Original Research Article

SELF-REPORTED SLEEP DISORDERS AND ASSOCIATED FACTORS AMONG UNDERGRADUATE STUDENTS IN A NIGERIAN TERTIARY INSTITUTION

ABSTRACT

Aim: The quality and quantity of sleep is strongly related to physiological and physical health and other measures of wellbeing. Undergraduates are particularly susceptible to increasing academic and social demands that can result in sleep disorders. This study aims to determine the prevalence and distribution of self-reported sleep disorders among undergraduates and the association between certain academic and non-academic related factors and quality of sleep.

Study design: Cross-sectional study

Place and duration: Obafemi Awolowo University Ile-Ife between January 2020 and January 2021

Methodology: A cross sectional study among three hundred and twenty-seven undergraduates of the college of health sciences, faculty of law and faculty of art who registered for the 2018/2019 academic session**.** A self-administered questionnaire was used to obtain sociodemographic and academic information (including number of courses per semester, Cumulative grade point average (CGPA) and carried over courses). Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep quality.

Results: The mean age of participants was 22 years. The prevalence of self - reported sleep disorder among the participants was 35.8%. Female students (66.3%) had better sleep quality when compared with their male counterparts (61.7%). Bivariate analysis shows a statistically significant association between the course of study and the quality of sleep (p=0.003). Total average sleep hour per day (p=0.002) and possible known factors affecting

bedtime or sleep pattern (p=0.01) showed statistically significant association with sleep quality.

Conclusion: There is a high prevalence of self-reported sleep disorders among the undergraduate population in which this study was conducted. The course being studied is associated with the quality of sleep.

Keywords: Sleep disorders, Undergraduates, academic performance.

INTRODUCTION

The rising proportions of young adults and adolescents with sleep disturbances calls for urgent attention. The reported negative effect which produce the grim picture among the active group of the population are impaired overall well-being, mood and academic performance[1]. According to National Sleep foundation (NSF), sleep is as essential as diet and exercise. Its quality is strongly related to physiological and physical health and other measures of wellbeing[2]. Sleep can be defined as a natural reversible periodic state of rest for the mind and body, in which the eyes are usually closed and consciousness is completely or partially lost so that there is a decrease in bodily movement and responsiveness to external stimuli[3].The quality of sleep is measured along quantitative and qualitative dimensions. The quantitative component includes the duration of 7-9 hours considered appropriate for young adults and adults by the national sleep foundation, while the qualitative component is a subjective measure of the depth and feeling of restfulness upon awakening[4]. On the other hand, sleep disorder is defined as irregular sleep with abnormal quality and quantity leading to daily activity dysfunction.[5] Sleep disorder can also be described as early or late insomnia, extreme sleepiness, sleep and waking schedule problems and parasomnia[5].

A larger percentage of the population, and in particular university students are unaware of sleep hygiene practices and hence do not have a better quality of sleep [2]. Researchers have

identified undergraduates as particularly susceptible to increasing academic and social demands in terms of late night internet surfing, night parties and others that can cause sleep disorders[6]. This can be attributed to reduced adult supervision in universities , new social opportunities and commitments, academic challenges and other extra-curricular activities resulting in irregular sleep schedule and higher risk of sleep deprivation[7].

In a study done in a Nigerian university, it was observed that one out of every two students (49.5%), had poor sleep quality[8]. Studies from other countries reported a prevalence of between 13.5%-86.4% among Iranian students and 19.2%-57.5% among students in some other countries[9]. In a global literature review of the medical students' sleep experience, it was found out that poor sleep is not only common among medical students, but its prevalence is also higher than in non-medical students and the general population[10]. The most commonly reported sleep related complaints among students are difficulty falling asleep, difficulty maintaining sleep, early morning awakenings, poor sleep quality, early morning fatigue/sleepiness, and daytime napping[11].

Numerous factors have been documented in research articles to be responsible for sleep disorders among students; sleep problems are associated with both intrinsic and environmental factors. Stressful events such as examinations and relationships have also been found to be factors[10]. Other factors identified in some groups of students are longer study times, studying just prior to sleep and associated anxiety about studies and results. It was also observed that these behaviors were not as successfully balanced with leisure time[10].

