

The Relationship Between Sleep Hygiene and Sleep Quality in Medical Faculty Students Airlangga University

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ABSTRACT

Backgrounds: Sleep hygiene is a behavior modification that can affect the fulfillment of sleep needs. In previous studies, it was stated that students who experienced poor sleep quality were the result of inadequate education on sleep hygiene practices. The use of sleep hygiene strategies is carried out as an intervention to improve the sleep practices of university students. **Objective:** This study aims to determine sleep hygiene, sleep quality, and analyze the relationship between sleep hygiene and sleep quality in students of the Faculty of Medicine, Airlangga University. **Method:** This study was an observational analytical study using a cross-sectional design. Sampling using stratified random sampling technique with correlation coefficient formula with minimum results of 39 samples. The instruments used in this study were the Sleep Hygiene Index (SHI) and Pittsburgh Sleep Quality Index (PSQI) questionnaires. Data is tabulated using Microsoft Excel and processed using SPSS. Then, the data is analyzed with the Spearman test. **Results:** Of the 93 students who participated, the dominant respondents were aged 18-25 years (94.6%), were female (69.9%), had normal sleep hygiene (77.4%), and had poor sleep quality (65%). The results of statistical analysis of sleep hygiene with sleep quality obtained a significant value (p) of 0.036 (p < 0.050). **Conclusion:** With the significance value (p), it can be concluded that there is a meaningful relationship between sleep hygiene and sleep quality.

Keywords: Sleep hygiene, sleep quality, medical students

INTRODUCTION

Sleep is one of the basic human needs that is important for the body. Sleep is defined as a subconscious state, where an individual can still be awakened by giving a stimulus, which is distinguished from a comatose state where the individual cannot be awakened by stimulation (Guyton and Hall, 2016). The normal sleep requirement of young adults (18 – 25 years) is 7 – 9 hours per day (Hirshkowitz et al. , 2015). A person is said to have good sleep quality, if the person meets the criteria: having more sleep time in bed (85%), being able to fall asleep within ≤ 30 minutes, waking up from sleep no more than once each night, and waking up for ≤ 20 minutes after falling asleep (Bianca, Budiarsa and Samatra, 2021). Factors that can affect a person's sleep quality include; diseases such as pain, fatigue, stress and emotions, environment, lifestyle, and medications (Subogo, 2020). Good quality sleep can affect cognitive function, mood, hormonal system, and immune function of the human body. While people who have poor sleep quality will affect physical health in the form of increased fatigue levels and the onset of various diseases, as well as poor psychological conditions in the form of unstable emotions, anxiety, and bad mood.

Sleep quality in young adults is worse with sleep pattern problems and longer sleep latency than older adults (Gadie et al., 2017). Medical students, who generally include young adults, are a vulnerable group with poor sleep quality. This is due to the burden, demands, and intensity of learning that is quite

large for the students themselves, considering the importance of the student's role in the future as a doctor. Lack of sleep duration is a barrier to student performance for exams, as well as causing fatigue, stress, anxiety, and depressive symptoms. In research conducted at Halu Oleo University, it was found that medical students in the second and third academic years experienced less sleep quality with sleep patterns and emotional stress as factors that influenced the quality of students (Yunaningsi and Haryati, 2020).

Sleep hygiene is a behavior modification that can affect the fulfillment of sleep needs. This behavior or habit is very effective in the process of improving the quality, quantity and fulfillment of sleep needs (Rohmawati, 2018). Some recommended sleep hygiene practices are: reducing irregular sleep-wake schedules, reducing strenuous activities or exercise at night, and reducing the use of caffeine, alcohol, and cigarettes (Stepanski and Wyatt, 2003). Activities in bed such as reading and watching television have also been linked to poor sleep measurement (Mastin, Bryson and Corwyn, 2006). Most college students with unwanted sleep habits are poorly aware of behaviors that can improve sleep quality. Lack of knowledge about good sleep hygiene contributes to poor sleep practices, which then affects health and well-being (Suen, Tam and Hon, 2010). Sleep quality in medical students may be improved through sleep hygiene education programs (Brick, Seely and Palermo, 2010).

