

Original Research

## The correlation between sleep quality and fatigue in students at 'Aisyiyah University Yogyakarta

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### Abstract

Students have many responsibilities and demands that must be completed to meet their learning load and must meet academic standards. This makes students sleep-deprived so that it can cause fatigue. Fatigue is an obstacle felt by students when studying because students feel that there is a decrease in energy when carrying out activities during the day and cause symptoms of drowsiness. This study aims to determine the correlation between sleep quality and fatigue in students at 'Aisyiyah University Yogyakarta. The method carried out in this study is a correlational quantitative with a cross-sectional design in students at 'Aisyiyah University Yogyakarta who used the Pittsburgh Sleep Quality Index (PSQI) questionnaire for sleep quality and the Swedish Occupational Fatigue Inventory (SOFI) questionnaire for fatigue. The sampling technique used proportionate stratified random sampling with a total of 375 student respondents. The research was analyzed using the Kendall Tau test. The results showed that the majority of students experienced poor sleep quality as many as 284 students (75.7%) and moderate fatigue of 301 students (80.3%). The results of the bivariate analysis test obtained the result of  $p=0.000$  ( $p<0.05$ ) stating that there was a correlation between sleep quality and fatigue in students at the University of 'Aisyiyah Yogyakarta. It can be concluded that there is a correlation between sleep quality and fatigue in students of 'Aisyiyah University Yogyakarta.

**Keywords:** fatigue; sleep quality; student

### 1. Introduction

Sleep-deprived humans will feel tired when doing daily activities. Sleep is the basic need of every human being to rest. When humans are sleeping, the body will carry out a process of recharging energy or restoring body power until it is in optimal condition so that it has a positive effect on health (Djamalilleil et al., 2020). If you want to achieve optimal conditions, then the body needs quality sleep. Good sleep quality when a person sleeps well and regularly. Sleep quality is the level of human sleep satisfaction that can be assessed from the duration of sleep, the frequency of waking up while sleeping, the time spent by a person to start falling asleep until falling asleep, and the intensity of a person's review while sleeping (Putri, 2017). Many adults have poor sleep quality because they experience sleep disorders, such as Insomnia, Parasomnia, Circadian Rhythm Sleep-wake Cycle Disorder, and others so that it causes several negative impacts on the human body, such as headaches, back pain, memory loss, cognitive impairment, and even fatigue in carrying out daily activities (Nursyifa et al., 2020).

Epidemiological research on sleep disorders is still very rare in Indonesia. However, the research of Nursyifa et al., (2020) explained that many students experience sleep disorders that lead to poor sleep quality. Poor sleep quality is experienced by many students. Djamalilleil et al., (2021) explained that 53 people (69.7%) of Baiturrahmah University medical students out of 76 students studied experienced poor sleep quality. Likewise, according to Putri (2017) the results of the study obtained 20 respondents (62.5%) from 32 students of the Alifah Padang Midwifery Academy had poor sleep quality. Therefore, students need special attention regarding their sleep needs.

There are many responsibilities and demands that must be completed by students to meet their learning period and load, such as lecture assignments from lecturers and field assignments/field practices. In addition, there are midterm exams, final exams, and writing final assignments that must be passed and required to achieve academic assessment standards so that there is no need to repeat courses. In order to achieve academic standards, students will stay awake all night without sleep which leads to sleep deprivation (Augesti et al., 2015). In addition, many students also have the habit of not sleeping all night (staying up late) by looking at social media and playing online games with friends so that they forget time to rest (Soamole & Toduho, 2022).

The lack of sleep experienced by students certainly has many adverse impacts on health. This is often not noticed and is considered not a serious problem. The bad impact that will occur if you lack sleep is that the body is susceptible to disease. Diseases that can be experienced by a person who is sleep-deprived are diabetes mellitus, stroke, heart disease, hypertension, and even death (Zahrani, 2020). Therefore, sleep deprivation is often considered one of the dangerous risk factors. In addition, sleep deprivation deserves serious attention because it can cause fatigue (Sutanto & Fitriana, 2020). Fatigue is a condition in which a person feels drained of energy both mentally and physically (Phillips, 2015). Fatigue occurs due to high demands and the inability to achieve goals so that it affects the ability to control oneself and deal with existing situations (Hardiyanti, 2013).

