

# Sleep practices among medical students in Pediatrics Department of University of Nigeria Teaching Hospital, Ituku/Ozalla, Enugu, Nigeria

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## Abstract

**Background:** Medical students are a population who are at great risk of having bad sleep practice and hygiene due to demanding clinical and academic activities. Poor sleep practices are a disturbing and destabilizing phenomenon. It affects many people and can affect the quality of work, performance and education of medical students. Determining the sleep practices and behaviors could be useful to establish a systematic mental health curriculum in medical schools.

**Objectives:** The objectives of this study is to describe sleep practices among undergraduate medical students in a Nigerian University.

**Materials and Methods:** Sleep practices were investigated using a convenience sample of medical students from the University of Nigeria Teaching Hospital Ituku Ozalla, Enugu from October 2012 to February 2013.

**Results:** A total number of participants enrolled were 241 consisting of 150 male and 90 female medical students. However, 222 (response rate: 92.1%) completed and returned the questionnaire. The median number of hours of night sleep on a weekday and weekend were 6 and 7 h respectively. There was a significant correlation between the number of hours of sleep and use of caffeine (Spearman  $r = -0.148$ ,  $P < 0.0321$ ). Ninety two (45.3%) had a sleep latency of 10-30 min while 157 (70.7%) woke up 1-2 times/night. Twenty five (11.3%) experience unusual sleep practices such as sleep walking, talking or night terrors.

**Conclusion:** Medical students in our institution have varying degrees of sleeping practice and behavior and this may affect academic performance.

**Key words:** Medical students, pediatrics, sleep practice

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## Introduction

According to Shakespeare: "Sleep is the second servant of nature's glorious feast and the premier banquet of the life meal."<sup>[1]</sup> Sleep is a circadian rhythm and a complex biological pattern.<sup>[1]</sup>

Poor sleep practice and stress due to various life-styles appears to be a great risk factor for physical and mental health status. For instance, low sleep may result in over activity and increase productivity, but in a long run, lack

of sufficient sleep may lead to psychological distress and low productivity.<sup>[2,3]</sup> Study recruiting healthy samples revealed that even low levels of sleepiness and poor sleep quality, sleep disruption and change in regular sleep-wake pattern may cause physical and psychological burden such as impairment in academic performance, decreased work efficiency and learning disability.<sup>[4]</sup>

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It is noted that almost one-third of adults report difficulty in sleep.<sup>[5]</sup> Recently, there has been a growing attention to sleep and sleeplessness-related problems. Epidemiological studies performed in Western Europe, the USA and Japan have reported prevalence of insomnia-related symptoms ranging from 10% to 48%.<sup>[6-8]</sup> The differences in the prevalence of insomnia among the different studies is not only due to cultural differences, but is also attributed to how one defines “insomnia.” Sleep disorders are associated with an increased prevalence of various somatic and/or psychiatric disorders as well as social problems.<sup>[9]</sup>

Some behavioral, physiological and neurocognitive processes do occur during sleep and these processes may be impaired by lack of sleep. Sleep deprivation has various consequences including sleepiness and impairments in neurocognitive and psychomotor performance.<sup>[9]</sup> Recent reviews now clearly identify a growing consensus that unrestricted hours-of-service adversely affect the performance of medical residents.<sup>[10-12]</sup> Numerous studies conducted within the past decade have analyzed the devastating effects of sleep deprivation on medical house staff in various medical as well as surgical specialties for example, Landrigan *et al.* showed a 35.9% reduction in errors by interns by introducing an intervention schedule that eliminated extended work shifts and reduced the number of hours worked per week.<sup>[13]</sup>

Sleep practices among medical students who are experiencing high levels of stress because of the demands of academic performance is an important topic for investigation. However, little research has focused on this group of people. Most studies have focused on young children, older adults or on a certain category of patients. Today’s medical students experience great psychological pressure due to quest to pass exams and avoid withdrawal. Such stress and anxiety can lead to sleep problems. In fact, the quality and quantity of sleep of many students might change after enrollment into medical school.<sup>[14]</sup>

Therefore, poor sleep practice can affect the cognitive and psychomotor performance – the functions, which are vital for medical students who are responsible for life of patients.

No previously published studies have assessed sleep practice among medical students in Nigeria.

## Materials and Methods

### Study area

The study was conducted at the University of Nigeria Teaching Hospital (UNTH) Ituku-Ozalla, Enugu; a tertiary health institution located about 20 km from the city of Enugu in South-Eastern Nigeria. The hospital receives referrals from various health facilities in Enugu State and the neighboring states of Anambra, Ebonyi, Benue, Imo and Abia.

