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THE RELATIONSHIP BETWEEN SELF-CONTROL AND BEDTIME PROCRASTINATION IN STUDENTS WHO ARE COMPLETING THEIR THESES

Sherleen Sharkesyan[1] & Denrich Suryadi[2]

[1]Faculty of Psychology, Tarumanagara University, Jakarta, Indonesia
Email: sherleen.705210066@stu.untar.ac.id
[2]Faculty of Psychology, Tarumanagara University, Jakarta, Indonesia
Email: denrichs@fpsi.untar.ac.id

ABSTRACT

The completion of a thesis often demands sustained effort, focus, and effective time management. However, many students struggle with bedtime procrastination, which can interfere with their ability to maintain a healthy sleep schedule and, consequently, affect their overall productivity and well-being. This study explores the relationship between self-control and bedtime procrastination among students who are in the process of completing their theses. Bedtime procrastination is the behaviour of delaying bedtime until later than planned for no apparent reason, despite being aware of the consequences. One of the main factors that influence bedtime procrastination is the lack of self-control. Self-control is an individual's ability that includes regulating emotions, resisting urges, and making careful choices in achieving goals. The purpose of this study is to investigate the relationship between self-control and bedtime procrastination in students who are completing their theses. Using a quantitative method, The instruments used in this study are Brief Self-Control Scale (BSCS) and Bedtime Procrastination Scale (BPS) was conducted to a total of 359 students who are in the process of completing their theses from various universities in Jakarta. The measuring instruments used in this study are Brief Self-Control Scale (BSCS) to measure self-control and Bedtime Procrastination Scale (BPS) to measure bedtime procrastination. The results obtained show that there is a strong negative relationship between self-control and bedtime procrastination in students who are completing their thesis.

Keywords: *Self-Control, Bedtime Procrastination, Final Year Student,Thesis*

1. PREFACE

Sleep is an essential biological need for humans after water, food and oxygen (Grandner et al, 2017). Centers for Disease Control and Prevention (CDC, 2024) recommends that individuals in the age range of 18 to 60 years get about 7 hours of sleep each night to maintain physical and mental health. However, in reality, many students, especially those in emerging adulthood, have difficulty fulfilling this recommended sleep duration. Emerging adulthood is often considered a transition period from adolescence to adulthood, where students are faced with various academic demands (Friedrich & Schlarb., 2018). In this case, thesis is one of the demands that must be fulfilled by final year students. Writing a thesis is one of the graduation requirements that adds to the academic burden of students and often disrupts their sleep time. Li et al. (2017) showed that university students in China sleep at 12:51 pm on average, with 72.7% of them sleeping after 11:00 pm, and 23.8% sleeping after midnight. The difference in sleep duration between weekdays and weekends was also significant, with college students only sleeping for 6.71 hours on weekdays but increasing to 8.36 hours on weekends.

Academic pressures such as tight assignment deadlines and thesis writing affect students' sleep patterns, resulting in them often being unable to fulfil the recommended sleep duration. This condition has a negative impact on their physical and mental health, as well as academic performance. Students who experience sleep deprivation are at a higher risk of developing health problems, such as mood disorders, fatigue, and decreased concentration. Bedtime procrastination

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is a common phenomenon among university students. Bedtime procrastination is the behaviour of delaying bedtime until later than the planned time, even though the individual is aware of the negative impact on their health (Kroese et al., 2016). This behavior results in college students only sleeping for 6 to 7 hours per night, which is far below the ideal sleep duration recommendation. This results in poor sleep quality, which in turn affects aspects of student life, including time management, self-regulation, and the ability to meet academic deadlines (Hong et al., 2024; Zhang & Wu, 2020)

Students who often delay sleep are also more prone to mental health problems, such as anxiety and depression, as well as physical problems such as fatigue (Chung et al., 2020). A study conducted on 102 students at the University of Heidelberg showed that students' sleep time was delayed by an average of more than 15 minutes and occurred approximately 2 days a week per person. On days when students delay bedtime, sleep time can be delayed by approximately 1 hour 30 minutes (Schmidt et al., 2024). This behaviour is known as bedtime procrastination. Bedtime procrastination can be defined as delaying bedtime until later than the planned time without any clear reason, even though the individual is aware of the negative consequences (Kroese et al., 2016). Many individuals delay bedtime because they feel the need to relax after a long and tiring day. Watching television or playing games is also often a way for students to relieve stress, although this has the potential to exacerbate sleep delays (Sirois et al., 2019). One of the factors that influence the habit of bedtime procrastination is the use of gadgets before bed. Students who use gadgets before bed are more likely to experience sleep delays, which reduce their sleep duration (Chen et al., 2022). In addition, other factors that can influence bedtime procrastination are gender and educational status.

