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## Factors Related to Sleep Quality in Final Semester Pharmacy Students of Mandala Waluya University

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### ABSTRACT

**Introduction:** Sleep is a recovery process for the body and brain and is very important for achieving optimal health. Lack of sleep can cause students to become tired or easily tired, emotional instability, lack of self-confidence, excessive impulsiveness and carelessness. A preliminary study with 32 final year pharmacy students revealed that 32 said they experienced symptoms of irregular sleep patterns, stress, decreased appetite, anxiety and restlessness.

**Objective:** This study aims to determine the relationship between stress, screen time, eating patterns and anxiety with sleep quality in final semester pharmacy students at Mandala Waluya University in 2024.

**Method:** The type of research used in this research is quantitative with a cross sectional study design. The population in this study was 158 final semester pharmacy students at Mandala Waluya University. A sample of 62 respondents was obtained using simple random sampling techniques. The analysis method uses Fisher's Exact Test.

**Result:** The statistical test results show that Stress obtained a value of  $p=0.004$  and  $\alpha 0.05$ , namely  $0.004 < 0.05$ , Screen Time obtained a value of  $p=0.004$  and  $\alpha 0.05$ , namely  $0.004 < 0.05$ , Eating Pattern obtained a value of  $p=0.001$  and  $\alpha 0.05$ , namely  $0.001 < 0.05$ , and Anxiety obtained a value of  $p = 0.000$  and  $\alpha 0.05$ , namely  $0.000 < 0.05$ .

**Conclusion:** Suggestions for students are that they hope to be able to improve sleep quality well so that it does not hinder the lecture process, then for further research, it is highly recommended to use online questionnaires such as Google Forms or similar and use other variables such as disease, caffeine consumption and the environment.

**Keywords:** Sleep Quality; Final Semester Students; Stress; Screen Time; Sleep Patterns; Anxiety

## INTRODUCTION

The world's population has experienced sleep difficulties of about 18% and increases every year with various complaints and causes various mental pressures for the sufferers. In research and survey results from Warwick Medical School in England, it has been found that various countries in Africa and Asia have about 150 million adults experiencing sleep disorders or about 20%. The survey involved 4,005 people and found that about 21.8% of the population had acute sleep problems (1-3).

The prevalence of sleep disorders in 2018 in Indonesia was around 10%, which means that approximately 28 million out of a total of 238 million people in Indonesia experienced sleep difficulties. In Java and Bali, the prevalence of sleep disorders is quite high at around 44% of the total elderly population of 25 million. The prevalence of sleep disorders in Jakarta was found to be high among adolescents with a result of 62.9%, the prevalence of sleep disorders in Semarang among adolescents was found to be 81.1%, and the prevalence of sleep disorders in South Tangerang among adolescents was also found to be 77.1% with sleep-wake transition disorders as the most frequently encountered type of disorder (4-6).

Factors causing sleep quality according to Zulfikar, E (52), explain that there are several factors causing poor sleep quality, including disease, environment, anxiety, stress, screen time, eating patterns, and caffeine consumption. A person's sleep quality can be said to be good if it does not show various signs indicating a lack of sleep and does not experience problems while sleeping. Good sleep quality must meet several aspects, including sleep duration, sleep latency, and good subjective sleep as well. Based on data from the International of Sleep Disorder, the percentage of causes of sleep disorders includes restlessness (5-15%), alcohol dependence (10%), late sleeping (10%), schedule changes (2-5%), disease (<1%), and stress (65%) (7,8).

Preliminary study introduction conducted on final semester pharmacy students at Universitas Mandala Waluya with informal interview method to 32 final semester pharmacy students on January 17, 2024, obtained results that 32 students experienced poor sleep quality, with several causes of poor sleep quality among them the highest being stress level of 37.5%, screen time of 34.3%, eating patterns of 21.8%, anxiety of 15.6%, caffeine consumption of 9.37%, environment of 3.12%, and illness 0%.

Causes of poor sleep quality of final semester pharmacy students from 32 students there are 12 students who experience stress or 37.5% which is the highest cause of poor sleep quality in final semester pharmacy students. Stress experienced due to the many assignments from courses and thesis assignments as a requirement to graduate from campus thus making schedules and sleep time disturbed due to stress factors from academics.

