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Article

The Mediating Role of Self-Control in the Link Between Internet Addiction and Depression among Indonesian Adolescents

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Abstract: There is an increase in the global prevalence of mental disorders including depression in adolescents aged 10-19 years including depression. One important factor related to the increasing prevalence of depression in adolescents is internet addiction which has also experienced an increase in prevalence globally. The global prevalence rate of internet addiction has reached 29% globally. Internet addiction has a serious impact on adolescent mental health. Another important factor that is also related to internet addiction and depression in adolescents is self-control, but this important factor has received less attention from researchers, Therefore, this study aims to determine whether there is a mediating role of self-control in the relationship between internet addiction and depression in adolescents. mediation analysis was used involving 315 adolescents. The results of the study showed that self-control can play a role in mediating the link between internet addiction and depression in adolescents. It is important for parents and schools to encourage adolescents to have self-control skills, training to enhance and improve self-control is important to be given to adolescents.

Keywords: Adolescents; internet addiction; depression; self-control; Indonesia

Introduction

Adolescence is an important development time in the span of human life, but it is full of problems. Adolescence is a stormy and stressful time of life. Adolescence is a transitional phase from the time of children to the adult phase, there are several important tasks for adolescents to be able to adapt to the tasks of adolescent development. During the period of development, adolescents are very vulnerable to various mental health problems. Globally, one in seven adolescents aged 10-19 years suffers from a mental disorder, or 15% of the total global population in the teenage age group, depression, anxiety, and behavioral disorders are the main causes of illness and disability among adolescents, and suicide is the cause third death among those aged 15–29 years (World Health Organization, 2024). The consequences of failing to deal with the mental health condition of adolescents can interfere with their physical and mental health which will have an impact in adulthood. In Indonesia, the same thing was also found related to the rising prevalence of mental health in adolescents. Research conducted by I-NAMHS (Wahdi et al., 2022) found that 1 out of 3 adolescents (34.9%) or the equivalent of 15.5 million Indonesian adolescents had mental health problems in the last 12 months; 1 out of 20 adolescents (5.5%) or equivalent to 2.45 million Indonesian adolescents have a mental disorder in the last 12 months, the prevalence of depression was found to be 5.3% of the entire research population, and

1.4% of the total research sample reported that adolescents have suicidal ideation, 0.5% have made plans to commit suicide..

An important factor related to why the prevalence of depression has increased in adolescents, which has become an important issue that has received attention lately, is internet addiction. Internet use activity related to depression is an interesting topic for various health researchers and policy makers as well as the general public, many studies show that internet activity is a fundamental social factor for depression (Ma & Gu, 2023). Positive and negative consequences are up for debate. Internet addiction is an important issue among adolescents. Internet addiction can be viewed as compulsive behavior involving online activities and weakness in controlling internet use (Young, 2009). The prevalence of internet addiction is reported, the global prevalence rate of internet addiction in adolescents from various countries is reported to have reached 29% globally (Ying Ying et al., 2020), this is certainly a common concern, especially regarding the effects caused by adolescents experiencing internet addiction. Another factor that is also important related to adolescent depression is self-control, a high level of self-control as a protection against internet addiction. Self-control is also a factor that protects against various maladaptive behaviors, adolescents with good self-control. In adolescents, self-control acts as the ability to change impulses and unwanted behavior in order to be in line with a goal-oriented response, and this is important during adolescence, self-control in adolescents helps to face the various challenges and problems they face when transitioning to adulthood. Therefore, the current research aims to explore the role of self-control in the relationship between internet addiction and depression in adolescents..

Literature Review

The literature study in this research has also been done to identify important factors related to depression in adolescents. As has been known before, the internet brings positive and negative impacts, the negative impact of Internet use turns out to have an impact on mental health problems, especially depression. Manap et al. (2023) conveyed that the current generation of adolescents (generation Z) refers to the generation born in the millennial era. Adolescents are the largest generation of Internet users and the group most vulnerable to excessive Internet use. Adolescents who spend a lot of time online and connected to each other through digital technology, mobile devices and the use of social media have reached an unprecedented level today, and this constant connectivity endangers the mental health of adolescents (Odgers & Jensen, 2020). Exposure to the internet and communication tools (gadgets) at an early age makes this generation unique and different from previous generations. However, how internet addiction affects depression is still not satisfactorily answered, and research on the relationship between the two still needs to be explored more deeply. Previous studies show that internet addiction is strongly associated with depression in adolescents, and conversely, depression can also predict internet addiction (Stanković & Nešić 2022; Al Mukhaini et al., 2021). Literature study by Aziz et al. (2021) regarding the current situation also shows an increasing trend of mental health problems leading to suicide.

A meta-analysis study conducted by Ye et al. (2023) also shows that depression is positively correlated with internet addiction, and conversely, adolescents who experience depressive disorders are found to have a higher risk of experiencing internet addiction, and conversely, adolescents with internet addiction have a higher risk of experiencing depression. Internet addiction is a predictor in explaining depression in adolescents (Boonvisudhi & Kuladee, 2017). One acceptable reason is that adolescents with internet addiction tend to avoid social contact in real life and are socially isolated (Kuss & Griffiths, 2012), internet addiction can also cause inappropriate stress coping and experience difficulties in life, resulting in worsening functioning in life, decreasing academic achievement and social relationships, thus causing depression (Lin & Tsai, 2002).

