

Prevalence of Sleep Deprivation And Its Associated Factors Among Students In A Private Medical School In Ghana

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Abstract

Introduction: The increase demand on medical students to combine clinical rotations, didactic lectures, examinations and project works have led to medical students adopting unhealthy sleep habits in order to achieve these targets. Sleep deprivation has been known to cause many problems that can negatively impact students' health and academic performance. This study aims to assess the prevalence of sleep deprivation and its associated factors amongst medical students in Family Health Medical School.

Methods: A cross-sectional descriptive study design was employed for this study. The study population comprised all medical students in the school. A random sampling technique was used via online questionnaires to take self-assessment data for sleep quality, over a period of four weeks using the Pittsburgh Sleep Quality Index (PSQI). Data collected was analyzed with Statistical Package for

Social Sciences (SPSS) version 26 using descriptive statistics (frequency and percentages), mean scores and Spearman correlation was used in data analysis. The level of significance was set at 0.05.

Results: A total of 146 medical students responded to the questionnaire. It comprised of 88 (60.3%) females and 58 (39.7%) males. The mean duration of night sleep was 5.7 ± 1.3 hours. The majority (71.2%) had PSQI scores indicative of poor sleep quality. Poor sleep was associated with bedtime use of technology and an increased academic workload.

Conclusion: There was a high prevalence of sleep deprivation in the studied subjects. It was associated with bedtime use of technology and an increased academic workload.

Keywords: Sleep, deprivation, students, stress, quality of work.

Introduction

The stressful nature and workload that go with training in medical school to become a physician put students at an increased risk of poor sleep practices and depriving themselves of adequate sleep.^{1,2} Sleep is a naturally occurring state of mind and body that is distinguished by altered consciousness, relatively inhibited sensory activity, reduced muscle activity and inhibition of nearly all voluntary muscles, and reduced interactions with the environment.^{3,4}

Sleep deprivation in an individual is defined as either an insufficient duration of sleep (quantitative sleep deprivation), a fragmented sleep period (qualitative sleep deprivation), or a combination of both factors.⁵

Sleep deprivation has a lot of harmful effects on cognitive performance.^{2,6} Furthermore, sleep deprivation is a risk factor for the development of obesity, impaired glucose tolerance, and diabetes.^{1,3,5,7-10} Other studies suggest a detrimental effect of sleep

deprivation on the immune system, supporting the common perception that increased susceptibility to infections occurs in those who are sleep-deprived.^{1,5} Lastly, sleep loss is also associated with increased age-specific mortality.^{5,10,11} The risk factors for sleep deprivation are multifactorial. They can be grouped into two major overlapping categories: lifestyle/occupational (e.g., night life, shift work, prolonged working hours, caffeine use, irregular sleep schedules, intense academic work), and sleep disorders (e.g., insomnia, sleep-disordered breathing, narcolepsy, and circadian rhythm disorders).⁷ The major causes of sleep loss result from lifestyle choices and sleep disorders. Some of these lifestyles include shift work, prolong working hours, caffeine use and intense academic work. Also, some sleep disorders that lead to sleep loss are insomnia, sleep-disordered breathing, narcolepsy, and circadian rhythm disorders.^{1,7-9} Medical students who lack sleep may be more susceptible to anxiety and depressive disorders. In addition, the safety of patients is a worry for medical personnel who lack sleep. The purpose of this study is to determine the prevalence of sleep deprivation and the factors that contribute to it among medical students at the Family Health Medical School.

Methods

A cross-sectional study was conducted from 13th May, 2021 to 31st June 2021, at the Family Health Medical School (FHMS) of the Family Health University College (FHUC) in Teshie, Accra, Ghana. Study participants were medical students. The inclusion criteria were all medical students in Family Health Medical School. The exclusion criteria were students who declined to take part in the study. After developing a sampling frame from a register, simple random sampling technique was used and participants enrolled to participate after signing the informed consent form. Data was collected using a questionnaire which was distributed using Google Forms, a survey administration web application. The total number of students selected was 146 out of 231 participants. The Pittsburgh Sleep Quality Index (PSQI) was used to measure the quality and patterns of sleep

over the last month. Associated factors assessed were: Increased academic workload, extreme thermal environment, bedtime coffee intake, noise, bright lighting and uncomfortable bed. Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Categorical variables were presented by frequency and percentages and continuous variables by mean and standard deviation. The relationship between PSQI and the possible associated factors for poor sleep quality were analyzed using Spearman's Rank Order Correlation. A p-value of < 0.05 was considered statistically significant.

Results

A total of 146 respondents were included in the study. Among the respondents, majority were females (88, 60.3%). Preclinical year students represented 57 (37.3%) of the sample while clinical year students represented 96 (62.7%).

Table 1 Sociodemographic characteristics of respondents

Variable	Attributes	Frequency (n = 146)	Percentage (%)
Sex	Female	88	60.3
	Male	58	39.7
Age Range	15 - 25	86	58.9
	26 - 35	51	34.9
	36 - 45	8	5.5
	45+	1	0.7
Year of study	Level 100	17	11.6
	Level 200	26	17.8
	Level 300	18	12.3
	Level 400	41	28.1
	Level 600	44	30.1

Abbreviations: n, count of participants in group; %, percentage of participants

Among the students, 26 (17.8%) went to bed before 10 pm., 41 (28.1%) went to bed between 10 pm and midnight, and 79 (54.1%) went to bed after midnight. The average duration of sleep reported by students was 5.7 ± 1.3 hours. Most of the respondents (92, 63.0%) woke up after 6 am. This was followed by 36 (24.7%) students who reported waking up between 4 am and 6 am while 18 students

(12.3%) reported waking up before 4 am. Thirteen students, representing 8.9% of the total, reported using medications to enhance their sleep. A total of 112 (76.7%) students reported that they never took coffee at night. The average duration of sleep latency reported by students was 25.1 ± 1.7 minutes. Sleep latency of fewer than 10 minutes was reported by 35 (24.0%) of the students; 10-30 minutes was reported by 74 (50.7 %) students; 31-60 minutes was reported by 36 (24.7%) students, and only 1 (0.6%) person had a sleep latency of more than 60 minutes.

