz, M. Alaiye, et al. Evaluation of smartphone addiction and related factors among university students, Int J Res Med Sci, 7 (2018), 2210.

5. A. R. Pratama, Investigating daily mobile device use among university students in Indonesia, IOP Conf Ser Mater Sci Eng, 325 (2018), 1.

6. N. Siddiqi, F. Jahan, F. Moin, F. A. L Shehhi, F. A. L. Balushi, Excessive use of mobile phones by medical students: Should precautions be taken, J Biomed Pharmacol, 10 (2017), 1631-1638.

7. M. Kwon, J. Y. Lee, W. Y. Won, Development and validation of a smartphone addiction Scale (SAS), PLoS One, 8 (2013), 2.

8. C. C. Arthy, E. Effendy, M. M. Amin, B. Loebis, V. Camellia, et al., Indonesian version of addiction rating scale of smartphone usage adapted from smartphone addiction scale-short version (SAS-SV) in junior high school, Open Access Maced J Med Sci, 7 (2019), 3235-3239.

9. M. S. Dahlan, L. Regresi, Seri 10 Edisi 2, J Epidemiologi Indonesia, 2018.

10. S. Gonçalves, P. Dias, A. Correia, Computers in human behavior reports Nomophobia and lifestyle: Smartphone use and its relationship to psychopathologies, Comput Hum Behav Reports, 2 (2020), 100025.

11. H. Al-Barashdi, A. Bouazza, N. Jabur, Smartphone addiction among university undergraduates: A literature review, J Sci Res Reports, 4 (2015), 210-225.

12. M. Mehrnaz, M. Farahnaz, K. Gholamreza, K. Homa Mohseni, S. Seyed Homayoon, et al., Smartphone addiction, sleep quality and mechanism, Int J Cogn Behav, 1 (2018), 1.

13. N. Nowreen, F. Ahad, Effect of smartphone usage on quality of sleep in medical students, Natl J Physiol Pharm Pharmacol, 9 (2018), 1366.

14. H. Azwanis Abdul, H. Nawawi, N. Shamsuri, N. Najihah Rahim, H. Pasi, Smartphone addiction and its relationship with psychological health among students of a medical school in East Coast Malaysia, Asian J Pharm Clin Res, 8 (2019), 257-260.

15. P. S. Tan, Z. Arshat, Parental attachment, smartphone addiction and stress among undergraduate students. Int J Educ Psychol Couns, 4 (2019), 149-163.

16. H. Kahyaoglu, S. Kurt, O. Uzal, S. Ozdilek, Effects of smartphone addiction level on social and educational life in health sciences students, Euras J Fam Med, 5 (2016), 13-19.