In addition to internet addiction, other factors that are also important factors for depression in adolescents, also need to be identified to be able to understand depression in adolescents related to internet addiction. One of the important factors that contribute to various behaviors is self-control. However, the self-control factor has received less attention from various studies in understanding the relationship between internet addiction and depression in adolescents. Geng et al. (2021) found that self-control is negatively related to depressive symptoms in adolescents. Many literature studies reveal that individuals with high self-control

show lower levels of depression compared to individuals with low self-control (Zhong et al., 2024). Park & Lee (2022) found that depression is negatively correlated with the level of self-control. Self-control plays an important role in the relationship between depression (Zihao et al., 2024). Zhang et al. (2024) convey that addictive behavior is related to self-control. Self-control failure is one of the core features of a number of mental health problems (Şimşir Gökalp, 2023). Self-control refers to an individual's ability to suppress impulses from within and regulate one's behavior, more than that self-control also influences the use of the internet specifically related to the capacity of adolescents to regulate the behavior of internet use (Wang et al., 2023). Self-control is "the ability to change one's internal responses, as well as stop unwanted behavioral tendencies and refrain from acting on desired things (Tangney et al., 2018). Adolescents who lack self-control tend to experience internet addiction (Li et al., 2021). Self-control allows adolescents to be aware of the consequences of their behavior, therefore lack of self-control is one of the most important risk factors associated with internet addiction. The lower the self-control, the higher the level of internet addiction (Fan et al., 2022). Self-control refers to the process of adjusting cognitive, emotional and behavioral responses to achieve personal goals.

Li et al. (2021) conveyed that previous research on self-control and internet addiction showed mixed results, some research has revealed that indicators of self-control (eg impulse control and resisting temptation) are negatively related to internet addiction, this bidirectional relationship cannot be fully explained, therefore research in the future needs to use moderation and mediation variables to be done. Students who have good self-control are able to overcome their internal desires and rationally regulate their emotions and behavior to achieve goals, therefore students with good self-control are able to regulate their behavior in using the internet and avoid internet addiction (Du & Zhang, 2022). Another study conducted by Agbaria (2021) examined the relationship between internet addiction and aggression, self-control and positive affect mediating the relationship, self-control is able to mediate the relationship between internet addiction and aggressive behavior in school students. Students with good self-control are low in aggressive behavior, and good self-control is associated with lower levels of internet addiction in adolescents. Adolescents with good self-control have clear plans related to the future, school achievement, think rationally, and have high motivation (Rothbaum et al., 1982).

Rehm (1977) further explained that based on the self-evaluation of depressed people, self-control in depressed people is maladaptive, in 2 ways in the self-evaluation phase. first, that depressive people often fail to make accurate internal attributions regarding causal relationships, and second, that depressive people tend to set strict self-evaluation criteria. Based on the attributional approach, depressed people become helpless in two ways, firstly depressed people make excessive external attributions to causality and thus believe a high degree of independence between performance and its consequences, and that helpless people are low in self-control, especially living in an unpleasant environment. Furthermore, people who are helpless in a state of depression will be passive and apathetic. The second form of helplessness, depressive people tend to carry out accurate or excessive actions, but they feel unable to obtain positive consequences, thus the person believes that this world does contain valid relationships of performance and consequences, but the depressive person is incompetent and useful. Then the depressive person will devalue himself and express inappropriate guilt, namely excessive attribution of internal causality to unpleasant consequences in the past (Rehm, 1977). Self-strengthening in the self-control phase of depressive people, depressive people tend to have low self-esteem and punish themselves excessively. The third factor is self-monitoring of self-control. There are at least two ways that can be used to classify the self-monitoring of depressed people, firstly, depressed people tend to be selective in paying attention to negative events, and secondly, depressed people tend to be selective in paying attention to positive outcomes. can be obtained immediately or delayed from his behavior. The term negative events is intended to include aversive stimuli and other stimuli that are perceived as cues to aversive stimuli (Rehm, 1977).

Individuals with a low level of self-control, and prioritize immediate gratification and short-term goals, which causes more impulsive behavior and ignores the potential negative consequences of the actions taken. In contrast, high levels of control are characterized by considering long-term outcomes rather than immediate gratification (Baumeister & Heatherton, 1996). Moreover, feelings of control are important for psychological

adjustment, and self-control is a strong predictor of a person's ability to carry out behavior so as to achieve desired goals (Moser & Dracup, 1995). A good level of self-control is closely related to the results of low stress in a person (Achtziger & Bayer, 2013), and a more positive life (Galla & Duckworth, 2015), and good self-control causes people to be happier (Cheung et al., 2014). The fact that self-control is often considered as one of the protective factors for internet addiction (Song & Park, 2019).

High self-control functions as a protective factor against internet addiction in adolescents (Li et al., 2021). Adolescents who have higher self-control are proven to be able to regulate their internet use effectively, and resist the temptation of stimulating elements in the online virtual world. The importance of self-control for mental health is widely known, but research investigating the relationship between addictive behavior, especially internet addiction, and mental health as well as the self-control mechanism underlying this relationship is quite limited to adolescents, as well as how the mechanism of internet addiction affects self-control and its consequences on depression. in adolescents still cannot be satisfactorily explained, therefore the current research aims to identify the mediating role of self-control in the relationship between internet addiction and depression in adolescents. The results of this research are useful for understanding causal relationships and understanding the importance of self-control as a risk factor for depression that needs to be considered. Previous studies on the mediating role of control in the relationship between internet addiction and depression in adolescents are still limited, although there is a very important role of self-control in various behaviors. Therefore, the current research aims to explore the role of self-control in the relationship between internet addiction and depression among adolescents.

