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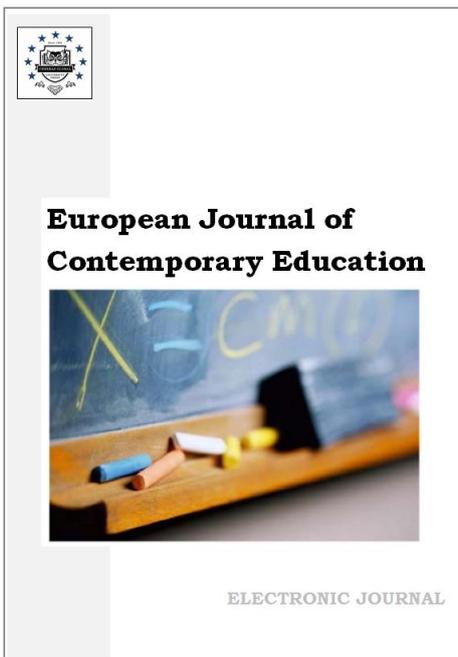
Sleep Disorders and Patterns among Medical Students at the University of Health and Allied Sciences, Ghana

Emmanuel Dziwornu [a], Etornam Aguadze [a], Eugene Dordoye [a], Jacob Owusu Sarfo [b,c,d,*]

[a] University of Health and Allied Sciences, Ho, Ghana
[b] University of Cape Coast, Cape Coast, Ghana
[c] Cherkas Global University, Washington, USA
[d] Volgograd State University, Volgograd, Russian Federation

Abstract

This study assesses the prevalence of sleep disorders and quality among medical students. A total of 221 (61.5 % males, 38.5 % females; mean±SD age = 22.07 ± 2.45 years) respondents were conveniently selected from all six levels using a cross-sectional survey design. The study results show that most medical students sleep after 11 pm and wake up after 6 am, with an average of 5hrs of sleep each night. They do not induce their sleep with pills, and their sleep quality is fairly good, with a latency of fewer than 15 minutes. There is little nocturnal wakening, if any, due mainly to the use of the washroom at night. Most of them experience daytime sleepiness, and a substantial number experience morning tiredness. The top 5 sleep disorders reported by the students are nightmares, narcolepsy, insomnia, restless leg syndrome/periodic leg movement disorder, and circadian rhythm disorders. The prevalence of sleep disorders and issues among medical students is high. There is a need for medical schools to recognise to assist students in developing healthy sleep patterns as they manage their academic workload. The university system must strengthen existing academic and social supports for student mental wellness. Our findings have implications for medical education, policy, and research in Ghana and beyond.

Keywords: sleep disorders, prevalence, sleep patterns, medical students, Ghana.

1. Introduction

Sleep is a physiological process necessary for optimal human function (Shattuck et al., 2019). Krueger et al. (2016) noted that sleep had been tagged with immune system response, restoration of brain energy, and removal of toxic by-products in the body amidst a lack of consensus on its

* Corresponding author
E-mail addresses: jacob.sarfo@ucc.edu.gh (J.O. Sarfo)

functions. Consequently, disturbance in sleep can affect general health and quality of life (Mc Carthy, 2021). An individual's sleep may be influenced by various factors, including lifestyle, gender, age, and occupation (dos Santos et al., 2018; Mc Carthy, 2021; Oginska, Pokorski, 2006). Sleep problems are found to be more prevalent in women and increase gradually with age (Han et al., 2019).

Among university students, there is a high rate of sleep problems (Schlarb et al., 2017). This high rate of sleep problems has been found to be related to several factors like drug use, room quality, family issues, stress, and psychological challenges (Altun et al., 2012). Also, electronic devices such as cell phones and computers affect students' sleep hygiene (Hershner, Chervin, 2014). According to Sweileh et al. (2011), approximately 42 % of students went to bed after midnight, and 18 % woke up before 6 am worldwide. The effect is that students with sleep problems struggle to function and perform academically (Alapin et al., 2000; Schlarb et al., 2017; Trockel et al., 2000). According to World Health Organisation (WHO, 1998), the day after a night of poor sleep is disturbing as inadequate rest impairs the ability to think, handle stress, maintain a healthy immune system, and control emotions.

