Joseph *et. al.,* Babcock Univ. Med. J.2026 9(S1):174-183
https://doi.org/10.38029/babcockuniv.med.j..v9iS1.971
eISSN: 2756-4657

RESEARCH ARTICLE OPEN ACCESS

Common sleep disorders and their sociodemographic and clinical determinants among patients attending a primary care clinic in Ilorin, North Central Nigeria

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Submitted: 4th June 2025
Accepted: 30th May 2026
Published: 31st October 2026
ID: Orcid ID

Abstract
Objective: This study set out to determine the prevalence of common sleep disorders among the study population and the sociodemographic and clinical factors associated with them.
Methods: This cross-sectional study was conducted over three months at outpatient clinics, University of Ilorin Teaching Hospital, North Central Nigeria. Data were collected from 405 respondents using the Global Sleep Assessment Questionnaire to screen for sleep disorders. The questionnaire was interviewer-administered, and data were analysed using the SPSS 23 Statistical package.
Result: In this study, insomnia (55.6%) was found to be the most common type of sleep disorder and was more prevalent among older age groups. Pain (OR=2.8, CI=1.9-4.3), (OR=1.6, CI= 1.0-2.4), and diabetes mellitus (OR=2.2, CI= 1.1-4.1), (OR=2.1, CI=1.1-3.9) were significant predictors of insomnia. and obstructive sleep apnoea, respectively. On the other hand, male gender (OR=2.2, CI=1.5- 3.5), diabetes mellitus (OR=2.1, CI=1.1- 3.9), and hypertension (OR=1.5, CI=1.0- 2.3) were predictors of excessive daytime sleepiness.
Conclusion: Sleep disorders are common among outpatients, with insomnia as the leading cause. Pain, diabetes, and hypertension are major predictors of these sleep disorders. Patients with these conditions should be screened for sleep disorders to provide comprehensive treatment. Proper management of pain, hypertension, and diabetes may reduce the occurrence of sleep disorders.

Keywords: Sleep Disorders, Outpatients, Global Sleep Assessment Questionnaire, Insomnia, Pain, Diabetes mellitus, Hypertension

Plain English Summary

Sleep is critical for overall health, yet many individuals struggle with it. Sleep issues are frequently overlooked, particularly in routine clinics. This study investigated the prevalence of sleep problems and the health or lifestyle factors that contribute to them.

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The study was conducted in a hospital's general outpatient clinic, where 405 participants were interviewed about their sleep using a specialised questionnaire. The findings revealed that more than half of the participants (about 56%) suffered from insomnia. This means that they had difficulty getting or staying asleep. Insomnia was most common among older adults. According to the study, those with pain, diabetes, or high blood pressure are more likely to develop sleep difficulties. Men and those with diabetes or high blood pressure were also more likely to feel extremely drowsy during the day.
In summary, sleep issues are prevalent, particularly among those with concomitant health concerns such as pain, diabetes, or hypertension. Doctors should inquire about sleep when treating certain illnesses. Managing these health concerns more effectively may also help improve sleep.

Background

Sleep is a complex physiologic phenomenon of the body. Sleep is an otherwise active period of the body where consciousness is suspended temporarily, with the brain essentially in a state of rest while responding only to internal cues (1). While sleep is vital for the health and well-being of all age groups, it is a physiological condition that is affected by multiple factors, including biological, psychological and environmental factors (2, 3, 4, 5).

Disruption in sleep leads to sleep disorders. This can take the form of disturbances in the quantity, quality, and timing of sleep, or of physiological conditions associated with sleep (6). Sleep problems, such as difficulty falling asleep, staying asleep, and early awakening with failure to continue sleep, are common in the general population.[7] The prevalence of sleep problems has increased in recent years, affecting 35% to 70% of community-dwelling older adults worldwide (7, 8). Sleep problems represent a huge economic and social burden for the individual and society (9).

