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RELATIONSHIPS AMONG PARENTING STYLE, SELF-REGULATION, AND SMARTPHONE ADDICTION PRONENESS IN INDONESIAN MIDDLE SCHOOL STUDENTS

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ASTRACT

Background: Although smartphones have countless benefits, many harmful effects are also at stake when they are overused. Adolescents are facing the troubling impacts of smartphone addiction, deteriorating their future as the nation's next generation. **Purpose**: The study aimed to identify the relationships among parenting style, self-regulation, and smartphone addiction proneness in Indonesian middle school students. **Methods**: This study used a cross-sectional, descriptive study design. Data collection took place from the 7th of January to the 8th of February, 2019 in five public junior high schools located in Jember Region, Indonesia. The total sample of this study was 158. Parental Authority Questionnaire, Self-Regulation Questionnaire, and Smartphone Addiction Proneness Scale were used to measure mother's parenting style, self-regulation, and smartphone addiction proneness, respectively. We applied Chi square test and Fisher's exact test to identify the differences in smartphone addiction proneness between the non-risk group and the risk group. Relationship between parenting style and smartphone addiction proneness was analyzed using a Pearson's correlation coefficient. A Pearsons's correlation coefficient was also used to identify the correlation between self-regulation and smartphone addcition proneness **Results**: The differences in smartphone addiction proneness between the risk group and non-risk group were significant depending on sex (p=0.004), daily smartphone usage time (p=0.025), purpose of smartphone usage (p=0.001), and the most frequently used Social Networking Site (SNS) (p=0.016). A significant positive correlation was found between permissive parenting style and smartphone addiction proneness (r= 0.174, p=0.029). A significant negative correlation was found between self-regulation and smartphone addiction proneness (r= -0.448, p=0.001). **Conclusion**: The results from this study can be used as a reference to raise the awareness of smartphone addiction to Indonesian parents and adolescents, support nursing schools to establish educational programs related to healthy use on smartphone and SNS applications, and assist nursing schools, school staff, and relevant experts in developing adolescents' self-regulation ability, and educate parents in developing a positive parenting style.

Keywords: smartphone addiction proneness, parenting style, self-regulation, middle school students, Indonesia

BACKGROUND

Smartphones have become an indispensable device for all groups of people, especially adolescents, due to their multipurpose and attractive features. Based on the study by Husni and Fatulloh (2016), involving 1,551 elementary and middle school

students in Bandung-Indonesia, approximately 67.4% of participants spent 1-4 hours per day using smartphones. The study showed that 18.6% and 7.7% of students spent 4-8 hours and 8-12 hours per day, respectively. Meanwhile, approximately 6.3% of participants spent more than 12 hours per day.

Although smartphones have countless benefits, many harmful effects are also at stake when they are overused. Furthermore, the increasing frequency and duration of smartphone usage are positively linked to a higher risk of smartphone addiction (Cha & Seo, 2018; Haug et al., 2015). Several studies have reported that smartphone addiction can result in several physical, psychological, and social problems (Cha & Seo, 2018; Cho & Lee, 2017; Kim, Kim, & Jee, 2015).

Several studies found that family environmental factors have an important role in predicting smartphone addiction. Specifically, positive parenting style characterized by affection, rational explanation, and parents' supervision could reduce smartphone addiction (Bae, 2015). Meanwhile, negative parenting style characterized by parental rejection and restriction could increase the level of adolescents' reliance on smartphones (Bae, 2015; Lian, You, Huang, & Yang, 2016).

Individual characteristics have been considered as an essential factor in human development. Thus, adolescents' personal characteristics should be factored when determining the extent to which adolescents are affected by their environments (Bronfenbrenner, 1979). Adolescents are easily captivated by new technology, and they can utilize various technological devices more easily than adults (Tapscott, 2009). Nowadays, adolescents' use of online space is strongly related to the fulfillment of their psychosocial development tasks, such as self-identity, self-esteem, and social connection improvement (Spies Shapiro & Margolin, 2014). Haug et al. (2015) also reported that adolescents tended to utilize their smartphone features suited to their preferences as a way to manage their friendship and academic-related stress. These adolescents' characteristics regarding technological utilization push adolescents to become strongly attached to their smartphones.

