



THE RELATIONSHIP BETWEEN ACADEMIC PROCRASTINATION AND SLEEP QUALITY OF STUDENTS OF MEDICAL STUDY PROGRAM, FACULTY OF MEDICINE, DIPONEGORO UNIVERSITY DURING THE COVID-19 PANDEMIC

Athaya Zayyan Pusparini^{1*}, Fanti Saktini², Hang Gunawan Asikin³, Tanjung Ayu Sumekar⁴

¹Undergraduate Program, Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia

²Department of Histology, Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia

³Department of Psychiatry, Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia

⁴Department of Physiology, Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia

*Corresponding Author : Email : athayazayyan@gmail.com

ABSTRACT

Background: The COVID-19 pandemic requires the government to take policies by establishing online learning. Online learning has significantly provided changes to students daily activities, thus resulting in academic procrastination. Academic procrastination is defined as an act of postponing academic activities that may lead to decreased academic performance, increased physical, emotional, mental problems, and unhealthy sleep patterns. Sleep is referred to as a crucial activity of daily routines, and poor sleep quality may contribute to negative impacts on academic success. **Objective:** To evaluate the relationship between procrastination and sleep quality for students of the Medical Study Program, Faculty of Medicine, Diponegoro University, during the COVID-19 pandemic. **Methods:** This research used a cross-sectional design. Subsequently, 84 active students of the Faculty of Medicine, Diponegoro University, Class of 2020, were found to meet the research criteria, agreed to the informed consent, and filled out the complete questionnaire. The statistical test used was Spearman's test analysis. **Results:** Referring to the results obtained, there was no significant relationship between academic procrastination and sleep quality for students during the COVID-19 pandemic. Moreover, 39 (46.4%) students were identified as having a high level of academic procrastination. Meanwhile, the majority of students with poor sleep quality during the COVID-19 pandemic was amounted to 52 (61.9%). **Conclusion:** There was no significant relationship between academic procrastination and sleep quality for students of the Medical Study Program, Faculty of Medicine, Diponegoro University, during the COVID-19 pandemic.

Keywords: COVID-19 pandemic; academic procrastination; sleep quality

INTRODUCTION

The coronavirus disease 2019 (COVID-19) outbreak was discovered at the end of December 2019 in Wuhan, China.¹ The World Health Organization (WHO) officially declared the COVID-19 pandemic an international emergency on January 30, 2020.² In response to the pandemic, online learning was initiated by the Indonesian Ministry of Education and Culture at the end of March 2020.³ Online learning causes academic procrastination in students where they tend to feel lazy and choose more entertaining activities.⁴

Academic procrastination is a tendency to delay and neglect academic responsibilities. According to previous research, about 90-95% of students procrastinate. Procrastination causes academic performance to decline and results in physical, emotional, and mental problems.⁵⁻⁷ Procrastination habits can lead to unhealthy sleep patterns.⁸

Sleep is an important part of the routine. Sleep quality is described as the energetic and fit feeling after waking up. Sleep quality includes quantitative aspects in the form of sleep duration and sleep latency, also subjective aspects such as depth and calm during sleep.^{9,10} Various factors can affect sleep quality, such as psychological factors, comfortable living environment, lifestyle, diet, and diseases.^{11,12}

Procrastinators tend to have poor sleep quality. Procrastination on academic tasks raises concerns that activate the brain's alert center and interfere with sleep. In addition, tasks performed before bedtime due to procrastination can cause the brain to think at rest so that the brain will feel tired when it is time to wake up.¹³

There have not been many studies in Indonesia discussing the impact of academic procrastination during the COVID-19 pandemic on sleep quality. Thus, this study aims to analyze the



effects of academic procrastination on students' sleep quality.

METHODS

This research was conducted by analytic observational study with a cross-sectional design which was conducted at the location of each subject through an online questionnaire from October to November 2021. The target population of this study was all research respondents, which were medical students. The population covered by this study were students of the Medical Study Program, Faculty of Medicine, Diponegoro University, Class of 2020.

The sample of this study were all students of the Medical Study Program, Faculty of Medicine, Diponegoro University, class of 2020 who met the inclusion criteria and did not meet the exclusion criteria. The inclusion criteria in this study were active female and male students, willing to sign an informed consent letter, and 100% participating in online learning. The exclusion criteria in this study were students who were obese, who smokes, consumes caffeine and/or alcohol, and had been diagnosed with anxiety. The selection of research subjects used the consecutive sampling method and found a total of 84 subjects. The independent variable in this study is procrastination and the dependent variable is sleep quality.