Methodology

To answer the existing problems, a quantitative approach of statistical analysis is used in the current study, mediation analysis is used to assess the extent to which self-control can act as a mediator in the relationship between internet addiction and depression in adolescents. The mediation model (M) is added between the predictor variables (X) and the outcome (Y). Mediation analysis provides an opportunity to test mechanisms based on theory, and can explain clear causal mechanisms. This analysis technique provides insight into indirect effects, explaining the observed relationship pathways.

1. Research Design

Data collection was conducted online using Google Form, with three questionnaires, namely self-control, internet addiction, and depression in adolescents of four high schools in Depok City, Indonesia. The data were then analyzed to assess reliability, normality, descriptions of the number and mean value of each demographic variable. To answer the objective in this study, mediation analysis is used to achieve the research objective. As understood, mediation analysis plays an important role in understanding the mechanism through which independent variables influence dependent variables through mediators, in this case internet addiction as an independent variable influences depression through self-control.

2. Respondents And Sampling Technique

Respondents in this study were high school students with an age range of 14 to 19 years, in 6 high schools, actively using smartphones and accessing the internet in their daily lives, and reside in the Depok area of West Java, which is administratively located on the border with the city of Jakarta. A total of 315 participants were involved in this study using non-probability sampling techniques. In order to reduce bias in purposive sampling, the target population and the sampling frame (characteristics of the individuals who will be sampled) have been determined in advance, and an online survey that is as short and simple as possible has also been created. Consideration of the use of purposive sampling due to consideration of ease of access to the sample based on criteria that have been set previously and relevant to the research. Purposeful sampling can only be generalized to the (sub)population where the sample was taken and not to the entire adolescent population in Indonesia, there is a bias in the use of positive sampling related to the population.

3. Instruments

Patient Health Questionnaire-9 (PHQ-9)

To measure depression in adolescents, using the PHQ-9 which has been adapted into an Indonesian version by Dian et al. (2022), based on the original measuring tool developed by Kroenke et al. (2001), that on the 9-item depression scale, the Patient Health Questionnaire-9 (PHQ-9) has sensitivity and specificity comparable to other mood measures, and consists of nine tools measuring depression, a diagnosis of the disorder based on the DSM-5. The PHQ-9 is a unidimensional measurement scale, the results of the concurrent validity test show that the adapted PHQ-9 has good validity and reliability, with a Cronchbach's alpha value of 0.885. A retest in this study was also carried out, the results showed that the PHQ-9 which had been adapted by Dian et al. (2022), has a very good model fit (PHQ-9 model fit table, n=315), that the PHQ-9 depression measuring tool is very suitable for measuring depression.

Table 1. Fit model PHQ-9

CFI	TLI	GFI	NFI	RMSEA	SRMR
0.968	0.958	0.976	0.952	0.075	0.030

Internet addiction Test (IAT-18)

The instrument for measuring internet addiction uses the internet addiction scale adapted by Siste et al. (2021), this measuring instrument was translated into an Indonesian version based on Young (1998). Factor analysis by Siste et al. (2021) on 643 respondents showed that the IAT-18 which had been adapted into Indonesian had good validity and reliability (CFI=0.95, SRMR = 0.057, RMSEA = 0.076).

Table 2. Fit model IAT-18

CFI	TLI	GFI	NFI	RMSEA	SRMR	CMIN/DF
0.799	.758	.851	0.952	0.105	0.096	4.760

The current research also retested the internal consistency of the IAT-18 which consists of 3 factors (salience, neglect of duty, loss of control), obtained CFI = 0.799, NFI = 0.952, RMSEA = 0.105, CMIN/DF = 4.760 (Model table fit IAT-18), several items in the instrument were excluded because the estimated values in the regression were standardized on items number 4, 9, and 11, resulting in a fit model for measuring internet addiction in high school students.

Brief Self Control (BSC-10)

Self-control scale that has been adapted into Indonesian by Arifin and Milla (2020) based on the development of de Ridder et al. (2011) who developed a short version of 10 item statements to measure self-control , the results of a study by Arifin and Mila (2020) on 144 respondents, show that the 10 items developed by de Ridder et al. (2011), and consisting of 2 factors inhibition and initiation, have good psychometric properties. A retest was also carried out in this study and found that the model was fit for measuring self-control in high school students, with a total of 315 respondents, with 7 items (items 1, 9, 12 were excluded, the standardization estimate value was below 0.5) resulting in a value of CFI = 0.947, TLI = 0.914, RMSEA = 0.081, GFI = 0.965, CMIN/DF = 3.055 (BSCS 7 item fit model table) which can be interpreted as the BSCS-7 item having a good fit model for measuring self-control in school students.

