



A Cross-sectional Survey of the Prevalence of Insomnia and Associated Sociodemographics among Ambulatory Adult Patients in a Nigerian Teaching Hospital

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of article.

Abstract

Background: Insomnia is a mental health condition that affects an estimated one-third of the global population. The disorder can impact the social and economic activities of the sufferers. In sub-Saharan Africa including Nigeria, the magnitude of, and the socio-demographics associated with insomnia is rarely known.

Objective: This study aimed to determine the prevalence of insomnia and the associated socio-demographics among ambulatory patients in Nigeria.

Methods: This was a quantitative cross-sectional survey among consecutively sampled ambulatory adult patients aged 18 years and above at the General Outpatient clinics of the Olabisi Onabanjo University Teaching Hospital, Sagamu, Southwest Nigeria between January and June 2023.

A 35-item structured questionnaire sectioned into three segments was used to evaluate the sociodemographic (section A), the medical and family history, and the living conditions of the respondents (Section B). Section C used the Athens Insomnia Scale (AIS) to evaluate insomnia. A Pearson Chi-square test was used to explore the association between insomnia and the socio-demographics of the respondents. A p-value <0.05 was considered statistically significant.

Results: Of the 469 respondents, 127 (27.1%) were aged >65 years (mean age= 44.3±13.21 years), 299 (63.8%) were females and 198 (42.2%) had insomnia. Slightly above half of the respondents (52.6%) who had a family history of sleep disorder had insomnia in this study. Marital status (p=0.012), living arrangements (p=0.001), educational qualification (p=0.003) and the number of children in the family (p=0.007) were significantly associated with insomnia in this study.

Conclusion: Insomnia is common among ambulatory adult patients in OOUTH, Sagamu Nigeria. Certain sociodemographic factors including living arrangements, educational qualification, number of children in the family and marital status are associated with insomnia in this population.

Keywords: Insomnia, Severity index, Adult insomniacs, Nigeria

INTRODUCTION

Insomnia is a global public health concern. Insomnia is defined as a difficulty with sleep initiation, maintenance or quality despite sufficient opportunity, in addition to subsequent daytime impairment lasting at least three months (American Academy of Sleep Medicine, 2014). It is estimated that about 10% of the world's population suffers from insomnia (Morin &

Jarrin, 2022). The disorder is a predictor for the onset of depression and increases the risk for psychopathology in adult population [Hertenstein *et al.*, 2023]. However, in sub-Saharan Africa including Nigeria, the socio-economic and behavioural impacts of the disorder can hardly be quantified due to dearth

of studies on the magnitude of the disorder on the continent.

Evidence suggests that insomnia contributes to negative health outcomes and may affect the social and economic life of individuals and their countries (Sheppard and Hogan, 2022). Prolonged insomnia may lead to hypertension, dyslipidemia, CVD, weight gain, metabolic syndrome, and T2DM in the long term. Certain cancers have also been linked to the disorder among men (Goran *et al.*, 2017). Insomnia is known to be influenced by socio-economic demographics including gender, level of education, living conditions and income (Mandelkorn *et al.*, 2021; Salfi *et al.*, 2021; Adjaye-Gbewonyo & Black, 2022). Insomnia is often diagnosed by patient reports of long sleep latency, frequent transient arousal and constant night awakening (Roth, 2007). The impact of this disorder on public health including frequency, morbidity, and quality of life strictly requires its

effective diagnosis and treatment in the clinical practice.

The diagnosis of insomnia can sometimes be difficult due to the personal and subjective nature of sleep (National Sleep Foundation, 2020). Many criteria have been developed to aid the diagnosis of insomnia. These criteria including the Insomnia Severity Index and Athens Insomnia Scale (AIS) contain self-answerable questionnaires for diagnosis and determining the severity of the disorder (Morin *et al.*, 2011; Ali *et al.*, 2019). Despite the availability of these diagnostic tools, the profundity of insomnia in sub-Saharan Africa, including Nigeria is not known. In Nigeria, there is a paucity of data on the prevalence of insomnia in the general population and this has created a knowledge gap on its detrimental socio-economic effect on society and management by health workers. This study aimed to evaluate the prevalence of insomnia among the Nigerian adult population.

