

ORIGINAL RESEARCH

THE RISK OF SMARTPHONE ADDICTION TO EMOTIONAL MENTAL DISORDERS AMONG JUNIOR HIGH SCHOOL STUDENTS

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Abstract

Background: The use of smartphones increases in Indonesia, its users are no longer among adults but have also spread to teenagers and children. Smartphone addiction causes a variety of problems, both physical, social, behavioral, and psychological problems of adolescents.

Objective: The objective of this study is to identify the association between the tendency of smartphone addiction and the occurrence of emotional mental disorders in adolescents of junior high school students in Samarinda.

Methods: This study used a descriptive analytic design through cross-sectional approach conducted in junior high schools in Samarinda. Sample of this study were 127 students. The 20 self-questionnaire adopted from the 2013 Basic Health Research questionnaire was used to measure emotional mental disorders, and the Smartphone Addiction Scale - Short Version (*SAS-SV*) questionnaire was used to measure smartphone addiction. Data were analyzed with multiple logistic regressions.

Results: Results showed that there was an association between smartphone addiction and emotional mental disorders among junior high school students in Samarinda ($p < .05$). Adjusted Odds Ratio (*AOR*) was obtained at 2.418 (95% *CI* was 1.033 – 5.660).

Conclusions: Smartphone addiction may lead emotional mental disorder among Junior High School students. The decisive rules are needed in the use of smartphones, both at school and at home to prevent the occurrence of smartphone addiction.

KEYWORDS

smartphone addiction; emotional mental disorders; adolescence; mental health

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INTRODUCTION

Based on the 2010 Population Census data, the population of Indonesia is 237.6 million, with the number of adolescents aged 10-24 years is very large, which is around 64 million or 27.6% ([Badan Pusat Statistik, 2010](#)). The large number of teenagers makes it a potential object to become a "commodity" for business people, including the smartphone business.

The use of smartphones in adolescents has a positive impact because it provides convenience and flexibility for teenagers to get useful information ([Sarwar & Soomro, 2013](#)). In addition, the use of smartphones has become a trend in the lifestyle of adolescents. Almost all teenagers already have smartphones, there is even a tendency to feel embarrassed and insecure if they do not have it ([Anderson & Jiang, 2018](#)).

According to data from the Indonesian Ministry of Research, Technology and Higher Education, smartphone users in Indonesia are more than 25% of Indonesian people or around 65 million people ([Kemenristekdikti, 2017](#)), this is in line with a survey conducted by the Indonesian Internet Service Providers Association which mentions that internet users in the age range of 10-15 years are 768 thousand and the age range of 15-19 years is 12.5 million. The most accessed internet content by users is 97.7% of social media or 129.2 million users, 96.8% of entertainment or 128.4 million users, and 96.4% of news or as much as 127.9 million users. The most social media that is accessed by users is Facebook at 71.6 million users (54%), Instagram 19.9 million users, and YouTube 14.5 million users ([Asosiasi Penyelenggara Jasa Internet Indonesia, 2016](#)). Whereas according to [Soliha \(2015\)](#) the average social media user among students has 5 active

accounts, with the largest percentage being Blackberry Messenger (BBM) of 53% and Facebook of 34% of users who mostly use smartphones (77%) or as many as 77 people out of 100 respondents.

The use of smartphones among adolescents can also have a negative impact, because the information received may not prove the truth (Anderson & Rainie, 2017). Lack of control from parents causes many teens to abuse smartphones to access content that can adversely affect adolescent behavior, such as violent behavior and pornography (Lee & Ogbolu, 2018). In addition to guidance and control from parents, it is also necessary to control teenagers themselves to prevent adolescents from using smartphones excessively which can add to the effects of addiction (Lee & Ogbolu, 2018).

Teens are more likely to spend time with smartphones than interacting with friends and family (Knudsen, 2017). Smartphone addiction causes a variety of teen problems, both physical, social, behavioral, and psychological problems of adolescents. Some problems that can arise due to uncontrolled use of smartphones, such as impaired vision, impaired hearing, impaired sleep quality (Hidayat & Mustikasari, 2014; Mohammadbeigi et al., 2016), reduce empathy (Prasetyo, 2017), depression problems in adolescents (Dewiratri & Karini, 2014), self-esteem and social support problems (Choi & Yoo, 2015), and emotional mental disorders (Gowthami & Kumar, 2016; Putri et al., 2017; Sarwar & Soomro, 2013).