The effects of sleep disorder are a major health concern due to the rising proportions of young adult and adolescents with sleep disorder and hence should be closely studied and examined across categories of students. This study was designed to contribute to the body of knowledge on the prevalence of self-reported sleep disorder among undergraduate students.

In addition, this study aims to determine the relationship between certain academic and non-academic related factors and quality of sleep. Findings from this study could highlight the burden of sleep disorders among students of Obafemi Awolowo University and, by extension, interventions like sleep education and sleep medicine can be advocated to improve the overall well-being of students.

METHODOLOGY

Study Design

A cross sectional descriptive study conducted among selected undergraduate students of Obafemi Awolowo University, Ile – Ife.

Study Population/participants

The study population were undergraduate students of the College of Health Sciences, Faculty of Law and Faculty of Art (Department of English) who registered for the 2018/2019 academic session.

Ethical consideration

The study protocol was approved by Health Research Ethics Committee, Institute of Public Health, Obafemi Awolowo University, Ile-Ife.

Sample Size Determination

The sample size was estimated using the Kish formula as follows, (this was derived from a previous study as the best estimate of poor sleep quality among medical students at a Nigerian University

$n= z^2 p (1 - p) \div d^2$,

Where,

n = required sample size,

z = confidence level at 95% (standard value of 1.96)

p = estimated prevalence rate (Using 32.5% from a previous study as the best estimate of poor sleep quality among medical students at a Nigerian University)

d = margin of error at 5% (standard value of 0.05)

$n = (1.96)^2 \times 0.325\ (1 - 0.325) \div 0.05^2$

n = 337

Data Collection

Data was collected through an electronic questionnaire. The questionnaire was designed using Google Forms and was typed in English language. It was organized into sections with questions enquiring about age, sex, ethnicity, academic level, total sleep time per 24 hours, naps during day, total study hours per day, any medical conditions, and possible factors affecting bedtime or sleep pattern. The class list and the phone numbers of students were collected from their class representatives via e-mail. The questionnaire was sent to each of the students through WhatsApp.

The Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality over one month[4]. Global PSQI score grade greater than or equal to 5 was adjudged as poor sleep quality. Academic performance was assessed by asking participants about their Cumulative Grade Point Average (CGPA). Participants provided their CGPA for the last semester prior to the study period.

Statistical Analysis

Data analysis was carried out using IBM Statistical Package of Social Sciences (SPSS) Version 26. The data for the study were summarized using appropriate descriptive and inferential statistical techniques. Descriptive statistical tool of frequency, counts and percentages were used to report the sociodemographic characteristics of the respondents as well as in describing the distribution of the key variables of the study. Inferential analysis was done using Chi-square test of association to assess the relationship between respondents' characteristics and their sleep quality. A *p*-value of <0.05 was considered statistically significant.

RESULTS

Table I shows the sociodemographic characteristics of the respondents. A total of 337 aged 18 – 30 were recruited in this study, 327 responded and 10 dropped out. A total of 327 students with age range 18 – 30 years participated in this study. Majority of the respondents were between 20 – 24 years (66.7%). The female respondents were178 (54.4%) while 149(45.6%) were male.

TABLE I: SOCIODEMOGRAPHICS CHARACTERITICS OF RESPONDENTS

VARIABLES		Frequency (N)	Percentage (%)
Age (years)	< 20	64	19.6
	20 – 24	218	66.7
	< 25	45	13.8

Sex	Female	178	54.4
	Male	149	45.6
Marital Status	Married	3	0.9
	Single	324	99.1

Forty-four (13.5%) respondents were in Dental students, 79(24.2%) were studying English Language, 63(19.3%) Law, while 134 (41.0%) were medical students. Concerning the year of study, 6(1.8%) were in their first year, 46(14.1%) were in second year, 56(17.1%) were in their third year, 84(25.7%) in fourth year, 74(22.6%) in fifth year and 61(18.7%) were in the sixth year. For non – medical students, 37(11.3%) of the respondent have first class, 91(27.8%) have second class upper, 29(8.9%) have second class lower, 4(1.2%) have third class, and 3(9%) have pass grades. For medical students, 129(39.4%) have pass, 17(5.2%) have distinctions while 17(5.2%) declined to indicate. Twenty-four (7.3%) respondents were carrying over course(s). (Table II)

