



Sleep health among medical students in Abakaliki Nigeria: A descriptive study

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ABSTRACT

Background: Sleep health focuses on those measurable characteristics of sleep that are most clearly associated with physical, mental, and neurobehavioral well-being, and not necessarily the absence of sleep disorder. Sleep health is characterised by subjective satisfaction, appropriate timing, adequate duration, high efficiency, and sustained alertness during waking hours. Adequate and restful sleep is particularly crucial for medical students, who face unique challenges due to the demanding nature of their academic and clinical responsibilities. There is limited data on sleep health among medical students in Nigeria.

Objectives: This research study investigated the pattern of sleep health among medical students in Abakaliki Nigeria.

Methods: This cross-sectional observational study was undertaken among the medical students of 2 public institutions in Abakaliki Nigeria from 16th to 23rd June 2023.

Results: Out of the 288 medical students (males- 53.1 %, females- 46.9 %), good sleep health was recorded in 6.6 %. The mean SATED sleep score was 4.9 ± 1.7 (male- 4.9 ± 1.8 , female- 4.9 ± 1.6) (p -value = 1) and it was significantly lower among the final-year students. Age difference, sex difference, and presence of chronic headache did not significantly affect the SATED sleep score. The mean sleep duration was 6.1 ± 1.5 hours (male- 6.1 ± 1.6 , female- 6.0 ± 1.4). Sleep duration (54.5 %) had the best rating while sleep efficiency (44 %) had the lowest rating among the assessed sleep domains.

Conclusion: Sleep health is poor among medical students in Abakaliki Nigeria and significantly poorer among final-year medical students.

1. Introduction

Sleep is a complex reversible neurobiological state characterized by closed eyes, behavioral quiescence, and perceptual disengagement from one's surroundings. It is a fundamental physiological process that plays a vital role in maintaining overall health and well-being. During sleep, there is a decrease in muscle activity, and interactions with the surrounding environment are significantly reduced. Adequate sleep duration and quality are paramount in facilitating memory consolidation, concentration, and problem-solving abilities [1]. National Health Foundation recommends a regular daily sleep duration of 7–9 h for young adults and 7–8 h for older adults [2].

Sleep health should focus on those measurable characteristics of sleep that are most clearly associated with physical, mental, and neurobehavioral well-being, and not necessarily the absence of sleep disorder [3]. Good sleep health is characterized by subjective satisfaction, appropriate timing, adequate duration, high efficiency, and sustained

alertness during waking hours [3]. The above characteristics are appropriate indicators of sleep health because they are valid and measurable, and each is associated with health outcomes [3]. Contrariwise, poor sleep health has been associated with many short-term and long-term health consequences some of which include increased risks of depression, anxiety, impaired immune function, somatic pain, and decreased productivity [4,5]. Furthermore, other long-term consequences of sleep disruption in otherwise healthy individuals include hypertension, dyslipidemia, cardiovascular disease, weight-related issues, metabolic syndrome, type 2 diabetes mellitus, and colorectal cancer [6].

Adequate and restful sleep is particularly crucial for medical students, who face unique challenges due to the demanding nature of their academic and clinical responsibilities. Medical education is known for its demanding nature, requiring extensive study hours, long teaching, and irregular schedules. These demanding conditions often contribute to sleep deprivation, midnight studies, and sleep disorders among medical

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students. Additionally, the constant pressure to excel academically, the emotional toll of working with patients, and the need to balance personal and professional responsibilities further compound the sleep-related challenges faced by medical students.

Several studies have found that medical students have a significant prevalence of sleep issues, such as poor sleep quality, excessive daytime sleepiness, and inadequate sleep duration [7].

