

PROBLEMATIC SMARTPHONE USE IN ADOLESCENTS: PARENTAL STRUCTURE AND PARENTAL PSYCHOLOGICAL CONTROL AS PREDICTORS

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Abstract

The use of smartphones in adolescents can negatively impact their daily lives. When adolescents' ability to control smartphone use is low, they could experience problematic smartphone use behavior (PSU). By internalizing control, parents play a crucial role in enhancing adolescents' self-control on smartphone use. Based on the controlling component of parenting, there are two types of parental control: parental structure and parental psychological control. Previous studies have found a relationship between parental psychological control and PSU. However, studies investigating the relationship between parental structure and parental psychological control simultaneously with PSU are limited. This study is important since parents found practicing those two types of parental control simultaneously. Therefore, this study aimed to investigate the effect of parental structure and psychological control on adolescents' problematic smartphone use. 219 adolescents aged 12-18 ($M = 14.49$ years) completed the Indonesian version of the Parental Structure Scale, Parental Psychological Control Scale, and Mobile Phone Problematic Use Scale questionnaires. Stepwise regression analysis shows that only parental psychological control predicts the increase of problematic smartphone use in adolescents. Our finding suggested that the type of parental control that emphasizes authority assertion, love withdrawal, and guilt induction is ineffective in decreasing problematic smartphone use in adolescents.

Keywords: adolescents, parental psychological control, parental structure, problematic smartphone use, smartphone

Problematic Smartphone Use pada Remaja: Parental Structure dan Parental Psychological Control sebagai Prediktor

Abstrak

Penggunaan *smartphone* pada remaja dapat berdampak negatif terhadap kehidupan sehari-hari. Ketika kemampuan remaja untuk mengontrol penggunaan *smartphone* rendah, mereka dapat mengalami perilaku penggunaan *smartphone* (PSU) yang bermasalah. Orang tua memainkan peran kunci dalam meningkatkan kontrol diri remaja terkait penggunaan *smartphone* yang bermasalah dengan menginternalisasi kontrol orang tua. Berdasarkan komponen kontrol pengasuhan, terdapat dua jenis kontrol orang tua: *parental structure* dan *parental psychological control*. Studi sebelumnya telah menemukan hubungan antara kontrol psikologis orang tua dan PSU. Namun, penelitian yang menyelidiki hubungan antara struktur orang tua dan kontrol psikologis orang tua secara bersamaan dengan PSU masih terbatas. Studi ini penting karena orang tua ditemukan mempraktekkan kedua jenis kontrol orang tua tersebut secara bersamaan. Oleh karena itu, penelitian ini bertujuan untuk mengetahui pengaruh *parental structure* dan *parental psychological control* terhadap penggunaan *smartphone* yang bermasalah pada remaja. Sebanyak 219 remaja usia 12-18 ($M = 14,49$ tahun) menyelesaikan kuesioner Parental Structure Scale, Parental Psychological Control Scale, dan Mobile Phone Problematic Use Scale (MPPUS) versi Indonesia. Hasil uji regresi stepwise menunjukkan hanya *parental psychological control* yang memprediksi peningkatan penggunaan *smartphone* bermasalah pada remaja. Berdasarkan hasil penelitian ini, kontrol orang tua yang menekankan pada otoritas, pengurangan cinta, dan membuat anak merasa bersalah tidak efektif mengurangi penggunaan *smartphone* yang bermasalah pada remaja.

Kata kunci: kontrol psikologis orang tua, penggunaan *smartphone* bermasalah, remaja, *smartphone*, struktur orang tua

INTRODUCTION

As technology develops in this digital era, smartphones have become an inseparable part of adolescents' daily lives. Central Bureau of Statistics (2021) reported that 74.64 percent of Indonesian youth aged 15-24 are smartphone users. This percentage increased by 11.49 percent from the previous year. This data shows the increasing need for adolescents to use smartphones is undeniable. The variety of features provided by smartphones makes it easy for adolescents to carry out various activities such as entertainment (playing games, watching videos, listening to music), interpersonal interactions (social media, telephone, messaging), and learning-related use (educational applications, online course, productivity) (Hong et al., 2021). In addition, smartphone use enables adolescents to explore their identity (Gerwin et al., 2018), build close relationships with peers, and help complete schoolwork (Vaterlaus et al., 2021).