### Study population

This is a prospective study involving students aged 20-26 years who are year 5 (pediatric class) undergraduate medical students of the College of Medicine of the University of Nigeria Enugu Campus and the UNTH, Ituku-Ozalla, Enugu, respectively was conducted. This study was carried out in October 2012 to February 2013 using convenient sampling method.

### Study procedure

A questionnaire with 59 questions divided into 6 sections was developed for this study. The questionnaire was based on diagnostic and statistical manual of mental disorders IV (DSM-IV) criteria and Pittsburgh sleep quality index (PSQI). (See additional materials for the questionnaire).

The version and section of DSM used is DSM-IV section 307.42-307.47 (dyssomnias and parasomnias). The PSQI questionnaire has 19 individual items, which are used to generate seven composite scores. The results give numbers in seven categories: Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction.

However, we modified it by removing the use of sleeping medication, daytime dysfunction and psychopathy. For purposes of this study, Sleep hygiene or good sleeping practices are defined as a variety of different practices that are necessary to have normal, quality night-time sleep and full daytime alertness.<sup>[7]</sup> Sleep habits were defined as that behavior pertaining to time to bed, time to rise, drinking coffee at night, duration of night sleep and consumption of sleeping pills.<sup>[7]</sup>

Confidentiality was assured to all students who were asked to volunteer and none were reimbursed. Students who were willing to participate were given a brief description about the study and its objectives. Verbal consent of the student was necessary for his/her enrollment.

Aim and objectives of this study are to describe sleep practices among undergraduate medical students in a Nigerian University.

### Inclusion criteria

Medical students in pediatrics who gave consent.

### Exclusion criteria

Students who were currently using sedative medications or narcotics for any acute or chronic medical condition were excluded from the study.

### Data analysis

All data were coded, entered and then analyzed using the statistical package for social sciences program, version 16

(Chicago II, USA). Descriptive results were expressed as frequency, percentage and mean  $\pm$  standard deviation.  $P < 0.05$  were accepted as statistically significant. Pearson Chi-square was used to test for significant relationships between categorical variables. Non-parametric Spearman rank order was used to test for correlation between continuous and ordinal variables. A difference in means between groups was carried out using Student's *t*-test.

### Ethical considerations

Ethical clearance for the study was sought from the Ethics and Research Committee of the UNTH.

## Results

### Demography

A total number of participants enrolled were 241 consisting of 150 male and 90 female medical students. However, 222 completed and returned the questionnaire (response rate: 92.1%). The mean age of the medical students was  $28.5 \pm 5.3$  years.

### Sleeping practice

212/222 (95.5%) responded to the question on "time to go to bed on weekdays." 79/212 (37.3%) of them went to bed before 10 pm, 59/212 (27.8%) went to bed between 10 pm and midnight while 74/212 (34.9%) went to bed after midnight. 10/222 (4.5%) did not give a specific time they go to bed on weekdays. On weekends, 76 of 209 (36.4%) that responded to question on "time to go to bed on weekends" went to bed before 10 pm, 61/209 (29.2%) went to bed between 10 pm and midnight while 72/209 (34.4%) went to bed after midnight. 13/222 (5.9%) did not have any specific time they go to bed on weekends. Median time to go to bed was 11 pm both on weekdays and weekend. 113/213 (53.1%) of the respondents to the question on "time to wake up on weekdays" reported waking up before 6 am, 98/213 (46%) work up between 6 am and 8 am, and finally, only 2 (0.9%) woke up after 8 am. On weekends, 73 of 211 (34.6%) woke up between 6 am and 8 am while 14/211 woke up after 8 am. Median time for waking up on weekdays and weekends were 5.30 am and 6 am respectively and the difference was statistically significant ( $P < 0.0001$ , Mann-Whitney U test, 2 tailed). The remaining 11/222 (5%) did respond to the question. The median number of hours of night sleep on a weekday and weekend were 6 and 7 h respectively ( $P < 0.0002$ , Mann-Whitney U test, two tailed). There was a significant correlation between the number of hours of sleep and use of caffeine (Spearman  $r = -0.148$ ,  $P < 0.0321$ ), but not with the use of alcohol.

The results on whether one has ever dosed off while driving or had an accident as a result of sleepiness showed that 6 (2.7%) and 8 (3.6%) of the students respectively had such experiences.

### Sleeping problems

With respect to the question on how long it takes a student to fall asleep after going to bed (sleep latency), result showed that 49 out of 203 (24.1%) that responded had sleep latency of  $< 10$  min, 92 (45.3%) had a sleep latency of 10-30 min while 19 (9.4%) and 9 (4.4%) had sleep latency of 30-60 min and  $> 60$  min respectively. The question on how many times on average a student wakes up during the night showed that 31/222 (14%) never woke up at night, 157 (70.7%) woke up 1-2 times/night, 27 (12.3%), 3 (1.4%) and 4 (1.8%) woke 3-4, 5-6 and more than 6 times/night respectively. 209/222 (94.1%) responded to the question on snoring. 77 (37%) reported snoring at night of which 3 (1.4%) reported it as often and 1 (0.5%) reported it to be every night. 13/222 did not respond to the question on snoring at night. There was no correlation between sleep latency and snoring at night.