Table 3. Fit model BSC-7

CFI	TLI	GFI	NFI	RMSEA	SRMR	CMIN/DF
0.947	0.914	0.965	0.924	0.081	0.063	3.055

4. Data Collection Process

Before the research was carried out, several ethical protocols were carried out starting from the permission application to the school to collect research data from adolescents. The first process carried out by the

researcher was to submit a research ethics letter to the Ethics Commission of Universiti Kebangsaan Malaysia. After the research permit was obtained (JEP-2023-271), the researcher submitted a research letter to the Faculty of Social Sciences and Humanities for further submission to the school in Depok, Indonesia.. The research proposal containing information about the research conducted, the informed consent sheet that was submitted when taking research data and presented it to adolescents, related to data confidentiality, research not directly related to clinical diagnosis, as well as the respondent's consent regarding the respondent's right not to participate in the research. All information related to the research has been presented. The school, which agreed to this research, provided a letter of permission to carry out the research. Data collection is carried out online using gform.

5. Data Analysis

Quantitative data obtained from adolescents and stored in Google Form, then coded according to the description of demographic data, namely the number of hours of internet use in 1 day, gender, and age, as well as coding on the response answers for three inventories. The data was then analyzed using SPSS 27 to classify demographic data and assess the correlation between variables. Spearman coefficient correlation is also used to explore the relationship between variables, age, total number of hours using the internet in a day, age, depression, self-control, and internet addiction using SPSS 27. To assess the reliability of the inventory, confirmatory factor analysis using JASP (JASP Team 2023), the analysis shows that all three inventories are suitable for use. A mediation analysis was carried out to assess the mediation effect uses PROCESS MACRO version 4.3 developed by Hayes (2022), model 4 in mediation analysis has been suggested. The Sobel test was also conducted to assess whether there was a significant mediation effect of self-control in the relationship between internet addiction and depression.

The Findings

The objective of this research is to assess the role of self-control as an intermediary in the relationship between internet addiction and depression among high school students with a total of n = 315 respondents. Table 4 presents the research respondent data, consisted of 180 female adolescents and 135 male adolescents, 40% of adolescents use the internet less than 8 hours per day, 31% more than 8 hours per day, 16.5% use the internet less than 3 hours. Based on age, 68.8% were 16 to 17 years old, 26.1% were 14 to 15 years old, and 5.1% were 18 to 19 years old.

Table 4. Demographics

Clasification	Category	N	Percentage
Internet hours	< 3 hours	52	16.5
	< 8 hours	128	40.7
	> 8 hours	98	31.1
	> 16 hours	37	11.7
Gender	Male	180	57.1
	Female	135	42.9
Age	14-15	82	26.1
	16-17	217	68.8
	18-19	**16**	**5.1**

Table 5 presents a correlation analysis between variables, it can be seen that self-control has a very significant correlation with self-control (r= -0.544**). Self-control is also negatively correlated with depression in adolescents (r-0.368). The initiation factor in self-control is also negatively correlated with depression (r=-0.436), greater than the inhibition factor (r=-0.280). In addition, internet addiction is positively correlated with depression (r= 0.398). The inhibition factor is also negatively correlated with internet addiction (r=-0.514) greater than the initiation factor, both correlations are negative. The results of the analysis show that the regression model path a, the direct effect of self-control on internet addiction, is significant, coefficient a, internet addiction (X) on self-control (M) = - 0.2681, $p < 0.001$, R2 = 28.8%, SE = 0.0238 , LLCI = -0.3150 and ULCI = -0.2212. On path b, the effect of the independent variable (internet addiction) on the dependent

variable (Y) is significant. On path b, which is the effect of intermediary variables on depression, it is found that coefficients) = -0.2719, p < 0.05, SE = 0.0779, LLCI = -0.4251 and ULCI = -0.1187. On path c' or the direct effect of internet addiction on depression, it was found coefficients 0.1854, p < 0.001, R2 = 23.3%, SE = 0.0389 LLCI = 0.1088 and ULCI = 0.2619. The total effect of path c, with a coefficient of 0.2583. p<0.001, R2 = 19.2%, SE = 0.0334.

Table 5. Corelations between variables

		1	2	3	4	5	6	7	8
1	Gender	1	0.083	0.031	0.448	-0.149	-0.077	-0.220	0.084
2	Age		1	0.181	0.077	0.061	0.079	0.018	-0.053
3	Hours			1	0.071	-0.146	-0.111	-0.161	0.264
4	Depression				1	-0.368	-0.280	-0.436	0.398
5	Self control					1	0.930	0.869	-.544**
6	Inhibition						1	0.647	-0.514
7	Initiation							1	-0.476
8	Internet addiction								1

*Note. **p<.01,*

The results of the analysis show that the regression model path a, namely the direct effect of self-control on internet addiction, is significant, coefficient a, internet addiction (X) on self-control (M) = - 0.2681, p < 0.001, R2 = 28.8%, SE = 0.0238 , LLCI = -0.3150 and ULCI = -0.2212. On path b, the effect of the independent variable (internet addiction) on the dependent variable (Y) is significant. On path b, which is the effect of intermediary variables on depression, it is found that coefficients) = -0.2719, p < 0.05, SE = 0.0779, LLCI = -0.4251 and ULCI = -0.1187. On path c' or the direct effect of internet addiction on depression, it was found (coefficients) = 0.1854, p < 0.001, R2 = 23.3%, SE = 0.0389 LLCI = 0.1088 and ULCI = 0.2619. The total effect of path c, with a coefficient of 0.2583. p<0.001, R2 = 19.2%, SE = 0.0334.

