

The relationship between sleep hygiene and the prevalence of insomnia in medical students during the COVID-19 pandemic at the Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

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A – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

Summary Background. Students with poor sleep quality will undoubtedly disturb their daily activities, such as being absent from lectures due to illness and falling asleep during lectures. A further impact of poor sleep quality is decreased student academic achievement. **Objectives.** To analyse the relationship between sleep hygiene and the prevalence of insomnia in medical students during the COVID-19 pandemic at the Faculty of Medicine, Universitas Sumatera Utara.

Material and methods. The research design was analytic with a cross-sectional approach. The study population was medical students in clinical clerkships, which amounted to 152 people using consecutive sampling methods. The data was collected using a Sleep Hygiene Index (SHI) and Insomnia Severity Index (ISI) questionnaire, conducted online via Google Forms. Data processing was carried out using SPSS and the Chi-square statistical test.

Results. Most students, as many as 101 people (66.4%), had moderate sleep hygiene, and most students were without insomnia (approx. 61.8%). The results of the Chi-square test bivariate analysis showed a relationship between the degree of sleep hygiene and the prevalence of insomnia in the medical students of Universitas Sumatera Utara.

Conclusions. Students are exposed to psychological impacts that can affect the quality of their sleep. Sleep hygiene and sleep cycles in students change due to changes in daily activities, such as physical activity, class schedules, assigned tasks and the use of electronic equipment.

Key words: intrinsic sleep disorders, anxiety, sleep hygiene, clinical clerkships.

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Background

Sleep quality includes two aspects, namely quantitative sleep and qualitative sleep. The quantitative aspect includes the length of sleep, while the qualitative is the subjective aspect of sleep latency and feeling refreshed upon waking [1].

Sleep problems that interfere with sleep quality are experienced by almost all of the world's population. 10–48% of the world's population is believed to experience sleep problems such as insomnia [2]. The phenomenon of poor sleep quality often occurs in students. More than 500 college students out of 1,845 (27%) are at risk of experiencing at least one sleep problem [3]. The results of previous studies conducted on students in Indonesia revealed that 44.6% had sleep disorders [4]. Students with poor sleep quality can see many harmful effects on their daily activities. A further impact of poor sleep quality is decreased student academic achievement [5].

Sleep hygiene is a collection of essential habits to get a regular night's sleep, better sleep quality and alertness throughout the day. Sleep hygiene is vital to implement so that it is easy to sleep at night and achieve a better quality and depth of sleep.

The pandemic changed people's habits, especially students, in implementing good sleep hygiene due to changes in daily activities. A study in Hong Kong showed that students' awareness of sleep hygiene practices was low. Improper sleep hygiene practices are significantly associated with poor sleep quality [6–7].

Objectives

The purpose of this study was to analyse the relationship between sleep hygiene and the occurrence of insomnia in USU Faculty of Medicine students who were undergoing senior clinical, administrative service in Medan.

Materials and methods

Research design

This study was an analytic study with a cross-sectional approach. The research was conducted in June 2021, when learning was still online due to the high number of COVID-19 cases.



Subject study

The research population was medical students who had clinical clerkships, with the sample size being 152 people. The determination of the sample using consecutive sampling met the inclusion and exclusion criteria. Inclusion criteria included students actively carrying out their duties at clinical clerkship stations, students who were declared physically and mentally healthy and students who were willing to participate in this study. At the same time, the exclusion criteria were students who previously had a history of sleep disorders, students with a history of using sleeping pills and students with a history of abuse of narcotic drugs. To determine sleep hygiene, an instrument called the Sleep Hygiene Index was used, which contains 13 questions, where each question was scored based on the answer, and then the total score was categorised into good, moderate and poor. To determine insomnia, the Insomnia Severity Index (ISI) instrument was used, which contains 7 questions which are then categorised into no insomnia, lower limit of insomnia, mild insomnia, moderate insomnia and severe insomnia.

Statistical analysis

The data values of clinical characteristics, such as age and gender of the respondents, were expressed in percentages. The relationship between sleep hygiene and insomnia was carried out using the Chi-square test. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 25.

Ethical consideration

This proposal received approval from the Faculty of Medicine Ethics Committee, Universitas Sumatera Utara, No. 889/KEP/USU/2021. All respondents who participated stated their willingness to participate in the study and provided informed consent.

Results

The characteristics of the 152 respondents who met the criteria are summarised in Table 1. In this study, it was found that the number of females was more than that of males, with a total of 96 respondents compared to 56 respondents. Based on age, it is known that the majority of respondents aged 21–23 years were 137 people (90.1%). Were 137 people (90.1%).

Characteristics	Frequency (n)	Percentage (%)
Gender		
male	56	36.8
female	96	63.2
Age		
21–23	137	90.1
24–26	15	9.9

Index of questionnaire	Frequency	Percentage (%)
Sleep hygiene		
good	37	24.3
moderate	101	66.4
poor	14	9.2
Level of insomnia		
no insomnia	94	61.8
lower limit of insomnia	46	30.3
moderate insomnia	12	7.9

In Table 2, it can be seen that the percentage of good sleep hygiene is 24.3%, with a total of 37 respondents, and moderate sleep hygiene amounts to 66.4%, with a total of 101 respondents, and poor sleep hygiene came to 9.2%, with a total of 14 respondents. Those without insomnia occupied the highest percentage level, amounting to 61.8%, followed by the lower limit of insomnia being 30.3% and moderate insomnia being 7.9%. The highest were those without insomnia, with 94 respondents.

Table 3 shows that of the 37 students (24.3%) who have good sleep hygiene, 32 people (21.1%) do not experience insomnia, while of the 14 people with poor sleep hygiene, three people experience moderate insomnia. The Chi-square test results show a relationship between sleep hygiene and the degree of insomnia among medical students ($p < 0.05$).