While there is a growing interest in the field of sleep medicine, data on sleep disorders are scanty in primary care practice in Nigeria (10). This study, therefore, set out to determine the prevalence of common sleep disorders and their sociodemographic and clinical determinants.

Materials and Methods

This study was a hospital-based cross-sectional study carried out in the Outpatient Clinic of the Family Medicine Department, University of Ilorin Teaching Hospital, Ilorin. Ilorin, predominantly of the Yoruba ethnic group, is the state capital of Kwara State in the North-Central region of Nigeria. The study population comprised adult patients attending the Outpatient Clinics of the University of Ilorin Teaching Hospital, Ilorin. A sample size of 405 was used for this study as derived using Fisher's statistical formula for estimating the minimum sample size in health studies as follows (11):

$n=Z^2pq/d^2$

Where n=desired sample size

Z=standard normal deviate, usually set at 1.96, which corresponds to a 95% confidence level. p = proportion in the target population estimated to have a particular characteristic. 50% (0.5) is used if there is no documented proportion (11).

q=1-p=0.5

d = the degree of accuracy desired was set at 0.05.

Therefore, the sample size for this study was:

$n= (1.96^2\times0.5\times0.5)/0.05^2 =384$.

To take care of non-respondents (anticipated response was 95%), then

n=384/0.95=405.

A systematic random sampling technique was used to recruit eligible participants to avoid selection bias. All consenting adults aged 18 years and above, male and female patients, were included in the study, while frail elderly patients who could not withstand the rigour of the study, any patient who needed immediate emergency care, and patients diagnosed with major psychiatric disorders were excluded from the study.

The study proposal was reviewed and approved by the Institutional Ethical Review Committee of the University of Ilorin Teaching Hospital. The subjects were adequately informed about the study and its benefits before obtaining their consent to carry out the study, as well as to publish its outcome. All ethical principles guiding research of this nature were strictly adhered to.

Data collection was done through the use of a structured questionnaire that was interviewer-based (including the sociodemographic data, medical history, and the Global Sleep Assessment Questionnaire).

With the background of the magnitude of the undiagnosed nature of sleep disorders, Roth et al in 2002 developed the Global Sleep Assessment Questionnaire (12). The Global Sleep Assessment Questionnaire was developed to be able to distinguish among sleep disorders; it was found to be a reliable and valid sleep disorder screening instrument, and to serve as a practical, user- friendly screening tool for use in primary care and sleep centres (12). The Global Sleep Assessment Questionnaire was used to test for sleep disorders such as primary insomnia, obstructive sleep apnea, periodic limb movement, restless leg syndrome, and parasomnias. The test reliability ranged from 51-92% for the different sleep disorders (12).

Pearson correlation coefficients suggested that the Global Sleep Assessment Questionnaire discriminated between diagnoses. The sensitivities and specificities respectively were insomnia (79%/57%), obstructive sleep apnea (93%/58%), periodic limb movement (93%/52%) and parasomnia (100%/49%) (12).

The Global Sleep Assessment Questionnaire has 11 questions. Each question was used to detect a particular type of sleep disorder. Question 1 was used to detect the presence of insomnia, while questions 2 and 3 screened for excessive daytime sleepiness. Question 4 screened for the possibility of work-related sleep disorder. Questions 5 and 6 detected the possibility of obstructive sleep apnea, while questions 7 and 8 screened for restless leg syndrome and periodic limb movement, respectively. Question 9 screened for parasomnias, though the question cannot discriminate between parasomnias. Question 10 screens for factors that could be associated with sleep disorders, such as pain, medication, etc. Question 11 was used to screen for the presence of depression and anxiety.