Research conducted on medical students of Qazvin University, found that students who experienced poor sleep quality were very high due to inadequate education on sleep hygiene practices (Mardalifa, Yulistini and Susanti, 2018). Another study conducted at university students in Hong Kong also found that more than half of the participants gave wrong answers related to napping during the day and drug use. More than 60% of students do not expect that using the bed for other purposes than sleep causes a negative impact on sleep behavior. These are the components assessed in sleep hygiene. In this study it was also said that they supported the use of sleep hygiene strategies as an intervention to improve the sleep practices of university students (Suen, Tam and Hon, 2010) While in research conducted on university students in Indonesia, medical students who had poor sleep quality was higher than students whose sleep quality was good (Nugroho, 2015).

From the description above, researchers are interested in conducting a study entitled "The Relationship Between Sleep Hygiene and Sleep Quality in Students of the Faculty of Medicine, Airlangga University". The purpose of this study is to find out how the relationship between sleep hygiene and sleep quality in medical students through a cross-sectional survey. The results of the study can be used as education to increase students' knowledge and motivation in maintaining proper sleep hygiene so that it is also expected to improve sleep quality in medical students.

MATERIALS & METHODS

Research Type and Design

The type of research used for this study is observational analytical research using a cross-sectional design. A cross-sectional study is a study in which the relationship between the independent variable and the dependent variable is assessed simultaneously at a time; which means there is no follow-up procedure on the study.

Population and Research Sample

Research Population

The population in this study is all students of the Airlangga University Medical Study Program for the class of 2019-2022.

Research Samples

The sample of this study is a student of the Medical Study Program of Airlangga University for the class of 2019-2022 who fulfilled the inclusion criteria for exclusion criteria.

1. Inclusion criteria

Students of the Medical Study Program of Airlangga University in the 2019-2022 period who are active and willing to become research respondents

2. Exclusion criteria

- Respondents filled out the research questionnaire incompletely
- They have severe diseases that are often associated with complaints of sleep disorders, such as: hypertension, chronic obstructive pulmonary disease, bronchitis, asthma, musculoskeletal disorders, diabetes mellitus, obesity, epilepsy, angina, arrhythmia, gastroesophageal reflux, hyperthyroidism, hypothyroidism, chronic kidney failure, African sleeping sickness (trypanosomiasis), and cancer (Subogo, 2020)

Large Sample

The sample size used in this study was determined using the formula below:

$$n \geq \left(\frac{Z_{1-\alpha/2} + Z_{1-\beta}}{\frac{1}{2} \log_s \frac{1+r}{1-r}} \right)^2 + 3$$

With n: Number of samples,

a: 0.05

b: 0.2

r: Proportion of occurrences (from literature Minar, 2021 0.46)

then n = 35

Taking into account the possibility of dropping out, the specified sample reserve is prepared using the formula:

$$n' = \frac{n}{1-f}$$

With n': Number of samples after taking into account the possibility of dropping out,

n: Minimum sample count ,

f: Proportions of dropping out (10%)

$$n' = \frac{35}{1-0,1} = 38,8 \approx 39$$

Thus, the minimum number of samples required in this study is 39 samples. With details of the class of 2019 students as many as 10 people, the class of 2020 as many as 10 people, the class of 2021 as many as 10 people, and the class of 2022 as many as 9 people, which will be randomly taken via computer.

Sampling Techniques

The sampling technique used in this study is probability sampling with a stratified random sampling method based on the inclusion and exclusion criteria determined above.

RESULTS

Research Overview

This study involved 107 respondents from pre-clinical students of the Faculty of Medicine, Airlangga University with 7 people not filling out the questionnaire completely, 3 people had a history of asthma, 2 people had a history of GERD, 1 person had a history of bronchitis, and 1 person had a history of hyperthyroidism. Therefore, the sample size used in this study was 93 respondents.

Characteristics of Research Respondents

Table 1 Frequency Distribution of Respondents based on Demographic Characteristics

No	Characteristics	Frequency (f)	Percentage (%)
1.	Batch		
	2019	24	25,8
	2020	21	22,6
	2021	26	28,0
	2022	22	23,7
	Total	93	100.0

2.	Gender		
	Male	28	30,1
	Female	65	69,9
	Total	93	100.0
3.	Age		
	14-17 years old	4	4,3
	18-25 years old	88	94.6
	26-64 years old	1	1,1
	Total	93	100.0

Table 1 shows that the study respondents came from medical students spread from the class of 2019-2022, with the most respondents coming from the class of 2021 with a percentage of 28.0%, the class of 2019 with a percentage of 25.8%, the class of 2022 with a percentage of 23.7%, and the least class of 2020 with a percentage of 22.6%. The majority of respondents were female with a percentage of 69.9% while the remaining 30.1% were male. Most the respondents were aged 18-25 years with a percentage of 94.6%, while 4.3% of respondents were aged 14-17 years, and another 1.1% were aged 26-64 years.