The Sobel Test results show that there is an indirect effect between internet addiction (IAT-9) and depression (PHQ-9) with self-control mediation (BSC-10), z value = 3.33399579 p value = p < 0.001. The results of the indirect effect on the PROCESS results show that the indirect effect coefficient is 0.0729, with a low level confidence interval (LLCI) = 0.0301 and a high level confidence interval (ULCI) = 0.1211, meaning that the range of CCLI and ULCI values does not include the value 0 or above 0, which means there is an indirect effect of internet addiction self-control (IAT-18) on depression (PHQ-9) through self-control (BSC-10).

Table 6. Mediation analysis

Variabel	**Coeff**	**se**	**R**	**R-sq**	**F**	**p**	**95% CI Odds Ratio**	
							Lower	Upper
Adiksi internet Path a Internet addiction (X) -> self control (M)	-0.2681	0.0238	0.5368	0.2881	126.68	<0.001	-0.3150	-0.2212
Path b Self control (M) -> Depression (Y)	-0.2719	0.0779	0.4382	0.1920	37.07	<0.001	-0.4251	-0.1187
Path c’ Direct effect of internet addiction (X) -> Depression (Y) Path c	0.1854	0.0389	0.438	0.192	37.07	<0.001	0.1088	0.2619
Total effect of internet addiction (X) -> Depression (Y)	**0.2583**	**0.0334**	**0.438**	**0.192**	**37.074**	**<0.001**	**0.1926**	**0.3240**

Discussion

The objective of this research is to identify the role of self-control mediating the relationship between internet addiction and depression in adolescents. It is known that the indirect effects of internet addiction and depression can be mediated by self-control. It should be noted that in self-control, there are two important elements, namely initiation and inhibition. The results of this study are in line with the results of Enyuan and Huiyu (2017) who found that self-control plays a mediating role in the influence of physical activity on internet addiction among students. The results of the analysis, the influence of internet addiction on self-control is negative, meaning that the higher the self-control, the lower the internet addiction. The relationship between self-control and internet addiction is negative, which means that the higher the self-control, the lower the level of internet addiction, in other words, adolescents who have high self-control are less likely to become internet addicted, while adolescents with low self-control are less likely to become addicted to the internet. greater risk of experiencing internet addiction. This is in line with previous studies (Agbaria 2021; Agbaria & Bdier 2021; Li et al., 2021; Özdemir et al., 2014).

The findings of the current research found that there is a very significant negative relationship between self-control and internet addiction, when compared to the correlation of other variables, this finding is convincing that self-control is an important factor related to internet addiction. Depression is also found to be negatively correlated with control, the relationship between the two is negative, depression is also correlated with internet addiction. Previous research found things that may be the same as the current research, for example Patel et al. (2023) also found that internet addiction among adolescents has been linked to depression, self-harming behavior, sleep disorders, increased alcohol and tobacco use, and obesity. The issue of internet addiction is related to various psychological problems.

Cash et al. (2012) view internet addiction as an impulse control disorder or even an obsessive compulsive disorder, however it is still not clear to this day whether the basic mechanism responsible for addictive behavior is the same in various types of internet addiction such as online sexual addiction, online gaming, and browsing excessive internet. The results of the study found that the number of hours spent using the internet was also found to be correlated with internet addiction in adolescents. Basically, internet addiction is defined as uncontrolled internet use that results in excessive time wasting or social dysfunction and may have the same pathology as other addictions, resulting in interpersonal, family, and social problems. Du & Zhang (2022) in their study also found that self-control plays a partial mediating role in physical activity on internet addiction among students. Students with a higher level of self-control are able to overcome their internal desires and regulate their emotions and behavior rationally to achieve their goals.

Students who can think rationally control their behavior in using the Internet and avoid the formation of symptoms of Internet addiction. Further Du & Zhang (2022) explained the mechanism of the dual system theory of self-control, self-control consists of two systems, namely drive and control. The impulse system is an automatic response process to tempting situations such as new and different emotions, incentives and rewards. The control system, on the other hand, is a higher level system that inhibits various impulsive responses. Individuals who get a high score in the control system are better able to weigh and consider the consequences afterwards because their rational psychological quality is higher and develop evaluation criteria and a high level of emphasis when facing temptation, thus suppressing the behavioral impulse of internet addiction. Individuals who have a higher score in the control system are better able to consider and weigh the consequences afterwards because their rational psychological quality is higher and develop evaluation criteria and a high level of emphasis when facing temptation, so that they can suppress the temptation of behavioral impulses that lead to internet addiction.

The relationship between self-control and depression also shows that it applies to depression, the results of the correlation test show that there is a negative relationship between self-control and depression. These findings are in line with the findings of Chen et al. (2020), that a high level of self-control is very important for the development of a person's physical and mental health. In line with the view of Li et al. (2021) that self-control plays a mediating role between internet addiction and depression, one reason is that self-control can act as an adaptation for adolescents. Self-control is also considered an important capacity that helps people achieve important goals in the face of temptation (de Ridder et al., 2020). The results of this

research are also in line with the initial hypothesis that self-control can act as an inhibiting and initiating factor (de Ridder et al., 2011). Self-control can also reduce the level of internet addiction and increase depression. Individuals who are motivated by high sensations and have low levels of self-control are vulnerable to internet addiction (Slater, 2003). The inhibition factor plays a major role in reducing the level of internet addiction, and the relationship is negative compared to the initiation factor, but both can reduce the level of internet addiction.

