Original Research Article

Factors Associated with Poor Quality of Sleep on Medical Students at Faculty of Medicine Udayana University

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ABSTRACT

Background: Medical students are among the populations most vulnerable to poor sleep quality. This was a result due to the demanding schedule and extensive course material required of a prospective physician. Sleep problems may contribute to malpractice, burnout, and a decline in professionalism at work. For that reason, monitoring sleep quality becomes an important matter to optimize the use of future health services.
Purpose: To identify factors contributing to poor sleep quality in medical students of the Faculty of Medicine at Udayana University.
Methods: This study was a descriptive study with a cross-sectional approach in which data were gathered by distributing a questionnaire to medical students at the Faculty of Medicine Udayana University. SPSS was used to analyze data using both univariate and bivariate analysis.
Results: This study was participated by 369 medical students at the Faculty of Medicine Udayana University in from academic year 2020, 2021, and 2022. The prevalence of poor sleep quality obtained from the statistics was 285 students 77,2%. This study looks into nine variables that are thought to be associated with sleep quality. Data analysis results indicated three factors were strongly linked with poor sleep quality which was sleep hygiene (p=0.000), academic stress (p=0.000), and caffeine consumption (p=0.014).
Conclusion: Poor quality of sleep in medical students at the Faculty of Medicine Udayana University was found having important significancy (p<0.05) with poor sleep hygiene, high levels of academic stress, and routine caffeine consumption.

Keywords: sleep quality, medical student, sleep quality factors

INTRODUCTION

Sleep is one of the essential components in maintaining an individual's health. It aids in improving brain function, including the process of learning and memorization, energy restoration, detoxification, and homeostasis for optimal nervous system performance.[1] Although sleep is an integral part of everyday life, many people are still unaware of its definition and significance Many individuals tend to neglect their sleep needs continuously. Long-term use of this behavior may lead to an increased risk of health disorders, for example, diabetes, heart disease, obesity, and depression.[2]

Sleep quantity refers to the duration of an individual's sleep, while sleep quality refers to the experience and satisfaction of one's experience during sleep. Good sleep quality is essential to support brain performance, emotional stability, and general well-being. This includes actions like the ability to fall asleep in less than 30 minutes after going to bed, staying asleep through the night, getting sufficient sleep duration for one's age, being able to return to sleep if

awakened during the night, and feeling energized upon waking up. On the other hand, poor sleep quality is the antithesis of these positive signs, resulting in uncomfortable symptoms such as difficulties initiating sleep, nighttime awakenings, fatigue, and increased cravings.[3]

Medical students are defined as individuals undergoing medical education. At the Faculty of Medicine of Udayana University, medical students undergo a 7-semester preclinical program, taking approximately 3.5 years to obtain a Bachelor of Medicine degree. After that, they spend 4 semesters-roughly 2 years- to receive clinical training for the medical doctor profession. The entire process for a medical student to complete their education to become a doctor takes a minimum of 5.5 years.

Medical students are susceptible to poor sleep quality due to their packed schedule and abundance of learning materials.[4] This statement is supported by studies demonstrating the risk of poor sleep quality among medical students. Meta-analyses on the issue of sleep quality reduction show that European medical students have the highest prevalence of poor sleep quality, with a percentage of 65.13%, followed by America, Africa, Asia, and Oceania.[5]

Research on sleep quality among medical students at the Faculty of Medicine of Udayana University 2015 and 2019 was conducted in 2015 and 2019, both revealed poor sleep quality in the students (45.7% and 58.3%).[6,7] As future healthcare providers, medical students need to understand the importance of sleep quality. Physicians who suffer from sleep deprivation have a 53% likelihood of committing medical malpractice.[8] Sleep problems also elevate the risk of burnout and decreased professionalism in the workplace.

Based on the issues raised in the preceding paragraphs, the author wants to conduct research on medical students in the Faculty of Medicine of Udayana University to gain a comprehensive understanding of factors associated with poor sleep quality.