The ease of using smartphones could lead to excessive use. It was reported that 54 percent of adolescents use smartphones to avoid interacting with others (offline) (Schaeffer, 2019), suggesting they feel more comfortable interacting online and decreasing face-to-face interactions. Consequently, excessive smartphone use may lead to a lack of social skills and poor opportunities for social interaction (Kim et al., 2015), while in fact, adolescence is an important stage for developing social interaction and when individuals should expand their social network (Twenge et al., 2019).

To date, the national data on the frequency, duration, and intensity of smartphone use in Indonesian adolescents are not available. However, Siste and colleagues (2019, 2021) found that the time spent by adolescents aged 12-18 years in Jakarta before and after online learning (distance education) during the pandemic is the same, that is, more than 20 hours per week. The duration of smartphone use from this study exceeds the American Academy of Pediatrics (AAP) recommendation to use smartphones no more than 14 hours per week for recreational purposes (Marciano & Camerini, 2021). When a smartphone is used for more than 2 hours for recreational purposes, it could affect brain development which is important for cognitive and motor development, learning, memory, and emotion regulation (Neophytou et al., 2019). Furthermore, Boers et al. (2019) found that the higher the frequency of smartphone use, the higher the likelihood of experiencing depression in adolescents.

In recent years, there has been extensive research on the excessive use of smartphones, and various terminologies have been used, such as problematic smartphone use (PSU) (Busch & McCarthy, 2021; Wolniewicz et al., 2018), smartphone addiction (Sun et al., 2019), mobile phone dependency (Seo et al., 2016), and problematic mobile phone use (Yao et al., 2021). It is important here to clarify the exact differences among the terms. Those terminologies have the same underlying construct and are frequently used interchangeably. However, excessive use is only measured by the duration or frequency of smartphone use, while problematic use is measured by quantity, patterns of use, or the negative consequences of the use (Fischer-Grote et al., 2019; Billieux, 2012). Excessive smartphone use does not always cause a PSU but can potentially lead to a PSU (Busch & McCarthy, 2021). In this article, the term PSU is used and defined as the inability to control oneself against repeated urges to use a smartphone, which eventually interferes with daily functions (Busch & McCarthy, 2021). PSU includes difficulty concentrating while doing activities, failure to execute planned work, inability to reduce smartphone use, withdrawal, and an increasing desire to continue using smartphones (such as checking smartphones continuously) (Kwon et al., 2013). According to Chang et al. (2019), adolescents are the most at-risk group for experiencing PSU. Previous studies have found the negative impact of PSU on adolescents' physical and mental health, including sleep disturbances (Zhang et al., 2021), decreased hand strength and grip (Radwan et al., 2020), depression and anxiety (Elhai et al., 2020), and low well-being (Horwood & Anglim, 2019). While in the educational context, PSU correlates with procrastination and academic anxiety (Yang et al., 2018).

Considering the adverse impact of PSU in various aspects, many researchers have examined determinant factors of PSU. Some studies found that the impact of parental behavior is still significant for adolescents, even though they have expanded their relationships with friends (Patton et al., 2016; Viner et al., 2012). Parental behavior in decreasing the occurrence of PSU in adolescents could be explained by enhancing adolescents' self-control and self-regulation regarding PSU, emphasized by Mangialavori et al. (2021), who found that chaotic family functions such as the absence of discipline and clear rules at home predict the PSU.

In parenting literature, the efforts made by parents in applying rules for adolescents are

examined through two perspectives: parental structure (Farkas & Grolnick, 2010) and parental psychological control (Barber, 1996). Parental structures set clear rules and expectations for adolescents' behavior, providing predictable outcomes and consistent feedback (Farkas & Grolnick, 2010). While parental psychological control is a practice of guilt induction, withdrawal of love, and affirmation of parental authority that affects adolescents' thoughts and feelings (Barber, 1996).