Emotional mental disorder is a state of emotional change that if left unchecked can develop into a pathological state (Kemenkes Ri, 2013b). Another term is psychological distress characterized by changes in thinking, behavior or mood that can be caused due to pressure and disruption of function for a certain period of time (Kemenkes Ri, 2013b). Based on Basic Health Research Report in Indonesia (Kemenkes Ri, 2013b), the prevalence of emotional mental disorders that occurred at the age of 15 years and over decreased compared to the prevalence that occurred in 2007. The prevalence in 2007 was 11.6%, down to 6% or 37,728 people in 2013. Prevalence in urban areas is greater than in rural areas. The highest prevalence rate in Central Sulawesi province is 11.6% and the lowest in Lampung is 1.2%. While in East Kalimantan province the prevalence of emotional mental disorders is 3.2%.

Excessive smartphone use can increase the risk of adolescent, physical and mental health problems. The aim of this study was to identify the association between the tendency of smartphone addiction and the occurrence of emotional mental disorders in adolescents of junior high school students in Samarinda.

METHODS

Study Design

This study used a descriptive analytic design through cross-sectional approach.

Sample

There were 127 junior high school students in the city of Samarinda who were selected by the cluster random sampling

method. Primary sampling unit was junior high school in Samarinda that was randomly selected. Selected junior high schools cannot be mentioned by researchers to guarantee confidentiality. There were no inclusion criteria in this research, every student had a same chance to be selected as a respondent. The number of samples was calculated using "Statistics and Sample Size" version 5, an android software developed by Truc (2016), which is to compare two proportions, with level of confidence of 95% and power of 80% - P1 (.427) and P2 (.227) were based on a previous study (Asif & Rahmadi, 2017). To avoid sampling error, correction for continuity was used.

Instrument

Dependent variable, which is emotional mental disorder was measured by the 20 self-questionnaire adopted from the 2013 Basic Health Research questionnaire. It consisted of 20 item questions with the answer choices in the form of yes and no using the Guttman scale. The cut-off point set in this study is 6, meaning that if the respondent answers at least 6 or more "yes" answers, then the respondent is indicated to suffering an emotional mental disorder. Data collected using the SRQ instrument has limitations only revealing the emotional status of individuals for a moment (\pm 30 days) and is not designed to diagnose mental disorders specifically (Kemenkes Ri, 2013a).

To measure the trend of smartphone addiction tendency, the Smartphone Addiction Scale - Short Version (SAS-SV) questionnaire was used which has analyzed its validity and reliability, where 10 valid statement items were obtained. The responses were originally coded on a five-point Likert-type scale ranging from 'strongly agree' (=5) to 'strongly disagree' (=1), which were combined to create a single index. Cronbach's alpha value is .911 (Kwon et al., 2013).

Data Collection

This research was conducted in Junior High School students in Samarinda on August to November 2018. After permission from the school was obtained, the researchers then came to the school and collected data. Students who were eligible to become respondents were collected in one room. Before a questionnaire was distributed, an explanation of the research procedures and objectives was conducted. Each respondent took the questionnaire and an informed consent to their home to get their parents' permit and signature. Once the consent has been signed, the students were then asked to fill out the questionnaire, and brought it back to the researchers in the day after.

Data Analysis

Data analysis were carried out using a computer program of Statistical Package for the Social Sciences (SPSS) version 2. A multivariate analysis was used to identify risk of smartphone addiction to emotional mental disorders was multiple logistic regressions.

Ethical Considerations

Research ethical behavior is followed throughout the duration research. Initially, written permission to conduct research secured from the appropriate headmaster of the schools. Written informed consent was then obtained from participants as a manifestation of

their voluntary involvement in research. Full study disclosures are given and participants are guaranteed confidentiality and anonymity. This research has been approved by the Polytechnic of Health Ministry of Health East Borneo Ethics Committee through a decree number LB.02.01/7.1/5621/2018.

RESULTS

The characteristics of junior high school students can be seen on this following table:

Table 1 Characteristics of Junior High School Students in Samarinda 2018

Characteristics	Frequency (F)	Percentage (%)
Age		
11 years old	3	2.4
12 years old	37	29.1
13 years old	43	33.9
14 years old	32	25.2
15 years old	11	8.7
16 years old	1	0.8
Sex		
Male	66	52
Female	61	48
Father's Education Level		
Basic Level	13	10.2
Senior High School	57	44.9
High School	57	44.9
Father's Occupation		
Do not have job	5	3.9
Government Employee	25	19.7
Private Employee	51	40.2
Entrepreneur	36	28.3
Retired	6	4.7
Others	4	3.1
Mother's Education Level		
Basic Level	12	9.4
Senior High School	61	48
High School	54	42.5
Mother's Occupation		
Housewife	74	58.3
Government Employee	20	15.7
Private Employee	13	10.2
Entrepreneur	16	12.6
Retired	2	1.6
Others	2	1.6
Have a Smartphone		
Yes	126	99.2
No	1	0.8
Smartphone Use		
Call and Short Message Service	3	2.4
Accessing Lessons	15	11.8
Social Media and Messenger	71	55.9
Online Music	3	2.4
Watching Movie Online	7	5.5
Playing Game Online	28	22
Daily Smartphone Use		
Less than 1 hour	16	12.6
1 – 2 hours	42	33.1
More than 2 to 3 hours	19	15
More than 3 hours	50	39.4
Total	127	100