Pre-testing of the questionnaire was done at the Outpatient Department of the Sobi Specialist Hospital, Ilorin, before the study was carried out, to assess its internal validity. This hospital is located within Ilorin and attends to patients of similar socio-demographic characteristics to those attending the study location. The pretesting revealed that interviewer administration of the questionnaire would be the best option, considering the varying educational status of the study population

All data collected were analysed using the Statistical Package for Social Sciences (SPSS) Version 23. The chi-square test was used in assessing the significance of associations between categorical groups. Logistic regression analysis was further carried out to determine the predictors of sleep disorders. A p-value less than 0.05 was considered statistically significant.

Results

Socio-demographic Characteristics of the Participants

A total of 405 patients were recruited, with a female preponderance of 67.9% and a female-to-male ratio of 2:1. The majority were those older than 60 years old, accounting for a quarter of the population studied. The majority of the respondents (73.3%) were married, and almost half (47.2%) were traders. The details of the results are shown in Table 1.

Table 1: Sociodemographic parameters of respondents

	Frequency (n)	Percentage (%)
Age (in years)		
18-29	51	12.6
30-39	77	19.1
40-49	86	21.2
50-59	88	21.7
≥ 60	103	25.4
Sex		
Female	275	67.9
Male	130	32.1
Marital Status		
Married	297	73.3
Single	50	12.3
Widow/widower	50	12.3
Divorced/Separated	8	2.1
Occupation		
Civil Servant	83	20.5
Students	30	7.4
Artisans/Farmers	56	13.8
Traders	191	47.2

Prevalence of Common Sleep Disorders among the Participants

Table 2 shows the occurrence of various types of sleep disorders among the respondents. The common types of sleep disorders with prevalence greater than one-third of the study population were insomnia (55.6%), Excessive daytime sleepiness (46.9%), parasomnia (35.3%) and obstructive sleep apnea (34.1%).

Table 2: The occurrence of various types of sleep disorders among respondents. N=405

Sleep Disorders	Present (%)	Absent (%)	N=405 (100%)
Insomnia	225 (55.6)	180 (44.4)	405 (100%)
Excessive Daytime Sleepiness (EDS)	190 (46.9)	215 (53.1)	405 (100%)
Parasomnia	143 (35.3)	262 (64.7)	405 (100%)
Obstructive Sleep Apnea (OSA)	138 (34.1)	267 (65.9)	405 (100%)
Work-Related Sleep Disorder	54 (13.3)	351 (86.7)	405 (100%)
Restless Leg Syndrome	45 (11.1)	360 (88.9)	405 (100%)
Periodic Limb Movement	31 (7.7)	374 (92.3)	405 (100%)

Association between Socio-demographic Characteristics and the Common Sleep Disorders

Table 3 shows the association between sociodemographic characteristics and the common types of sleep disorders among the respondents. Insomnia was more common among those aged greater than 40 years, with the highest rate among those aged greater than 60 years (60.2%). Insomnia was also more common among males (60.8%), singles (60.0%), and students (66.7%). However, these observations were not statistically significant. Excessive daytime sleepiness (EDS) tended to occur more with increasing age, but this finding was not statistically significant (P = 0.060). In addition, excessive daytime sleepiness was one-half times more common among males than females, and this was statistically significant (P <0.0001). Obstructive sleep apnea (OSA) was more frequent among those aged 50-59 years, a statistically significant finding (P = 0.020). The results are shown in Table 3.

Table 3a: Association between sociodemographic characteristics of respondents and types of sleep disorders