### Paranosmia

Results on the question about unusual sleep behaviors showed that 25/222 (11.3%) experience unusual sleep behaviors such as sleep walking, talking or night terrors. Spearman correlation test showed a significant correlation between sleep latency and unusual sleep behaviors ( $r = 0.15$ ,  $P < 0.039$ , confidence interval = 95%). Result of some abnormal sleep experiences [Tables 1-3] showed that more than 40% of the students did often experience chest discomfort, feeling of panic and low motivation on waking up from sleep and more than 60% did sometimes experience low energy and tiredness or feeling of depression after waking up and over 70% woke up more than once at night.

## Discussion

From our study, we noted that one third of medical students go to bed after midnight on weekdays and more

**Table 1: Prevalence of some sleep experiences/practices of the students**

Sleep experiences/practices	Rarely N (%)	Sometimes N (%)	Often N (%)	Unsure or no response N (%)
Act out dreams	113 (50.9)	97 (43.7)	9 (4.1)	3 (1.4)
Palpitations	105 (47.3)	107 (48.2)	3 (1.4)	7 (3.2)
Chest discomfort	114 (51.4)	14 (6.3)	90 (40.5)	4 (1.8)
Libido/erectile problems	106 (47.7)	14 (6.3)	3 (1.4)	88 (39.6)
Feeling of panic	98 (44.1)	27 (12.2)	94 (42.3)	3 (1.4)
Unable to relax	100 (45.0)	117 (52.7)	4 (1.8)	1 (0.5)
Anxiety	92 (41.4)	49 (22.1)	80 (36.0)	1 (0.5)
Poor concentration	151 (68.0)	65 (29.3)	6 (2.7)	0 (0.0)
Feel depressed	81 (36.5)	135 (60.8)	5 (2.3)	1 (0.5)
Change in appetite	164 (73.9)	53 (23.9)	4 (1.8)	1 (0.5)
Low motivation	83 (37.4)	45 (20.3)	93 (41.9)	1 (0.5)
Tired	59 (26.6)	149 (67.1)	13 (5.9)	1 (0.5)
Loss of interest in doing things	160 (72.1)	56 (25.2)	5 (2.3)	1 (0.5)

**Table 2: Frequency of sleep problems among the students**

Sleep problem	Never N (%)	Occasionally N (%)	Sometimes N (%)	Often N (%)	Almost always N (%)	Unsure or no response N (%)
Snoring	132 (59.5)	59 (26.6)	14 (6.3)	3 (1.4)	1 (0.5)	13 (5.9)
Choking	178 (80.2)	19 (8.6)	1 (0.5)	1 (0.5)	21 (9.5)	2 (1.0)
Stop breathing	192 (86.5)	7 (3.2)	4 (1.8)	0 (0.0)	0 (0.0)	19 (8.6)
Difficulty falling asleep	70 (31.5)	81 (36.5)	47 (21.2)	6 (2.7)	1 (0.5)	17 (7.7)
Awakening	62 (27.9)	77 (34.7)	46 (20.7)	15 (6.8)	6 (2.7)	16 (7.2)
Unrefreshed	64 (28.8)	78 (35.1)	60 (27.0)	7 (3.2)	1 (0.5)	12 (5.4)
Restless sleep	97 (43.7)	80 (36.0)	24 (10.8)	2 (0.9)	0 (0.0)	19 (8.6)
Morning headaches	97 (43.7)	81 (36.5)	24 (10.8)	3 (1.4)	2 (0.9)	15 (6.8)
Jerky legs	161 (72.5)	34 (15.3)	6 (2.7)	1 (0.5)	1 (0.5)	19 (8.6)
Uncomfortable sensation in the legs	130 (58.6)	53 (23.9)	15 (6.8)	4 (1.8)	0 (0.0)	20 (9.1)
Muscle weakness in response to strong emotions	164 (73.9)	1 (0.50)	28 (12.6)	5 (2.3)	3 (1.4)	20 (9.0)