The data were collected after delivering explanations regarding the procedures, objectives, and benefits of the research to the subjects and then asking for approval through informed consent. Subjects then filled out a questionnaire guided by the researcher. The data obtained were tested using the Spearman correlation test using SPSS-25. Hypothesis testing was conducted twice regarding the relationship between procrastination and sleep quality in the form of numerical-numerical and numerical-ordinal data.

RESULTS

The respondents' characteristics by the descriptive analysis are presented in the form of mean, median, sum, and percentage in the table.

Table 1. Respondents' Characteristics, n=84

Variable	Median (min-max)	p
Age	19,0 (18 – 21)	<0,001*
Duration of physical exercise	30,0 (0 – 400)	<0,001*
Sleep quality	6,0 (1 – 14)	<0,001*

Variable	Mean (SD)	p
Academic procrastination	14,64 (5,778)	0,200*

Variable	Sum (percentage)
Gender	
- Male	18 (21,4%)
- Female	66 (78,6%)
Academic procrastination	
- Low procrastination	45 (53,6%)
- High procrastination	39 (46,4%)
Sleep quality	
- Good sleep quality	32 (38,1%)
- Poor sleep quality	52 (61,9%)

Description: *Kolmogorov Smirnov

Based on table 1, the average academic procrastination is 14.64. The majority of subjects have poor sleep quality.

Table 2. Differences in sleep quality with different durations of physical exercise

	Duration of Physical Exercise	p
	Median (min-max)	
Good sleep quality	30,0 (0 – 240)	0,014*
Poor sleep quality	35,0 (0 – 400)	

Description: *Mann-Whitney

Based on table 2, the results of the Mann-Whitney analysis showed a p-value of 0.014. It can be concluded that there is a significant difference in sleep quality based on the length of physical exercise.



Table 3. The relationship between procrastination and components of sleep quality

Variable	Academic Procrastination	
	Correlation Coefficient (r)#	Significance (p)
Subjective sleep quality	r=0,17	p=0,062*
Sleep latency	r=-0,003	p=0,489*
Sleep duration	r=-0,157	p=0,077*
Daily sleep efficiency	r=-0,033	p=0,382*
Sleep disturbance	r=-0,036	p=0,373*
Sleeping pills consumption	r=0,009	p=0,468*
Daytime activities dysfunction	r=0,323	p=0,001

Description: *Insignificant, #Spearman Correlation Test

Based on the analysis of the Spearman test in table 3, there is a significant value ($p < 0.05$) on the level of academic procrastination with the dysfunction of daytime activities. Both have a weak positive correlation ($r=0.323$).

Table 4. The relationship between procrastination and sleep quality

Variable	Academic Procrastination	
	Correlation Coefficient (r)#	Significance (p)
Sleep quality	r=0,059	p=0,298*

Description: *Insignificant, #Spearman Correlation Test

Based on the Spearman test analysis in table 4, the p-value is 0.298 ($p > 0.05$). So it can be concluded that the level of academic procrastination with sleep quality have no significant correlation.

Table 5. The relationship between procrastination and sleep quality

Variabel	Academic Procrastination	
	Koefisien Korelasi (r)#	Signifikansi (p)
Sleep quality interpretation	r=0,034	p=0,38*

Description: *Insignificant, #Spearman Correlation Test

Based on the Spearman test results in table 5, the p-value is 0.38 ($p > 0.05$). Thus, the level of academic procrastination with the interpretation of sleep quality have no significant correlation.

DISCUSSION

This study found that academic procrastination and sleep quality had no significant correlation ($p > 0.05$). In terms of sleep quality components, academic procrastination had a weak positive correlation with the daytime dysfunction component ($r=0.323$) and had no significant correlation with the other six. This result is different from the study conducted by Sirois which stated that procrastination had a significant correlation with sleep quality and all components of sleep quality except sleep disturbances, sleep efficiency, and subjective sleep quality.¹⁴