Fatigue is an obstacle that many students feel when learning. Fatigue due to lack of sleep can reduce a person's energy when carrying out activities during the day and cause symptoms such as drowsiness. If students are sleepy, it will be difficult to concentrate (Djamalilleil et al., 2020). In addition, the impact of someone who experiences fatigue is a decrease in student academic achievement (Putri et. al., 2021). Azwar and Candra (2019) explained that the aspect that triggers fatigue in students is the existing college load so that there is high academic stress as a result of lecture demands. According to B and Hamzah (2020) the percentage of respondents who experience the most stress due to heavy academic factors.

The stress of the academic factor is due to work overload in students. Work overload can occur because students have to go through lectures from morning to evening and almost every day from Monday to Friday and students also have to do college assignments, such as quizzes, independent assignments, and group assignments with limited collection time (Alimah et al., 2016). As research by Maisa et al., (2021) said that high academic stress causes poor sleep quality. Therefore, insufficient rest and suboptimal sleep cause fatigue in students (Sahri & Hasibuan, 2023).

Based on the background description above, the author chose to conduct research on students at 'Aisyiyah University Yogyakarta because no one has done research on sleep quality and fatigue in students of 'Aisyiyah University Yogyakarta. Based on preliminary studies, it was also found that many students have sleep disorders, such as sleep paralysis, snoring, and waking up suddenly because they cannot breathe. In addition, they also have less sleep hours due to doing college assignments, such as making videos, journal resumes, projects from lecturers with different courses, some are working on theses, studying when they want to take exams, assignments from organizations, and there are also those who only play gadgets so that they are tired characterized by waking up during the day, aches, dizziness, weakness, bad mood, afternoon sleep, to cramps. Therefore, the author wants to conduct a study on "The correlation between Sleep Quality and Fatigue in Students at 'Aisyiyah University Yogyakarta".

## **2. Research Methods**

### **2.1.Types and Design of Research**

The type of research used is correlational quantitative research with a cross-sectional research design to identify the correlation between sleep quality and fatigue at a certain time.

## 2.2. Research Population and Sample

The population in this study is 6121 students of 'Aisyiyah University Yogyakarta. The sampling method is carried out by the proportionate stratified random sampling method to ensure that the proportion of students from each study program is proportionally represented. The sample was determined using the slovin formula and 375 students were obtained as a sample for this study. The sample in this study is active students at Universitas 'Aisyiyah Yogyakarta, students from S1, D4, and D3 who are able to communicate verbally and cooperatively, and students who are willing to become participants and agree to the consent sheet. The samples that were not included were working students, students with chronic diseases, and students who were diagnosed with sleep disorders by doctors.

## 2.3. Research Instruments

The instrument in this study used the Pittsburgh Sleep Quality Index (PSQI) questionnaire to measure sleep quality and its components (sleep latency, sleep duration, sleep efficiency, sleep disorders, sleep medication use, and daytime dysfunction) and fatigue variables using the Swedish Occupational Fatigue Inventory (SOFI) to measure fatigue in a person with the dimension assessed as sleepiness, physical discomfort, lack of motivation, lack of energy, and physical exertion.

The validity test of the PSQI questionnaire has been carried out in the Agustin study (2012) by conducting a test on 30 respondents with the result that  $r$  count (0.410-0.831) >  $r$  table (0.361). The SOFI questionnaire has been tested for validity in the research of Suparman et al. (2022) with a test on 224 workers at a geothermal company in Indonesia with the result that  $r$  calculation (0.321 - 0.847) >  $r$  table.

## 2.4. Data Analysis

Univariate analysis is explained by the sum and percentage values of each variable using a table and interpreted based on the results obtained. Bivariate analysis to see the correlation between sleep quality and fatigue using the Kendall Tau correlation test.

## 2.5. Research Ethics

This research has been declared ethical by the Research Ethics Committee of Aisyiyah University Yogyakarta in accordance with the Research Ethics Certificate number 3413/KEP-UNISA/I/2024 and the range of this research starts from November 2023–April 2024.

