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Assessment of Sleep Quality and Duration of Medical Students in Enugu State College of Medicine

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ABSTRACT

Sleep is a physiological behaviour that occurs in all animal species forming about one - third of human life and is essential for survival. Prolonged sleep deprivation leads to severe physical impairment usually accompanied by cognitive loss and can even lead to death. Sleep is a naturally recurring state of mind and body, characterized by relatively inhibited sensory activity and reduced interactions with surroundings, altered consciousness, reduced muscle activity and inhibition of nearly all voluntary eye muscles. Therefore, this study is aimed at investigating the impact of various sleep duration among students and the effect on their academic performance. Using a simple random method of sampling, questionnaires were physically distributed among medicine and surgery students of ESUT College of medicine and 265 students participated. Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) version 23 (SPSS Inc., Chicago, IL) with a value of <0.05 considered significant. From the analysis of the data retrieved from the questionnaire, it was observed that during a regular school week, majority of students (27.5%) obtained 6 hours of sleep, while the night prior to an examination, of students (27.9%) obtained 4 hours of sleep. Also, 68.7% of students believe that insufficient sleep has a negative impact on memory consolidation, while 31.3% believes otherwise. In conclusion from the results, the study suggests that students should be educated regarding good sleep hygiene practices as this has a positive effect on their academic performance.

Keywords: Sleep Quality, Duration and Medical Students

INTRODUCTION

Sleep is an essential tactics for normal functioning in all animal species and forms about one – third of human life. Lack of sleep has some drastic health outcome like severe physical impairment, cognitive loss and at are very severe case death. Sleep is a natural recurring state of mind and body, characterized by relatively inhibited sensory activity and reduced interactions with surroundings, altered consciousness, reduced muscle activity and inhibition of nearly all voluntary eye muscles. [1], [2] It is very vital for health and wellbeing [3] and is defined by the medical dictionary as a period of rest for the body and mind during which volition and consciousness are in partial or complete abeyance and the bodily functions partially suspended [4]. Coma and other disorders of consciousness like sleep shows a reduced response to stimuli but are quite different from sleep as sleep is characterized by displaying a different active brain patterns and is believed to play an important role in memory consolidation [5]. Sleep onset latency (SOL) is the length of time that it takes to accomplish the transition from full wakefulness to sleep, normally to the lightest of the non-rapid eye movement (REM) sleep stages [6]. The Pittsburgh Sleep Quality Index (PSQI) and The Epworth Sleepiness Scale (ESS) are self-report questionnaires which has been developed to asses sleep quality. The Pittsburgh Sleep Quality Index (PSQI) assesses sleep quality over a month time interval. The PSQI measures 19 different aspects of sleep, offering seven components' scores and one composite score, and takes 5–10 minutes to complete [7]. The component scores consist of subjective sleep quality, sleep latency (i.e., how long it takes to fall asleep), sleep duration, habitual sleep efficiency (i.e., the percentage of time in bed that one is asleep), sleep disturbances, use of sleeping medication, and daytime dysfunction. It was developed by researchers at the University of Pittsburgh [2], the PSQI is intended to be a standardized sleep questionnaire for clinicians and researchers to use with ease and is used for multiple populations. The Epworth Sleepiness Scale (ESS) in the other hand is a scale which intends to measure daytime sleepiness using a very short questionnaire which can help diagnose sleep disorders. It was introduced in 1991 by Dr. Murray Johns of Epworth Hospital in Melbourne, Australia [8]. The activities included in the questionnaire are: sitting and reading, watching TV, sitting inactive in a public place, such as a meeting or theatre, riding as a passenger in a car for an