AGE	Insomnia		Excessive Daytime Sleepiness (EDS)		Parasomnia		Obstructive Sleep Apnea (OPS)	
N= 405	Present (225)	Absent (180)	Present (190)	Absent (215)	Present (143)	Absent (262)	Present (138)	Absent (264)
18-29(51)	26(51.0%)	25(49.0%)	20(39.2%)	31(60.8%)	13(25.5%)	38 (74.5%)	7 (13.7%)	44(86.3%)
30-39(77)	38 (49.4%)	39(50.6%)	32(41.6%)	45(58.4%)	28(36.4%)	49 (63.6%)	27(35.1%)	50(64.9%)
40-49(86)	48 (55.8%)	38(44.2%)	38(44.2%)	48(55.8%)	36(41.9%)	50 (58.1%)	32(37.2%)	54(62.8%)
50-59(88)	51(58.0%)	37(42.0%)	39(44.3%)	49(55.7%)	32(36.4%)	56 (53.6%)	36(40.9%)	52(59.1%)
>60(103)	62 (60.2%)	41(39.8%)	61(59.2%)	42(40.8%)	34(33.0%)	69 (67.0%)	35(35.0%)	67(65.0%)
X2	2.738		8.862		4.087		11.676	
p-value	0.603		0.06		0.394		0.02	
Gender	Present	Absent	Present	Absent	Present	Absent	Present	Absent
F (275)	146(53.1%)	129(46.9%)	110(40%)	165(60%)	100(36.4%)	175(63.6%)	86 (31.3)	189(68.7%)
M (130)	79(60.8%)	51(39.2%)	80(61.5%)	50(38.5%)	43 (33.1%)	87 (66.9%)	52(40.0%)	78(60.0%)
X2	1.808		15.589		0.286		2.617	
p-value	0.179		0.000		0.593		0.106	

Table 3b: Association between sociodemographic characteristics of respondents and types of sleep disorders

N= 405	Insomnia		Excessive Daytime Sleepiness		Parasomnia		Obstructive Sleep Apnea	
Marital Status	Present	Absent	Present	Absent	Present	Absent	Present	Absent
Married (297)	164(55.2%)	133(44.8%)	134(45.1%)	163(54.9%)	102(34.3%)	195(65.7%)	105(35.4%)	192(64.6%)
Single (50)	30(60.0%)	20(40.0%)	26(52.0%)	24(48.0%)	20(40.0%)	30(60.0%)	14(28.0%)	36(72.0%)
Previously Married (58)	31(53.4%)	27(46.6%)	30(51.7%)	28(48.3%)	21(36.2%)	37(63.8%)	19(32.8%)	39(67.2%)
X2	0.518		1.443		0.623		1.082	
p-value	0.722		0.486		0.732		0.582	
Occupational	Present	Absent	Present	Absent	Present	Absent	Present	Absent
Civil servants (83)	50(60.2%)	33(39.8%)	39(47.0%)	44(53.0%)	34(41.0%)	49(59.0%)	35(42.2%)	48(57.8%)
Students	20(66.7%)	10(33.3%)	13(43.3%)	17(56.7%)	4(13.3%)	26(86.7%)	5(16.7%)	25(83.3%)
Artisans/farmers (56)	26(46.4%)	30(53.6%)	26(46.4%)	30(53.6%)	20(35.7%)	36(64.3%)	18(32.1%)	38(67.9%)
Traders (191)	104(54.5%)	87(45.5%)	87(45.5%)	104(54.5%)	71(37.2%)	120(62.8%)	65(34.0%)	126(66.0%)

Unemployed (45)	25(55.6%)	20(44.4%)	25(55.6%)	20(44.4%)	14(31.1%)	31(68.9%)	15(33.3%)	30(66.7%)
X2	4.227		1.652		8.146		6.572	
p-value	0.377		0.799		0.086		0.16	

Association between Some Clinical Conditions and Common Sleep Disorders among the Respondents

Table 4 shows the association between some clinical conditions and common types of sleep disorders among the respondents. Excessive daytime sleepiness, Insomnia and Obstructive sleep apnea all occurred significantly more among respondents with pain (P = 0.018, P <0.0001, P = 0.026, respectively) and diabetes mellitus (P = 0.007, P = 0.023, P = 0.015). Insomnia (60.6%), EDS (53.3%) and OSA (40.0%) occurred more commonly among respondents with hypertension than those without hypertension. These associations were only significant for excessive daytime sleepiness (P = 0.041) and obstructive sleep apnea (P = 0.048). Obstructive sleep apnea occurred more among respondents who were obese. This association was statistically significant with a p-value of 0.017.