Screen time is the second highest cause of poor sleep quality of final semester pharmacy students, from 32 students who have poor sleep quality there are 11 students or 34.3% who engage in screen time every day. This activity is caused by the habit of staring at laptops and gadgets to work on theses and using social media to find news and references such as WhatsApp, Instagram, and Twitter. It is this habit that disrupts sleep time.

Eating patterns become the third cause of poor sleep quality of final semester pharmacy students, from 32 students who have poor sleep quality there are 7 students or 21.8% of students who have poor eating patterns. Due to the many assignments and working on theses, the time and schedule for eating become delayed, resulting in excessive hunger that disrupts sleep time.

Anxiety is the fourth causal factor of poor sleep quality in final semester pharmacy students where from 32 students who have poor sleep quality there are 5 students or 15.6% who experience anxiety. This is caused by the tight schedule for completing assignments and the tight schedule for working on theses making students' minds fearful and worried about the time and completion of the thesis. From this anxiety, students experience fear and excessive overthinking, thus disrupting sleep time due to excessive anxiety (1),(9,10).

Caffeine consumption is found in 3 students out of 32 students who experience poor sleep quality or 9.37%, due to working on assignments, thus students choose to consume caffeine to avoid excessive drowsiness. The environment only has one student or 3.12%, a noisy and uncomfortable environment makes the sleep quality of final semester pharmacy students poor. From several causes of poor sleep quality, final year students of the S1 Pharmacy study program found that stress, screen time, eating patterns, and anxiety are the dominant factors causing poor sleep quality among students. The causes of stress can be divided into 2, namely internal factors and external factors. Internal factors here include a person's physical condition and emotional state, while external factors can be exemplified by an unsupportive environment, such as a suddenly changing environment. Students who are preparing their thesis experience mild stress and tend to have very poor sleep quality. Stress will affect the hormones epinephrine, norepinephrine, and cortisol in the human nervous system, resulting in disruption of the

NREM and REM sleep cycles, causing people to be unable to sleep soundly at night (11). Poor sleep quality will impact physiological and psychological health deterioration. Physiologically, poor sleep quality can lead to low levels of individual health and increased fatigue or easy tiredness.

Psychologically, low sleep quality can result in emotional instability, lack of self-confidence, excessive impulsivity, and carelessness (12). Previous research conducted by Arliani (4) on factors related to sleep quality in students who consume coffee stated that students with good sleep quality amounted to 49.15% and students with poor sleep quality amounted to 50.85%. The determinants of coffee consumption have a significant relationship with sleep quality, and the determinants of psychological fatigue have a significant relationship with sleep quality, where students experiencing psychological fatigue are at 3.84 times greater risk of having poor sleep quality compared to students who do not experience psychological fatigue. Based on the above, the researcher is interested in studying "Factors Related to Sleep Quality in Final Semester Pharmacy Students at Universitas Mandala Waluya."

## METHOD

The type of research used in this study is quantitative with a cross-sectional study design to determine the factors related to sleep quality in final semester pharmacy students at Universitas Mandala Waluya, where the researcher conducts variable measurements at one time, meaning that the subject is measured only once, and the measurement is conducted at the time of data collection. The research was conducted at the Faculty of Science and Technology, S1 Pharmacy Department, Universitas Mandala Waluya in March 2024 on 62 respondents with the questionnaire method.

The sampling technique is simple random sampling represents the population. Simple random sampling is taking samples from the population randomly without paying attention to the strata in the population and each member. The population has the same opportunity to be sampled (56). Primary data comes directly from respondents, while secondary data is in the form of Information from offices/agencies related to this research includes, among others, namely management of the Undergraduate Pharmacy study program, Faculty of Science and Technology, Mandala Waluya University.

## RESULTS

**Table 1.** Table Distribution of Respondents According to Gender and Age Semester Pharmacy Students End of Mandala Waluya University

	Characteristics	n	%
<b>Gender</b>	Man	5	8.1
	Woman	57	91.9
<b>Age</b>	20-23 years	45	72.6
	24-27 years	17	27.4
	20-23 years	45	72.6
<b>Total</b>		<b>62</b>	<b>100</b>

**Table 2.** Distribution of Respondents According to Sleep Quality of Final Semester Pharmacy Students at Mandala Waluya University

Variable	Characteristics	n	%
<b>Sleep quality</b>	Good	10	16.1
	Bad	52	83.9
<b>Stress</b>	Moderate	18	29.0
	High	44	71.0
<b>Screen Time</b>	Good	13	21.0
	Bad	49	79.0
<b>Total</b>		<b>62</b>	<b>100</b>

Table 2 shows that of the 62 respondents, respondents with poor sleep quality were 52 students (83.9%), severe stress levels were 44 students (71.0%), and poor screen time were 49 students (79.0%).