Sleep problems are particularly significant among medical students (Yassin et al., 2020) due to the daunting and challenging academic workload they are confronted with (Azad et al., 2015; Wong et al., 2005). Lawson et al. (2019) reported that 66 % of medical students at the University of Ghana went to bed between 10 pm and 12 am, 85 % woke up before 6 am, and the majority slept for an average of five hours per night. In effect, these students resort to using drugs to disrupt their sleep to keep them awake and meet academic demands (Hershner, Chervin, 2014).

This study is valuable because of the direct relationship between sleep and mental health (Kim, Dimsdale, 2007). Since these students become the medical workforce of the nation and the world at large, it is scary that their mental health is jeopardised by the process that makes them professionals. As such, the study sought to establish the prevalence and forms of sleep problems among medical students using a sample from a new medical school in Ghana.

2. Methods
Design
The study used a cross-sectional survey design to allow for the data collection from a broader range of medical students at the University of Health and Allied Sciences (UHAS), Ho, in the Volta Region of Ghana. Data were collected across all year groups of the student population in the school to present a more precise picture of the entire student body.

Population and sample
The study was conducted in the School of Medicine at UHAS. The UHAS school of medicine is situated at the Ho Teaching Hospital in the capital of the Volta region. The school has so far graduated two batches of medical students since its inception in 2014. It runs three programmes, namely medicine, physician assistantship, and dentistry. The total number of students in the school studying medicine is 409. All medical students (i.e., preclinical and clinical students) in UHAS who agreed to take part in the study were sampled. Overall, 221 Participants were conveniently sampled using Kish and Leslie formula (1965), assuming a non-response of 5 %.

Instruments
We used the SLEEP-50 and the Pittsburgh Sleep Quality Index (PSQI) as the main instruments for data collection. The PSQI is a self-rated questionnaire that assesses sleep quality and disturbances or patterns over a 1-month interval. It consists of 19 items with 7 subscales measuring subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency (total time in bed of sleep), sleep disturbances, use of sleep medication, and daytime dysfunction. The SLEEP-50 questionnaire, on the other hand, was used to assess sleep disorders among medical students.

Ethics
Ethical approval was obtained from the University of Health and Allied Sciences Research Ethics Committee to conduct the research among the students (REG number UHAS REC A.12[173]2-21). Participants signed a consent form before their participation. Strict confidentiality was upheld, and no coercion or inducement whatsoever was used. The study complied with the Helsinki declaration.

3. Results
Demographic data
The data were analysed using SPSS, and the results are presented in this section. A total of 221 medical students participated in the study, and Table 1 below presents their demographic information. Of the total participants, there were more males (136, 61.5 %) than females (85, 38.5 %), a mean age of 22.07 ± 2.45 years, 117 (52.9 %) preclinical year students and 104 (47.1 %) clinical year students. There were 186 (84.5 %) residing on campus, and 35 (15.8 %) were non-residents. Regarding the type of admission, 29 (13.1 %) students were regular students, while 192 (86.9 %) were full-fee-paying students. Some 47 (21.3 %) participants engaged in extra work at night.

Table 1. Demographic characteristics of participants

Characteristics	Frequency (n = 221)	Percentage (%)
Gender		
Male	136	61.5
Female	85	38.5
Year of Study		
Year 1	35	15.8
Year 2	29	13.1
Year 3	53	24.0
Year 4	30	13.6
Year 5	30	13.6
Year 6	44	19.9
Residential Status		
Resident	186	84.5
Non-resident	35	15.8
Type of Admission		
Regular	29	13.1
Fee-paying	192	86.9
Extra work at night		
Yes	47	21.3
No	174	78.7

Notes: Age (in years) [Mean, SD] = 22.07 ± 2.45

Sleep habits among medical students
This entails the time students go to bed at night and woke up in the morning, hence taking into consideration their average duration of night sleep, whether they take coffee at night and any sleeping pills.
Of the respondents, 62 (28 %) students went to bed before 11 pm. Also, 125 (56.6 %), forming the majority, went to bed between 11 pm and 1 am, with 34 (15.4 %) sleeping after 1 am. The average duration of sleep reported by students was 5.4 ± 1.1 hours. Thus, most respondents (138, 62.4 %) woke up between 5 am and 7 am and only 12 (5.4 %) students woke up after 8 am. Again, 6 (2.8 %) participants reported using medications to enable them to sleep at night. A total of 199 (90.1 %) participants reported that they never drank coffee at night.