In general, self-control is assumed to help people inhibit urges towards desired results (inhibition) in order to achieve other desired results (initiation). The inhibition and initiation approaches have a distinction between self-control processes related to the inhibition of direct impulses and processes related to the initiation of goal-directed behavior (de Ridder et al., 2011). Burt (2020) view self-control as a capacity, and a resource that can be used to fight against the desire or impulse of hedonism that is temporary for the sake of a more valuable long-term goal. Self-control is an effort to inhibit a stronger and immediately rewarding response after a choice situation known as self-control conflict. Adequate self-control early on is associated with a variety of positive long-term outcomes, including good physical and mental health.

Self-control is important because it increases the level of positivity by controlling thoughts, emotions, and behavior. Adolescents with high self-control skills feel more comfortable asking others for help because they are more worried about giving up their personal control. Adolescents with good self-control are better able to relate to others, compromise, and express emotions, making them more adaptable, constructive, reflective, and obedient. Therefore, adolescents with high self-control are happier and healthier compared to adolescents with low self-control (Mirandi et al., 2023). Furthermore, de Ridder et al. (2011) explained that self-control is considered important for adaptive behavior, self-control helps people do what they should or must do in living a healthy, happy and productive life. Self-control also helps a person not to do things they shouldn't do if they don't want to jeopardize a healthy, happy and productive life. The fact that self-control is equally beneficial for both desired and undesired behavior suggests that self-control may work in two ways – either supporting the initiation of goal-directed behavior or inhibiting impulsive behavior. In accordance with the objective of the study, self-control can function as a protective factor for depression due to internet addiction. Self-control can help a person resist impulsive urges related to internet use that cause a person to become depressed.

The current research provides insight into the importance of self-control in adolescents, the current research is an innovation in theoretical research related to the influence of internet addiction on self-control which further affects depression among adolescents, at the same time, this research also provides a warning and at the same time an idea for prevention and offers the following possibilities for internet addiction intervention in adolescents. Adolescents ideally have good self-control until they become adults, in addition to increasing their knowledge about the negative side of the internet, increasing their understanding of internet addiction, and consciously controlling the amount of Internet use. What society can do, especially parents, is to create a good interpersonal environment for adolescents, a positive interpersonal environment can help adolescents overcome personal and social problems, including escape from the fear of being rejected, so that this effort can reduce the possibility of adolescents becoming addicted internet. The school environment should also be able to be an institution that continues to educate students to become good adolescents.

Conclusion

The results of research on 315 adolescent in the Depok, Indonesia show that self-control can be a mediator in the relationship between internet addiction and depression in adolescents. This research clearly shows the importance of self-control to prevent and reduce depression and internet addiction in adolescents. Self-control was found to be negatively correlated and highly significant with internet addiction, it can be assumed that the higher the self-control, the lower the internet addiction, or vice versa. Self-control is also found to be correlated with depression and the relationship between the two is negative, this can be interpreted as the higher the self-control, the lower the depression. Therefore, the advice that can be given is that parents and schools can provide good skills to adolescents related to self-control through behavioral training to reduce internet addiction. Self-control is important as an adaptive factor and as a buffer factor in various behavioral problems.

Self-control is a protective factor that can keep individuals mentally healthy, and with good self-control is capital for individuals to avoid maladaptive behavior. Future research can further explore the importance of self-control accompanied by more rigorous experimental methods, so that the effects of self-control can be observed directly, and it is necessary to provide complete training related to self-control skills. Future research is recommended to use experiments to evaluate the effectiveness of self-control against internet addiction and depression in adolescents, longitudinal research to evaluate the effectiveness of self-control training treatment should be considered, considering the importance of self-control in various behaviors.

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References

Al Mukhaini, A. M., Al Houqani, F. A., & Al Kindi, R. M. (2021). Internet addiction and depression among postgraduate residents: a cross-sectional survey. *Sultan Qaboos University Medical Journal*, *21*(3), 408. https://doi:10.18295/squmj.4.2021.008.

Arifin, H. H., & Milla, M. N. (2020). Adaptasi dan properti psikometrik skala kontrol diri ringkas versi Indonesia. *Jurnal Psikologi Sosial*, *18*(2), 179-195.

Achtziger, A., & Bayer, U. C. (2013). Self-control mediates the link between perfectionism and stress. *Motivation and Emotion*, *37*, 413-423. https://doi:10.1007/s11031-012-9321-6.

Agbaria, Q. (2021). Internet addiction and aggression: The mediating roles of self-control and positive affect. *International Journal of Mental Health and Addiction*, *19*(4), 1227-1242. https://DOI:10.1007/s11469-019-00220-z.

Agbaria, Q., & Bdier, D. (2021). The role of self-control and identity status as predictors of internet addiction among Israeli-Palestinian college students in Israel. *International Journal of Mental Health and Addiction*, *19*(1), 252-266. https://doi.org/10.1007/s11469-019-00172-4

Aziz, A. R. A., Kasmani, M. F., & Ab Razak, N. H. (2021). Implikasi ketagihan media sosial terhadap kesihatan mental remaja semasa pandemik COVID-19. *e-BANGI*, *Journal of Social Sciences and Humanities, 18*(8), 66-81.

Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry*, *7*(1), 1-15.