In addition, the failure of self-regulation could increase media usage, which will develop into media addiction (LaRose & Eastin, 2004). Van Deursen et al. (2015) showed that low level of self-regulation increased the risk of smartphone addiction. The combination of the immature self-regulation of adolescents and the above characteristics of adolescents drives smartphone addiction more so when compared to the other age groups. Adolescents are facing the troubling impacts of smartphone addiction, deteriorating their future as the nation's next generation. However, studies investigating the correlation of parenting style, self-regulation, and smartphone addiction proneness among adolescents in Indonesia remain limited. Therefore, a study of the relationships among parenting style, self-regulation, and addiction proneness among middle school students in Indonesia becomes very important.

METHODS

a. Design:

This study used a cross-sectional, descriptive study design to identify the relationships among parenting style, self-regulation, and smartphone addiction proneness in Indonesian middle school students.

b. Place and time of research:

The study was conducted from the 7th of January to the 8th of February, 2019 in five public junior high schools, including Public Junior High School (Sekolah Menengah Pertama Negeri/SMPN) 1, 3, 4, 10, and 12 Jember located in the urban area of Jember Region, Indonesia. There were 15 classes included in Public Junior High School (Sekolah Menengah Pertama/SMPN) 4 Jember, while 18 classes were included in SMPN 3 Jember. Students in SMPN 1, 10, and 12 were recruited from 19 classes for each school.

c. Population and samples:

A convenience sampling was used to recruit participants for this study. The criteria for inclusion in this study were as follows: student in grades 7-9 of middle school in Jember Region, smartphone user, living with both parents, and willing to participate in the study. Students who lived with one parent, either mother or father, only, were excluded from the study.

This study utilized G-power software program version 3.1.9.2 to calculate the minimum sample size with correlation statistical test. To calculate the sample size using the correlation statistical analysis test, four parameters should be determined, including the level of significance, power, effect size, and the tailedness of the test (Mayr, Erdfelder, Buchner, & Faul, 2007). The levels of significance, effect size, and power of this study are 0.05, 0.25, and 0.8, respectively. The levels of significance and power in this study were based on a previous similar study by Lee, Chae, Bang, and Choi (2015). Since this study was a correlational study and tested the relationship between variables in one direction, it used one-tailed test. Based on the information about the level of significance, power, effect size, and the tailedness of the test, the minimum sample size for main analysis of this study was 130. Accounting for missing values and withdrawal, a missing rate of 20% was set. Accordingly, the investigator had to approach 164 potential respondents for the study. Due to incompletion of some questionnaires, data from some participants were excluded from the study. A total of 158 eligible middle school students participated in this study.

d. Data Measurement:

The smartphone addiction proneness, parenting style, and self-regulation were measured by three different instruments.

1. Smartphone Addiction Proneness Scale (SAPS)

   SAPS developed by Kim et al. (2014) consists of 15 items using a 4-point Likert-type response format, ranging from 1 (strongly disagree) to 4 (strongly agree). The items were constructed for four subdomains, including disturbance of adaptive functions, virtual life orientation, withdrawal, and tolerance. The scores varied from 15 to 60, and the clinical cut off score for smartphone addiction proneness was 41. Smartphone addiction proneness is classified as follows: high-risk group (total score ≥45), potential-risk group (total score=42-44), and non-risk group (total score ≤41). In the data analysis of this study, only two categorizations of smartphone addiction proneness, including non-risk and risk groups, were used. High-risk and potential risk groups were merged into one category, namely risk group. The reliability of SAPS was confirmed with a Cronbach's alpha of .88, indicating high reliability (Kim et al., 2014).