The hypothesis regarding the relationship between procrastination and sleep quality of the Medical Study Program, Faculty of Medicine, Diponegoro University students class of 2020 during the COVID-19 pandemic is not proven. Additionally, the procrastination score does not correlate with sleep quality. Other factors that affect sleep quality were not examined in the study. Several other factors that can affect sleep quality include the level of cleanliness, room temperature, noise intensity, room light intensity, fatigue level, anxiety level, and stress level. Factors that can improve sleep quality are good room hygiene, moderate temperatures, and room lighting while sleeping that is not too bright. Meanwhile, the factors that can reduce sleep quality include noise, excessive fatigue, anxiety, and emotional stress. Stress levels are also a mediator between procrastination and poor sleep quality. Procrastinators tend to have high levels of stress, causing poor sleep quality.^{11,12,14}

The results showed that 39 (46.4%) subjects were in the category of high academic procrastination. This result is following previous research conducted before the COVID-19 pandemic at the Faculty of Medicine, University of Lampung. The research found only 5 (4.17%) respondents in the high procrastination category, and most of the respondents were in the low academic procrastination category, as many as 115 (95.83%).¹⁵

In this study, based on the total score of the seven components of the PSQI questionnaire, the



majority of subjects had poor sleep quality at a total of 51 (61.9%) respondents. These results are consistent with previous research in Brazil which also used the PSQI questionnaire, which found that 87.1% of students had poor sleep quality. In a study conducted in Brazil, first and second-year medical students had subjectively poorer sleep quality and greater daytime dysfunction than the third to sixth-year students. This may be because students can adapt better to routines and learning after the second year of education.¹⁶

Similarly, research conducted in Egypt found that the majority of students had poor sleep quality (58.5%)¹⁷ On the other hand, the results of this study differed from research conducted in India. Only 37.6% of medical students out of a total of 684 respondents had poor sleep quality. The difference in the results of this study may be due to differences in the sociodemographic background of the research subjects.¹⁸ Poor sleep quality tends to occur in students because of irregular schedules and the amount of academic and social pressure. These things make students vulnerable to sleep disturbances and experience a decrease in their sleep quality. Compared to other universities, medical students experience poorer sleep quality due to the heavy workload of studies, such as busy schedules, extensive syllabus, and various clinical training. Other supporting factors that can influence are the heavy academic burden and economic pressure.^{19,20}

The results of this study showed a significant difference in sleep quality with the length of physical exercise ($p=0.014$, $p<0.05$). Subjects with poor sleep quality showed longer physical exercise than those with good sleep quality. This result is different from previous research in Iran where interventions were carried out on subjects in the form of increased physical exercise every week for 12 weeks and resulted in a decrease in PSQI scores at week 12, indicating that physical exercise can improve sleep quality from the aspect of subjective sleep quality, sleep latency, sleep duration, efficiency of sleep habits, and reduced sleep disturbances, use of sleeping pills, and daytime dysfunction.²¹ The difference in the results of this study may be due to the study design.

The results of this study showed a significant correlation between procrastination and daytime dysfunction, and also longer physical exercise in

subjects with poor sleep quality than subjects with good sleep quality. Previous studies conducted on young adults found no effects of physical exercise on daytime dysfunction.²² This result differs from other studies which found that physical exercise can reduce daytime dysfunction.²³ This may be due to the lack of information in this study regarding intensity, frequency, type, and time of physical exercise.

The intensity, duration, type, and time of physical exercise are supporting factors in its effect on sleep quality. In previous studies, the results of physical exercise at night had a positive effect on the onset, total time, and sleep efficiency, but strenuous physical exercise performed 1 hour or less before bedtime could interfere with sleep.²⁴ However, another study stated that strenuous physical exercise before bedtime did not interfere with sleep quality.²⁵ There were differences in the findings of strenuous physical exercise on sleep quality, but moderate physical exercise significantly improved sleep quality.^{22,26}

The limitation of this research is that there were unexamined factors and could affect the variables in this study. Factors such as level of cleanliness, room temperature, noise intensity, room light intensity, fatigue level, anxiety level, stress level, as well as intensity, frequency, type, and time of physical exercise can affect sleep quality.

CONCLUSION

There was no significant relationship between academic procrastination and sleep quality of students of the Medical Study Program, Faculty of Medicine, Diponegoro University during the COVID-19 pandemic.

ETHICAL APPROVAL

The study was according to the ethics and was initiated after obtaining ethical clearance from the Health Research Ethics Commission, Faculty of Medicine, Diponegoro University, Semarang. The ethical clearance letter number is 390/EC/KEPK/FK-UNDIP/X/2021.

CONFLICTS OF INTEREST

There is no conflict of interest related to the materials, methods, and findings in this study.

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