Univariate Analysis Results

Distribution of Respondents by Sleep Hygiene

Table 2 Frequency Distribution of Respondents by Sleep Hygiene

<i>Sleep Hygiene</i>	Frequency (f)	Percentage (%)
Good	5	5,4
Normal	72	77,4
Poor	16	17,2
Total	93	100.0

Table 2 shows that most respondents received normal *sleep hygiene* results of 77.4% with a frequency of 72 people. The percentage of respondents who got poor sleep hygiene results was 17.2% as many as 16 people and the remaining only 5 people who got good *sleep hygiene* results with a percentage of 5.4%.

Distribution of Respondents by Sleep Quality

Table 3 Distribution of Respondents Frequency by Sleep Quality

<i>Sleep Quality</i>	Frequency (f)	Percentage (%)
Good	28	30,1
Poor	65	69,9
Total	93	100.0

Table 3 shows that the number of respondents who got good sleep quality results was 28 people with a percentage of 30.1%, while respondents who got poor sleep quality results were more with a percentage of 69.9% as many as 65 people.

Results of Bivariate Analysis

The bivariate analysis conducted in this study was to look for a relationship between sleep hygiene and sleep quality. Bivariate analysis was performed using the Spearman test.

Table 4 Correlation of Sleep Hygiene with Sleep Quality

<i>Spearman's rho</i>	<i>Sleep Hygiene</i>	<i>Sleep Hygiene</i> <i>Sleep Quality</i>	
		Correlation Coefficient	
		1,000	,218*
		Sig. (2-tailed)	.036
		N	93
	<i>Sleep Quality</i>	Correlation Coefficient	,218*
		Sig. (2-tailed)	.036
		N	93

*. Correlation is significant at the 0.05 level (2-tailed).

The table above describes the relationship between sleep hygiene and sleep quality assessed using bivariate statistical tests with Spearman Rho. In the results of statistical tests with Spearman Rho gave a p-value of 0.036. The value is less than 0.05 which indicates a correlation between sleep hygiene and sleep quality in Airlangga University medical students. While the value of the Spearman correlation coefficient of 0.218 which shows a positive correlation which means that the better the sleep hygiene, the better the quality of sleep.

DISCUSSION

General Characteristics of Research Respondents

The data in this study was obtained from filling out the Sleep Hygiene Index (SHI) and the Pittsburgh Sleep Quality Index (PSQI) question through form which was distributed online to 4 batches of students of the Faculty of Medicine, Airlangga University. A total of 93 samples that met the inclusion and exclusion criteria were obtained in this study, from a minimum number of 39 samples. The data obtained was then processed using the IBM SPSS application version 26.

This study used samples from 4 batches of pre-clinical medical students from 2019-2022 so that the results of the study are expected to be evenly distributed. Most respondents as many as 94.6% were in the age range of 18-25 years who fall into the category of young adults. This relates to a similar study at Qazvin University with an average age of 22.8 years (Yazdi et al., 2016), as well as most respondents aged 19 years at the University of North Sumatra (Minar, 2021).

In the age range of 18-25 years, the amount of sleep duration needed based on recommendations from the National Sleep Foundation in America is about 7-9 hours. Medical students are a vulnerable group to poor sleep quality. In addition, students tend to prioritize lectures, learning, and social activities by choosing to sacrifice sleep hygiene practices, or because of the lack of student knowledge about good sleep hygiene (Mardalifa, Yulistini and Susanti, 2018).