Table 4: Showing the association between clinical conditions and common types of sleep disorders among respondents

	EDS		INSOMIA		OSA		PARASOMIA	
N=405(100)	Present	Absent	Present	Absent	Present	Absent	Present	Absent
	190 (46.9)	215(53.1)	225(55.6)	180(44.4)	138(34.1)	267(65.9)	143(35.3)	262(64.7)
PAIN No 345(85.2)	80(40.6)	117(59.4)	84(42.6)	113(57.4)	56 (28.4)	141(71.6)	64 (32.5)	133(67.5)
PAIN Yes 60(14.8)	110(52.9)	98(47.1)	141(67.8)	67 (32.2)	82 (39.4)	126(60.6)	79 (38.0)	129(62.0)
X^2		5.639		24.907		4.968		1.107
P		0.018		0.000		0.026		0.293
DM No 353(87.2)	156 (44.2)	197 (55.8)	188(53.3)	165(46.7)	112(31.7)	241(68.3)	122(34.6)	231(65.4)
DM Yes 52(12.8)	34 (65.5)	18 (34.6)	37 (71.2)	15 (28.8)	26 (50.0)	26 (50.0)	21 (40.4)	31(59.6)
X^2		7.344		5.176		5.947		0.442
P		0.007		0.023		0.015		0.506
HTN No 240(59.3)	102 (42.5)	138 (57.5)	125(52.1)	115(47.9)	72 (30.0)	168(70.0)	87 (36.2)	153(63.8)
HTN Yes 165(40.7)	88 (53.3)	77 (46.7)	100(60.6)	65 (39.4)	66 (40.0)	99 (60.0)	56 (33.9)	109(66.1)
X^2		4.183		2.542		3.919		0.139
P		0.041		0.111		0.048		0.710
OBESITY No 328(81)	155(47.3)	173 (52.7)	185(56.4)	143(43.6)	224(68.3)	104(31.7)	212(64.6)	116(35.4)
OBESITY Yes 77(19.0)	35 (45.5)	42 (54.5)	40(51.9)	37(48.1)	34(44.2)	43(55.8)	27(35.1)	50(64.9)
X^2		0.983		1.857		10.213		0.152
P		0.806		0.603		0.017		0.985

Predictors of Common Sleep Disorders among the Respondents

Table 5 shows the logistic regression analysis for predictors of common sleep disorders. This result shows that having pain of any type (OR=2.8, CI=1.9-4.3) and having diabetes mellitus (OR=2.2, CI= 1.1-4.1) are statistically significant predictors of insomnia. Being male (OR=2,2, CI=1.5-3.5), having diabetes mellitus (OR=2.1, CI=1.1-3.9) and having hypertension (OR=1.5, CI=1.0-2.3) were found to be significant predictors of excessive day time sleepiness, having pain of any type (OR=1.6, CI = 1.0-2.4) and diabetes mellitus (OR=2.1, CI=1.1-3.9) were found to be significant predictors of obstructive sleep apnoea (Table 5).

Table 5: Multiple logistic regression analysis for predictors of common sleep disorders

Sleep disorders/ Predictors	Regression (r)	Odds ratio (OR)	95% CI	P-value (P)
Insomnia				
Pain	1.039	2.8	1.9-4.3	<0.001
Diabetes	0.767	2.2	1.1-4.1	0.022
EDS				
Gender	0.81	2.2	1.5-3.5	<0.001
Pain	0.403	1.5	1.0-2.2	0.053
Diabetes	0.749	2.1	1.1-3.9	0.018
Hypertension	0.426	1.5	1.0-2.3	0.043
OSA				
Age group (50-59)	0.324	0.7	0.4-1.3	0.293
Pain	0.451	1.6	1.0-2.4	0.039
Diabetes	0.741	2.1	1.1-3.9	0.019
Hypertension	0.283	1.3	0.8-2.1	0.224
Obesity	0.36	1.4	0.8-2.4	0.186