In recent years, there has been growing concern about the impact of sleep deprivation and poor sleep quality on medical students' physical, mental, and academic performance worldwide [8]. Therefore, understanding the sleep health of medical students in Nigeria becomes imperative, as their well-being directly impacts their capacity to cope with the tedious training. Nigeria, as a rapidly developing country with a diverse healthcare system, offers an intriguing context for this research. The limited existing studies on sleep health among medical students in Nigeria underscore the need for a more comprehensive exploration of this topic. By conducting an in-depth analysis, this study aims to bridge the existing knowledge gaps, provide valuable insights into Nigerian medical students' sleep habits and challenges, and propose potential interventions to improve sleep health in this population. The findings of this research study will not only contribute to the existing literature on sleep health but also provide valuable guidance for healthcare professionals, educators, and policymakers in Nigeria to develop targeted strategies and interventions to promote better sleep habits and overall well-being among medical students.

This research study investigated the sleep health of medical students in Abakaliki Nigeria, recognizing the distinct cultural, educational, and environmental factors that may contribute to their sleep patterns. By exploring the sleep-related challenges faced by these students, the study seeks to shed light on the potential implications for their overall well-being, academic performance, and patient care. By addressing this critical issue, we aim to improve the quality of life and optimize the educational experience of medical students, ultimately benefiting the healthcare system and the patients they serve.

2. Methods

2.1. Study design

This is a cross-sectional descriptive study.

2.2. Setting

The study was conducted among the clinical class medical students of Ebonyi State University and Alex Ekwueme Federal University, both are public tertiary institutions in Abakaliki Ebonyi State.

2.3. Selection of patients

The consecutive medical students that were present in the class for lectures among the 400 level and the 600 level classes were recruited for the study on different days for different classes from 16th to 23rd June 2023. The 400 level students are those in 4th year of medical training while the 600 level students are those in 6th (final) year of medical training.

2.4. Interventions

There was no intervention.

2.5. Methods of measurement

The students were screened for sleep health with an adapted SATED (Satisfaction, Alertness, Time, Efficiency, Duration) sleep questionnaire [3]. This questionnaire is reliable and valid for measuring sleep health in the general population [9]. SATED is an acronym for S- Satisfaction, A-

Alertness, T- Time of sleep, E- Efficiency, and D- Duration (Table 1) [3]. It is a simple questionnaire developed to determine the degree of sleep fulfilment.

2.6. Data collection and processing

Data collection was done using an adapted SATED questionnaire. It is based on five simple questions. Each question has three possible responses that can be scored 0, 1, and 2 (Table 1). When the scores of the 5 questions are summed, the total score of zero (0) indicates Worst Sleep Health while a total score of ten (9) indicates Best Sleep Health. Good sleep health is a SATED sleep score of ≥8 while poor sleep health is < 8 [10].

Biodata and other socio-demographic data like alcohol use, cigarette smoking, and significant medical history like chronic headache, hypertension etc were obtained from the students. The study population was classified based on clinical parameters and the mean SATED sleep health score with standard deviation was calculated for each group. The study population was grouped into ≥25 and <24 years age groups. Alcohol abuse was defined as intake of >14 units/week and >7 units/week for males and females respectively [11]. Tobacco use was defined as any habitual use of the tobacco plant leaf and its products [12]. Chronic headache was defined as a headache occurring 15 or more days per month for over 3 months [13].

2.7. Loss of data such as dropouts or patients lost to follow-up

There was no significant attrition as it was a cross-sectional study.

2.8. Ethical guidelines followed by the investigators

There were no significant ethical issues as the study was not inter-ventional and the students' identity was not disclosed or compromised except that informed consent was obtained from the students before the interview.

2.9. Statistical methods used

The data were analyzed with IBM Statistical Product and Service Solution (SPSS) version 25. Categorical variables were presented as proportions and percentages while numerical variables were presented as means and standard deviations. Chi-square was used as a test of statistical significance for categorical variables while the student t-test was used as a test of statistical significance for the numerical variables, with a p-value of <0.05 as significant.

3. Results

A total of 288 medical students made up of 153 (53.1 %) males and 135 (46.9 %) females were recruited for the study (see Table 2).