Research shows that women are more likely to engage in bedtime procrastination than men, and university students are more likely to do this compared to individuals who are not university students (Herzog-Krzywoszanska & Krzywoszanski, 2019). Some other factors influencing bedtime procrastination, including economic factors, where college students are more vulnerable due to flexible schedules, but students from low-income families tend to focus more on academics, personality factors, such as extroverts who are more easily involved in night activities, conscientiousness that suppresses procrastination due to discipline, and neuroticism that tends to go to bed early due to fatigue, self-regulation factors, where low self-regulation skills increase the risk of procrastination, and academic and device use factors, where busy schedules and excessive device use before bedtime trigger bedtime delay (Schmidt et al., 2024). Bedtime procrastination is known to show a negative relationship with self-control. Individuals with low self-control are more likely to delay their bedtime as they are more susceptible to distractions and struggle to organise healthy sleep habits (Kroese et al., 2014). Self-control is defined as an individual's ability to control their impulses and drives, and delay immediate gratification to achieve better long-term goals (Tangney et al., 2004).

Self-control plays an important role in managing healthy sleep habits. Individuals with low self-control are more likely to delay their bedtime, as they are more susceptible to distractions and less able to organise healthy sleep habits (Geng et al., 2021). Baumeister et al. (2007) put forward their definition of self-control, namely as the capacity to change individual responses, especially to bring them in line with standards, such as aspirations, values, morals, and social expectations, and to pursue long-term goals. Self-control allows a person to withhold or override a response, making it possible to elicit a different response. Baumeister et al. (2007) suggests that self-control functions as a limited resource, much like a muscle. The more it is trained, the more challenging it becomes to exert self-control in subsequent situations. This process requires

substantial mental energy, making self-control a complex and demanding ability. While some individuals need greater capacity to maintain self-control, it plays a crucial role in enabling humans to form complex societies and adhere to social norms.

Bedtime procrastination, in particular, has been found to negatively correlate with self-control, with individuals who possess lower self-control struggling more to stick to their planned sleep schedule(2004)es. The focus of this research is to explore the relationship between self-control and bedtime procrastination among students working on their thesis. Based on the existing literature, it is hypothesized that there is a significant negative correlation between self-control and bedtime procrastination, such that individuals with higher self-control will exhibit lower levels of bedtime procrastination.

2. RESEARCH METHOD

The method used in this study is a correlational quantitative method with self-control as the independent variable and bedtime procrastination as the dependent variable involving 359 final semester students aged 19-25 years who are completing their thesis from various universities in Jakarta. The questionnaire was distributed using Google Form on various social media platforms, such as Line, Twitter, Instagram, and WhatsApp

Brief Self-Control Scale (BSCS)

The Brief-Self Control Scale (BSCS) is the compact version of the Self-Control Scale (SCS) developed by Tangney et al. (2004). The Brief Self-Control Scale (BSCS) comprises 13 items, including 5 positive statements and 8 negative statements, rated on a 5-point Likert scale ranging from 1 (not at all like me) to 5 (very much like me). Tangney et al. (2004) reported that the BSCS demonstrates reliability similar to the original Self-Control Scale (SCS), with Cronbach's alpha values of 0.830 and 0.850, compared to the SCS's 0.890. The BSCS was developed based on the four aspects of self-control identified by Baumeister et al. (1994), controlling thoughts, emotions, impulses, and performance. Initially, Tangney et al. (2004) created a measurement tool with 93 items divided into five dimensions: self-discipline, non impulsive behavior, healthy habits, work ethic, and reliability.

However, Exploratory Factor Analyses (EFA) showed this model was not accurate in predicting behaviour, so the BSCS was developed into a unidimensional measurement tool. Even so, the validity of the BSCS unidimensional model is in doubt based on the results of Confirmatory Factor Analyses (CFA) conducted by Lindner et al. (2015). The test showed low TFI, CFI, and RMSEA values, making this model considered less valid and reliable.

A number of studies, such as those conducted by Ferrari et al. (2009), proposed a two-dimensional model of BSCS, namely general self-discipline with a Cronbach's alpha reliability of 0.800 and impulse control, with a Cronbach's alpha reliability of 0.690. This two-dimensional model is supported by Lindner et al. (2015) who found that, although not perfect in goodness-of-fit index, this model has fairly stable factor loadings and reliability. Therefore, the researcher will use the Ferrari et al. (2015) version. in measuring self-control. In scoring the BSCS, negative items are reversed first before being summed, the higher the score, the higher the individual's self-control, and vice versa.