The similarity between parental structure and psychological control is that parents play an active role in providing boundaries and rules to control adolescents' behavior. The difference is that parental structure emphasizes parental supervision and establishing clear rules. Parents who apply parental structure control adolescents' thoughts, feelings, and behavior. On the other hand, parental psychological control emphasizes rules that control adolescents' psychology and feelings. Parents who apply psychological control take advantage of the adolescents' guilt to obey the rules. Although those two types of control have significant differences, González-Cámara et al. (2019) found that parents apply both types of control in daily parenting practices. Parents can provide supervision and clear rules while making adolescents feel guilty if they do not follow the rules. Both parental controls can meet or damage the basic psychological needs of adolescents (Abidin et al., 2019; Costa et al., 2014). Fulfillment or non-fulfillment of the basic psychological needs of adolescents correlates with an increase and decrease in self-control, which gradually affects problematic smartphone use in adolescents (Costa et al., 2014; Li et al., 2013).

Previous research has found the importance of self-control and self-regulation to prevent and decrease problematic smartphone use in adolescents (Yang et al., 2018). Other studies have revealed the significant role of parental control in developing and increasing adolescents' self-control and self-regulation (Abidin et al., 2019). However, the relationship between different types of parental control with PSU is still not widely found. Research investigating the relationship between parental psychological control and PSU is still limited and mostly studied in China (Yao et al., 2021; Wang et al., 2022). Yao et al. (2021) reported a positive relationship between parental psychological control with adolescents' problematic smartphone use. However, no research has been conducted on the relationship between parental structure and PSU. Most of the research on the parental

structure has been carried out in an individualistic culture (Flamm & Grolnick, 2013; Grolnick et al., 2014). And also, most research on problematic smartphone use is carried out in East Asia, such as China, Japan, and Korea (Lee et al., 2016; Tateno et al., 2022; Yang et al., 2018), there are still few studies conducted in Southeast Asia. Therefore, the present study is conducted to investigate: (1) whether the parental structure and parental psychological control predict problematic smartphone use in adolescents, and (2) which type of parental control predicts more strongly reducing problematic smartphone use in adolescents.

Based on the current literature, our hypotheses are: (1) parental structure negatively predicts problematic smartphone use, while parental psychological control positively predicts problematic smartphone use in adolescents, and (2) parental structure predicts reduced problematic smartphone use in adolescents stronger than parental psychological control.

METHODS

This study applied a correlational and cross-sectional quantitative approach to investigate the predictive relationship between parental structure, parental psychological control, and problematic smartphone use in adolescents. The ethical clearance was obtained from the Ethical Committee of Universitas Padjadjaran (Number 85/UN6.KEP/EC/2023). The study was conducted in September 2022.

The population of this study is adolescents aged 12-18 years in Indonesia who live with their parents. Participants in this study were limited to adolescents who owned smartphones. From the existing population, samples were taken using the convenience sampling method. We involved 219 students from two middle schools in Bandung (JHS, $n = 122$; SHS, $n = 97$). The data collection was conducted classically, with 20-25 students in each class. An online survey using the Jotform platform was used. Participants filled out the questionnaires under the guidance of the researchers. Informed consent was given both verbally and in writing on the first page of the questionnaire. The time required to complete the survey is approximately 25 minutes. The demographics data collected consist of age, gender (male, female), duration of smartphone usage daily for recreational purposes, parents who lived with the participants (both parents, father only, mother only), and the most dominant parent in caring for the participants (both parents, father only, mother only). The variables measured were parental structure and parental psychological control as independent variables

and problematic smartphone use as the dependent variable.

Based on the operational definition, the parental structure is the assessment of adolescents on the control of their parents in providing clear and consistent rules, guidelines, and expectations; prediction of consequences; feedback; opportunity; rationalization of rules and expectations; and authority. The parental structure was measured using the 24-item Parental Structure Scale (Ratelle et al., 2018) with a 5-point Likert-type scale (1 = never, 5 = always), adapted and validated into the Indonesian version. It includes six dimensions: (1) clear rules ($\alpha = 0.74$; 4 items; e.g., "My parents believe in having a lot of rules and sticking with them"), (2) predictability ($\alpha = 0.5$; 4 items; e.g., "I am aware of the consequences of my bad behavior"), (3) feedback ($\alpha = 0.73$; 4 items; e.g., "My parents tell me when I do something according to the rules and the expectations they have of me"), (4) opportunities ($\alpha = 0.83$; 4 items; e.g., "My parents show me how to do things for myself"), (5) rationale ($\alpha = 0.31$; 4 items; e.g., "My parents did not explain the reasons for setting the rules and expectations"^(R)), and (6) authority ($\alpha = 0.73$; 4 items; e.g., "Normally, my parents know where I go and what I do after school"). The results of the reliability test indicate that one item is not reliable, so only 23 items are included in the subsequent analyses ($\alpha = 0.88$). The validity analysis used content validity (I-CVI = 0.99). The parental structure score is obtained by making an average of each response. The higher the score, the higher the level of structure parents give to adolescents.