Table 1
SATED sleep health questionnaire.

SLEEP DIMENSIONS	Rarely/ Never [0]	Sometimes [1]	Always [2]
SATISFACTION- Are you satisfied with your sleep?			
ALERTNESS- Do you stay awake all day without dozing?			
TIMING- Are you asleep (or trying to sleep) between 2 a.m. and 4 a.m.?			
EFFICIENCY- Do you spend less than 30 min awake at night? (This includes the time it takes to fall asleep and the awakenings at night)			
DURATION- Do you sleep between 6 and 8 h per day?			

Table 2
Age and Sex distribution.

Age range (years)	Male- n (%)	Female- n (%)	Total- N (%)
<20	2 (0.7)	0 (0.0)	2 (0.7)
20–24	40 (13.9)	88 (30.5)	128 (44.4)
25–30	83 (28.8)	42 (14.6)	125 (43.4)
≥30	28 (9.7)	5 (1.7)	33 (11.4)
Total	153 (53.1)	135 (46.9)	288 (100)

The mean age was 25.4 ± 3.6 years (male- 26.6 ± 3.6 , Female- 23.9 ± 2.9) with an age range of 20–38 years (p-value- <0.001). Chronic headache was present in 66 (22.9 %), alcohol abuse in 7 (2.4 %), cigarette smoking in 6 (2.1 %), hypertension in 6 (2.1 %) and bronchial asthma in 2 (0.7) (see Table 3).

Good sleep health which is a SATED score of 8–10 was noted in 19 (6.6 %) students (see Table 4). The Mean SATED sleep score was 4.9 ± 1.7 with no significant sex difference (male- 4.9 ± 1.8 , female- 4.9 ± 1.6) (p-value = 1).

The students in the 600-level (final year) class had a significantly lower SATED sleep score compared to their 400-level counterparts but age difference, sex difference and presence of chronic headache did not significantly affect the SATED sleep score (see Table 5).

The mean sleep duration was 6.1 ± 1.5 h (male- 6.1 ± 1.6 , female- 6.0 ± 1.4) (p = 0.57). Among the assessed sleep domains, sleep duration (54.5 %) had the best rating while sleep efficiency (44 %) had the lowest rating (see Table 6).

4. Discussions

The purpose of this study was to assess the sleep health of medical students in Abakaliki, Nigeria. There has not been any study of sleep health among medical students in southeast Nigeria. A cross-sectional survey was conducted among 288 medical students. They constituted 400-level and 600-level students. The males were 53.1 % while the females were 46.9 %. The mean age was 25.4 years with a significantly higher mean age for male students.

The above finding may not be universally true as demographic characteristics vary widely among medical student populations. The possible explanation for the finding could be related to early female entry into schools due to their early intellectual and sexual maturation compared to the males [14,15]. Additionally, male gender is associated with poor academic performance due to harsh socioeconomic factors and consequent repetition of classes [16–18].

The frequency of good sleep health was 19 (6.6 %) while the mean SATED sleep score was 4.9 with no significant age or sex difference. The findings of this study suggest that sleep health is a major problem among medical students in Abakaliki Nigeria and it is similar to the report from other studies within Africa and globally [7,19–21]. Wondie et al. reported a high prevalence of poor sleep quality among medical students in a cross-sectional study in Ethiopia Africa and they noted that stress, depression, poor sleep hygiene, and poor social support were significant factors associated with poor sleep quality [20]. In a similar vein, Nsengimana et al. in Rwanda Africa reported a very high prevalence of

Table 3
Sex distribution of the clinical characteristics.

Clinical variable	Male- n = 153 (%)	Female- n = 135 (%)	Total- N = 288 (%)
Chronic headache	36 (23.5)	30 (22.2)	66 (22.9)
Alcohol abuse	7 (4.6)	0 (0.0)	7 (2.4)
Cigarette smoking	6 (3.9)	0 (0.0)	6 (2.1)
Hypertension	6 (3.9)	0 (0.0)	6 (2.1)
Bronchial asthma	2 (1.31)	0 (0.0)	2 (0.7)

Table 4
Sex distribution of SATED Sleep health score.