## 3. Results and Discussion

### 3.1. Univariate Analysis

Table 1. Characteristics of Respondents

Characteristic Respondents		Frekuensi (n= 375)	(%)
Age	17 years	1	0.3
	18 years	36	9.6
	19 years	90	24
	20 years	117	31.2
	21 years	73	19.5
	22 years	46	12.3
	23 years	9	2.4
	24 years	3	0.8
Gender	Man	76	20.3
	Woman	299	79.7

Characteristic Respondents		Frekuensi (n= 375)	(%)
Faculties and Study Programs	<b>Faculty of Health Sciences</b>	<b>255</b>	<b>68</b>
	S1 Midwife Professional Education	26	6.9
	S1 Nursing	59	15.7
	S1 Physiotherapy	32	8.5
	S1 Nutrition	29	7.7
	D4 Medical Laboratory Technology	45	12.0
	D4 Nursing Anesthesiology	37	9.9
	D3 Radiology	25	6.7
	D3 Midwifery	2	0.5
	<b>Faculty of Economics, Social Sciences and Humanities</b>	<b>90</b>	<b>24.0</b>
	S1 Accounting	9	2.4
	S1 Management	19	5.1
	S1 Management	13	3.5
	S1 Public Administration	15	4.0
	S1 Communication Sciences	34	9.1
	S1 Psychology		
	<b>Faculty of Science and Technology</b>	<b>30</b>	<b>8.0</b>
	S1 Architecture	10	2.7
	S1 Biotechnology	8	2.1
	S1 Information Technology	12	3.2

Source: Primary Data, 2024

Table 1 shows the distribution of respondent characteristics based on age, gender, faculty, and semester, it can be seen that the majority of respondents are 20 years old (31.2%), female (79.7%), come from the Faculty of Health Sciences (68%), and are in the third semester (27.5%).

**Table 2. Sleep Quality of Students of 'Aisyiyah University Yogyakarta**

No	Sleep Quality	Frequency (n=375)	(%)
1	Good	91	24,3
2	Bad	284	75,7
	<b>TOTAL</b>	<b>375</b>	<b>100</b>

Source: Primary Data, 2024

Table 2 shows the sleep quality of students of Universitas 'Aisyiyah Yogyakarta that the majority of students experience poor sleep quality as many as 284 students (75.7%). The same thing was also found in the study of Djamililleil et al., (2020) in 76 students of the Faculty of Medicine, Baiturrahmah University class of 2018 who had the most poor sleep quality, namely 53 people (69.7%) and Stefanie & Irawaty (2019) in students of the Faculty of Medicine, Tarumanagara University as many as 144 students (73.1%) experienced poor sleep quality. This happens because students experience overthinking or overthinking that does not need to be thought about at night. Ratnaningtyas and Fitriani (2020) said that students who are too hard in thinking about something so that they experience excessive anxiety which results in students having difficulty controlling their emotions and ultimately has an impact on difficulty in starting to sleep.

Meanwhile, students who cannot sleep because students are doing assignments, studying evaluations, exams, or completing theses, causing them to have difficulty sleeping. This is supported

by research by Stefanie & Irawaty (2019) who said that students have a burden of academic assignments and responsibilities that cause a high prevalence of poor sleep quality in students. Factors that can cause a decrease in sleep quality are the irregularity of the circadian rhythm or human biological clock due to the circadian rhythm that determines the variation of human sleep needs. If a person does not follow the circadian rhythm that regulates sleep and wakefulness, it will lead to sleep disturbances (Czeisler & Buxton, 2022). Almost 60% of students stated that the cause of sleep disorders is academic activities such as doing coursework and reading textbooks (Stefanie & Irawaty, 2019). In addition, many students do not immediately go to bed at night, but play mobile phones to open social media. This is supported by research by Trisnawati et al. (2022) who said that students who have poor sleep quality because students often forget time to rest due to staying up late. Students are confused with the use of electronics to do assignments or open social media because electronic items emit light that can inhibit the circadian rhythm mechanism (biological clock) is disturbed so that students cannot sleep. This is supported by research by Hidayat et al., (2023) saying that light from electronic devices such as smartphones, tablets, or televisions can interfere with the production of the hormone melatonin which is responsible for regulating sleep cycles. The less the hormone melatonin is produced, the less drowsiness is felt.

The age characteristics of the majority of respondents were at the age of 20 years. The same thing was also found in the research of Widiani et al., (2023) on 373 students majoring in nursing, where the majority of respondents were 20 years old, as many as 140 students (37.1%). The quality of sleep usually varies based on age because the older the human being, the less sleep needs they need. Adults start sleeping late at night and wake up somewhat during the day, but due to the demands of education or work, these adults sometimes wake up early which results in their circadian cycle being disrupted. If a person does not follow the circadian rhythm that regulates sleep and wakefulness, it will lead to sleep disturbances (Czeisler & Buxton, 2022).