MATERIALS & METHODS
This research is a descriptive cross-sectional study conducted on medical students in Faculty of Medicine. Online questionnaires distributed to medical students from July to October of 2023 provided the research data. The sampling method used was total sampling with samples that had been adjusted accordance with the inclusion and exclusion criteria. Data included the inclusion criteria are active medical student from academic year 2020, 2021, and 2022 who consent to participate in this research. Students with prescription medications that interfere with their ability to sleep and those who did not complete the questionnaire properly were the study's exclusion criteria. Data collected were then processed with univariate and bivariate analyses (chi-square) using SPSS 25 software which aims to obtain the frequency distribution and to describe the association between poor sleep quality and variables examined in this study. Information on Ethical Clearance Number: 835/UN14.2.2.VII.14/LT/2023 dated 29 March 2023.

RESULT
The results of the research obtained research samples that met the research inclusion criteria are from 369 respondents. Univariate analysis done to gain the frequency distribution of sample from medical students at Faculty of Medicine Udayana University are shown from tables below.

Table 1. Gender Distribution

Gender	Frequency (n)	Percentage (%)
Male	129	35
Female	240	65
Total	369	100

The sample distribution based on gender shows that 129 (35%) respondents were man and the other 240 (65%) respondents were women who dominated the number.

Table 2. Age Distribution

Age (year)	Frequency (n)	Percentage (%)
18	12	3.3
19	95	25.7
20	148	40.1
21	100	27.1
22	12	3.3
23	2	0.5
Total	369	100

Table 2 shows the distribution of respondents based on age. The age of samples in this study ranged from 18 to 23 years old. There are 148 people (40,1%) from the age of 20 years old who made up the majority and two persons (0.5%) are 23 years old which made up the least frequency from age.

Table 3. Academic Year Distribution

Academic Year	Frequency (n)	Percentage (%)
2020	138	37.4
2021	138	37.4
2022	93	25.2
Total	369	100

This study was conducted on students from three academic years with samples from the academic year of 2020 138 people (37.4%), from the academic year of 2021 138 people (37.4%) and the academic year of 2022 93 people (25,2%).

Table 4. Risk Variables

Variable		Frequency (n)	Percentage (%)
Body Mass Index	Underweight	35	9.5
	Normal	254	68.8
	Overweight and Obese	80	21,7
Sleep Hygiene	Good	29	7.9
	Fair	301	81.6
	Poor	39	10.6
Residential Status	House (with family)	188	50.9
	Boarding House (without family)	181	49.1
Academic Stress	Low	105	28.5
	Moderate	261	70.7
	High	3	0.8
Physical Activity	Low	33	8.9
	Moderate	161	43.6
	High	175	47.4
Routine Caffeine Consumption	Yes	100	27.1
	No	269	72.9
Sleep Quality	Good	84	22.8
	Poor	285	77.2

Based on Table 4, there were 254 samples (68,8%) had a normal BMI, 35 people (9,5%) with underweight BMI, and 80 people (21,7%) had an overweight or obese BMI. Out of the total sample, only 29 people (7,9%) were categorized as having good sleep hygiene while the other 301 people (81,6%) as having fair sleep hygiene and 39 people (10,6%) as having poor sleep hygiene. The amount of 188 people (50,9%) from the samples live with their family, while the remaining 181 people (49,1%) live alone without their family. Stress levels were assessed through the Perceived Stress Scale (PSS) which resulted in 105 individuals (28,5%) having low academic stress levels, 261 individuals (70,7%) having moderate stress levels, and 3 individuals (0,8%) having high stress levels. There were 33 people (8,9%) reported low physical activity, 161 people (43.6%) with moderate physical activity, and 175 people (47,4%) had a high level of physical activity. According to the assessment of routine caffeine consumption, 100 individuals (27,1%) regularly had a consumption of caffeine and the other 269 people (72,9%) didn't. The majority of samples have poor quality of sleep which was 285 people (77,2%) and the other 84 people (22,8%) have good sleep quality.

The bivariate analysis was conducted to connect sleep quality with other variables examined in this study. Results on bivariate analysis were shown below.

Table 5. Association of Sleep Quality and Gender

Gender	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
Male	34	40.5	95	33.3	129	35	0.228
Female	50	59.5	190	66.7	240	65	
Total	84		285		369		

The analysis of the relationship between sleep quality and gender in medical students at the Faculty of Medicine Udayana University indicates that the percentage of poor sleep quality among females was higher than that among males. In particular,190 out of 240 females (79.2%) reported having poor sleep quality compared to 95 out of 129 males (73.6%). The statistical test results show a p-value of 0.228 (p>0.05), interpreted as a lack of a significant relationship between gender and sleep quality among medical students at Udayana University do not significantly associate as shown in Table 5.