Table 2. Summary of the Descriptive Statistics of Sleep habits of respondents

Variables	Frequency (n = 221)	Percentage (%)
Bedtime		
7 pm-9 pm	2	0.9
9 pm-11 pm	60	27.1
11 pm-1 am	125	56.6
After 1 am	34	15.4
Wake up time		
3 am-4 am	30	13.6

4 am-5 am	41	18.6
5 am-6 am	65	29.4
6 am-7 am	73	33.0
After 7 am	12	5.4
Coffee use at night		
Never	199	90.1
1 - 2 per week	9	4.1
3 - 4 per week	11	5.0
Almost nightly	2	0.9
Use of sleeping pills		
Never	215	97.3
1 - 2 per week	5	2.3
Almost nightly	1	0.5

Sleep quality and latency

Regarding sleep quality, as subjectively reported by participants, 13 (5.9 %) of respondents reported poor sleep quality, and 37 (16.7 %) reported their sleep quality to be bad. On the other hand, 32 (14.5 %) reported having an excellent sleep, and 139 (62.9 %) had satisfactory sleep, indicating a satisfactory sleep quality among respondents.

Time taken for students to fall asleep (sleep latency) showed that 106(48%) students had a sleep latency of < 15 minutes; 16-30 minutes reported by 84(38 %); 31-60 minutes by 22 (10 %); and 9 (4.1 %) reported having sleep latency of > 60 minutes.

Table 3. Sleep quality and sleep latency among medical students

Variables	**Frequency**	**Percentage**
Sleep quality		
Very good	32	14.5
Fairly good	139	62.9
Fairly bad	37	16.7
Very bad	13	5.9
Duration of sleep latency (in minutes)		
<15	106	48.0
16-30	84	38.0
31-60	22	10.0
>60	9	4.1

Sleep pattern

The finding in the following table presents the frequency of nocturnal awakenings. This reveals that 64 (29.0 %) never experienced it, 84 (37.1 %) reported experiencing it 1 – 2 times per night, 3-4 times per night was reported in 46 (20.8 %) respondents, and > 5 times per night in 9 (4.1 %). The nightly nocturnal awakenings were reported by 35 (15.8 %) due to noise, and 47 (21.3) indicated that it is due to washroom use.

Poor sleep at night may result in fatigue and sleepiness the next day. In this regard, 155(70.1) participants reported never having morning tiredness, and 45(20.3%) reported having morning tiredness daily. Daytime sleepiness during activities (DS) was reported never to have happened in 105 (47.5), whereas 58 (26.2 %) had it daily.

Forms of sleep disorders among medical students

Sleep disorders come in different forms. In this study, the disorders reported are presented in Table 5 below. The commonest sleep disorder reported is a nightmare (69.23 %). This was followed by narcolepsy (40.72 %), insomnia (23.08 %) and RLS (22.62 %). The other disorders recorded but which had low frequencies include sleepwalking (6.33 %), OSA (11.31 %) and CRDs (19.91 %).

Table 4. Summary of the descriptive statistics of sleep patterns

Variable	Frequency (Percentage)			
	Never	Nightly	1-2 nights/week	3-4 nights/week
Nocturnal Wakening	148 (66.1)	46 (20.8)	20(9.0)	9(4.1)
Cause of Nocturnal wakening				
Noise	135 (61.1)	35(15.8)	41(18.6)	10(4.5)
To use washroom	91 (41.2)	47(21.3)	68 (30.8)	15 (6.8)
	Never	Daily	1-2days/week	3-4days/week
Morning tiredness	155(70.1)	45(20.3)	11 (5.0)	10(4.5)
DS during activities	105 (47.5)	58 (26.2)	36 (16.3)	22(10)