Bedtime Procrastination Scale (BPS)

The Bedtime Procrastination Scale (BPS), is a measurement used for measuring bedtime procrastination developed by Kroese et al (2014). The scale consists of 9 items, including 4

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positive statements and 5 negative statements, rated on a 5-point Likert scale from 1 ("never") to 5 ("always"). Factor analysis indicates that the BPS is a unidimensional tool. Kroese et al. (2014) reported Cronbach's alpha reliability of 0.920, reflecting excellent reliability. Participants in the study had a mean age of 37.9 years. Scoring is done by summing responses across all items, with higher scores indicating greater levels of bedtime procrastination and lower scores reflecting lesser levels.

3. RESULT AND DISCUSSION

Before conducting the normality and hypothesis tests, reliability and validity tests were carried out. The BSCS validity test revealed one item with a corrected item-total correlation below 0.2, leading to its elimination. After this adjustment, the BSCS demonstrated a reliability value of 0.951 for the general self-discipline dimension and 0.877 for the impulse control dimension. Validity values ranged from 0.772 to 0.845 for general self-discipline and 0.625 to 0.805 for impulse control, indicating that the BSCS possesses strong validity and reliability. For the BPS, all items had corrected item-total correlation values above 0.2, so no items were removed. The BPS showed a reliability value of 0.918, with item validity ranging from 0.641 to 0.811, confirming its excellent psychometric properties. For more information, see table 1.

Table 1
Reliability and Validity of Brief Self-Control Scale (BSCS) and Bedtime Procrastination Scale (BPS)

Measurement	Dimensions	Reliability	Validity
Brief Self-Control Scale (BSCS)	General Self-Discipline	0.951	0.772 – 0.845
	Impulse Control	0.877	0.625 – 0.805
Bedtime Procrastination Scale (BPS)	Unidimensional	0.918	0.641 – 0.811

Normality test was carried out using One Sample Kolmogorov-Smirnov. The results show the value of Asymp. Sig. (2-tailed) or p-value of 0.000 (<0.050) for both variables. Thus, self-control and bedtime procrastination data are not normally distributed. For more information, see table 2.

Table 2
Normality Test of Brief Self-Control Scale (BSCS) and Bedtime Procrastination Scale (BPS)

Measurement	Asymp. Sig (2-tailed)	Description
Brief Self-Control Scale (BSCS)	0.000	Not normally distributed
Bedtime Procrastination Scale (BPS)	0.000	Not normally distributed

The hypothesis was tested using Spearman's correlation due to the non-normal distribution of the data. The analysis revealed a significant negative correlation between self-control and bedtime procrastination among students completing their thesis, $r(357) = -0.740, p = 0.000$. This indicates that higher self-control is associated with lower bedtime procrastination, supporting the research hypothesis. For more information see table 3.

Table 3
Correlation between Between Self-Control and Bedtime Procrastination

Variable	N	r	p	Description
Self-Control and Bedtime Procrastination	359	-0.740	0.000	Negative and significant

Researchers also conducted a difference test between bedtime procrastination and self-control based on gender. It was found that there is a significant difference between men and women on the self-control variable (p = 0.024 < 0.050). Based on the mean rank displayed, it was also found that the level of self-control of male is lower when compared to self-control of female with a mean rank of 164.14 for male and 189.67 for female. Based on the results of the difference test for bedtime procrastination based on gender, there is no significant difference (p = .104 > .050) when viewed based on gender. The test results indicate that the level of bedtime procrastination there is no difference when viewed from gender. For more information see table 4.

Table 4
Difference Test Based on Gender

Variable	Gender	Mean	Sig.
Self-Control	Male	164.14	0.024
	Female	189.67	
Bedtime Procrastination	Male	191.36	0.104
	Female	173.07	

Based on the test conducted, it was found that there is a significant difference (p = 0.000 < 0.050) when viewed from the participants' sleep duration. In the results obtained, it can be seen that participants who have a sleep duration of 3 to 4 hours have the lowest self-control with a mean rank of 138.58. Participants with the highest self-control have a sleep duration of 7 to 8 hours which has a mean rank of 222.57. Based on the results for the differences test between bedtime procrastination and sleep duration, a significant difference was obtained (p = .000 < .050) when viewed from the participants' sleep duration. The test results showed that participants with a sleep duration of 3 to 4 hours have the highest level of bedtime procrastination with a mean rank of 235.15 and participants with a sleep duration of 7 to 8 hours tend to have lower level of bedtime procrastination with a mean rank of 134.78. For more information see table 5.