Table 6. Association of Sleep Quality and Age

Age (years old)	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
18-20	56	66.7	199	69.8	255	69.1	0.228
21-23	28	33.3	86	30.2	114	30.9	
Total	84		285		369		

The analysis of the relationship between sleep quality and age is presented in Table 6. The participants who ranged in age from 18 to 23 years old were split into two groups: those who were between the ages of 18 and 20 years old and those who were between the ages of 21 and 23 years old. There were 199 people (69,8%) in the 18-20 years old age group and 86 people (30,2%) in the 21-23 years old age group who reported having poor sleep quality. The statistical test's p-value of 0.582 indicated that there was no significant relationship between sleep quality and age.

Table 7. Association of Sleep Quality and Academic Year

Academic Year	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
2020	33	39.3	105	36.8	138	37.4	0.825
2021	29	34.5	109	38.2	138	37.4	
2021	22	26.2	71	24.9	93	25.2	
Total	84		285		369		

The findings of the analysis testing the relationship between sleep quality and academic year among medical students at the Faculty of Medicine Udayana University are displayed in Table 7. The data reveals that 105 students (76.1%) from the academic year 2020, 109 students (79%) from the academic year 2021, and 71 students (76.3%) from the academic year 2022 had poor sleep quality. These findings indicate a high percentage of poor sleep quality across each academic year. The statistical test yields a p-value of 0.825 (p>0.05), which suggests there was no significant association between academic year and sleep quality among these students.

Table 8. Association of Sleep Quality and Body Mass Index

Body Mass Index	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
Underweight	9	10.7	26	9.1	35	9.5	0.287
Normal	62	73.8	192	67.4	254	68.8	
Overweight or Obese	13	15.5	67	23.5	93	21.7	
Total	84		285		369		

The analysis test regarding sleep quality and body mass index (BMI) reveals the results of poor sleep quality in 26 individuals with an underweight BMI (74.3%), 192 individuals with a normal BMI (75.6%), and 67 individuals with an overweight or obese BMI (83.8%). The p-value in the statistical test is 0.287 (p>0.05), showing that there is no significant relationship between sleep quality and body mass index. Table 8 illustrates the bivariate analysis of the relationship between sleep quality and body mass index.

Table 9. Association of Sleep Quality and Sleep Hygiene

Sleep Hygiene	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
Good	16	19	13	4.6	29	7.9	0.000
Moderate	63	75	238	83.5	301	81.6	
Poor	5	6	34	11.9	39	10.6	
Total	84		285		369		

Based on the analysis results of medical students in this research, the majority of respondents with poor sleep hygiene (87.2%) had poor sleep quality, followed by respondents with moderate sleep hygiene (79.1%), and respondents with good sleep hygiene (44.8%). The statistical test results yield a p-value of 0.000 (p<0.005), indicating a significant relationship between sleep quality and sleep hygiene. Table 9 illustrates the relationship between sleep quality and sleep hygiene.

Table 10. Association of Sleep Quality and Residential Status

Residential Status	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
House (with family)	45	53.6	143	50.2	188	50.9	0.584
Boarding House (without family)	39	46.4	142	49.8	181	49.1	
Total	84		285		369		

Based on the bivariate analysis of the samples, poor sleep quality was found by 143 out of 188 respondents (76.1%) who live with their family experience poor sleep quality, and 142 out of 181 respondents (78.5%) who live in boarding houses (without family) also exhibit poor sleep quality. The percentage of poor sleep quality is found to be slightly higher among students living in boarding houses without family. The statistical test conducted yields a p-value of 0.584 (p>0.05), indicating the absence of a significant relationship between sleep quality and residential status. The table detailing the relationship between sleep quality and residential status can be seen in Table 10.

Table 11. Association of Sleep Quality and Academic Stress

Academic Stress	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
Low	47	56	58	20.4	105	28.5	0.000
Moderate	37	44	224	78.6	261	70.7	
High	0	0	3	1.1	3	0.8	
Total	84		285		369		

Table 11 presents the results of the analysis conducted regarding the relationship between sleep quality and academic stress. Respondents with poor sleep quality are distributed among 58 individuals (55.2%) with low academic stress, 224 individuals (85.8%) with moderate academic stress, and 3 individuals (100%) with high academic stress. The results of the statistical test show a p-value of 0.000 (p<0.05), which means a significant relationship between sleep quality and the level of academic stress among medical students at Udayana University.