**Table 3.** Distribution of Respondents Based on Activities Frequently Performed in Front of Electronic Screens for Final Semester Pharmacy Students at Mandala Waluya University

No.	Answers	n	%
1.	Playing game	5	8.1
2.	Communicate with friends via social media	35	56.5
3.	Online shopping	7	11.3
4.	Looking for references for assignments	15	24.2
<b>Jumlah</b>		<b>62</b>	<b>100</b>

**Table 4.** Distribution of Stress Based on Sleep Quality in Final Semester Pharmacy Students at Mandala Waluya University

No	Stres	Sleep Quality				Total	
		Good		Bad		n	%
		n	%	n	%		
1.	Moderate	7	38.9	11	61.1	18	100
2.	High	3	6.8	41	93.2	44	100
	<b>Total</b>	<b>10</b>	<b>16.1</b>	<b>52</b>	<b>83.9</b>	<b>62</b>	<b>100</b>

Based on table 4 above, it shows that of the 62 respondents there were 18 respondents with moderate stress, 11 students (61.1%) with poor sleep quality. Meanwhile, of the 44 respondents with severe stress, there were 41 students (93.2%) with poor sleep quality. This means that students with severe stress have poor sleep quality. Based on the results of data analysis using the Fisher's Exact Test with a value of  $\rho = 0.004 < 0.05$ . So  $H_0$  is rejected and  $H_a$  is accepted so it can be concluded that there is a relationship between stress and sleep quality in final semester pharmacy students at Mandala Waluya University.

**Table 5.** Distribution of Screen Time Based on Sleep Quality in Final Semester Pharmacy Students at Mandala Waluya University

No	Screen Time	Sleep Quality				Total	
		Good		Bad		n	%
		n	%	n	%		
1.	Good	6	46.2	7	53.8	13	100
2.	Bad	4	8.2	45	91.8	49	100
	<b>Total</b>	<b>10</b>	<b>16.1</b>	<b>52</b>	<b>83.9</b>	<b>62</b>	<b>100</b>

Table 5 above shows that of the 62 respondents, there were 13 respondents with good screen time and 7 students (53.8%) with poor sleep quality. Meanwhile, among the 49 respondents, there were 45 students (91.8%) with poor screen time and poor sleep quality. This means that students with poor screen time have poor sleep quality. Based on the results of data analysis using the Fisher's Exact Test with a value of  $\rho = 0.004 < \alpha = 0.05$ . So  $H_0$  is rejected and  $H_a$  is accepted so it can be concluded that there is a relationship between screen time and sleep quality in final semester pharmacy students at Mandala Waluya University.

**Table 6.** Distribution of Dietary Patterns Based on Sleep Quality in Final Semester Pharmacy Students at Mandala Waluya University

No.	Eating Patterns	Sleep Quality				Total	
		Good		Bad		n	%
		n	%	n	%		
1.	Good	9	36.0	16	64.0	25	100
2.	Bad	1	2.7	36	97.3	37	100
	<b>Total</b>	<b>10</b>	<b>16.1</b>	<b>52</b>	<b>83.9</b>	<b>62</b>	<b>100</b>

Based on table 6, it shows that out of 62 respondents, there are 25 respondents with good eating patterns where 16 students (64.0%) have poor sleep quality. Meanwhile, among 37 respondents with poor eating patterns,

there are 36 students (97.3%) with poor sleep quality. This means that students with poor eating patterns have poor sleep quality. Based on the results of data analysis using Fisher's Exact Test with a value of  $p = 0.001 < \alpha = 0.05$ ,  $H_0$  is rejected and  $H_a$  is accepted, so it can be concluded that there is a relationship between eating patterns and sleep quality in final semester pharmacy students at Mandala Waluya University.