**Table 3: Likelihood of falling asleep in some usual ways of life among the students**

Sleepiness	Never N (%)	Slight chance N (%)	Moderate chance N (%)	High chance N (%)	Unsure or no response N (%)
Sitting and reading	24 (10.8)	101 (45.5)	58 (26.1)	35 (15.8)	4 (1.8)
Watching TV	41 (18.5)	105 (47.3)	52 (23.4)	17 (7.7)	7 (3.2)
Sitting quietly in public	76 (34.2)	91 (41.0)	32 (14.4)	16 (7.2)	7 (3.2)
Passenger in a car for an hour	62 (27.9)	76 (34.2)	48 (21.6)	32 (14.4)	4 (1.8)
Lying down for a rest in the afternoon	15 (6.8)	62 (27.9)	69 (31.1)	68 (30.6)	8 (3.7)
Sitting and talking to someone	152 (68.5)	40 (18.0)	13 (5.9)	11 (5.0)	6 (2.7)
Sitting quietly after lunch	49 (22.1)	80 (36.0)	65 (29.3)	28 (12.6)	0 (0.0)
In a car stopped for a few minutes in traffic	145 (65.3)	45 (20.3)	12 (5.4)	20 (9.0)	0 (0.0)
Driving	177 (79.9)	16 (7.2)	3 (1.4)	26 (11.7)	0 (0.0)

than half reported waking up before 6 am. The reason adduced to this is anxiety, which stems from the use of caffeine. This stimulant is believed to keep the medical student awake to enable him cover whole lots of the syllabus before exams. These findings are in tandem with that in some studies where bedtime is often close to midnight.<sup>[15,16]</sup> The average sleep duration on weekdays in this study was 6 h. This is comparable with results obtained among college students in Nigeria who reported average sleep duration of 6.2 h.<sup>[17]</sup> The Nigeria study and ours are at variance with that seen among Korean College students and that of Tsui and Wing where average sleep durations were found to be  $6.7 \pm 1.3$  and 6.9 h respectively.<sup>[18,19]</sup> The reason for this could be due to differences in geographical locations and ethno cultural differences.<sup>[20]</sup> Bed and wake times among medical students on weekend varied significantly from that of weekdays. The reason why students sleep longer and wake later on weekends could be due to the busy lecture schedules and ward rounds that clad the weekdays.

It took about 45% of our medical students 10-30 min to sleep after going to bed (sleep latency) and over 70% woke up more than once at night. Bonnet and Arand<sup>[21]</sup> noted a normal

sleep latency of 8.2 min in their study among university students. This abnormal sleeping practice may be due to use of stimulants, poor feeding habit and fear of not covering the day's work especially during exams. Forquer *et al.*<sup>[22]</sup> noted more than 33% of the students taking longer than 30 min to fall asleep and 43% waking more than once nightly. The figure obtained from our study differs from that of Forquer because he used mainly non-medical students in his target population.

We noted with interest that 37% of respondents reported snoring at night. However, this snoring is not associated with sleep latency. Nakano *et al.*<sup>[23]</sup> noted that snoring intensity may be related to sleepiness, but this occurs in the presence of obstructive sleep apnea. However, he pointed out that snoring intensity and sleepiness were not correlated in normal individuals. This supports our study where snoring is unrelated to sleepiness.

From this present study, we noted that 11.1% of the population of our medical students had unusual sleep practice such as sleep walking, talking or night terrors. This prevalence is similar to that obtained in other studies.<sup>[24,25]</sup> These abnormal sleep behaviors consist of arousals from deep non-rapid eye movement sleep and are characterized

by intense behavioral manifestations of fear and autonomic hyperactivity.<sup>[25]</sup> The main reason why some of our medical students had these problems could be due to sleep deprivation from the use of caffeine as mentioned above.

It is important to note here that more than 40% of the students did often experience chest discomfort, feeling of panic and low motivation on waking up from sleep and more than 60% did sometimes experience low energy and tiredness or feeling of depression after waking up. These abnormal sleep experiences usually arise from inadequate sleeping durations. This was corroborated in a study where it was noted that as many as 90% of patients with depression will have sleep quality complaints.<sup>[26]</sup> It was also highlighted that about two-thirds of patients undergoing depressive episodes or sleeping problems will have sleep latency.<sup>[27]</sup>

We noted that the majority of our medical students with sleep problems live in the hostels. It is possible that the noisy conditions and harsh living conditions in the hostels could contribute to this. This finding is in tandem with other studies.<sup>[27,28]</sup>

There is high failure rate of our medical students in pediatrics despite good lectures and ward rounds. It is an ominous sign militating the whole system of medical education and the health infrastructure in the country. One may say that this poor academic performance may be related to poor sleep quality. However, this needs to be investigated.

## Conclusion

Medical students in our institution have varying degree of sleeping practice and this may affect academic performance. It is advisable therefore to include sleep hygiene in the curriculum of medical students.

## Limitations

We did not do sleep studies like polysomnogram, maintenance of wakefulness test due to lack of facility.

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