hour without a break, lying down to rest in the afternoon when circumstances permit, sitting and talking to someone, sitting quietly after a lunch without alcohol, sitting in a car, stopped for a few minutes in traffic. You're asked to rate your usual chances of having dozed off or fallen asleep while engaged in these different activities on a scale of 0 to 3. The Epworth Sleepiness Scale has been validated primarily in obstructive sleep apnea, though it has also shown success in detecting narcolepsy and idiopathic hypersomnia [8]. It is used to measure excessive daytime sleepiness and is repeated after the administration of treatment to document the improvement of symptoms [9]. In narcolepsy, the Epworth Sleepiness Scale has both a high specificity (100%) and sensitivity (93.5%) [6]. The Epworth Sleepiness Scale has been used to compare the sensitivity and specificity of other similar measurements of sleep quality [10]. Lack of sleep has been linked to poor attention and cognition, [11] and according to [5], in his studies documented that a well-controlled sleep deprivation studies have shown that lack of sleep not only increases fatigue and sleepiness but also worsens cognitive performance [12]. Although the exact mechanism behind the relationship between sleep, memory, and neuroplasticity are still unknown [13]. The general understanding is that specific synaptic connection that were active during the awake periods are strengthened during sleep allowing for the consolidation of memory and synaptic connection that were inactive are awakened [14]. This is because during sleep, most of the body's systems are in an anabolic state, helping to restore the immune, nervous, skeletal, and muscular systems [15], these are vital processes that maintain mood, memory, and cognitive function, and play a large role in the function of the endocrine and immune systems. Thus, sleep provides an essential function for memory consolidation which in turn is critical for successful academic performance [16]. Each age bracket has an outlined number of sleep designated to them, Newborns (0–3 months) should at least get 14 to 17 hours, the Infants (4–11 months) should have 12 to 15 hours, the toddlers (1–2 years) should get 11 to 14 hours, the Preschoolers (3–4 years) should get 10 to 13 hours, the School-age children (5–12 years) should get 9 to 11 hours, teenagers (13–17 years) should get 8 to 10 hours, Adults (18–64 years) should get 7 to 9 hours, while the senior citizens (65 years and over) should get 7 to 8 hours. Aside reading and participating in classes, factors like change in sleeping conditions, academic stress, sacrificing sleep to participate in social commitments, mood, immune system function, and even substance abuse also affects an average university student's sleep life [17], [18]. Medical students have been reported by [6] to have significantly the worse quality of sleep, including inconsistent sleep schedules and sleep deprivation which makes them suffer from a greater amount of daytime sleepiness than the general population [19]. Even at that there are some reservations about self-reported sleep duration according to [3] who suggested that such report is only moderately correlated with actual sleep time as measured by actigraphy and those affected with sleep state misperception may typically report having slept only four hours despite having slept a full eight hours [20]. Sleep problems have been associated with deficits in attention and academic performance, drowsy driving, risk-taking behavior and depression, impaired social relationships, and poorer health [5], [21] [22] [23] [24] [25], [26] Sleep is believed to have a facilitated role in the learning and memory process. Given that sleep affects cognitive functioning, sleep quality should be a major concern for medical students whose academic performance is of great importance. Students needs between seven and a half to eight hours of sleep to function at their best and this is why medical students should be informed of the importance of healthy sleep patterns as this may be able to improve their GPA. This study is aimed at investigating the impact of various sleep duration among medicine and surgery students and the effect on their academic performance.

MATERIALS AND METHOD

This study was conducted in Enugu State University College of Medicine. The participants included male and female medicine and surgery students who are preparing for or have taken at least one of the professional (MBBS) examination. A simple random sample of 265 students were surveyed and the questionnaires were physically distributed and collected. The items within the questionnaire sought to obtain data on the sleep duration amongst medical students and the effect on their academic performance. Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) version 23 (SPSS Inc., Chicago, IL) with a value of <0.05 considered significant.

RESULTS

This shows the demographics of participants. Most of the participants (46.8%) were in the current class at 400 level, (24.2%) were 500 level, (14.0%) were 600 level, (10.9%) were 300 level and (4.2%) were 200 level. Most of the participants (51.3%) aged 20 – 23 years, (37.0%) were 24 -27 years, (6.8%) were 16 – 19 years and (4.9%) were 28 – 31 years. About (53.6%) of the participants are female and (46.4%) are male. See table below.

Table 1: Demographic Characteristics

Variable	Frequency (n=265)	Percent (%=100)
Current Class		
200 Level	11	4.2
300 Level	29	10.9
400 Level	124	46.8
500 Level	64	24.2
600 Level	37	14.0
Age (Years)		
16 – 19	18	6.8
20 – 23	136	51.3
24 – 27	98	37.0
28 – 31	13	4.9
Gender		
Male	123	46.4
Female	142	53.6

Table 2 indicated the sleep duration and timing among students of Medicine and Surgery Department. Most of the participants (27.5%) typically obtain 6 hours sleep at night, while (24.2%) obtain 5 hours sleep at night, (17.7%) obtain 7 hours sleep at night and only (0.4%) obtain 2 hours sleep at night. However, majority of the participants (27.5%) typically obtain 4 hours sleep during the night before MBBS exams while (24.9%) obtain 3 hours sleep during the night before MBBS exams and only (1.9%) obtain less than or equal to 1-hour sleep during the night before MBBS exams. See table below;

Table 2: To describe the sleep duration and timing among students of Medicine and Surgery Department

Variable	Frequency (n=265)	Percent (%=100)
How many hours of sleep do you typically obtain at night?		
≤ 1	2	0.8
2	1	0.4
3	6	2.3
4	23	8.7
5	64	24.2
6	73	27.5
7	47	17.7
8	40	15.1
9	5	1.9
10	4	1.5
During the night before MBBS exams, how many hours of sleep have you typically obtain?		
3	66	24.9
4	74	27.9
5	53	20.0
6	26	9.8
7	3	1.1
8	2	0.8
≥ 9	2	0.8

The effect of insufficient sleep on memory consolidation among students of Medicine and Surgery Department was observed in 68.7% of the participants. See table below.