Table 1 showing the highest age of students was 13 years as much as 43 people (33.9%) and as many as 66 students are male or by 52%. At the father's education level, only 13 people had basic education (elementary and junior high school), while the mother's education level still had 12 mothers with basic education (elementary and junior high school). Based on the occupation of parents, it was found that the majority worked as private employees, namely as many as 51 people (40.2%), while the majority of mothers worked as housewives, namely 74 people (58.3%). Almost all students have their own smartphones, only 1 student does not have a smartphone.

The highest number of smartphone use is used to access social media and messenger as many as 71 students (55.9%) and only 3 students use it to make phone call or Short Message Service and listen to music online. The average time to use a smartphone in a day for the last week was more than 3 hours with 50 students (39.4%) and those using smartphones less than 1 hour as many as 16 students or 12.6%.

Figures for the tendency of students who experience smartphone addiction and emotional mental disorders can be seen in the following table:

Table 2 Trend of Smartphone Addiction and Emotional Mental Disorders of Junior High School Students in Samarinda 2018

Variables	Frequency (F)	Percentage (%)
Smartphone Addiction		
Addicted	60	47.2
Not Addicted	67	52.8
Emotional Mental Disorders		
Yes	49	38.6
No	78	61.4
Total	127	100

Based on **Table 2**, there were 60 students or 47.2% who experienced a tendency towards smartphone addiction, and as many as 76 students who did not experience the tendency of smartphone addiction or 52.8%. There were 49 students or 38.6%

who experienced emotional mental disorders, and as many as 78 students who did not experience emotional mental disorders or equal to 61.4%.

Table 3 Final Model of Multiple Logistic Regression

Variables	B	p value	Adj. OR
Tendency of Smartphone Addiction			
Addicted	0.883	0.042*	2.418
Not Addicted			(1.033-5.660)
Sex			
Male	1.315	0.003*	
Female			
Rule in School			
No smartphone use restriction	1.546	0.001*	
Smartphone use restriction			
Average time of Smartphone Use	-0.005	0.007*	

The association risk of smartphone addiction to emotional mental disorders adjusted with sex, rule in school, and average time of smartphone use were statistically significant (p value: 0.042). The ORs with analyzed by their 95% CIs were estimated by logistic regression models. Adjusted OR and 95% confidence interval is 2.418 (95% CI: 1.033-5.660), which mean that students who tend to be addicted to smartphone have an odds of 2.418 times greater for emotional mental disorders than students who have no tendency to be addicted to smartphone, adjusted by sex, rule in school, and average time of smartphone use.

smartphone. This is in line with survey data conducted by the Indonesian Internet Service Providers Association (IISPA) which states that in 2017 internet users in Indonesia reached 143.26 million, and the third highest users are adolescents aged 13-18 years old which is 16.68%. This percentage looks tiny, but on the same survey it turns out that the penetration of internet users in the age range of 13-18 years old is the highest, which is equal to 75.50%. The largest percentage device to access the internet was smartphones, which is 44.16% ([Asosiasi Penyelenggara Jasa Internet Indonesia, 2017](#)).

DISCUSSIONS

From the data collected from the study, it was found that almost every junior high school student in Samarinda had their own

The high number of smartphone users among teenagers provides a great opportunity for an increase in smartphone addiction. Addiction to smartphone use can also be termed nomophobia or feel anxious if the smartphone is not nearby. It was found that the average smartphone use addiction in adolescents was 48.8 which

was in the high category ([Hidayat & Mustikasari., 2014](#)). This is also in line with the research conducted by [Agusta \(2016\)](#) in senior high school students in Jogjakarta who stated that the prevalence of smartphone addiction was 42%. In addition, the results of the study ([Asif & Rahmadi, 2017](#)) showed that 52% of adolescents aged 11-12 years were highly addicted.

Based on the study, it was found that the incidence of emotional mental disorders in junior high school students in Samarinda was 38.6%. This is quite high and quite alarming among teenagers, because teenagers are the future of the progress of the Indonesian nation. In Indonesia, people with emotional mental disorders are 6% at the age of 15 years and above ([Kemenkes Ri, 2013b](#)). If this emotional mental disorder is not immediately addressed, it can cause severe mental disorders. Teenagers who are healthy both physically and psychologically are very valuable capital for the progress of the nation in the future. Unhealthy teens can be a burden for future health financing ([Kutcher, 2017](#)).