Boonvisudhi, T., & Kuladee, S. (2017). Association between Internet addiction and depression in Thai medical students at Faculty of Medicine, Ramathibodi Hospital. *PloS one*, *12*(3), e0174209. https://doi.org/10.1371/journal.pone.0174209

Burt, C. H. (2020). Self-control and crime: beyond Gottfredson & Hirschi's theory. *Annual Review of Criminology*, *3*(1), 43-73.

Cash, H., D. Rae, C., H. Steel, A., & Winkler, A. (2012). Internet addiction: A brief summary of research and practice. *Current psychiatry reviews*, *8*(4), 292-298.

Chen, X., Qiu, N., Chen, C., Wang, D., Zhang, G., & Zhai, L. (2020). Self-efficacy and depression in boxers: a mediation model. *Frontiers in Psychiatry*, *11*, 00791. https://doi.org/10.3389/fpsyt.2020.00791

Cheung, T. T., Gillebaart, M., Kroese, F., & De Ridder, D. (2014). Why are people with high self-control happier? The effect of trait self-control on happiness as mediated by regulatory focus. *Frontiers in psychology*, *5*, 722. https://doi.org/10.3389/fpsyg.2014.00722.

de Ridder, D. T., de Boer, B. J., Lugtig, P., Bakker, A. B., & van Hooft, E. A. (2011). Not doing bad things is not equivalent to doing the right thing: Distinguishing between inhibitory and initiatory self-

control. *Personality and Individual Differences*, *50*(7), 1006-1011. https://doi.org/10.1016/j.paid.2011.01.015.

de Ridder, D., van der Weiden, A., Gillebaart, M., Benjamins, J., & Ybema, J. F. (2020). Just do it: Engaging in self-control on a daily basis improves the capacity for self-control. *Motivation Science*, *6*(4), 309. https://doi.org/10.1037/mot0000158.

Dian, C. N., Effendy, E., & Amin, M. M. (2022). The validation of Indonesian version of Patient Health Questionnaire-9. *Open Access Macedonian Journal of Medical Sciences*, *10*(T7), 193-198. https://doi.org/10.3889/oamjms.2022.9293.

Du, Z., & Zhang, X. (2022). Analysis of the mediating effects of self-efficacy and self-control between physical activity and Internet addiction among Chinese college students. *Frontiers in Psychology*, *13*, 1002830. https://doi.org/10.3389/fpsyg.2022.1002830.

Enyuan, Z., & Huiyu, Z. (2017). An empirical study on the relationship between subjective well-being, self-control and Internet addiction of college students. *J. Grad. Sch. Chin. Acad. Soc. Sci*, *5*, 17-24.

Fan, Z., Chen, M., & Lin, Y. (2022). Self-control and problematic internet use in college students: the chain mediating effect of rejection sensitivity and loneliness. *Psychology Research and Behavior Management*, 459-470. https://doi.org/10.2147/PRBM.S352060

Galla, B. M., & Duckworth, A. L. (2015). More than resisting temptation: Beneficial habits mediate the relationship between self-control and positive life outcomes. *Journal of personality and social psychology*, *109*(3), 508. https://doi.org/10.1037/pspp0000026.

Geng, Y., Gu, J., Wang, J., & Zhang, R. (2021). Smartphone addiction and depression, anxiety: The role of bedtime procrastination and self-control. *Journal of affective disorders*, *293*, 415-421.

Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford publications.

JASP Team (2023). *JASP* (Version 0.17.3)[Windows 10 Pro]. https://jasp-stats.org/.

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. Journal of general internal medicine, *16*(9), 606-613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x.

Kuss, D. J., & Griffiths, M. D. (2012). Internet gaming addiction: A systematic review of empirical research. *International Journal of Mental Health and Addiction*, *10,* 278-296. https://doi:10.1007/s11469-011-9318-5.

Li, S., Ren, P., Chiu, M. M., Wang, C., & Lei, H. (2021). The relationship between self-control and internet addiction among students: A meta-analysis. *Frontiers in Psychology*, *12*, 735755. https://doi.org/10.3389/fpsyg.2021.735755.

Li, H. J., Li, J., Qi, M., Song, T. H., & Chen, J. X. (2021). The mediating effect of self-control on depression and tendencies of eating disorders in adolescents. *Frontiers in Psychiatry, 12,* 690245. https://doi.org/10.3389/fpsyt.2021.690245.

Li, J., Chen, Y., Lu, J., Li, W., & Yu, C. (2021). Self-control, consideration of future consequences, and internet addiction among Chinese adolescents: The moderating effect of deviant peer affiliation. International *Journal of Environmental Research and Public Health, 18*(17), 9026. https://doi.org/10.3390/ijerph18179026.

Lin, S. S., & Tsai, C. C. (2002). Sensation seeking and internet dependence of Taiwanese high school adolescents. *Computers in Human Behavior, 18*(4), 411-426. https://doi.org/10.1016/S0747-5632(01)00056-5.

Mirandi, M., Lis, A., Mazzeschi, C., Li, J. B., Salmi, L. P., & Delvecchio, E. (2023). Flourishing and self-control in adolescence: the role of perceived parenting. *International Journal of Environmental Research and Public Health*, *20*(16), 6568.

Ma, Y., & Gu, J. (2023). Internet and depression in adolescents: Evidence from China. *Frontiers in Psychology*, *14*, 1026920. https://doi:10.3389/fpsyg.2023.1026920.