**Table 7.** Distribution of Anxiety Based on Sleep Quality in Final Semester Pharmacy Students at Mandala Waluya University

No	Anxiety	Sleep Quality				Total	
		Good		Bad		n	%
		n	%	n	%		
1.	Moderate	10	76.9	3	23.1	13	100
2.	Weight	0	0	49	100	49	100
<b>Total</b>		<b>10</b>	<b>16.1</b>	<b>52</b>	<b>83.9</b>	<b>62</b>	<b>100</b>

Based on table 7, it shows that out of 62 respondents, 13 respondents with moderate anxiety have 3 students (23.1%) with poor sleep quality. Meanwhile, among 49 respondents with severe stress, there are 49 students (100%) with poor sleep quality. This means that students with severe anxiety have a higher number of poor sleep quality. Based on the results of data analysis using Fisher's Exact Test with a value of  $p = 0.000$  and  $< \alpha = 0.05$ ,  $H_0$  is rejected and  $H_a$  is accepted, so it can be concluded that there is a relationship between anxiety and sleep quality in final semester pharmacy students at Mandala Waluya University.

## DISCUSSION

Stress is one of the reactions or psychological responses of humans when faced with things that are perceived to have exceeded limits or are considered difficult to face. Every human has experiences with stress and things. This is a normal condition even before humans are born. The results of the distribution of respondents, the researcher assumes that eating patterns are related to sleep quality in final semester pharmacy students at Mandala Waluya University due to the many assignments from campus, the numerous revisions given, and the difficulty in finding references for final assignments, causing students to become lazy to eat and prefer to consume snacks and caffeinated drinks, thus the students' hunger disrupts their sleep quality.

This research was conducted on final year students of the S1 Pharmacy study program at Mandala Waluya University. The average age of final semester students is 20 to 27 years. The age of the respondents falls into the young adult age range, which is between 20 to 44 years. The classification of normal sleep time based on the Ministry of Health of the Republic of Indonesia for the age range of 20 to 44 years is 7 to 8 hours. Therefore, it can be classified that the age of the respondents falls into the young adult category. The normal sleep time for young adults is 6 to 8.5 hours, and at this age, young adults rarely take naps. The impacts of poor sleep quality in early adulthood include decreased daily activity, feelings of fatigue, weakness, unstable vital signs, poor neuromuscular condition, slow wound healing, and decreased body immunity.

According to Mubarak (34), approximately 20 to 25% of sleep time is spent in REM sleep, 5 to 10% in stage I sleep, 50% in stage II sleep, and 10 to 20% in stages III and IV, and this remains consistent throughout life. In young adulthood, there will be a shift in circadian rhythm, causing sleep times to shift as well. The complex lecture activities with a number of piled-up assignments, as well as module exams, final assignment preparation for final year students, and other activities outside of lectures and organizations will cause the fatigue burden experienced by students; these are some factors that cause students to often stay up late and make them feel sleepy when attending lectures the next day. This will disrupt the students' sleep process, so the expected sleep quality will not be achieved.

According to the research results, there are 3 respondents (6.8%) with severe stress but good sleep quality. Based on interviews with final semester pharmacy students, respondents said they cope with stress by crying and confiding in close friends. However, after the respondents advanced to the second level, recently the respondents experienced severe stress; before experiencing severe stress, the respondents said their sleep was still normal. However, during the time the respondents experienced stress that was heavier than usual, the respondents said that this affected their sleep quality, making it worse. However, the respondents were still able to cope with their stress through several means such as gathering with close friends, expressing their stress by crying, and confiding with friends so that the stress feelings of the respondents become reduced so that the quality of sleep is still well controlled. Screen time is a person's habit in using electronic devices for a long time such as staring at laptops, computers, televisions, smartphones, and playstations. This habit can be influenced by the emergence of social

networks like other social media. The results of data analysis using Fisher's Exact Test obtained a p-value = 0.004 and  $\alpha = 0.05$ , namely  $0.004 < 0.05$ . Thus,  $H_0$  is rejected and  $H_a$  is accepted so it can be concluded that there is a relationship between screen time and sleep quality in final semester pharmacy students at Mandala Waluya University.