Since there is no reliable and valid instrument for measuring smartphone addiction proneness in Bahasa Indonesia, translation, content validity, and reliability test of Smartphone Addiction Proneness Scale (SAPS) were conducted for this study. The translation and content validity process were conducted using five stages of cross-cultural adaptation of self-report measurement guideline (Beaton, Bombardier, Guillemin, & Ferraz, 2000). The five stages of cross-cultural adaptation process of Smartphone Addiction Proneness Scale (SAPS) based on the guideline of Beaton et al. (2000) includes forward translation, synthesis of translation, back translation, expert committee review, and pretesting of the pre-final version of the developed questionnaire.

The SAPS-Indonesian version was reviewed by an expert panel to assess the content validity. Content validity index (CVI) was calculated for item-level CVI (I-CVI) and scale-level CVI (S-CVI). I-CVI reflected the content validity of each item, while S-CVI indicated the content validity of

the overall scale. In this study, all of the items of the SAPS-Indonesian version produced I-CVI of 1.00, indicating an excellent value. The S-CVI was 1.00, reflecting an excellent validity of the overall scale. The reliability test of SAPS was conducted as well, following the process of cross-cultural adaptation. The reliability test of the SAPS-Indonesian version involving 158 participants was verified with an overall Cronbach's alpha value of .79, indicating an acceptable internal consistency.

2. Parenting Style

Parental Authority Questionnaire (PAQ) was used to measure adolescents' perceived parenting style. The Parental Authority Questionnaire (PAQ) Indonesian version developed by Tamami (2011) included father and mother versions. The current study focused on adolescents' perceived parenting style of the mother. Therefore, only the PAQ of mother-Indonesian version was used. Validity and reliability tests were performed by involving 272 middle school students. The reliability test of the PAQ of mother-Indonesian version showed high consistency with Cronbach's alpha coefficient of .80 and .82, respectively (Tamami, 2011). The PAQ of mother-Indonesian version consisted of 27 items with each item scored on a 4-point Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree). The items were categorized into three subscales, including authoritative (10 items), authoritarian (10 items), and permissive parenting style (7 items). The total score of each subscale was summed.

3. Self-Regulation

Self-regulation was measured using the Self-Regulation Questionnaire (SRQ) Indonesian version developed Restuti (2016). Validity and reliability tests of the SRQ-Indonesian version were conducted by involving 234 middle and high school students. The SRQ Indonesian version consisted of 23 items and each item was scored on a 4-point Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree) for favorable items. Unfavorable items were scored in reverse. Cronbach's alpha coefficient of the SRQ-Indonesian version in this study was .83, indicating a good reliability The total score of all dimensions was summed. A higher total score of the SRQ indicated higher self-regulation ability.

e. Data analysis method:

The collected data of this study were analyzed using Statistical Package for the Social Science (SPSS) version 23 for Windows. Descriptive statistics of frequencies, means, and standard deviations were performed for demographic characteristics. The differences in the risk level of smartphone addiction proneness by personal characteristics (age, gender, grade, smartphone daily usage time, purpose of smartphone usage, most frequently used contents of smartphone, most frequently used SNS) and family characteristics (family's socioeconomic status and parents' education level) were analyzed by using Chi-Square test and Fisher Exact test. The correlation between parenting style and smartphone addiction proneness was analyzed by using Pearson correlation test. The correlation between self-regulation and smartphone addiction proneness was analyzed by using Pearson correlation test. Results were considered significant at p-value <0.05.

f. Ethical aspect:

Permission to conduct the study was first obtained from the International Review Board (IRB) of University of Muhammadiyah Yogyakarta (UMY), Indonesia, prior to

participant recruitment (IRB No. 622/EP-FKIK-UMY/XII/2018, approved date: December, 24th, 2018). After obtaining research permits from the IRB of UMY, the researcher applied for other research permits from the National Political and Society Protection Board (Badan Kesatuan Bangsa dan Politik/BAKESBANG) and Office of Education of Jember Region. The eligible students received both verbal and written information about the purpose of the study, the procedure of the study, and the participants' rights and obligations during the research. At this time, the eligible students were informed that participation was voluntary and they were allowed to withdraw from the study at any time without penalty. As the age of the participants was less than 18 years, the students who agreed to participate in the study received two informed consent forms, including student's assent and parents' consent forms. The researcher protected any information of the participants by transcribing all data by code numbers. There was no name attached to the questionnaires. The questionnaires of the study will be stored in a safe cabinet after the study is completed for up to five years in the future.