SATED Score	Male- n = 153 (%)	Female- n = 135 (%)	Total- N = 288 (%)
0	0 (0)	0 (0)	0 (0)
1	4 (2.6)	0 (0)	4 (1.4)
2	10 (6.5)	8 (5.9)	18 (6.3)
3	25 (16.3)	18 (13.3)	43 (14.9)
4	24 (15.7)	25 (18.5)	49 (17.0)
5	21 (13.7)	32 (23.7)	53 (18.4)
6	41 (26.8)	31 (23.0)	72 (25.0)
7	18 (11.8)	12 (8.9)	30 (10.4)
8	8 (5.2)	7 (5.2)	15 (5.2)
9	0 (0)	0 (0)	0 (0)
10	2 (1.3)	2 (1.5)	4 (1.2)

Table 5
SATED Sleep health score and the clinical variables.

Variables		Mean SATED Score	Frequency- n (%)	95 % CI	p-value
Age	<25 years	5.09 ± 1.71	130 (45.1)	−0.1050 to 0.7050	0.1459
	≥25 years	4.79 ± 1.76	158 (54.9)		
Sex	Male	4.93 ± 1.84	153 (53.1)	−0.4145 to 0.3945	0.9612
	Female	4.94 ± 1.62	135 (46.9)		
Class	400 level	5.10 ± 1.77	173 (60.1)	0.0201 to 0.8399	0.0398
	600 level	4.67 ± 1.67	115 (39.9)		
Headache	Present	5.0 ± 1.58	66 (22.9)	−0.3714 to 0.5914	0.6532
	Absent	4.89 ± 1.79	222 (77.1)		

Table 6
Mean score of Sleep Health Dimensions- Maximum score = 2.

Sleep Dimensions	Mean	Percentage (%)
Sleep Satisfaction	0.99	49.5
Alertness during the day	0.95	47.5
Timing of sleep	1.03	51.5
Sleep Efficiency	0.88	44
Sleep Duration	1.09	54.5

poor sleep quality in medical students with some participants reporting using medication to fall asleep and sleep efficiency being the most impaired [21].

This is not surprising, given the high workload and stress levels that medical students face [22,23]. Poor sleep quality and sleep deprivation can have several negative consequences for medical students, including decreased academic performance, impaired decision-making, and increased risk of accidents. The reported poor sleep quality among medical students could become a norm as Aliyu et al. reported poor quality of sleep among doctors practicing in Nigeria and most had >80 working hours in a week [24].

The final-year (6th year) students had significantly poorer sleep health compared to the 4th year students. This is expected as the final year students have higher academic demands in view of the scope of the final MBBS examination they are faced with. This final MBBS examination is associated with high anxiety and emotional disturbances which affect sleep health. The anxiety could result from fear of possible failure in the final examination, family responsibilities, and the transition from a dependent lifestyle to independent living. The 4th year students are new to the clinical class and are yet to be exposed to the full scope of the curriculum of clinical classes.

Chronic headache was present in 66 (22.9 %), alcohol abuse in 7 (2.4 %), cigarette smoking in 6 (2.1 %), hypertension in 6 (2.1 %) and bronchial asthma in 2 (0.7). Headaches, particularly morning headaches, and chronic headaches, have been reported to result from, or worsened by, a sleep disorder, and management of the sleep disorder may improve or resolve the headache [25]. Chronic headaches unexpectedly did not have any significant association with poor sleep health. This could result from the overriding influence of other confounding variables like anxiety, depression, and general stress as reported in other studies among medical students [26–28].