Table 5
Difference Test Based on Sleep Duration

Variable	Sleep Duration	Mean	Sig.
Self-Control	3 – 4 hours	138.58	0.000
	5 – 6 hours	170.28	
	7 – 8 hours	222.57	
	More than 8 hours	168.69	
Bedtime Procrastination	3 – 4 hours	235.15	0.000
	5 – 6 hours	191.55	
	7 – 8 hours	134.78	
	More than 8 hours	156.50	

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Based on the difference test conducted for self control based on the cause of delayed sleep time, a significant difference ($p = 0.000 < .05$) was obtained. In the results shown, it can be concluded that participants with the highest level of self-control are participants who delay sleep due to playing games with a mean rank of 135.44 and participants with the lowest level of self-control with participants who delay sleep due to watching television with a mean rank of 271.50. rank of 271.50. According to the difference test conducted for bedtime procrastination based on the cause of delayed sleep time, a significant difference ($p = .000 < .05$) was obtained. In the results shown, it can be concluded that participants with the lowest level of bedtime procrastination are participants who tend to delay sleep time because of watching television with a mean rank of 89.50 and participants with the highest level of bedtime procrastination, have a more delayed sleep due to stress or anxiety with a mean rank of 230.84. For more information see table 6

Table 6
Difference Test Based on Cause of Delayed Sleep Time

Variable	Cause of Delayed Sleep Time	Mean	Sig.
Self-Control	Social media	198.49	0.000
	Watching TV	271.50	
	Playing games	135.44	
	Chatting with others	165.09	
	Watch a series or movie	154.86	
	Working	248.57	
	Studying or working on assignments	215.23	
	Stress or anxiety	136.18	
Bedtime Procrastination	Social media	165.60	0.000
	Watching TV	89.50	
	Playing games	212.66	
	Chatting with others	221.19	
	Watch a series or movie	196.27	
	Working	88.93	
	Studying or working on assignments	150.11	
	Stress or anxiety	230.84	

The results of the main data analysis showed a significant negative relationship between self-control and bedtime procrastination. This means that the lower one's level of self-control, the higher the tendency to delay bedtime. This finding is in line with Exelmans and Van den Bulck's research, which found that individuals with low self-control tend to have difficulty determining their bedtime (Exelmans & Van den Bulck, 2021). This is due to a lack of ability to resist temptation and regulate their behaviour, especially in the face of distractions at night. In addition, Kroese et al. (2016) supports these results by emphasising that weaknesses in self-control contributes in the emergence of bedtime procrastination behaviour. The inability to manage urges can exacerbate this tendency, especially when individuals are already mentally exhausted after a demanding day.

Furthermore, Nauts et al. (2019) explained that many people engage in bedtime procrastination as a form of compensation after facing a busy or obligation-filled day. At night, they feel the need for free time as a 'reward' for themselves, which often leads them to delay sleep. This reflects the dilemma between the need to rest and the urge to indulge, which is often difficult to manage without adequate self-control. When self-control is weakened, individuals are more susceptible to this behaviour, especially in the context of fatigue and the need to release stress at the end of the day. In the context of thesis-writing students, the interplay between fatigue, stress, and the desire to unwind without adequate self-control can significantly contribute to bedtime procrastination. These findings reinforce the idea that self-control is a critical factor in managing bedtime procrastination. When self-control is depleted, students are more vulnerable to delaying sleep, which can further affect their mental and physical well-being, hindering their academic progress and overall health.

Based on the results of the difference test of self-control variables and gender, it was found that there was a significant difference between female and male self-control. The findings in this study reveal that male have lower self-control than females. Referring to several previous studies, it is found that differences in the level of self-control in gender will narrow with age. Tetering et al. (2020) found that females in the age of children to adolescents have a higher level of self-control than males. Younger males tend to have lower self-control, which risks increasing impulsive and antisocial behavior. However, other findings in this study suggest that the difference between genders in self-control levels gets smaller with age, especially in the older age group. The cause of this difference, perhaps may be due to differences in brain development between males and females, where it is stated that males have a longer brain development longer when compared to females (Brouwer et al., 2021).