TABLE II: ACADEMIC INFORMATION OF RESPONDENTS

ACADEMIC INFORMATION	**VARIABLES**	**Frequency (N)**	**Percentage (%)**
Course of Study	Dentistry	44	13.5
	English Language	79	24.2
	Law	63	19.3
	Medicine and Surgery	134	41.0
	Not indicated	7	2.1
Year of Study	Fifth year	74	22.6

	First year	6	1.8
	Fourth year	84	25.7
	Second year	46	14.1
	Sixth year	61	18.7
	Third year	56	17.1
CGPA as at last Semester	Pass (≤1.49)	3	0.9
	Third Class (1.50 - 2.49)	4	1.2
	Second Class Lower (2.50 - 3.49)	29	8.9
	Second Class Upper (3.50 - 4.49)	91	27.8
	First Class (4.50+)	37	11.3
	Pass (Medical School)	129	39.4
	Distinction (Med)	17	5.2
	Declined to indicate	17	5.2
Are you carrying over any course?	No	303	92.7
	Yes	24	7.3

Two hundred and forty-eight (75.8%) were not involved in part time jobs. About half of the respondents 148(45.3%) have between 4.1 – 8.0 hours of sleep every day. Most of the respondents, 291(89.0%) read between 4.0 – 8.0 hours every day. (Table III)

TABLE III: SLEEP QUALITY RELATED FACTORS

INDICATORS	**VARIABLES**	**Frequency (N)**	**Percentage (%)**

Are you engaged in any part-time employment?	No	248	75.8
	Yes	79	24.2
Total average hours spent studying per 24 hours	≤ 4.0	144	44.0
	4.1 - 8.0	148	45.3
	8.1+	35	10.7
Total average sleep hours per 24 hours	≤4.0	25	7.6
	4.1 - 8.0	291	89.0
	8.1+	11	3.4

Overall, it was observed that 210(64.2%) students had good sleep quality while 117(35.8%) had poor sleep quality as shown in table IV.

TABLE IV: SLEEP QUALITY AMONG RESPONDENTS

SLEEP QUALITY	**Frequency (N)**	**Percentage (%)**
Good sleep quality	210	64.2
Poor sleep quality	117	35.8
Total	**327**	**100.0**

Table V shows 64(44.5%) non-medical students and 52(28.7%) medical students had poor sleep quality. The bivariate analysis shows a statistically significant association between the course of study and the quality of sleep (p=0.003). The year of study, CGPA at last semester and carry over course did not show any statistically significant relationship with sleep quality.

TABLE V: RELATIONSHIP BETWEEN SLEEP QUALITY AND ACADEMIC FACTORS

	Good sleep **Frequency in percentage (N %)**	**Poor sleep** **Frequency in percentage (N %)**	***P* value**
Course of study			
Non-Medical	81 (55.5)	65 (44.5)	
Medical	129 (71.3)	52 (28.7)	0.003*
Year of Study			
First year	5 (83.3)	1 (16.7)	
Second year	28 (60.9)	18 (39.1)	
Third year	34 (60.7)	22 (39.3)	
Fourth year	53 (63.1)	31 (36.9)	
Fifth year	43 (58.1)	31 (41.9)	
Sixth year	47 (77)	14 (23)	0.21
CGPA as at last Semester(medical students)			
Pass	122 (72.6)	46 (27.4)	
Distinction	7 (53.8)	6 (46.2)	0.15

CGPA as at last Semester (other students)			
First Class (4.50+)	24 (64.9)	13 (35.1)	
Second Class Upper (3.50 - 4.49)	53 (58.2)	38 (41.8)	
Second Class Lower (2.50 - 3.49)	18 (62.1)	11 (37.9)	
Third Class (1.50 - 2.49)	2 (50)	2 (50)	
Pass (.50 - 1.49)	4 (30.8)	9 (69.2)	0.29
Are you carrying over any course?			
Yes	14 (58.3)	10 (41.7)	
No	196 (64.7)	107 (35.3)	0.53

* Statistically significant value (p<0.05)

Table VI shows the relationship between quality of sleep and some non-academic related factors. Total average sleep hour per day (p=0.002) and possible known factors affecting bedtime or sleep pattern (p=0.01) showed statistically significant relationship with sleep quality. Other factors such as part-time employment, average hours of study per day, taking of naps during the day and known underlying medical conditions did not have statistically significant relationship with sleep quality.