Table 12. Association of Sleep Quality and Physical Activity

Physical Activity	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
Low	5	6	28	9.8	33	8.9	0.172
Moderate	32	38.1	129	45.3	161	43.6	
High	47	56	128	44.9	175	47.4	
Total	84		285		369		

The results of the analysis of the relation between sleep quality and physical activity among medical students in this study depict that 28 out of 33 individuals (84.8%) with low physical activity, 129 out of 161 individuals (80.1%) with moderate physical activity, and 128 out of 175 individuals (73.1%) with high levels of physical activity exhibit poor quality of sleep. The statistical test results show a p-value of 0.172 (p>0.05) meaning there was no significance between sleep quality and physical activity. The data on the relationship between sleep quality and physical activity is shown in Table 12.

Table 13. Association of Sleep Quality and Routine Caffeine Consumption

Routine Caffeine Consumption	Sleep Quality						P value
	Good		Poor		Total		
	N	%	N	%	N	%	
Yes	14	16.7	86	30.2	100	27.1	0.014
No	70	83.3	199	69.8	269	72.9	
Total	84		285		369		

The analysis of the association between routine caffeine consumption and sleep quality is displayed in Table 13. It reveals that 86 individuals (86%) who regularly consume caffeine and 199 individuals (74%) who do not regularly consume caffeine exhibit poor sleep quality. The p-value in the statistical test is 0.014 (p<0.05), indicating a significant relationship between sleep quality and caffeine consumption.

DISCUSSION

Based on the research on factors related to poor sleep quality among medical students at the Faculty of Medicine Udayana University, the data collected indicate that 369 respondents participated in this study, with 138 students from the academic year of 2020 (37.4%), 138 students from the academic year of 2021 (37.4%), and 93 students from the academic year of 2022 (25.2%). The prevalence of poor sleep quality in this study is 77.2%, with 285 students having poor sleep quality. This means that the majority of medical students in this study have poor sleep quality compared to those having good sleep quality. This prevalence is higher than research on students in Europe (65.13%), followed by America (59.92%), Africa (54.54%), Asia (47.44%), and Oceania (30.51%).[5] This study shows similar findings to a study at a university in Saudi Arabia among medical students, which reported a prevalence of 76% for poor sleep quality.[9]

The distribution of poor sleep quality based on gender indicates a higher prevalence of poor sleep quality in female students (79.2%) compared to male students (73.6%), although no significant relationship was found. Previous studies by Gunanthi and Diniari, also Bianca (2021) also found a tendency for poor sleep quality in females compared to males.[6,7] Hormonal variations in females, resulting from the menstrual cycle, pregnancy, and menopause, may also impact this sensitivity. Sleep activity itself is influenced by various hormones, including melatonin, cortisol, leptin, and ghrelin, as well as estrogen and progesterone, which are the main sex hormones in women. Therefore, hormonal fluctuations in the menstrual cycle affect changes in the control of sleep-regulating hormones. [10,11] This study did not find a significant relationship between sleep quality and gender with a p-value of 0.228 (p<0,05), consistent with literature studies on medical students in China.[12] This result implies that gender differences are not directly associated with sleep quality.

Samples in this study on medical students at the Faculty of Medicine Udayana University ranged in age from 18 to 23 years. This age distribution was then divided into two groups: the 18-20 age group and the 21-23 age group. Based on this division, the analysis of poor sleep quality was highest among respondents in the 18-20 age group (69.8%). No significant differences were found in poor sleep quality at each age level in this study (p=0.582) (p>0.05). This result aligns with a systematic review and meta-analysis on sleep problems published in 2020 with a p-value of 0.589, indicating no significance found. However, this study contradicts the findings of Gunanthi and Diniari (2016), who reported a significant relationship between poor sleep quality and age. This variation in age ranges in the two studies could have an impact on this discrepancy. Gunanthi and Diniari's study included respondents aged 16-20 years, while this study had respondents with a more varied age range, namely 18-23 years.[6]