Based on the operational definition, parental psychological control is the assessment of adolescents on the control of their parents in encouraging guilt in children, attracting love from children, and limiting children's self-expression by asserting authority. Parental psychological control was measured using the 18-item Parental Psychological Control Scale (PPCS; Wang et al., 2007) validated in the Indonesian version ($\alpha = 0.88$). Items were rated with a 5-point Likert scale (1 = not at all true, 5 = very true). PPCS consists of 3 dimensions: (1) guilt induction ($\alpha = 0.82$; 10 items; e.g., "My parents said that I should feel ashamed if I didn't behave the way they wanted"), (2) love withdrawal ($\alpha = 0.79$; 5 items; e.g., "My parents avoided me when I let them down"), and (3) authority assertion ($\alpha = 0.64$; 3 items; e.g., "My parents rebuffed me with things like, 'You'll understand better when you grow up'"). The validity analysis using content validity achieved a satisfactory

coefficient (I-CVI = 0.99). The parental psychological control score is obtained by making an average of each response. The higher the score obtained, the higher the psychological control of parents.

Based on the operational definition, problematic smartphone use is an assessment of adolescents' behavior in excessive smartphone use, preoccupation with using smartphones, and showing withdrawal symptoms when not using smartphones. Problematic smartphone use was measured using the 24-item Mobile Phone Problematic Use Scale (MPPUS; Kalhori et al., 2015) ($\alpha = 0.88$) rated with a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree), which was adapted into Indonesian version. MPPUS consists of 3 dimensions: (1) overuse of smartphone ($\alpha = 0.87$; 14 items; e.g., "My productivity decreases if I spend time with my smartphone"), (2) withdrawal symptoms ($\alpha = 0.83$; 7 items; e.g., "I get irritated if I have to turn off my smartphone at a meeting, dinner, or at the movies"), and (3) preoccupation ($\alpha = 0.64$; 3 items; e.g., "Sometimes when I'm chatting on my smartphone while doing other things, I get lost in the chat and don't pay attention to what I'm doing"). The validity analysis of the scale was done by using the measurement of content validity with I-CVI = 0.97, which indicates good relevancy between the items and the construct (Polit & Beck, 2006). The problematic smartphone use score is obtained by making an average of each response. The higher the score obtained, the higher the problematic smartphone use in adolescents.

All measurements used in the present study were translated and validated using the International Test Commission guidance (2017). A total of 219 data were analyzed. In this study, two data analysis techniques were carried out: descriptive and stepwise regression. Descriptive analyses in the form of averages and percentages are used to describe the participants' demographics, while the research variables are described by the mean and standard deviation. Stepwise regression analyses were conducted to predict the effect of parental structure and psychological control on adolescents' problematic smartphone use after controlling gender and age. In this study, all assumptions of stepwise regression have been achieved with data normally distributed ($p = 0.1 > 0.05$), linear ($p = 0.1 > 0.05$ and $p = 0.5 > 0.05$), and there is no multicollinearity (Tolerance = 0.993 > 0.10; VIF = 1.008 < 10) and heteroscedasticity ($p = 0.57 > 0.05$ and $p = 0.43 > 0.05$). All of the analyses were done using IBM SPSS Statistics version 22.