The number of female respondents was more in this study, which was 69.9% because the majority of students of the Faculty of Medicine Airlangga University were women. Based on some studies, a person's sleep quality can be influenced by gender. Women tend to have poorer sleep quality than men. This may be due to the fact that women physiologically need more time to sleep. The results of a study in Taiwan found a high prevalence of morning fatigue and daytime sleepiness in female students compared to male students (Yazdi et al. , 2016)

Sleep Hygiene Characteristics of Research Respondents

In the results of this study, it was found that 72 students of the Faculty of Medicine, Airlangga University who were respondents had normal sleep hygiene. While good and bad sleep hygiene showed the number of 5 and 16 people, respectively. The most problematic components of SHI are sleep schedules, bedtime activities, and bed use. On average, respondents have different sleep times from day to day. There are many potential reasons why students have irregular sleep schedules, such as studying until late at night, varied class schedules, social priorities, just finding freedom, to lack of knowledge (RD Putri, 2020). The average student also does other activities that keep you awake before going to bed, such as using the internet, playing games, or watching TV. In addition, the average respondent also carried out these activities in bed, thus affecting the condition of student sleep hygiene to become worse because the use of beds is included in the components that affect sleep hygiene. Environmental factors can also affect sleep hygiene, such as noise, bed comfort, lighting and temperature in the bedroom.

The best components of SHI in respondents were diet and bed comfort. On average, respondents did not consume alcohol, cigarettes or caffeine 4 hours before going to bed or after waking up and never slept with an uncomfortable bed, such as a bad mattress or pillow, blankets that were too thick or too thin. This is in accordance with the opinion of several studies that maintain the comfort level of the bed environment by striving for a temperature that is not hot and comfortable rooms can improve sleep hygiene or good sleep quality (Rohmawati, 2018).

The results of this study are in line with previous research at several universities in Indonesia, which found that most students sleep hygiene was normal (Mardalifa, Yulistini and Susanti, 2018; Minar, 2021). While in research conducted in Nigeria, the average SHI score was 19, which means good sleep hygiene from a total of 348 undergraduate student respondents (Seun-Fadipe et al., 2018).

Poor sleep hygiene was found in an Indian study that was as much as 77%, things that may lead to poor sleep hygiene include long lectures, practicum classes, busy schedules, and ignorance and inability of students to practice good sleep hygiene (Kaur and Singh, 2017).

Sleep Quality Characteristics of Research Respondents

In the results of this study, it was found that the prevalence of poor sleep quality was more than good sleep quality, which was as much as 69.9% of the total research respondents. The results of this study are in line with some previous sleep quality studies. In a study conducted at Halu Oleo University, it was found that medical students in the second and third academic years experienced less sleep quality with sleep patterns and emotional stress as factors that influenced the quality of student sleep. From the results of the analysis, the data was obtained from a total of 174 respondents, as many as 155 people (89.1%) had poor sleep quality (Yunaningsi and Haryati, 2020). While in China, it was found that 54.7% of the total sample of 4,318 people had poor sleep quality (Cheng *et al.* , 2012). Poor sleep quality is also common among students at a university in Milan (Marelli *et al.*, 2021).

Sleep quality is a state of sleep that an individual lives to produce freshness and fitness upon waking. Sleep quality includes quantitative aspects of sleep, such as sleep duration, sleep latency, as well as subjective aspects of sleep. There are 7 components assessed in the PSQI instrument to determine the quality of a person's sleep. The first component is subjective sleep quality. In this study, the majority of respondents felt that the quality of sleep was good, but the objective results from the instrument showed that most of the respondents' sleep quality was poor. Sleep quality that feels good, but actually bad shows that respondents are less aware of improving the quality of sleep. This is because sleep problems are the most common health problem, but are often overlooked (Mufid, 2020).

The second component is sleep duration or the length of sleep. The results showed most respondents had a sleep duration of more than 6 hours. In the average age range of respondents is 18-25 years, the amount of sleep duration needed based on recommendations from the National Sleep Foundation in America is around 7-9 hours. Lack of sleep, especially during a pandemic, is a common problem that is often experienced by students due to the accumulation of coursework and academic dependencies, so that most sleep hours are backward to being late at night (Ulhaq and Purwanto, 2021).

Sleep latency, which is the third component of sleep quality, is the time it takes a person from wakefulness to fall asleep (Effendi, 2017). Sleep latency in respondents obtained quite good results, although there were some poor sleep latency results. Poor sleep latency in respondents could be due to irregular sleep habits, and reduced sleep duration during the pandemic. The increase in sleep latency and the amount of sleep time that decreases can occur due to changes in the form of learning during the pandemic, thus making students burdened and stressful situations that can affect sleep quality (Kartika *et al.* , 2021). Sleep efficiency is affected by the amount of sleep and the amount of time spent in bed. In this study, most respondents had good sleep efficiency. This is in line with the results of the majority of respondents sleep latency which is also no more than 15-30 minutes.