The gender characteristics of the majority of respondents are female. This is supported by research by Patricia et al., (2023) who said that women are more prone to stress due to emotional instability which is more dominant using emotions than logic so that they are more easily stressed when faced with problems.

The majority of respondents at Universitas 'Aisyiyah Yogyakarta were in the Faculty of Health Sciences (FIKES) as many as 255 students (68%) with the S1 Nursing study program as many as 59 students (15.7%). The same thing was found in the study of Annisa et al., (2021) in students of the Faculty of Health Sciences UPN Veteran Jakarta, namely 355 students and those who experienced poor sleep quality were 286 students (80.6%). This is because health students have various tasks where the time and effort required to complete their tasks are very short and make students think a lot so that they are stressed. In addition, health students have poor sleep quality due to the incidence of depression because students have nursing care tasks and often have a revision process with a very short time (Widiani et al., 2023).

The majority of respondents were in the third semester as many as 103 students (27.5%). This is in line with Nugroho and Setiawan (2019) research on 60 respondents in the third semester of the Faculty of Medicine, University of Muhammadiyah Surakarta. This happens because students in the third semester already have a second year in lectures which will add to the burden in assignments and activities in lectures which of course adds to the stress conditions for students. This is supported in Haryati et research. Al., (2020) who said that students in the second and third academic years have a busy academic schedule and a workload in various activities that can certainly have an impact on sleep quality. Third-semester students are students who are still experiencing a transition period from high school (SMA) to the world of lectures (Pradana et. al., 2024). Therefore, there is an adaptation process in managing their daily schedules and not many have difficulty adapting so that they experience poor

sleep quality. This is supported by research by Bastian et al. (2023) who said that many students have quality sleep during the transition period from high school to college.

**Table 3. Fatigue of 'Aisyiyah University Yogyakarta Students**

No	Fatigue	Frequency (n=375)	(%)
1	Low	73	19,5
2	Medium	301	80,3
3	High	1	0,2
<b>TOTAL</b>		375	100

Source: Primary Data, 2024

**Table 4. Dimension of Student Fatigue at 'Aisyiyah University Yogyakarta**

No	Fatigue Dimension	Average
1	Exerting Physical Effort	1,65
2	Lack of Energy at Work	2,23
3	Lack of Motivation at Work	1,59
4	Physical Discomfort	1,73
5	Feeling sleepy	2,73

Source: Primary Data, 2024

Table 3 shows the fatigue of students of Universitas 'Aisyiyah Yogyakarta that the majority of students experience moderate fatigue as many as 301 students (80.3%) and table 4 shows the average value of the fatigue dimension. The first dimension of fatigue for students is the dimension of feeling sleepy with an average of 2.73. The second highest score is lack of energy at work. The third highest score is physical discomfort. The fourth highest value is exerting physical strength. The last value is a lack of motivation at work.

The feeling of sleepiness is related to the hours of a person's sleep. If a person has poor sleep quality due to sleep deprivation, he or she will experience drowsiness, easy sleepiness, blurred vision due to drowsiness, and frequent yawning (Azwar & Chandra, 2019). Therefore, students who have less sleep hours will feel sleepy, fall asleep easily, and often yawn which indicates fatigue in students.

The majority of respondents were at the age of 20. This is in line with the research of Lolan et al., (2021) on 149 students of the Faculty of Medicine, Nusa Cendana University of Kupang who had a majority of respondents aged 20 years as many as 51 students (34.22%). This is because the age of 20 years is including early adulthood which at that age does not have a way to overcome emotional instability. This research is supported by Ambarwati et al., (2019) who said that in early adulthood, students experience stress due to internal factors such as not being able to understand and respond to problems properly, while from external factors such as increasing the burden of lectures.

The majority of students studying at Universitas 'Aisyiyah Yogyakarta are students of the Faculty of Health Sciences with the S1 Nursing study program and are female. There is a significant difference in the number of male and female students studying at 'Aisyiyah University Yogyakarta. This is in line with the research of Suha et al., (2022) in 228 students (93.8%) who majored in nursing, the majority of whom were female, because health students, especially nursing majors, are synonymous with women because they are loving. Women are more prone to stress than men, causing fatigue. This was mentioned by Lolan et al., (2021) showing that women experience a menstrual cycle every month which will affect the decline in their physical and psychological conditions. Fatigue is also more susceptible to being experienced by health students, especially nursing majors, because it is related to work overload in lectures. This was revealed in the research of Suha et al., (2022) which stated that work overload in

students can be caused by a busy lecture schedule starting from Monday to Friday and starting from morning to evening.