Table 1 Demographic Characteristics and duration of smartphone use

Variable	Category	N	%
Gender	Girls	116	53
	Boys	103	47
Age categorization	Early adolescence	48	21.9
	Middle Adolescence	171	78.1
Parents who play the most role in parenting	Mother	70	32
	Father	7	3.2
	Mother and Father	140	63.9
	Grandfather and Grandmother	2	0.9
Smartphone usage duration daily (in hour)	< 2 h	10	4.6
	2 - 4 h	36	16.4
	5 - 7 h	71	32.4
	8 - 10 h	65	29.7
	> 10 h	37	16.9

Note: N= number of participants, %= percentage

RESULTS

Demographic Characteristics

The demographic characteristics and the duration of smartphone use are described in Table 1. Participants in this study were adolescents aged 12-18 years, with an average age of 14.49 years. Of 219 participants, most adolescents use smartphones for around 5-10 hours daily.

Problematic Smartphone Use in Adolescence

Based on a descriptive analysis of the PSU dimensions (Table 2), participants tended to have a PSU score ($M = 3.02$; $SD = 0.71$) higher than the hypothetical mean (range = 1-5). This shows that most adolescents feel they cannot control their smartphone use to the point where it interferes with their daily lives. Withdrawal symptoms were the dimensions most experienced by adolescents ($M = 3.33$; $SD = 0.83$).

Table 2 Descriptive statistics of parental structure, parental psychological control, problematic smartphone use

Variable	Mean	Standard deviation
Parental structure	3.73	0.56
Clear rules	3.96	0.69
Predictability	3.90	0.63
Opportunity	3.85	0.87
Rationale	3.56	0.63
Authority	3.46	0.90
Parental psychological control	3.06	0.73
Guilt induction	3.11	0.77
Love withdrawal	2.71	0.98
Authority assertion	3.46	0.90
Problematic smartphone use	3.02	0.71
Overuse of smartphone	2.95	0.74
Withdrawal symptoms	3.33	0.83
Preoccupation	2.67	0.93

Parental Structure

Participants tended to have a parental structure score ($M = 3.73$; $SD = 0.56$) higher than the hypothetical mean (range = 1-5). This shows that most adolescents tend to perceive their parents as applying a parental structure in controlling their behavior. Based on the descriptive analysis of parental structure dimensions (Table 2), the majority of adolescents tended to perceive their parents as giving clear rules ($M = 3.96$; $SD = 0.69$) and predictability of the consequences of their actions ($M = 3.90$; $SD = 0.63$).

Parental Psychological Control

Participants reported higher parental psychological control scores ($M = 3.06$; $SD = 0.73$) than the average hypothesis (range = 1-5). This shows that most adolescents tend to perceive their parents as applying parental psychological control in controlling their behavior. Based on the descriptive analysis of parental psychological control dimensions (Table 2), the function of parental psychological control perceived most by adolescents is the authority assertions ($M = 3.46$; $SD = 0.90$), followed by guilt induction ($M = 3.11$; $SD = 0.77$) and love withdrawal ($M = 2.71$; $SD = 0.98$).

Table 3 Correlation between parental structure, parental psychological control, and problematic smartphone use

Variable	1	2	3
Parental structure	-		
Parental psychological control	0.089	-	
Problematic smartphone use	-	0.303**	-
	0.009		

Note: * $p < 0.005$, ** $p < 0.01$

Correlation of Research Variable

The correlation analysis revealed that parental psychological control was positively correlated with problematic smartphone use in adolescents and showed a weak correlation ($r = 0.3$; $p \leq 0.01$). No correlation was identified between parental structure and problematic smartphone use ($p = 0.89 > 0.05$).

The Role of Parental Structure and Parental Psychological Control on Problematic Smartphone Use in Adolescents

Table 4 shows the roles of parental psychological control and parental structure on problematic smartphone use in adolescents. The stepwise regression analysis showed that parental psychological control predicts problematic smartphone use ($\beta = 0.305$; $p < 0.05$). The results show that the model was significant ($F(4,219) = 6.105$, $p < 0.05$) with a predictor contribution of 10.2 percent. However, if we look at each variable, the model explains that parental structure is not a significant predictor of problematic smartphone use ($\beta = -0.024$; $p = 0.720 > 0.05$). This is consistent with the correlation analysis indicating that parental structure and problematic smartphone use were not significant.