Manap, J., Saim, N. J., Kasim, A. C., Sarnon, N. H., Tambi, N., Amin, A. S., ... & Nen, S. (2023). Faktor yang Mempengaruhi Gaya Hidup Sihat Remaja Generasi Z di Malaysia. *e-BANGI*: *Journal of Social Sciences and Humanities, 20(*1), 253-260.

Moser, D. K., & Dracup, K. (1995). Psychosocial recovery from a cardiac event: the influence of perceived control. *Heart & Lung, 24*(4), 273-280. https://doi.org/10.1016/S0147-9563(05)80070-6.

Odgers, C. L., & Jensen, M. R. (2020). Adolescent mental health in the digital age: Facts, fears, and future directions [Annual research review]. *Journal of Child Psychology and Psychiatry*, *61*(3), 336.

Özdemir, Y., Kuzucu, Y., & Ak, Ş. (2014). Depression, loneliness and Internet addiction: How important is low self-control?. *Computers in Human Behavior*, *34*, 284-290. https://doi.org/10.1016/j.chb.2014.02.009.

Park, Y., & Lee, S. (2022). Gender differences in smartphone addiction and depression among Korean adolescents: Focusing on the internal mechanisms of attention deficit and self-control. *Computers in Human Behavior*, *136*, 107400.

Patel, A. K., Bernstein, S. A., & Gold, J. A. (2023). *A Nuanced Approach to Adolescent Mental Health in the Era of Social Media.*

Rehm, L. P. (1977). A self-control model of depression. *Behavior Therapy*, *8*(5), 787-804. https://doi.org/10.1016/S0005-7894(77)80150-0.

Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology*, *42*(1), 5. https://doi.org/10.1037/0022-3514.42.1.5.

Şimşir Gökalp, Z. (2023). Examining the association between self-control and mental health among adolescents: The mediating role of resilience. *School Psychology International*, *44*(6), 649-667.

Siste, K., Suwartono, C., Nasrun, M. W., Bardosono, S., Sekartini, R., Pandelaki, J., ... & Wiguna, T. (2021). Validation study of the Indonesian internet addiction test among adolescents. *PLoS One*, *16*(2), e0245833. https://doi.org/10.1371/journal.pone.0245833.

Slater, M. D. (2003). Alienation, aggression, and sensation seeking as predictors of adolescent use of violent film, computer, and website content. *Journal of Communication*, *53*(1), 105-121. https://doi.org/10.1111/j.1460-2466.2003.tb03008.x.

Song, W. J., & Park, J. W. (2019). The influence of stress on internet addiction: Mediating effects of self-control and mindfulness. International *Journal of Mental Health and Addiction, 17,* 1063-1075. https://doi:10.1007/s11469-019-0051-9.

Stanković, M., & Nešić, M. (2022). Association of internet addiction with depression, anxiety, stress, and the quality of sleep: Mediation analysis approach in Serbian medical students. *Current Research in Behavioral Sciences, 3,* 100071. https://doi.org/10.1016/j.crbeha.2022.100071.

Tangney, J. P., Boone, A. L., & Baumeister, R. F. (2018). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. In *Self-regulation and self-control* (pp. 173-212). Routledge.

Wahdi, A. E., Setyawan, A., Putri, Y. A., Wilopo, S. A., Erskine, H. E., Wallis, K., ... & Ramaiya, A. (2022). *Indonesia National Adolescent Mental Health Survey (I-NAMHS).*

Wang, W., Ye, J., Zhu, Y., Huang, D., & Zhao, X. (2023). Longitudinal relationship between internet self-control and problematic internet use among Chinese adolescents: mediating role of meaning in life. *Frontiers in Psychiatry*, *14*, 1258673.

World Health Organization. (2024, October 10). *Mental health of adolescents*. https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health.

Ye, X. L., Zhang, W., & Zhao, F. F. (2023). Depression and Internet Addiction among Adolescents: A Meta-Analysis. *Psychiatry Research,* 115311. https://doi.org/10.1016/j.psychres.2023.115311.

Ying Ying, C., Awaluddin, S. M., Kuang Kuay, L., Siew Man, C., Baharudin, A., Miaw Yn, L., ... & Ibrahim, N. (2020). Association of internet addiction with adolescents' lifestyle: A national school-based survey. *International Journal of Environmental Research and Public Health, 18*(1), 168. https://doi.org/10.3390/ijerph18010168.

Young, K. S. (2009). Internet addiction: The emergence of a new clinical disorder. *Cyberpsychology & Behavior, 1*(3).

Young, K. S. (1998). Internet addiction: The emergence of a new clinical disorder. *Cyberpsychol Behav. 8;*1(3), 237–44.

Zhang, H., Chen, C., Zhang, L., Xue, S., & Tang, W. (2024). The association between the deviation from balanced time perspective on adolescent pandemic mobile phone addiction: the moderating role of self-control and the mediating role of psychological distress. *Frontiers in Psychology*, *14*, 1298256.

Zhong, Y., Hu, Q., Chen, J., Li, Y., Chen, R., Li, Y., ... & Xu, Y. (2024). The impact of childhood trauma on Adolescent Depressive Symptoms: the Chain Mediating role of borderline personality traits and self-control. *BMC psychiatry*, *24*(1), 377.

Zihao, W., Ying, Z., & Xiaoyun, Z. (2024). The relationship between depression, self-control and meaning in life among young undergraduate students: Evidence from path analysis and network analysis. *Personality and Individual Differences*, *228*, 112737.