TABLE VI: RELATIONSHIP BETWEEN SLEEP QUALITY AND NON-ACADEMIC FACTORS

	Good sleep Frequency in	**Poor sleep Frequency in**	***P* value**

	percentage (N %)	percentage (N %)	
Are you engaged in any part-time employment?			
Yes	50 (63.3)	29 (36.7)	
No	160 (64.5)	88 (35.5)	0.84
Total average hours spent studying per 24 hours			
≤ 4.0	93 (64.6)	51 (35.4)	
4.1 - 8.0	95 (64.2)	53 (35.8)	
8.1+	22 (62.9)	13 (37.1)	0.98
Total average sleep hours per 24 hours			
≤4.0	8 (32)	17 (68)	
4.1 - 8.0	195 (67)	96 (33)	
8.1+	7 (63.6)	4 (36.4)	0.002*
Do you take naps (short sleep) during the day?			
Yes	140 (65.7)	73 (34.3)	
No	70 (61.4)	44 (38.6)	0.44
Do you have any medical problem?			
Yes	18 (51.4)	17 (48.6)	
No	192 (65.8)	100 (34.2)	0.95
Are there any known possible factors affecting your bedtime or sleep pattern?			

Yes	85 (56.7)	65 (43.3)	
No	125 (70.6)	52 (29.4)	0.01*

* Statistically significant value (p<0.05)

DISCUSSION

This study observed that the prevalence of poor sleep quality among respondents was 35.8%. Course of study and average sleep hours per hour were found to be associated with poor sleep quality.

The observed prevalence of poor sleep quality in this study is lower than 50.1% and 55.8% reported in previous studies among undergraduates in Nigeria[8] and Ethiopia[12] , respectively. The lower prevalence in this study may be because this study was carried out when school was not in session. Some recall bias may have influenced responses, especially regarding quality of sleep. Nonetheless, the prevalence observed in this study is high enough to raise concerns about the negative effect of poor sleep quality.

In this study, non-medical students had a significantly poorer sleep quality that the medical students. This is inconsistent with the result reported in previous studies documented in a global literature review of the medical students' sleep experience, where medical students were observed to have poorer sleep quality. This may be because of the understanding of medical students about the importance of sleep in the consolidation of memory and impact on cognitive processes. Also, medical students in the population studied may have been able to adapt to academic stressful condition and hence were able to achieve better sleep quality even with the limited sleep hours they get daily. Furthermore, it may also be because of the

conducive and tranquil location of the medical student hostel in the population studied, which is free of factors that could impair the sleep of these students.

From this study, it was observed that both medical and non – medical student with good sleep quality had a better academic performance than those with poor sleep quality. This is consistent with observations reported in previous studies[13],[14].This may be because adequate sleep is important for the consolidation of memory, which is important for academic performance[15],[16]. In addition, poor sleep might affect certain part of the brain, especially the frontal, parietal regions including subcortical structures such as basal ganglia and thalamus[17],[18]. These structures regulate arithmetic calculations, logical reasoning, and attention, decision making, and planning emotional processing, inhibition controls which are very important for good academic performance. This observation might have public health significance because it shows that interventions which can improve sleep quality among undergraduate student population are likely to improve their academic performance[8].

It was also observed from this study that the number of hours of sleep per 24hrs and presence of known possible factors affecting bed time/sleep pattern both have a significant association with sleep quality. Students who sleep less than 4 hours in a day have poor sleep quality than students who sleep above 4 hours in day. Also, students who reported they had known factors affecting their sleep pattern has a poor sleep quality compared to those who did not have. This is similar to previous study conducted among undergraduate students where mean sleep duration was found to have significant association with sleep quality[19], this may be because the students could not achieve good sleep quality within the limited hours of sleep due to some other external factors or medical conditions.

Students who engaged in part time jobs were more likely to have a poor sleep quality than students without part time jobs. This may be because adding a part time job to academics

squabble can potentially increase psychological stress which may in turn influence sleep pattern/sleep quality. As many of this part – time jobs may require the student working at night; this schedule can also affect their sleep pattern.

In conclusion, this study further emphasizes the relationship between sleep quality and academic performance of undergraduate students among the selected faculties.