Table 4 Stepwise regression analysis with parental psychological control and parental structure as predictors and problematic smartphone use in adolescents as dependent variable

Model	Variable	Standardized	t	Sig.
		coefficients Beta		
1	Constant		5.564	0.000*
	Gender	-0.092	-1.355	0.177
	Age	0.047	0.686	0.493
	R ²	0.011		
2	Constant		3.027	0.003*
	Gender	-0.069	-1.053	0.294
	Age	0.064	0.984	0.326
	PPC	0.305	4.665	0.000*
	PS	-0.024	-0.359	0.720
	R ²	0.102		

Note: a. Dependent Variable= PSU; PPC = Parental Psychological Control; PS = Parental Structure; N = 219; * $p < 0.05$. ** $p < 0.01$

DISCUSSION

The current study aims to investigate whether the parental structure and parental psychological control predict adolescent problematic smartphone use. Furthermore, it examines which type of parental control has a strong effect on reducing problematic smartphone use in adolescents. The results show that only parental psychological control predicts the increase in problematic smartphone use in adolescents.

The most significant finding in the present study is that parental psychological control is positively associated with problematic smartphone use in adolescents. Based on this result, the more parents apply control emphasizing authority assertion, love withdrawal, and guilt induction, the more adolescents become problematic with smartphone use. This is because parental psychological controls can damage the basic psychological needs of adolescents (Costa et al., 2014).

The fulfillment of the basic psychological needs of adolescents is correlated with high self-regulation in adolescents, which gradually helps them to regulate their smartphone use (Li et al., 2013; Zakiyyah & Latifah, 2022). Being under parental psychological control can undermine the need for autonomy because children feel coerced (Grolnick & Pomerantz, 2009), the need for competence as they feel they have no control over their behavior, and the need for connectedness as they feel rejected by their parents when not obeying the given rules (Yao et al., 2021). The frustration of needs leads to difficulty in regulating self, which eventually could cause PSU in adolescents. These results were consistent with previous findings. Li et al. (2013) reported that parental psychological control (love withdrawal) predicts PSU in adolescents, and Shek et al. (2018) explained that PSU in adolescents was predicted by maternal psychological control. A study by Yao et al. (2021) explained that adolescents' need for frustration and problematic smartphone use was determined by parental psychological control. Another possible explanation for our finding is that adolescents might increase the use of smartphones to satisfy their unmet basic psychological needs (Lee & Kim, 2021). Adolescents will perceive parental psychological control as a stressful situation and use smartphones as dysfunctional coping stress (Li et al., 2013; Wu et al., 2016).

The most unexpected finding is that our study did not find a relationship between parental structure and problematic smartphone use. The results

are not fully in line with our hypothesis. We hypothesized that parental structure and psychological control could influence problematic smartphone use in adolescents because parental control plays an important role in reducing risky behavior during adolescence (Harris-McKoy, 2016). This finding might be explained by the fact that parental impact gradually diminishes over time as adolescents become more independent and experience individuation (Rosič et al., 2022; Shek et al., 2018). This finding contradicts previous studies, which have suggested that parental mediation (the parental structure that directly monitors smartphone usage) affects appropriate smartphone usage among children and reduces their impulsiveness (Hwang & Jeong, 2015).

In general, the strength of the present study is the use of adolescents' perspectives to assess the parenting behavior they experienced and their smartphone use. It gives a better chance to the accuracy of the results because of objectivity and honesty (de-Sola et al., 2017). Previous researchers suggest that studies with parental perspectives tend to display good behavior (more positive parenting and lower child smartphone use).

CONCLUSION AND SUGGESTION

The main goal of the current study was to determine the effect of parental structure and parental psychological control on problematic smartphone use in adolescents. The findings indicate that only parental psychological control predicts increased problematic smartphone use in adolescents. This finding highlights the ineffective of parental psychological control.

The scope of this study was limited in terms of generalisability due to the sampling methods we used. In future investigations, it is recommended to use other sampling techniques that can better generalize the study population. Another recommendation is to research paternal and maternal psychological control because it is possible that fathers and mothers applied different parental control, thus having a different effect on adolescent PSU behavior. In terms of parenting practices, it is not recommended to use parental psychological control to decrease problematic smartphone use in adolescents. The results of this study can contribute to creating a psychoeducational program that explains to parents the adverse effect of psychological control on adolescent smartphone use, thus, encouraging parents to reduce control in the form of authority assertion, love withdrawal, and guilt induction.

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