Table 3: To identify the effect of insufficient sleep on memory consolidation among students of Medicine and Surgery Department

Variable	Frequency (n=265)	Percent (100)
Yes	182	68.7
No	83	31.3

As shown in table 4, (10.6%) of the participants do take substance to induce sleep while (28.3%) do take substance to prevent sleep. Also, most of the participants (41.5%) occasionally experience daytime sleepiness and (35.1%) rarely experience daytime sleepiness whereby only (4.2%) always experience daytime sleepiness. On the other hand, more than half of the participants (55.8%) never believe that daytime sleepiness affect their academic performance, (23.0%) believe that daily daytime sleepiness affect their academic performance, (12.8%) believe that weekly daytime sleepiness affect their academic performance and (8.3%) believe that monthly daytime sleepiness affect their academic performance. Also, during the period of their MBBS exams, (48.7%) sometimes take nap during the daytime, (18.5%) often take nap during the daytime, (15.8%) always take nap during the daytime and (17.0%) never take nap during the daytime.

Table 4: To identify the factors affecting the sleep patterns and sleep quality of the students

Variable	Frequency (n=265)	Percent (%=100)
Do you take any substance to induce sleep?		
Yes	28	10.6
No	237	89.4
Do you take any substance to prevent sleep?		
Yes	75	28.3
No	190	71.7
How often do you experience daytime sleepiness?		
Never Rarely	16	6.0
Occasionally	93	35.1
Frequently	110	41.5
Always	35	13.2
How often do you believe your daytime sleepiness affect your academic performance?		
Never	11	4.2
Daily	148	55.8
Weekly	61	23.0
Monthly	34	12.8
During the period of your MBBS exams do you take a nap during the daytime?		
Never	22	8.3
Yes	45	17.0

DISCUSSION

It has been a documented fact that sleep is essential for survival because of the associated health outcomes, yet, we can't outrightly say that the effect it has is generally based. This is because the severity of the effect of insufficient sleep is individually based; affecting some people less than the others⁵. Looking at the data gotten it is shown that the questionnaires were handed out to those who had an experience in the MBBS examinations, some of which have taken the examinations as second and third attempts. Majority of the participants obtain a moderate amount of sleep in a typical school week but during the period of exams there is a fall in sleep duration which might be one of the many reasons for increased MBBS exam failure in colleges. According to [9], specific synaptic connection that were active during awake periods are strengthened during sleep allowing for the consolidation of memory [14]. This simply proves that insufficient sleep can lead to memory disarray. From the results also in table 2, it was observed that on a typical school week, majority of students (27.5%) obtained 6 hours of sleep at night, while 24.2% obtained 5 hours, 17.7% obtained 7 hours of sleep, 15.1% obtained 8 hours of sleep and only 0.4% obtained 2 hours of sleep. While on the night prior to examination majority of the students 27.9% obtained 4 hours of sleep at night, 24.9% obtained 3 hours while 1.9% obtained less than 1 hour of sleep at night. This study correlates with [7], in their work on 364 student pharmacists who reported that more than half of the pharmacist students obtained less than 7 hours of sleep at night during a normal school week (54.7%) and below 7 hours on the night prior to an examination (81.7%) [26]. Table 3 showed that majority of the students (68.7%) believed that insufficient sleep distorts memory consolidation and other associated health issues like fatigue, irritation and lack of concentration, while (31.3%) of students believes that lesser hours of sleep has no effect on them. This correlates with the study of [4], who stated that quality sleep is correlated with healthy emotional regulation and [8], who reported that poor sleep is associated with a lack of concentration and inability to function during the day that affects academic performance [27], [28]. Table 4 shows that most of the participants experience occasional daytime sleepiness (41.5%) but majority of them (55.8%) do not believe that daytime sleepiness affects their academic performance. The day time sleepiness is in line with the findings of [13], which recorded it as one of the effects of insufficient sleep [29]. It was also observed in our study that some students make use of stimulants during normal school week but a greater number of them (89.4%) don't while some only use it during exam period. This is also in line with the findings of [19].

CONCLUSION

Medical students should understand that sleep is important in their journey as students. They should be educated regarding good sleep hygiene practices for better academic achievement, they should also learn to make out time to study before the period of exam to avoid compilation of workload.

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