The majority of respondents were in the third semester. This is in line with the research of Sumoked, A. et al., (2019) on 73 students in the third semester of the Nursing Study Program, Faculty of Medicine. The higher the semester, it is undeniable that the courses will be difficult and complex which will certainly cause more fatigue in students. This is supported by the research of Suha et al., (2022) which revealed that students of the class of 2018 were under more pressure than the class of 2019 and 2020.

### 3.2. Bivariate Analysis

**Table 5.** The correlation between Sleep Quality and Fatigue in Students at 'Aisyiyah University Yogyakarta

No	Sleep Quality	Fatigue						Total	%
		Low		Medium		High			
		Sum	%	Sum	%	Sum	%		
1	Good	37	9,9	54	14,4	0	0	91	24,3
2	Bad	36	9,6	247	65,9	1	0,3	284	75,7
	Total	73	19,5	301	80,3	1	0,3	375	100
	Koef. Correlation								1,000
	p-value								0,000

Source: Primary Data, 2024

Based on table 5 above, it shows that of the 375 students who have been studied, it shows that the correlation between sleep quality and fatigue in students of Universitas 'Aisyiyah Yogyakarta is 75.7% in the category of poor sleep quality and 65.9% moderate fatigue.

Data processing to determine the correlation between sleep quality and fatigue is Kendall Tau. This test was used to prove the hypothesis, namely whether or not there was a correlation between sleep quality and fatigue in students at the University of 'Aisyiyah Yogyakarta. Based on the results of Kendall Tau with a p-value of  $p\text{-value} (0.000) \leq \alpha (0.05)$ , it can be said that there is a correlation between sleep quality and fatigue in students at the University of 'Aisyiyah Yogyakarta with a close correlation coefficient of 1,000 (very strong) and the direction of the research results is positive. This means that the worse the quality of sleep students, the higher the level of fatigue experienced. This result is also supported by research conducted by Dimkatni et al. (2020) which found that 69.7% of respondents had poor sleep quality and had fatigue ranging from mild to high. Pratama and Wijaya (2019) found in their research that there is a correlation between sleep quality and fatigue in PT. Pamapersada, South Sumatra.

The majority of respondents were 20 years old who experienced poor sleep quality and moderate fatigue. This is attributed to the theory of Czeisler and Buxton (2022), which says that the older people get, the less their sleep needs are. The age of 20 years is included in young adults who still have emotional instability and cannot understand and respond to problems properly (Ambarwati et al., 2019). In addition, the majority of respondents who had poor sleep quality and experienced moderate fatigue were women. This can be attributed to the study of Patricia et al. (2023), which showed that women are more susceptible to stress, thus affecting sleep quality and fatigue levels.

### 4. Conclusion

Most of the sleep quality with fatigue in students of Universitas 'Aisyiyah Yogyakarta was in the category of poor sleep quality as many as 284 students (75.7%) and moderate fatigue as many as 247 students (65.9%). The results of the study have proven that the hypothesis that has been formulated is acceptable, namely that there is a positive correlation between sleep quality and fatigue in students of

Universitas 'Aisyiyah Yogyakarta, meaning that the worse the sleep quality, the more fatigue occurs, and vice versa.

### Suggestion

Universitas 'Aisyiyah Yogyakarta can create a balanced schedule between the assignments charged with the deadline for collecting each student course so that there is no work overload for students. Therefore, Universitas 'Aisyiyah Yogyakarta can create a special database for lecturers that can see the workload and work time given by each course so that each lecturer wants to give assignments to students to know how much has been given to students.

It is hoped that students of Universitas 'Aisyiyah Yogyakarta will improve the quality of good sleep by improving good time management, such as reducing unnecessary habits at night, doing their tasks little by little before the collection deadline is approaching, and reducing the use of gadgets when they want to sleep.

It is hoped that this study will serve as input and reference material for related research on the correlation between sleep quality and fatigue in students of Universitas 'Aisyiyah Yogyakarta and as a basis for determining appropriate interventions to deal with fatigue problems in students caused by sleep quality and to determine good sleep techniques or ways for students. In addition, researchers can then look for other factors that cause student fatigue.

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