RESULTS:

1. Individual and Family Characteristics of the Participants

Individual and family characteristics of participants are shown in Table 1. A total of 158 middle school students participated in this study. Participants aged 14-15 years old participated the most (54.1%). Participants were mostly female (56.0%) and 37.75% were in Grade 8. Regarding smartphone ownership, nearly all participants (95.6%) in this study used their personal smartphones. The majority of them (52.5%) spent less than four hours per day for using a smartphone. Getting information and communicating with people were the biggest purposes (59.5%) for using smartphones. More than half of the participants (70.3%) chose Social Network Sites (SNS) as their most frequently used content of smartphones. Among four kinds of SNS which are common in Indonesia, the majority of participants (77.8%) preferred using WhatsApp. According to family characteristics, almost all participants (90.6%) in this study perceived they came from a family with middle socioeconomic status. Regarding the level of parents' education, most of the fathers (52.2%) and mothers (52.8%) graduated from high school.

Table 1. Individual and Family Characteristics of the Participants

Characteristics	Category	n	Percentage (%)
Age (years)	12-13	66	41.5
	14-15	86	54.1
	>15	6	3.8
Sex	Male	69	43.4
	Female	89	56.0
Grade	7	53	33.3
	8	60	37.7
	9	45	28.3
Smartphone Ownership	Personal Smartphone	152	95.6
	Shared Smartphone	6	3.8
Daily Smartphone Usage Time (hours)	≤4	83	52.5
	>4	75	47.5
Purpose of Smartphone Use	Getting New Information and Communication with People	94	59.5
	Seeking Fun and Regulating Mood	64	40.5

Most Frequently Used Content of Smartphone	Social Network Sites (SNS)	111	70.3
	Others (music, online game, streaming video)	47	29.7
Most Frequently Used SNS	Facebook, Twitter, Instagram	35	22.2
	WhatsApp	123	77.8
Family's Socioeconomic Status	Low	6	3.8
	Middle	144	90.6
	High	8	5.0
Father's Education Level	Elementary School	13	8.2
	High School	83	52.2
	University or higher	62	39.0
Mother's Education Level	Elementary School	14	8.8
	High School	84	52.8
	University or higher	60	37.7

2. The Level of Parenting Style, Self-Regulation, and Smartphone Addiction Proneness

As shown in Table 2, the mean scores of parenting style, including permissive, authoritarian, and authoritative, are 16.11 (SD = 2.51), 25.64 (SD = 3.53), 31.08 (SD = 4.04), respectively. Mean score for self-regulation is 65.60 (SD = 6.71), while mean score for smartphone addiction proneness is 34.65 (SD = 5.76).

Table 2. The Level of Parenting Style, Self-Regulation, and Smartphone Addiction Proneness (N=158)

Variable	Mean ± SD	Min-Max	Possible Range
Permissive	16.11 ± 2.51	9-23	0-28
Authoritarian	25.64 ± 3.53	18-36	0-40
Authoritative	31.08 ± 4.04	14-40	0-40
Self-Regulation	65.60 ± 6.71	50-86	0-92
Smartphone Addiction Proneness	34.65 ± 5.76	19-51	0-60

SD: Standard Deviation

3. Smartphone Addiction Proneness of Indonesian Middle School Students

As presented in Table 3, of the 158 participants, 88.6% (n=140) were identified as non-risk group for smartphone addiction and 11.4% (n=18) were classified as risk group based on their scores on the Smartphone Addiction Proneness Scale (SAPS). Among 18 participants in the risk group, five participants were classified into the high-risk group, while 13 participants were classified as potential-risk group.