Table 3. Comparison of Sleep Hygiene Index to the degree of insomnia

Sleep hygiene	No insomnia		Lower limit of insomnia		Moderate insomnia		Total		p
	F	%	F	%	F	%	F	%	
Good	32	86.5	4	10.8	1	2.7	37	100	0.001
Moderate	58	57.4	35	34.7	8	7.9	101	100	
Poor	4	28.6	7	50.0	3	21.4	14	100	

Discussion

The study's results showed that the sleep hygiene score was dominated by the moderate score category (66.4%). This study's results align with research conducted on students at the University of Indonesia, where the proportion of moderate sleep hygiene in students was 59.51%, which illustrates that most students' sleep hygiene is adequate [8]. The results of research on medical students in the pre-clinical stage at Andalas Padang University found that in 65 respondents, most had moderate sleep hygiene (52 people (80%)) [7].

While the research was conducted on medical students outside Indonesia, it was found that 48% of Ethiopian medical students had poor sleep hygiene. This is in line with studies on medical students in various countries such as Brazil (51.5%) and the USA (50.9%). This situation occurs because of differences in learning systems. As in Europe, in the early semester, medical students have a busy class schedule and are still in the adaptation phase of the lecture system. This is quite different from the prevalence of sleep hygiene in Asian countries. The study time for medicine in Asian countries is relatively longer than in European countries, and this can be associated with better sleep hygiene habits [9].

The pandemic had changed many habits and routines of society. The proportion of the most affected people is students, and students are exposed to psychological impacts that can affect the quality of their sleep. Sleep hygiene and sleep cycles in students change due to changes in daily activities such as physical activity, class schedules, assigned tasks, and the use of electronic equipment [7].

In this study, the components of the Sleep Hygiene Index (SHI) having the most problems were bed use, activity before bedtime and sleep schedule. The average respondent slept at different times of the day and used the bed for activities other than sleeping (e.g. watching television, reading, eating or studying). Some respondents did something that kept them awake until before bedtime (e.g. reading books/newspapers, watching television, listening to the radio). The best components of the SHI are bed comfort, diet and bedroom comfort.

The results showed that the sleep hygiene of medical students was dominated by the moderate category, which could be caused by various factors, one of which was the tendency

to study or do academic assignments late at night, as the time from morning to evening was used for online studies. At present, clinical clerkship learning is still 25% offline and 75% online. Poor sleep quality during the COVID-19 pandemic was also associated with stress and anxiety, primarily due to the limitation of social interaction and fear of spreading infection, which could cause mental and physical stress [7].

This study's frequency distribution of respondents was obtained based on insomnia. It can be seen that 94 students (61.8%) did not experience insomnia, while the lower limit of insomnia amounted to 46 people (30.3%), and moderate insomnia amounted to 12 people (7.9%). There were no students who experienced severe insomnia. The results of this study are not in line with other studies which found that 44.6% of medical students who underwent on clinical clerkship experienced insomnia while studying during a pandemic [10], and research conducted on medical students (pre-clinic) at Gadjah Mada University, which showed that 44.6% of students experienced insomnia during the COVID-19 pandemic [11].

The difference in the prevalence of insomnia in clinical clerkship students may be due to differences in the learning patterns at other universities. At the Universitas Sumatera Utara, for medical students in clinical clerkship, the online learning method is still the preferred learning process, with the proportion of offline learning being 25% and online learning being 75%. With the online learning method, all students are told to be at home to practice physical distancing. Students are also given a previous schedule so that students are expected to have good time management in carrying out all assignments. This can affect the sleep hygiene of students and can reduce the incidence of insomnia. Medical students face challenges such as sudden changes in skills training routines, including online studies and exams, patient contact and peer interaction. These changes increase screen time and can create barriers to their skills training. All of these factors can ultimately burden the mental and emotional health of the students, which in turn will increase the risk of insomnia. There is a significant relationship between the length of screen time and the occurrence of sleep disturbances in medical students [12].

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This study's results are in line with previous studies on sleep hygiene, which stated that sleep hygiene and sleep quality had a positive correlation with the incidence of insomnia [7, 8]. The results of this study also convey that the Insomnia Severity Index has good consistency, reliability and validity and is recommended as a screening tool for insomnia [7].

The restrictions imposed during the COVID-19 pandemic have also brought considerable changes to daily habits and activities, especially in terms of limiting the form of activity, changes in sleep patterns and some lifestyle deviations that have become unhealthy, causing poor sleep hygiene [9]. The results of a study on the impact of the COVID-19 lockdown and sleep quality on university students and administrative workers in Italy concluded that there was an increase in the time needed to sleep, the time to wake up and the quality of sleep and insomnia symptoms, which got worse after the COVID-19 pandemic. This is more dominant in students compared to workers. Previously, only 15% of students had symptoms of insomnia. After the COVID-19 pandemic, this increased to 42%. 27.8% of the sample showed symptoms of depression, and 34.3% showed symptoms of anxiety [12]. Some things that can be done to reduce symptoms of insomnia during the COVID-19 pandemic are healthy sleep hygiene, namely implementing healthy sleep patterns, limiting sleep time, as well as other cognitive behavioural therapy combined with broader methods [13].

Conclusions

There is a relationship between sleep hygiene and insomnia in medical students in clinical clerkships. During the COVID-19 pandemic, there were many changes to daily habits and activities, especially changes in sleep patterns and some lifestyle deviations that became less healthy, causing poor sleep hygiene. Students are exposed to psychological impacts that can affect the quality of their sleep. Sleep hygiene and sleep cycles in students change due to changes in daily activities, such as physical activity, class schedules, assigned tasks and the use of electronic equipment.

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