In addition to age, academic years are also thought to be related to sleep quality. Each student has a different academic workload according to their academic year. Poor sleep quality, when viewed by academic year, was

highest among students in the 2021 academic year (79%). This may be influenced by a more demanding academic workload as third-year students, especially in the Bachelor of Medicine Program at the Faculty of Medicine Udayana University. No significance was found between sleep quality and academic year with a p-value of 0.825 (p>0.05). A study on medical students in the second to sixth academic years in Saudi Arabia also did not find a significant relationship between these two variables.[6]

According to body mass index (BMI), poor sleep quality was the least common (74,3%) among respondents with an underweight BMI and most common (83,8%) among those with overweight or obese BMI. When BMI is above the normal limits, the risk for excess fat accumulation in the body also increases. This excess fat has an impact on various aspects, such as emotional regulation, hormonal balance changes, inflammation, and psychological condition changes. The balance of food intake is influenced by the hormone's ghrelin, which controls appetite, and leptin, which indicates fullness after eating. Individuals with BMI above normal have a higher risk of dysregulation of signals in both hormones, leading to disturbances in hunger and fullness signals which increase the risk of weight gain, overweight, and obesity. The influence between sleep quality and obesity is bidirectional. Poor sleep quality also increases the risk of someone gaining weight due to reduced hormone sensitivity, decreased physical activity due to fatigue from poor sleep quality, emotional eating patterns, hormonal imbalances, and metabolic changes.[14] Based on the test results, no significant relationship was found between sleep quality and BMI with a p-value of 0.287 (p>0.05). This result is consistent with a previous study by Ardiani and Subrata regarding the relationship between sleep quality and BMI.[15]

Sleep hygiene is one of the main variables influencing poor sleep quality. The Sleep Hygiene Index questionnaire is used to examine sleep hygiene. The majority of students without good sleep hygiene tend to have poor sleep quality. The highest percentage of poor sleep quality was found in students with poor sleep hygiene (87.2%), followed by students with moderate sleep hygiene (79.1%) and good sleep hygiene (44.8%). This finding indicates an increasing percentage of poor sleep quality along with worsening sleep hygiene. The relationship between poor sleep quality and sleep hygiene is highly significant with a p-value of 0.000, consistent with research conducted by Amalia et al.[16] The Sleep Hygiene Index evaluates behaviors to establish healthy sleep, starting from individual habits before bedtime, daily activities, and an environment that supports a good sleep atmosphere. Research in Taiwan suggests that obtaining better sleep quality is influenced by an individual's awareness of proper sleep hygiene. Education about sleep hygiene supports individuals in adopting habits that support health, especially in achieving good sleep quality. This significance highlights the importance of developing appropriate sleep hygiene routines to promote good sleep quality.[17] These habits include establishing a bedtime routine, reducing gadget use before sleep, regular exercise, etc.

According to residential status, respondents who live in boarding houses (without family) have poorer sleep quality (78,5%) compared to respondents who live at home (with family) (76.1%). This information aligns with the study conducted by Gunanthi and Diniari, which found that students living in boarding houses without family experienced higher rates of poor sleep quality.[6] However, a p-value of 0.584 (p>0.05) indicated that there was no significant relationship between sleep quality and residential status. The residential status in this study was analysed solely based on their choices without other specific information that could influence the results of this analysis. Students who live away from home and live alone without family may experience social and psychological changes and require some time to adjust to

their new living environment. This factor might affect the greater proportion of poor sleep quality in students living alone in boarding houses.

Stress level has also been shown to have a substantial impact on sleep quality. Students may experience academic stress because of their heavy workload. This study measured stress levels using the Perceived Stress Scale (PSS) questionnaire. The study's findings found the highest percentage of poor sleep quality in respondents with high-stress levels (100%), followed by respondents with moderate stress levels (85.8%), and the lowest percentage in respondents with low stress levels (55.2%). A p-value of 0.000 (p<0,05) was used in the significance test to examine the link between sleep quality and academic stress. The results of this study are consistent with previous research on medical students at Jinnah Sindh University.[18] Persistent stressors brought on by academic activities may lead to physical and mental fatigue, affecting poor sleep quality.[19] The link between sleep quality and stress is influenced by the activity of the hypothalamic-pituitary-adrenal axis (HPA) in the nervous system. Elevated HPA axis activity can disrupt sleep, increase cortisol activity as a stress hormone, and lead to more frequent awakenings at night.[20] The biological clock in humans is regulated by a circadian rhythm. This circadian rhythm is primarily influenced by the adrenal glands that release glucocorticoids. Cortisol and corticosterone, produced by glucocorticoids, play a major role in an individual's circadian cycle. Glucocorticoid hormones are essential vectors in the regulation of the stress response. Stress stimulates the autonomic nervous system to react quickly, as well as glucocorticoids through the HPA axis to respond. This results in an increase in cortisol hormone production, which keeps a person more alert and makes it difficult to maintain sleep. This process is what causes stress to have a close relationship with poor sleep quality.[21]