The researcher's assumption is that screen time is related to sleep quality in final semester pharmacy students at Mandala Waluya University due to the many assignments from campus, thesis preparation, searching for references, and using social media as a communication tool, causing students to spend more time staring at electronic screens for a very long time, thus disrupting rest activities and sleep time. The results show that there is a relationship between screen time and sleep quality in final semester pharmacy students at Mandala Waluya University. This has been tested with the Chi Square Test, resulting in  $p = 0.004$ , which means the value is quite strong and one-directional, meaning that if screen time activity increases, the level of sleep pattern disturbance will increase, and vice versa. The cause of sleep pattern disturbances in students is access to social media on the internet through mobile phones, which can affect poor sleep quality. There are several results that respondents who have poor screen time but do not experience sleep disturbances, and conversely, respondents who have good screen time but experience sleep disturbances. This is caused by several factors, such as consuming caffeine, watching TV before sleeping, a hot and noisy home environment, having a TV in the bedroom, or the bedroom being close to the TV; these conditions become supporting factors that can influence the occurrence of sleep pattern disturbances and vice versa. The results of this study show that there are 4 respondents (8.2%) who have poor screen time but good sleep quality. This is because the respondents are able to sleep well. Respondents spend a lot of time in front of electronic screens such as watching videos, watching Korean dramas, searching for references, and playing games. However, what makes respondents have good sleep quality is that some respondents live in comfortable places, good environments, and far from crowds. From interviews conducted with respondents, they said that good sleep quality depends on a good and comfortable atmosphere, even though staring at screens for longer will not disturb sleep as long as the bed and resting place feel comfortable.

In addition, the results of this study show that there are 7 respondents (53.8%) who have good screen time but poor sleep quality. This light screen time is due to respondents being able to limit activities in front of electronic screens and prioritizing learning using books and listening to lessons through audio. However, some factors that cause respondents to have good screen time but poor sleep quality are that respondents experience high levels of stress and anxiety, which leads to poor sleep quality. Respondents use electronics less, but because their thoughts and feelings of anxiety are too high, these respondents have difficulty sleeping.

Eating patterns are efforts in the form of adjusting the amount of food, types of food, and eating habits through visual information such as maintaining health, nutritional status, prevention, or healing of diseases. A good eating pattern will ensure good health and a healthy quality of life. The assumption of the study found that there is a relationship between eating patterns and sleep quality. This is because students still think about their final assignments before sleeping, such as searching for references, as students who are compiling final assignments will face many obstacles and challenges that will cause students to feel lazy to eat, so hunger leads many students to experience disturbed sleep quality. The results of this study indicate that there is a relationship between eating patterns and sleep quality with a p-value of 0.001, which means the value is quite strong and one-directional. The worse the eating pattern of students, the worse the sleep quality of students. This is based on the theory of growth and development, where students are at the early stage of adult transition or in the stage of entering adulthood (17-40), where in this phase a person's physical continues to develop, as do their social and psychological aspects. This change causes an adult to experience various lifestyles, behaviors, including experiences in determining what food will be consumed. This statement is consistent with the research results, that students' eating patterns are mostly lacking. Although the results state that friends influence the informants' eating patterns, this means that peers have a negative influence and friends only affect eating patterns but do not yet have the potential to promote health, especially encouraging the habit of healthy eating patterns.

Anxiety is a condition of pressure or tension that cannot be explained, which is combined through psychological reactions and feelings of restlessness about adapting to risks. This may serve as a reminder for someone to address it. The results of the study show that the level of anxiety among final semester pharmacy students at Universitas Mandala Waluya from 62 respondents (100%) includes 49 students who experience severe anxiety and 13 students with moderate anxiety. Among the students who experience severe anxiety in this study. According to Hurlock (18), the developmental tasks of young adults are as follows: starting to work, choosing a partner, starting a family, raising children, managing a household, taking responsibility as citizens, seeking enjoyable social groups. The demands and developmental tasks of these students arise due to changes occurring in the functional aspects of individuals, namely physical, psychological, and social. According to Sutjiato (39), anxiety is a condition of physical and psychological pressure due to demands from within and the environment. This statement means that a person can be said to experience anxiety when they are under pressure from demands

originating from within themselves and their environment. Anxiety lasts longer, can last for several hours or even several days. The characteristics of anxiety include stomach pain, tense muscles, feelings of tension, difficulty sleeping, and a light body (22, 40). The causes of anxiety for those who are writing their thesis are divided into two, namely internal anxiety (new experiences, poor time management, pessimism, and negative thinking) and external anxiety (lack of available references, difficulty meeting lecturers). One way to prevent anxiety is to manage time well between rest, exercise, and eliminating negative thoughts.

## CONCLUSION

Based on the research results and discussions presented in this research regarding the factors related to sleep quality in final semester pharmacy students at Universitas Mandala Waluya, it can be concluded that there is a relationship between the three variables, namely stress, screen time, eating patterns, and anxiety with the sleep quality of students.

## SUGGESTION

For future researchers, it is highly recommended to use an online questionnaire such as Google Form or similar. This research is still basic research so further research is needed with different variables such as caffeine consumption, environment and disease.

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