CI = Confidence interval

Discussion

The results from this study show that the commonest types of sleep disorders among the respondents are insomnia, excessive daytime sleepiness, parasomnia, and obstructive sleep apnoea. In this study, insomnia, with a prevalence of 55.6%, is the most common type of sleep disorder. This agrees with the finding of Adewole et al in Ife, Southwestern Nigeria, where insomnia was the most common type of dyssomnia with a prevalence of 48.7% and also the most common type of sleep disorder with an overall prevalence of 27.3% (10). However, Bhaskar et al in a primary care setting in Bengaluru, India, found a lower prevalence of 33% for insomnia among general outpatients (13). The difference in prevalence in these studies might be mainly due to differences in the study locations and the age distribution of the study populations. This study has a higher population in the older age group than the studies by Adewole et al and Bhaskar et al. Insomnia has consistently been found to be higher among the older age group, with associated poorer health outcomes (14). However, the prevalence of insomnia in this study was similar to an earlier study in Ibadan, Southwestern Nigeria, with a prevalence of 51.9% (15). This study shows that insomnia was associated with increased age, and this finding agrees with most studies (16, 17, 18). In this study, contrary to most Western and other studies, insomnia was more associated with the male gender (16, 17). This finding was, however, not statistically significant.

Increasing age has been linked to a higher risk of sleep disorders, which is mediated by significant shifts in sleep pathophysiology (19, 20, 21, 22, 23). These include changes in the brain's anatomical structure, brain atrophy, and degeneration of the white matter (21, 24). Additionally, there is age-related dysregulation of sleep neurotransmitters and decreased melatonin secretion (19, 24). This study collaborated with the existing understanding of the pathophysiologic connection between increasing age and the higher prevalence of sleep disorders. Furthermore, due to pathophysiologic changes in women, such as hormonal fluctuations, differences in respiratory anatomy, as well as psychosocial, cultural, and behavioural factors, women were more likely to report a higher occurrence of various sleep disorders in addition to atypical presentations (25, 26). However, in this study, more men reported experiencing sleep disorders. In addition, there were no statistically significant associations between other sociodemographic and economic factors and the occurrence of sleep disorders. While some of these findings were not statistically significant, they highlight the multifactorial nature of the determinants of sleep disorders, which may result from the combined effects of regular physiological changes and coexisting medical conditions such as pain, diabetes mellitus, and hypertension

The most significant predictor of insomnia in this study is the presence of any type of pain, with nearly three times the odds of having insomnia when experiencing pain. This finding is in line with the established bi-directional causative relationship between pain and insomnia in the literature. Pain is reported as the most important medical cause of insomnia because it can trigger the brain to stay awake (18). On the other hand, insomnia has been linked to a reduction of pain threshold (27). Therefore, evaluation for the presence of pain syndromes should be done for all patients with chronic insomnia. Furthermore, the significant relationship between insomnia and diabetes mellitus found in this study is also supported by scientific evidence. Patients living with diabetes have been found to have poor quality of sleep leading to insomnia due to nocturnal hypoglycaemia, and vice versa,

insomnia has been linked to the development of type 2 diabetes mellitus (28, 29).

The prevalence of EDS reported in this study (46.9%) is within the upper limit of the range of 1.5% to over 40% reported prevalence of EDS globally (30). The fact that geographical factors affect the prevalence of EDS worldwide has been documented, and a prevalence of EDS as high as 62% has been reported in the literature (31). This study shows that excessive daytime sleepiness was more common with increasing age, although this was not significant; it agrees with other studies that suggested an association of excessive daytime sleepiness with increasing age (32, 33). The male gender was significantly associated with EDS in this study, as found in other similar studies (34, 35). This was contrary to other studies that showed an association of EDS with female gender (32). This needs further research, but a hypothesis may be that males have shorter sleep duration since shorter sleep duration has been associated with EDS (36). What is clear from this study and the body of literature reviewed is that gender is a significant predictor of EDS. EDS was also found to be significantly associated with diabetes mellitus in this study, and this finding agrees with that of Ulnader et al. (37). EDS was also found to be significantly associated with hypertension in this study, and this finding agrees with other studies on EDS and its determinants (30, 38).