Typically, intellectual pursuits take precedence for medical students. Physical activity becomes a choice in addition to primary activities, offering pleasurable benefits that lower stress and promote psychological comfort and relaxation. When the variable of physical activity was analyzed for sleep quality, the results indicate that respondents with low physical activity levels have the worst sleep quality (84.8%), while those with high physical activity levels have the best sleep quality (73.1%). In general, there is a trend of increasing poor sleep quality risk with decreasing physical activity levels. The analysis test for the relationship between sleep quality and physical activity did not show significance with a p-value of 0.172 (p>0.05). These results run counter to a study in Arab countries that found a strong relationship between sleep quality and physical activity.[22] Another study also showed that the time a person engages in physical activity can also affect their sleep activity. Intensive physical activity performed at night close to bedtime increases the risk of disturbed sleep, potentially causing poor sleep quality. Moderate-intensity physical activities such as yoga, weight training, and tai chi can help improve sleep quality and reduce insomnia, especially if done consistently.[23] The difference in results may be influenced by differences in data collection methods between these two studies. This study collects activity data simply by grouping physical activity and the frequency of respondents, unlike the study by Mahfouz et al., which uses a specific questionnaire to measure physical activity, resulting in differences in the calculation of the significance of the relationship between poor sleep quality and physical activity.

The variables influencing poor sleep quality include routine caffeine consumption. According to test results, poor sleep quality is higher among respondents who have a routine caffeine consumption, at 86%, while good sleep quality is higher among respondents who do not consume caffeine

regularly. There is a significant relationship between sleep quality and caffeine consumption with a p-value of 0.014 (p<0.05), as indicated by the study conducted by Ardiani and Subrata (2021). [15] Caffeine, as a stimulant of the central nervous system, increases alertness and reduces drowsiness by inhibiting adenosine activity, a neurotransmitter that initiates sleep. Caffeine also inhibits the secretion of melatonin hormone, which plays a crucial role in regulating circadian rhythms and causes drowsiness in the evening as a signal to sleep.[24] It is not uncommon for medical students to rely on caffeine consumption at night to stay awake while studying or engaging in other activities, leading to delayed sleep and an increased risk of irregular sleep patterns. The consumption of caffeine by medical students alters sleep patterns and results in poor sleep quality, particularly when the caffeine is consumed in the late afternoon or evening.[25] This research has limitations related to the lack of data on the dosage of caffeine consumed by respondents, as it is only categorized subjectively according to each respondent. Future research should delve deeper, calculating dosage and considering the timing of caffeine consumption.

The purpose of this cross-sectional study was to gather and analyze data to get more specific information on the variables being studied. Among the 9 factors studied, 3 were found to be significantly related to sleep quality—sleep hygiene, academic stress, and caffeine consumption—, while the other 6 factors—gender, age, academic year, body mass index, living arrangement, and physical activity—were not found to have a significant relationship. The study's population was limited to medical students at the Faculty of Medicine Udayana University for the academic years 2020, 2021, and 2022, so the results may not be generalizable to other populations. The use of self-filled questionnaires may introduce respondent bias, and there may be other unconsidered factors that could influence an individual's sleep quality.

CONCLUSION
This research indicates the prevalence of poor sleep quality among medical students in the Faculty of Medicine at Udayana University is 285 out of 369 individuals (77.2%). The results of the analysis of the relationship between sleep quality and suspected influencing factors through bivariate testing identified three variables significantly associated (p<0.05): sleep hygiene (p=0.000), academic stress (p=0.000), and caffeine consumption (p=0.014). Meanwhile, the other six factors showed no significant association: gender (p=0.228), age (p=0.778), academic year (p=0.825), body mass index (p=0.287), living arrangement (p=0.584), and physical activity (p=0.172). Further research is suggested to do a more comprehensive control study in analyzing factors linked to poor quality of sleep on medical student.

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