Notes: DS – Daytime Sleepiness

Table 5. Summary of the descriptive statistics of forms of sleep disorders among medical students

Sleep disorders	Cut-off score for risk	Frequency	Percentage (%)
OSA	≥15	25	11.31
Insomnia	≥19	51	23.08
Narcolepsy	≥7	90	40.72
RLS/PLMD	≥7	50	22.62
CRDs	≥8	44	19.91
Sleepwalking	≥7	14	6.33
Nightmare	≥9	153	69.23

Notes: RLS – Restless Leg Syndrome, PLMD – Periodic Limb Movement Disorder, CRDs – Circadian Rhythm Disorders

In summary, the study revealed that most medical students sleep after 11 pm and wake up after 6 am with an average of 5hrs of sleep each night, and they do not induce their sleep with any pills. Additionally, their sleep quality is fairly good, with a latency of fewer than 15 minutes, with little nocturnal wakening and, if any at all, due mostly to washroom use at night. Finally, the majority experience daytime sleepiness and a substantial number (though less than half of them) experience morning tiredness. Medical students' top 5 sleep disorders are a nightmare, narcolepsy, insomnia, restless leg syndrome/periodic leg movement disorder and circadian rhythm disorders.

4. Discussion

Disturbance in sleep affects general life functioning, which is a good reason to explore and understand the situation among different segments of every population. The current population studied reported an average of 5 hours of sleep. Many of these students slept after 11 pm, resulting in tiredness and sleepiness during the day. This can affect their activities, such as attending lectures and undertaking personal studies. It may also result in emotions such as anger (Randler, Vollmer, 2013; Saghir et al., 2018), depression, and anxiety (Bauducco et al., 2016). Short and Louca (2015) indicated that even one night of sleep challenges results in changes in functioning. This points to the fact that many medical students may experience or exhibit poor interpersonal relationships towards and from their colleagues and other students. Unaddressed will affect their future working relations with other professionals and clients.

Medical students have a huge academic task that drains their energy each day. This can explain their short sleep latency since they will go to bed tired. Also, daytime sleepiness and morning tiredness could all feed into the latency period at night. It is worth noting that these experiences (huge academic tasks, daytime sleepiness, and morning tiredness) are significant factors in the academic journey of the medical student as these will derail their energy, attention, and effort during the day, leading to burnout and other significant mental health challenges

(Amaral et al., 2021). In effect, the medical student must pay close attention to these factors and employ strategies to manage them properly.

Very few of the students reported having excellent sleep. The majority reported having fairly good sleep, with some reporting bad sleep experiences. This notwithstanding, a significant number of students experience some sleep disorders. Notable among them are a nightmare, narcolepsy, insomnia, restless leg syndrome/periodic leg movement disorder, and circadian rhythm disorders, the top five. This is a confirmation of other studies that students generally experience sleep disorders (Gaultney, 2010), and this tends to be worse among medical students (Yassin et al., 2020). Sleep disorders are linked to sleep quality and pattern, in which the current population under study reported shorter sleep hours and fairly good sleep quality (Zafar, Ansari, 2020). These are significant issues of concern that school authorities, counsellors, and academic advisors must engage students to deal with (Wong et al., 2005) since they can affect their academic work (Yassin et al., 2020) and mental wellbeing (Guo et al., 2017; Randler, Vollmer, 2013; Saghir et al., 2018).

5. Conclusion

Sleep problems and disturbances exist significantly among medical students. In this new medical school in Ghana, students have reported shorter sleep hours and several sleep disorders. The cliché has been that medical school is demanding, so they are bound to experience sleep challenges. Meanwhile, these challenges are the recipe for doom for the soon-to-be doctors and the patients they will treat. If sleep problems are not good for the general population, then it is even more not for the medical student who will soon be entrusted live.

It is recommended that medical students recognise and devise strategies to manage their academic load and sleep adequately. They must utilise services that enhance their existence in school and provide social support for each other in school. The university system must create an avenue for support for students. Counselling and advisory mechanisms must be strengthened and resourced to cater for student needs.

6. Declaration of Competing Interest

The authors of the manuscript declare that there is no interest in conflict, and all reference materials were dully acknowledged.

7. Funding

None

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