This study shows that obstructive sleep apnoea was significantly associated with the age group 50-59 years, pain, hypertension, and obesity. On further logistic regression, only pain and diabetes mellitus were found to be significant predictors of obstructive sleep apnoea in this study. This finding agrees with that of Sogebi and Ogunwale, who found age, blood pressure and obesity to be significantly associated with OSA (39). This also agrees with Thompson et al who found that patients with diabetes mellitus were at a higher risk for OSA (39). The fact that pain is highly predictive of obstructive sleep apnoea could be a result of arthritis, which is a common complication of obesity, a common risk factor for obstructive sleep apnoea (40).

One major strength of this study is the fact that the instrument used was able to screen for multiple sleep disorders at the same time. Thus, one does not need to use multiple screening tools for different sleep disorders. In addition, this study has reported valuable data on sleep disorders in the African primary setting, which are not usually available.

Limitations of this study include its hospital-based design, which limits the ability of its findings to be generalised to the general population. Also, with its cross-sectional design, the identified predictors cannot be assessed as possible causes of the sleep disorders described. Furthermore, there are many research tools available for studying sleep disorders, and so many of the studies cited in this work did not use the GSAQ, therefore limiting the quality of comparison of research findings.

Conclusion

This study shows that sleep disorders are highly common among outpatients presenting to the primary care clinic at a tertiary institution and that insomnia is the commonest, with more than half of the respondents having it. The study also established that pain, diabetes mellitus, and hypertension are the major predictors of these common sleep disorders. It thus stands to reason that patients presenting with these conditions need to be screened for the common sleep disorders to be able to offer comprehensive treatment. Although there is no causal effect established in this study, this study also suggests that proper management of pain, hypertension, and diabetes mellitus might reduce the occurrence of sleep disorders and vice versa.

List of Abbreviations

CI: Confidence Interval
EDS: Excessive Daytime Sleepiness
F: Female
GSAQ: Global Sleep Assessment Questionnaire
M: Male
OR: Odd Ratio
OSA: Obstructive Sleep Apnoea
SPSS: Statistical Package for Social Sciences
UITH: University of Ilorin Teaching Hospital
X^2: Chi Square.

Declarations

Ethics Approval and Consent to Participate

The study was reviewed and approved by the Institutional Ethical Review Committee of UITH. The subjects were adequately informed about the study and its benefits before obtaining their consent. All ethical principles guiding research of this nature were strictly adhered to.

Consent for Publication

The consent for publication of the research is embedded in the ethical approval received from the institution's Ethical Review Committee. All potential identifiers, like the names and hospital numbers of the patients, are not included in the manuscript.

Availability of Data and Materials

All relevant supportive data and materials used in this study are available upon request from the corresponding author.

Competing Interest
All the authors declare no conflict of interest for this research.

Funding
The authors received no financial funding or support for this research except for their contribution.

Authors' Contribution
JAI conceptualised the research idea, designed and reviewed the manuscript.
ATA reviewed the literature, collected data, and wrote the manuscript.
BAI collected and analysed data and wrote the manuscript.
AMF reviewed the literature, wrote and reviewed the manuscript.
ANT collected data, wrote and reviewed the manuscript.
OLO and TAMF did the expert review of the final manuscript.

Acknowledgments
The authors acknowledge and appreciate all the staff of the departments of family medicine and medical records of the University of Ilorin Teaching Hospital for their support in carrying out this study.

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