Regarding self-reported sleep quality, 12 (5.9%) of respondents reported very bad sleep quality, 36 (24.7%) reported fairly bad sleep quality, 78 (53.4%) reported fairly good sleep quality, and 20 (13.7%) reported very good sleep quality. The majority of participants (71.2%) had PSQI scores greater than 5, indicating poor sleep quality, while 28.8% had good sleep quality. Table 2 shows the possible factors of sleep deprivation assessed and their frequencies in a Likert scale format.

Table 2 Distribution of reasons for poor sleep

Reason	Everyday n(%)	Sometimes n(%)	Rarely n(%)	Not at all (%)
Bedtime use of technology	48 (32.9%)	58 (39.7%)	18 (12.3%)	22 (15.1%)
Noise	12 (8.2%)	63 (43.2%)	43 (29.5%)	28 (19.2%)
Uncomfortable Bed	11 (7.5%)	38 (26.0%)	24 (16.4%)	73 (50.0%)
Bright lights	16 (11.0%)	44 (30.1%)	23 (15.8%)	63 (43.2%)
Warm sleeping environment	9 (6.2%)	36 (24.7%)	45 (30.8%)	56 (38.4%)
Cold sleeping environment	23 (15.8%)	59 (40.4%)	26 (17.8%)	38 (26.0%)
Increased academic work load	59 (40.4%)	65 (44.5%)	11 (7.5%)	11 (7.5%)
Evening coffee drinking	2 (1.4%)	16 (11.0%)	16 (11.0%)	112 (76.7%)

Abbreviations: n, counts of participants; %, percentage of participants

Spearman Order Rank test demonstrated that there was significant positive correlation between sleep quality and the following: Bedtime use of technology and increased academic work load. No statistically significant correlation was found between sleep quality and the rest of the other factors assessed.

Table 3 Spearman's test between PSQI assessed and associated factors of sleep quality

Factor	Spearman correlation	P-value
Bedtime use of technology	0.194	0.009*
Noise	0.099	0.117
Uncomfortable Bed	0.052	0.265
Bright lights	0.083	0.160
Warm sleeping environment	-0.870	0.149
Cold sleeping environment	-0.064	0.222
Increased academic workload	0.236	0.002*
Evening coffee drinking	0.020	0.403

Abbreviations: *, Correlation is significant at 0.05 level

Discussion

From the study, several factors contribute to sleep deprivation among medical students. With regards to sleep characteristics, the majority of the students (54.1%) went to bed after midnight. This differs from studies done by Lawson et al at the University of Ghana (2019), where a majority of students (101, 66%) went to bed between the times of 10 to 12 pm.¹ It also differs from a study done by Chinawa et al. where some students 89 (37.3%) were reported to have slept before 10pm.¹² The average duration of sleep reported by students was 5.7 ± 1.3 hours. This is consistent with the findings of Lawson et al. who found an average sleep duration of 5.7 1.2 hours.¹ This is below the recommended duration of sleep, which is 7 to 9 hours, and is probably due to the busy nature of the medical school academic schedule. Regarding sleep latency, the study showed that majority (50.7%) of the students had a sleep latency of about 10 to 30 minutes. This is in close comparison with the study by Lawson et al (57.55%).¹ This can again be explained by the rigorous academic schedules of medical students. Majority (71.2%) of the students had poor sleep quality according to their PSQI. The high prevalence of poor sleep quality recorded in this study corroborates with similar studies which found poor sleep quality among majority

(76%) of students.^{3,10,12} Sleep deprivation has been shown to have major negative effects on emotional intelligence, including the ability to show empathy. One disturbing trend that has been reported is that medical students become less, rather than more, empathetic as they progress through their years of training.⁷ Increase academic workload was linked to sleep deprivation in this study. This thus confirms the findings of Džaferović et al which also established a relationship between increase academic workload and poor sleep quality.⁶ Unlike the findings of Lawson et al,¹ this study did not find any association between poor sleep quality and environmental factors such as bright lights and noise. This could be due to regional differences in noise pollution and lighting on the different campuses being compared. Many students did not report drinking coffee at night, and the study did not establish an association between coffee drinking at night and poor sleep quality. This was similar to the study done by Lawson et al.¹ This can be explained by the variations in nutritional diets worldwide. Coffee is consumed more in the European and

North American worlds, while Africa has a low consumption of coffee per capita.^{2,4,9,12}

Conclusion

This study recorded a high prevalence of poor sleep quality among some medical students in Ghana and found association between bedtime use of technology, increased academic workload and poor sleep quality. Future studies involving multiple Ghanaian medical schools are encouraged to estimate the national prevalence of stress and poor sleep quality in Ghanaian medical students and to inform health educators on strategies to assist students in improving their poor sleep quality while pursuing medical education.

Conflict of Interest

The authors have no conflict of interest.

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