Table 3. Smartphone Addiction Proneness of Middle School Student (N=158)

Smartphone Addiction Proneness Scale	Non-risk group (n=140, 88.6%) M (SD)	Risk group (n=18,11.4%) M (SD)
Total score	33.42 (4.82)	44.17 (2.89)
Score on each domain		
Disturbance of adaptive functions	11.55 (2.32)	15.06 (2.36)
Virtual life orientation	3.54 (0.93)	4.89 (1.18)
Withdrawal	8.37 (2.04)	11.39 (1.54)
Tolerance	9.96 (1.75)	12.83 (1.54)

SD: Standard deviation; p <0.05

4. Differences in Smartphone Addiction Proneness by Individual and Family Characteristics

To identify the differences in smartphone addiction proneness according to individual and family characteristics of participants between the non-risk group and the risk groups, Chi-square test and Fisher's exact test were performed. As evidenced from Table 4, smartphone addiction proneness was significantly different based on some individual characteristics of participants, including sex (p=0.004), daily smartphone usage time (p=0.025), purpose of smartphone

usage (p=0.001), and the most frequently used SNS (p=0.016). More specifically, 18% (n=16) of female students were in the risk group of smartphone addiction proneness while 2.9% (n=2) of the male students were in the risk group. There were 17.3% (n=13) of participants in the risk group who spent more than four hours per day using a smartphone while 6% (n=5) of participants in the risk group spent less than or equal to four hours.

As many as 21.9% (n=14) of participants in the risk group used their smartphones for seeking fun and regulating their feeling, whereas 4.3% (n=4) of participants in the risk group used a smartphone for getting new information and communicating with people. There were 8.1% (n=10) of participants in the risk group who used WhatsApp the most among other SNS applications while 22.9% (n=8) of participants in the risk group used Facebook, Twitter, or Instagram the most. Regarding the family characteristics, there was no difference in smartphone addiction proneness between the two groups depending on family's socioeconomic status and parents' education level.

Table 4. Differences in Smartphone Addiction Proneness by Individual and Family Characteristics (N=158)

Personal and Family Characteristics	Category	Non-risk group (n=140)	Risk group (n=18)	x^2	p
		n (%)	n (%)		
Age (years)	12-13	59 (89.4)	7 (10.6)	0.978	0.613
	14-15	75 (87.2)	11 (12.8)		
	>15	6 (100.0)	0 (0.0)		
Sex	Male	67 (97.1)	2 (2.9)		0.004†
	Female	73 (82.0)	16 (18.0)		
Grade	7	48 (90.6)	5 (9.4)	2.575	0.276
	8	55 (91.7)	5 (8.3)		
	9	37 (82.2)	8 (17.8)		
Smartphone Ownership	Personal	134 (88.2)	18 (11.8)		1.000†
	Shared	6 (100)	0 (0.0)		
Daily Smartphone Usage Time (hours)	≤4	78 (94.0)	5 (6.0)	4.992	0.025
	>4	62 (82.7)	13 (17.3)		
Purpose of Smartphone Usage	Getting New Information and Communicating with People	90 (95.7)	4 (4.3)		0.001†
	Seeking Fun and Regulating Mood	50 (78.1)	14 (21.9)		
Most Frequently Used Content of Smartphone	Social Network Sites (SNS)	96 (86.5)	15 (13.5)		0.276†
	Others (music, online game, streaming video)	44 (93.6)	3 (6.4)		
Most Frequently Used SNS	Facebook, Twitter, Instagram	27 (77.1)	8 (22.9)	5.854	0.016
	WhatsApp	113 (91.9)	10 (8.1)		
Family's Socioeconomic Status	Low	6 (100.0)	0 (0.0)	1.975	0.373
	Moderate	126 (87.5)	18 (12.5)		
	High	8 (100.0)	0 (0.0)		
Father's Education Level	Elementary School	13 (100.0)	0 (0.0)	2.296	0.317
	High School	74 (89.2)	9 (10.8)		
	University or higher	53 (85.5)	9 (14.5)		

Mother's Education Level	Elementary School	14 (100.0)	0 (0.0)	2.612	0.271
	High School				
	University or higher	72 (85.7)	12 (14.3)		
		54 (90.0)	6 (10.0)		

p <0.05

† Fisher's Exact Test

5. Relationship among Parenting Style, Self-Regulation, and Smartphone Addiction Proneness

A Pearson correlation test was performed to identify the relationship among parenting style of mother and smartphone addiction proneness in each subscale. Parenting style was classified into three types of parenting style based on Baumrind's model, including permissive, authoritarian, and authoritative. As seen in Table 5, permissive parenting style significantly correlated to smartphone addiction proneness (r=0.174, p=0.029). A positive correlation between permissive and smartphone addiction proneness indicated that the higher the score of permissive parenting style of mother, the higher the score of smartphone addiction proneness.