It can be said that it is therefore imperative to conduct additional research to examine potential causes, implement appropriate measures that can improve sleep quality and treat abnormalities of sleep in this population. This could improve their academic performance. Also, for students who are engaged in part – time job solely to sponsor their academics, financial aids can be provided so they can focus more on their academic.

CONCLUSION

There is a high prevalence of self-reported sleep disorders among the undergraduate population in which this study was conducted. The course being studied is associated with the quality of sleep. Other factors such as part-time employment, average hours of study per day, taking of naps during the day and known underlying medical conditions are not associated with sleep quality.

LIMITATIONS

This study was cross-sectional. Thus, it is difficult to ascertain cause and effects among the various factors studied. In spite of this, our findings add to the accumulating evidence that ensuring good sleep quality could enhance academic performance among undergraduate.

This study was also carried out when the school was on break, and this may have influenced the result.

RECOMMENDATION:

Awareness on the importance of sleep and specifically sleep quality should be increased among undergraduates in order to enhance their overall performance in every aspect of their life, especially in academics which require a degree of memory consolidation.

REFERENCES

1. Gaultney JF. The prevalence of sleep disorders in college students: impact on academic performance. J. Am. Coll. Health 2010;59(2):91-97.
2. Steptoe A, O'Donnell K, Marmot M, Wardle J. Positive affect, psychological well-being, and good sleep. J. Psychosom. Res. 2008;64(4):409-415.
3. Carskadon MA, Dement WC. Normal human sleep: an overview. Principles and practice of sleep medicine 2005;4(1):13-23.
4. Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989;28(2):193-213.
5. Eslami Akbar R. The prevalence of sleep disorder and its causes and effects on students residing in Jahrom University of Medical Sciences dormitories, 2008. Journal of Jahrom University of Medical Sciences 2012;9(4):13.
6. Kloss JD, Nash CO, Horsey SE, Taylor DJ. The delivery of behavioral sleep medicine to college students. J. Adolesc. Health 2011;48(6):553-561.
7. Taylor DJ, Bramoweth AD. Patterns and consequences of inadequate sleep in college students: substance use and motor vehicle accidents. J. Adolesc. Health 2010;46(6):610-612.
8. Seun-Fadipe CT, Mosaku KS. Sleep quality and psychological distress among undergraduate students of a Nigerian university. Sleep Health 2017;3(3):190-194.
9. Mokarrar MH, Afsharmanesh A, Afshari M, Mohammadi F. Prevalence of sleep disorder among medical students in an Eastern university in Iran. Iranian Journal of Health Sciences 2017;5(1):49-54.
10. Azad MC, Fraser K, Rumana N, et al. Sleep disturbances among medical students: a global perspective. J. Clin. Sleep Med. 2015;11(1):69-74.
11. Lack LC. Delayed sleep and sleep loss in university students. J. Am. Coll. Health 1986;35(3):105-110.
12. Lemma S, Gelaye B, Berhane Y, Worku A, Williams MA. Sleep quality and its psychological correlates among university students in Ethiopia: a cross-sectional study. BMC Psychiatry 2012;12(1):1-7.
13. Curcio G, Ferrara M, De Gennaro L. Sleep loss, learning capacity and academic performance. Sleep Med. Rev. 2006;10(5):323-337.
14. Adeosun SO, Asa SO, Babalola OO, Akanmu MA. Effects of night-reading on daytime sleepiness, sleep quality and academic performance of undergraduate pharmacy students in Nigeria. Sleep Biol. Rhythms 2008;6(2):91-94.
15. Fogel SM, Smith CT, Cote KA. Dissociable learning-dependent changes in REM and non-REM sleep in declarative and procedural memory systems. Behav. Brain Res. 2007;180(1):48-61.

16. Walker MP, Stickgold R. Sleep-dependent learning and memory consolidation. Neuron 2004;44(1):121-133.
17. Coull JT. Neural correlates of attention and arousal: insights from electrophysiology, functional neuroimaging and psychopharmacology. Prog. Neurobiol. 1998;55(4):343-361.
18. Goel N, Rao H, Durmer JS, Dinges DF. Neurocognitive consequences of sleep deprivation. Paper presented at: Seminars in neurology, 2009.
19. Manzar MD, Zannat W, Kaur M, Hussain ME. Sleep in university students across years of university education and gender influences. Int. J. Adolesc. Med. Health 2015;27(3):341-348.