The next component of sleep quality is sleep disturbance. The results of the study found that most respondents did not experience sleep disorders such as snoring, movement disorders so often waking up, and nightmares. The majority of respondents who experience sleep disorders are caused by two things, namely waking up at night and nightmares. Students are at high risk for sleep disorders that can affect their daily health, this is because students tend to have many thoughts and dependencies so they experience stress or other thought disorders (Mufid, 2020).

The use of sleeping pills is not too much of a problem for sleep disorders in the results of this study, because most respondents have never consumed sleeping pills. The use of medications often affects the sleep cycle, some can cause a decrease in REM sleep and increase drowsiness. This can worsen health such as causing parasomnias, allergic reactions, and dependence. The last component of sleep quality is dysfunction of daytime activity. On average, respondents experience sleep disturbances experienced during the day or disturbances in daily activities caused by feeling sleepy. This is very identical experienced by medical students because of the consequences of academic obligations that must be carried out, as well as other individual factors such as lifestyle. In this pandemic era, student activity schedules become irregular and sleep patterns worsen, this is also another factor that can affect activity dysfunction during the day which then also affects the quality of student sleep (Mufid, 2020).

The Relationship of Sleep Hygiene with Sleep Quality

In this research, it was found that there was a significant relationship between sleep hygiene and sleep quality in medical students of Airlangga University. This can be concluded because the value of $p = 0.036$ ($p < 0.050$) in the Spearman Rho test. From the results of data collection through the Sleep Hygiene Index (SHI) questionnaire and Pittsburgh Sleep Quality Index (PSQI), researchers found that in the group with good sleep hygiene, which was 5 people (5.4%), there were 3 people (3.2 %) with good sleep quality and 2 people (2.2%) with poor sleep quality. In the group with normal sleep hygiene, there were 72 people (77.4%), there were 23 people (24.7%) with good sleep quality and 49 people (52.7%) with poor sleep quality. In the group with poor sleep hygiene, there were 16 people (17.2%), there were 2 people (2.2%) with good sleep quality and 14 people (17.2%) with poor sleep quality.

The results in this study are in line with the research conducted by Subogo (2020) with 92 respondents. In the study stated that there was a significant relationship between sleep hygiene and sleep quality with a value of $p = 0.001$ ($p < 0.050$). This is different from the results of research conducted at Pelita Harapan University on 105 respondents who stated that sleep hygiene has an insignificant relationship with sleep quality with a value of $p = 0.368$ ($p > 0.050$) on the Chi Square test (KA Putri, 2020). In addition, research conducted at Tehran University showed that poor sleep quality is caused by poor sleep hygiene (Rezaei et al., 2018). In research conducted on hemodialysis patients, it was also found that providing sleep hygiene education led to a significant improvement in sleep quality (Soleimani, Motaarefi and Hasanpour-Dehkordi, 2016).

Research Limitations

- 1) There are many other confounding factors that can affect sleep quality in college students besides using sleep hygiene, such as illness, fatigue, emotional stress, environment, lifestyle, and drug consumption.
- 2) The data collection is carried out online, so it cannot be conditioned whether the respondent fills out the questionnaire correctly, even though there are filling instructions.
- 3) Data collection was carried out during the COVID-19 pandemic, so it is likely to affect sleep patterns and sleep quality in students.
- 4) There is a risk of online form system errors such as not being able to be filled, not producing results, or not being able to provide feedback automatically, so it needs to be confirmed again by cross checking again.

CONCLUSION

Based on the objectives and results of research on the relationship between sleep hygiene and sleep quality in students of the Faculty of Medicine, Airlangga University, the following conclusions can be drawn:

1. As many as 77.4% of students of the Faculty of Medicine, Airlangga University received normal sleep hygiene results, 17.2% received poor sleep hygiene results, and 5.4% received good sleep hygiene results.
2. As many as 69.9% of students of the Faculty of Medicine, Airlangga University have poor sleep quality, while 30.1% have good sleep quality.
3. There is a significant relationship between sleep hygiene and sleep quality in students of the Faculty of Medicine, Airlangga University.

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