A negative correlation was found between self-regulation and smartphone addiction proneness (r=-0.448, p<0.001), which indicated that the higher the self-regulation is, the lower risk of the participant becoming addicted to a smartphone, and, vice versa, the lower the self-regulation is, the higher the risk of the participant becoming addicted to smartphones.

Table 5. Relationship among Parenting Style, Self-Regulation, and Smartphone Addiction Proneness (N=158)

	Parenting Style			Self-Regulation r (p)
	Permissive r (p)	Authoritarian r (p)	Authoritative r (p)	
Smartphone Addiction Proneness	0.174* (0.029)	0.097 (0.226)	-0.066 (0.410)	-0.448** (0.001)

*. Correlation is significant at the 0.05 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

The prevalence of smartphone addiction proneness in this study was 11.4%, which was lower compared to other studies conducted in some countries in Asia, including South Korea (30.9%), China (29.8%), Thailand (45.8%), and Japan (26.4%) (Cha & Seo, 2018; Chen et al., 2017; Tangmunkongvorakul et al., 2019; Tateno et al., 2019). The different prevalence of smartphone addiction proneness among these countries could be affected by the different instrument and categorization method used. There is no survey nationally representing smartphone addiction in Indonesia, thus comparing this finding with the current situation in Indonesia becomes quite challenging. However, this finding should be considered as an important issue which needs more serious attention from relevant institutions in establishing strategies to overcome these phenomena.

Individual characteristics of adolescents, including sex, daily smartphone usage time, purpose of smartphone usage, and most frequently used SNS, showed significant differences between the risk group and the non-risk group. Most participants in the risk group were female, whereas most participants in the non-risk group were male. Supporting the finding of the current study, previous studies showed that smartphone addiction had been found to be more prevalent among female adolescents (Augner & Hacker, 2012; Lee & Lee, 2017; Lee, Chang, Lin, & Cheng, 2014). Females have also been reported to spend more time on smartphone use per day than their counterparts (Roberts, Yaya, & Manolis, 2014).

Another study reported that females exhibited 2.7 times more risk of smartphone addiction than males (Lee, Kim, & Choi, 2017). This might be because female adolescents were more disposed to use

smartphones for social purposes, such as maintaining social relationship with their valued people, prompting greater utilization of various communication services of the smartphone, such as chatting, texting, and SNS (Chiu, Hong, & Chiu, 2013). Meanwhile, males used their smartphones mostly for functional purposes, such as downloading programs and other work-related uses (Lemish & Cohen, 2005). This finding implied that prevention and intervention strategies to overcome and reduce smartphone addiction among adolescents should be implemented by considering the gender perspective on smartphone use.

Daily smartphone usage time has been found to be significantly different between the two groups. Most participants in the risk group spent more than four hours on smartphone use, while most participants in the non-risk group spent less than four hours. Some previous studies supported this finding. According to Haug et al. (2015), Aljomaa, Al.Qudah, Albursan, Bakhiet, and Abduljabbar (2016), and Hussain, Griffiths, and Sheffield (2017), longer duration on smartphone use strongly predicted smartphone addiction, whereas shorter smartphone usage time negatively affected smartphone addiction (Cha & Seo, 2018). As middle school students are still dependent on their parents and interact with their parents the most in daily life, this finding emphasized a need of supporting parents in providing clear rules and time limit on daily smartphone use to their children.