The mean sleep duration was 6.1 h without significant sex difference. This is comparable to the report from other studies among medical students and in variance with 7 h in undergraduate in other disciplines [29–31]. This is not surprising, given the high workload and stress levels that medical students face [22,23]. Among the assessed sleep domains, sleep duration (54.5 %) had the best rating while sleep efficiency (44 %) had the lowest rating. This finding is in consonance with the report of Dalmases et al. in the Catalan health survey [32]. This finding could result from the unreliability of reported sleep duration as an index of sleep health as most people over-report their sleep duration [33]. It is also important to note that sleep duration does not always represent quality sleep [34]. On the other hand, most young people use their phones when they have retired to bed thereby reducing sleep efficiency [35]. The above finding suggests that the indices of sleep health as contained in the SATED sleep questionnaire should always be used in concert and not in isolation.

In view of the findings of poor sleep health and its attendant consequences from this study, there are several possible interventions that could be implemented to improve sleep health among medical students. They include education about sleep hygiene, the formation of support groups, and the use of cognitive behavioural therapy (CBT).

Medical students should be educated about the importance of sleep and how to promote good sleep habits. This could include information on topics such as establishing a regular sleep schedule, creating a relaxing bedtime routine, and avoiding caffeine and alcohol before bed.

Support groups can provide a safe space for medical students to discuss their sleep problems and learn from each other. This can be especially helpful for students who feel isolated or ashamed of their sleep problems.

CBT could help them to change their thinking patterns and behaviours that contribute to sleep problems. CBT has been shown to be effective in treating insomnia in other populations, and it could be a helpful intervention for medical students as well.

The interventions described above could improve sleep health among medical students and help them achieve their full potential.

Furthermore, Medical schools and other stakeholders should work to reduce the stress levels of medical students and to provide them with support and resources to manage their anxiety. Addressing the underlying causes of sleep problems could help improve sleep health among medical students and ensure that they are well-rested and ready to learn and practice medicine.

5. Limitations

The study limitations include.

1. The study was conducted in two universities in Abakaliki, Nigeria with a relatively small sample size, which may have limited the power of the study, and the findings may not be generalizable to other medical schools in Nigeria or other countries.
2. The study used a cross-sectional design, which means that it could not establish causality between sleep health and socio-demographic factors.
3. The study relied on self-reported sleep data, which is subject to recall bias.

Despite these limitations, the study provides valuable insights into the sleep health of medical students in Abakaliki, Nigeria. Future research is needed to confirm these findings and identify interventions to improve sleep health among medical students.

6. Conclusions and recommendations

Sleep health as measured with the SATED sleep health score is poor among medical students in Abakaliki Nigeria. It is significantly poorer among final-year medical students.

In view of the attendant consequences of poor sleep health, interventions like education about sleep hygiene, the formation of support groups, the use of cognitive behavioural therapy (CBT), and the provision of resources to manage anxiety could help improve sleep health among medical students and ensure that they are well-rested and ready to learn and practice medicine.

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CRediT authorship contribution statement

Chukwuemeka Eze: conceived and designed the study, collected the data and wrote the initial and the revised versions, took the decision to send this manuscript for publication in your esteemed journal.

Declaration of competing interest

I, the author of the manuscript titled **SLEEP HEALTH AMONG MEDICAL STUDENTS IN ABAKALIKI NIGERIA: A DESCRIPTIVE STUDY**, hereby submit it for consideration for publication as an **ORIGINAL ARTICLE** in **SLEEP HEALTH JOURNAL**. *I agree to the following.*

1. This manuscript is my original work and is free from plagiarism.
2. This manuscript or a substantial part of it has not been submitted to any other journal for publication. It has also not been published previously.
3. The data in this study have not been used for any other manuscript published by me.
4. I take full responsibility for the design and conduct of the study, had full access to the data and controlled the decision to publish the study.
5. All conflicts of interest are stated in writing.
6. In the event of publication of this manuscript by Sleep Health Journal, the copyright to this work shall stand transferred to the Journal.

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