The part of the brain that regulates self-control, the Prefrontal Cortex (PFC) is responsible for decision-making, reasoning, expression, personality, maintaining social norms, and other complex behaviors (El-Baba & Schury, 2024). In that section, males have slower development compared to females, although males have a larger volume and thickness of the PFC section. Males also showed higher impulsivity, higher impulsivity and a slower decline in impulsivity, which could be one of the reasons for men being one of the causes of men's lower self-control when compared to women (Heitzeg et al., 2018).

In the differences test of bedtime procrastination and gender, it was found that there was no significant difference between self-control and bedtime procrastination. This can occur because there are other factors that predict bedtime procrastination regardless of gender that cause there to be no difference, one of them is chronotype. Chronotype is an expression or representation of circadian rhythms that involve various mechanisms, such as body temperature, cortisol secretion,

cognitive function, and diet and sleep (Chauhan et al., 2023). In short, a chronotype is a biological preference for sleep and wake time patterns. Chronotypes fall into two main categories: late-night chronotypes (also known as “owls”) and early-morning chronotypes (also known as morning chronotypes (also known as ‘larks’). Individuals with a night chronotype will tend to feel more awake at night compared to those with a morning chronotype. This condition may be one of the factors that cause individuals with night chronotypes to engage in activities other than sleeping at night, even though they know that their sleep time will be reduced and make them feel exhausted the next day (Kühnel et al., 2018).

Based on the results of the difference test of bedtime procrastination in terms of sleep duration, a significant difference was found. Participants who slept for only 3 to 4 hours exhibited higher levels of bedtime procrastination. These findings align with research by Hill et al. (2022), which suggests that bedtime procrastination is associated with shorter sleep duration, ultimately leading to poorer sleep quality. Furthermore, this difference test can be linked to the self-control difference test based on sleep duration, which also showed a significant variation. Participants with a sleep duration of 3 to 4 hours demonstrated the lowest levels of self-control, indicating a negative relationship between self-control and bedtime procrastination. Individuals with lower self-control tend to struggle more with resisting the urge to delay sleep, increasing the likelihood of bedtime procrastination and further reducing overall sleep duration.

Additionally, a difference test for bedtime procrastination was conducted based on the cause of sleep delay, revealing significant variations. Participants who experienced stress or anxiety tended to engage in higher levels of bedtime procrastination. This finding is supported by Schmidt et al. (2024), who confirmed that increased stress levels are strongly associated with greater bedtime procrastination. High stress during the day can lead individuals to postpone sleep at night, ultimately resulting in shorter sleep duration and poorer sleep quality. Anxiety also emerged as a strong predictor of bedtime procrastination. A study by Chung et al. (2020) found that participants with high levels of depression and anxiety exhibited increased bedtime procrastination. On average, these participants reported a delayed bedtime of 50 minutes and a delayed wake-up time of 46 minutes.

This study has several limitations, including limited time causing small numbers of participants, which may limit the generalisation of the results. In addition, references regarding bedtime procrastination, especially in final year students, are still minimal, so researchers face obstacles in obtaining relevant data. The quantitative method used also limits the depth of information regarding the variables studied. Therefore, it is recommended that future research use qualitative or experimental methods to obtain more comprehensive results.

4. CONCLUSIONS AND SUGGESTIONS

This study seeks to explore the connection between self-control and bedtime procrastination among students working on their thesis. The findings indicates there is a negative and significant correlation between self-control and bedtime procrastination in students that are working on their thesis, this result can be interpreted as the lower levels of self-control are associated with a higher likelihood of bedtime procrastination, and conversely, higher self-control is linked to reduced bedtime procrastination. In the additional data analysis, an independent t-test was conducted, revealing differences in self-control variables based on gender, as well as differences in self-control and bedtime procrastination variables based on sleep duration. Additionally, significant differences were found in bedtime procrastination variables based on the cause of

sleep delay. However, no significant difference was observed in bedtime procrastination variables based on gender.

The researcher hopes that this study can provide a reference for other researchers who are interested in exploring the topic of bedtime procrastination. To obtain more accurate research results, it is recommended that future studies collect data related to daily activity schedules and specific times of implementation. This data is important because variations in participants' activities, both during the day and at night, can affect sleep and wake up times, so that the research results become more relevant and unbiased.

In addition, to reduce bedtime procrastination and improve self-control, several strategies can be implemented, set specific, realistic, and measurable goals, starting with small steps like adding one paragraph to your thesis daily, practice effective time management by creating structured schedules and starting with small, manageable tasks to build momentum, develop delayed gratification by postponing enjoyable activities until main tasks are completed, using self-rewards as motivation, and foster a supportive environment that encourages positive behavioral changes over time.

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