Among other smartphone contents, including music, online games, and streaming video, Social Networking Sites (SNS) were the most used content among adolescents. SNS was revealed to have a more significant effect on smartphone addiction than the effect of game use (Jeong, Kim, Yum, & Hwang, 2016). The first reason why SNS exhibits the strongest effect on addiction is that, once people access SNS, they are also able to access various types of entertainment applications, such as online games, videos, and music (Kuss & Griffiths, 2017). Second, SNS enables people to either maintain relationships or create new connections with others from different areas across the world, something that cannot be done with other contents on a smartphone (Boyd & Ellison, 2007). Third, people nowadays tend to use SNS applications to send messages or make online calls rather than making conventional phone calls and messages, which require additional cost (Salehan & Negahban, 2013). These aforementioned benefits of SNS pull more adolescents to become engaged in SNS application, which contributes to excessive use of a smartphone. As a result, the more frequently adolescents use SNS, the longer time they spent on smartphone use, which later increases the vulnerability to smartphone addiction. This finding, hence, proved that educational programs on good practices for using smartphone and SNS are necessary with the goals that adolescents will be able to develop a healthy utilization of such communication tools.

The two groups showed a significant difference regarding the purpose of smartphone use. Getting new information and communicating with people were the two most important motives in using smartphone in the non-risk group. Meanwhile, participants in the risk group mostly used their smartphones for seeking fun and regulating mood. These findings were in line with a previous study in which students who showed less addiction to smartphone were more likely to use their smartphone for communication activities and information seeking. Meanwhile, students who were dominantly using their smartphones to seek enjoyment and regulate their mood showed greater addiction to smartphones (Zhang, Chen, & Lee, 2014). This might be because behaviors that produce feelings of fun and enjoyment are more likely to raise our motivation to keep doing the same behaviors (Song, LaRose, Eastin, & Lin, 2004). Therefore, when smartphone users experience a better feeling and obtain pleasure when they use a smartphone, then they are more likely to get addicted to smartphones. This result can be used to develop health education programs related to healthy smartphone use for the risk

group by including fun and attractive activities such as game-based learning, quizzes, and competition to improve the engagement of adolescents in the programs.

The two groups showed a significant difference in terms of the most frequently used SNS application, in which WhatsApp was found to be the most used application among participants. In accordance with this study, a recent study in Indonesia found that, since it has been released, WhatsApp has become the most popular application among Indonesian people to date (Kholisoh & Ria, 2017). The WhatsApp messenger application enables people to send messages, audio, and video in real time (Ahad & Lim, 2014). A study in Indonesia also found that WhatsApp increased the effectiveness of the learning process because students were able to make discussions in an online group and communicate with their lecturer, particularly about homework (Khusaini, Suyudi, Winarto, & Sugiyanto, 2017). Therefore, it is not surprising that participants in both groups used WhatsApp the most among other social network sites. This finding can be a great opportunity for Indonesian nurses in developing effective and low-cost health promotions for adolescents by using WhatsApp, such as conducting online group discussion on health issues via WhatsApp.

Both groups showed no difference in smartphone addiction proneness depending on perceived family socioeconomic status. Regarding the parents' education level, either the father' or the mother's education level appeared to not be statistically different between the two groups. Akin to this study, Cha and Seo (2018) found that family income and parents' education were not significantly related to smartphone addiction proneness among Korean middle school students. Similarly, Kumcagiz and Gunduz (2016) showed no significant difference in the mean scores of smartphone addiction among university students based on family economic background. Furthermore, Cha and Seo (2018) argued that, since a smartphone provides various contents tailored to the individual's needs and interest, individuals from any level of socioeconomic status would easily find a content in which they were interested, or that satisfied their needs. This finding demonstrated that, due to the convenient and multifarious functions of smartphones, adolescents from families with different level of socioeconomic status may have a similar risk in smartphone addiction.