Some risk factors related to emotional mental disorders include: sex, abuse, comfort in school, consumption of alcohol and drugs, chronic illness, and level of education ([Idaiani et al., 2015](#); [Mubasyiroh et al., 2017](#); [Utina, 2012](#); [Widakdo & Besral., 2013](#)). In addition to the risk factors mentioned above, emotional mental disorders may be influenced by the use of smartphones with excessive internet access, such as the use of social media and games online ([Al-Ayouby, 2017](#); [Asif & Rahmadi, 2017](#); [Cahyono, 2016](#); [Kim, 2017](#); [Kusuma, 2014](#); [Nurina & Alyu, 2017](#))

Based on the study, it was found that there was a relationship between the tendency of smartphone addiction and emotional mental disorders in junior high school students in Samarinda. Teenagers use smartphones more likely to accessing social media and messenger than to accessing information that is useful for school lessons. They can spend hours accessing social media and communicating via messenger which can have an impact on their psychosocial status. Some studies show that the level of adolescent addiction to smartphone use can have a negative impact both physically, psychologically and behavior, including impaired of vision, hearing, sleep quality, decreased empathy, depression problems in adolescents, self-esteem problems and social support and emotional mental problems ([Al-Ayouby, 2017](#); [Budhyati Mz, 2012](#); [Choi & Yoo, 2015](#); [De-Sola Gutiérrez et al., 2016](#); [Gowthami & Kumar, 2016](#); [Hidayat & Mustikasari., 2014](#); [Mohammadbeigi et al., 2016](#); [Prasetyo, 2017](#)).

This is in line with several previous studies related to the impact of using smartphones and excessive social media. Some of the results of previous studies stated that excessive smartphone use can affect the work of the brain and thus tend to experience psychosocial disorders ([Gowthami & Kumar, 2016](#)). In addition, excessive smartphone use can also influence behavior in socializing and decreasing empathy in adolescents ([Al-Ayouby, 2017](#); [Nurina & Alyu, 2017](#); [Prasetyo, 2017](#)).

The high rate of addiction to smartphones in adolescents is caused by a change in the way they communicate with, the use of technology through social media which gives more freedom to

adolescents in exploring their feelings, opinions and perspectives ([Thompson, 2013](#)). In addition, there is a fear of to be out of date if it does not have social media, and fear that important information will be left behind through social media and messenger applications, so that teenagers tend to always access social media and messaging ([Thompson, 2013](#)). This can be seen in the highest smartphone usage, namely to access social media and messenger, which is equal to 55.9% in adolescent junior high school students in Samarinda.

Emotional mental disorders are very detrimental because if they are not dealt with properly and quickly, they may cause adolescents to fall into a state of severe mental disorder ([World Health Organization](#)). This has an impact on the productivity of adolescents in carrying out their roles. In addition, severe mental disorders are very difficult to cure, so they can increase health financing and become a significant burden for the country.

Many previous studies have found the effects of smartphones addiction for health problems, but research on mental emotional disorders is still minimal, especially in Indonesia. With these findings, it is expected to provide information and knowledge, both to nurses as health workers and to the public in general, specifically related to the dangers of smartphone use to adolescent mental health. Although it was realized that there were still limitations to this study if viewed from the use of instruments that did not specifically measure the incidence of mental emotional disorders in adolescents. The conduct of research in schools can also provide the possibility of information bias.

CONCLUSION

Most teenagers use smartphones to access social media and messenger with an average time of using a smartphone more than 3 hours to accessing social media and messenger. 47.2% of students experience a tendency towards smartphone addiction. Teenagers who experience emotional mental disorders are 49 students or 38.6%. There is a relationship between smartphone addiction tendencies with emotional mental disorders. For further research, it can be developed in applied research to try out some complementary therapies that can be used to rehabilitate smartphone addiction, so that mental emotional disorders in adolescents can be prevented.

Declaration of Conflicting Interest

Authors have no possibility conflict of interest on this study.

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Authors Contribution

All authors have contributed from conception to the finalization of this study. Most of the significant intellectual content of this publishable copy of the article was done by the corresponding author. **RS** contributed in planning research, collecting data, analyzing data, and compiling manuscripts. **TT** contributed in helping with research planning, collecting data, and providing suggestion for the manuscript. **ES** contributed to planning preparation and reviewing the content of mental emotional. **UK** contributed in giving related advice about adolescents and their development, and help in publications process.

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