Another variable reflecting family characteristics of participants in this study was the mother's parenting style. In this study, permissive parenting style showed a significant positive correlation with smartphone addiction proneness, which means that the higher the score on permissive parenting style, the higher the score on smartphone addiction proneness. According to Baumrind (1971), parents with permissive parenting style exhibited a high level of responsiveness, warmth, and indulgence, but low level of parental control and disciplinary action to their children. In agreement to this study, children who live in a family with a lower level of parental monitoring and lack of discipline have been reported to have a higher dependency to the internet (Park, Kim, & Cho, 2008). More importantly, Kim and Kim (2004) reported that, when parents provided lower supervision to the children, children would not receive appropriate guidance which could help them to regulate their smartphone usage. On the other hand, children who obtain appropriate and sufficient monitoring and supervision from parents were less likely to engage in problematic behaviors such as addictive use of internet and smartphone addiction (Bae, 2015). However, there is also a need to inform parents that, although monitoring and supervision is essential to prevent maladaptive smartphone use among teenagers, strict supervision does not become simply a more effective way. As Stoltz et al. (2012) reported, when parents overly protected and strictly monitored their children, children were more inclined to seek social relationship from smartphone use. The above findings urge the importance of assisting parents in developing positive parenting styles and an appropriate parental

monitoring related to adolescents' smartphone use.

Self-regulation showed significant negative correlation with smartphone addiction proneness among Indonesian middle school students. This finding was in line with some recent studies which revealed that self-regulation is an essential factor in smartphone addiction. Ching and Tak (2017) stated that people having higher self-regulation skills became more aware of the rationale and the desired outcome of certain behaviors and had more worthwhile life goals. As a result, they were less likely to use smartphone uncontrollably. Kim et al. (2016) also stated that the level of self-regulation ability could also reflect an individual's capacity to delay satisfaction. Individuals with a high sense of self-regulation would demonstrate higher self-discipline, higher focus on long-term goals, and greater capability to delay short-term gratification. Therefore, those people showed a low tendency to attain the temporary satisfaction which smartphones can provide (Ching & Tak, 2017). Ching and Tak (2017) and Gökçearslan, Mumcu, Haşlaman, and Çevik (2016) reported that students with lower self-regulation abilities were more likely to exhibit an addictive use of smartphones. This may be because individuals with poor self-regulation showed a low capability to avoid distractors and were unable to focus on their works (Eerde, 2000; Restubog et al., 2011). Therefore, it seems necessary to facilitate adolescents in developing a higher self-regulation ability related to smartphone use.

CONCLUSION

Individual characteristics of adolescents, including sex, daily smartphone usage time, purpose of smartphone usage, and most frequently used SNS, showed significant differences between the risk group and the non-risk group. Differences of smartphone addiction proneness based on age, grade, smartphone ownership, and frequently used content of smartphone were not observed in this study.

Family socioeconomic and parent education level which reflected the family characteristics in this study have no differences in the two groups. Based on the results of bivariate analysis, among three types of parenting style of mother, only permissive parenting has been found to be significant factor correlated to smartphone addiction proneness in Indonesian middle school students. Another factor which reflected individual characteristics of adolescent and which showed significant association with smartphone addiction proneness was self-regulation.

The findings of this study indicate that smartphone addiction proneness among Indonesian adolescents can be considered as a serious situation. Consequently, it requires more serious attention from relevant institutions, such as family, school, and government. This study can be used as a reference to raise awareness among parents and adolescents of addictive use of smartphones. Considering the study finding which proved that a higher score on self-regulation correlated to a lower score on smartphone addiction proneness, this study can be also used to support teachers, schools, or relevant experts in developing adolescents' self-regulation ability. This study also revealed that permissive parenting style of mother was correlated to greater smartphone addiction proneness. Therefore, parenting experts should also be encouraged to educate parents in developing a positive parenting style characterized by the presence of sufficient parental monitoring and supervision.

Future research is certainly needed to produce more essential findings which can comprehensively represent the smartphone use and smartphone addiction proneness in Indonesia. Future research should expand the setting of research by targeting population from several cities in Indonesia. Involving middle school students both from public and private schools should be also considered to gain a different perspective of the smartphone use patterns of Indonesian adolescents. A poor parental monitoring has been reported to

increase problematic internet use (Liau, Khoo, & Ang, 2008). Therefore, another parental factor such as parental monitoring should be analyzed in future research. As reported by Tome, Matos, Simoes, Diniz, and Camacho (2012), adolescents' risk behaviors have been also strongly influenced by peers.

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