METHODOLOGY

Study design

This was a quantitative cross-sectional survey among consecutively sampled respondents attending General Outpatient clinics.

Study setting

The study was carried out at the Department of Family Medicine, General Outpatient Clinic of Olabisi Onabanjo University Teaching Hospital (OOUTH), Sagamu in Ogun State, South-west Nigeria. The hospital is a 300-bed state-owned tertiary hospital with many specialty units including psychiatric, trauma, cardiology, renal, obstetrics and gynaecology and orthopaedic.

Study population

Consecutively sampled ambulatory patients aged 18 years and above who presented at the General Outpatient Clinic of OOUTH during the study (January to June 2023) were recruited into the study. Pregnant women were excluded due to evidence that suggests that insomnia in this category of patient could be due to discomfort, depression and other pregnancy-related complications (Anderson, 2018). Patients who had psychiatric disorders and cognitive impairments were excluded from this study.

Sample size determination

The minimum sample size for the study was determined using Raosoft® online software (<http://www.raosoft.com>). Using an unknown estimate population, 95% confidence interval and 5% margin of error. The minimum sample size was 384. With a 10% addition to cater for non-response, a sample size of 423 was obtained.

Questionnaire design

A 35-item structured questionnaire was developed after a review of studies on the topic (Mandelkorn *et al.*, 2021; Salfi *et al.*, 2021; Ali *et al.*, 2019). The questionnaire was sectioned into 3 segments: The first Section explored the demographic data of the respondents which included the age, gender, marital status, number of children, household living arrangements, educational qualifications, occupation, and monthly income. The second section used the dichotomous question “yes” or “no” response to assess variables including the participant co-morbidities, use of sleep medication, and lifestyles. Physical exercise was defined as at least 10 minutes of brisk walking daily (Public Health England, 2017). Family history of insomnia, sleeping conditions and other factors associated with insomnia were also evaluated. Coffee is among the weakest stimulants commonly used by adults and was therefore used a reference in this study.

The third section is the AIS which was used to evaluate insomnia. The AIS is an 8-item self-reported questionnaire within the past month. The items 1-5 in the AIS are related to night sleep, while items 6-8 are associated with daytime functioning. In all the AIS evaluates awakening during the night, sleep promotion, final awakening, sleep quality, total sleep duration, sleepiness during the day, well-being during the day and functioning capacity during the day (Porwal *et al.*, 2021). The score for each item ranges from 0 to 3 (0 score=no problem, 1=minor problem, 2=considerable problem, 3=serious problem). Those

respondents who score 6 and above of the summation of 18 are considered to have insomnia (Ali *et al.*, 2019). AIS questionnaire is specific and reliable in detecting insomnia (Ali *et al.*, 2019). Athens Insomnia Scale was adopted in this study because of its simple language, ease of questions and calculation, effectiveness, and reprint rights (Bhaskar *et al.*, 2015). The monthly income of the respondents was classified using the World Bank's definition of abject poverty <\$2.15 per day (World Bank, 2022). A dollar on the average exchanged for ₦633.65 at the time of the study.

The questionnaire was face-validated by two clinicians with at least 15 years of experience and pre-tested among 20 patients at OOUTH who were subsequently excluded from the main study. The feedback from the pre-test led to the re-wording of some questions which were considered to be ambiguous. The final questionnaire was evaluated for reliability using Cronbach's Alpha test which gave a value of 0.82 excluding the AIS questions.

RESULTS

The socio-demographic characteristics of respondents

Table 1 presents the socio-demographics of the respondents. Of the 500 copies of the questionnaire distributed 469 (93.8%) were analysed. The remaining 31 (6.2%) were not properly filled. Many of the 469

Data collection

The respondents were approached for recruitment at the waiting hall after checking their vital signs at the nurse's station and before the consultation. The questionnaire was administered to the respondents after their informed consent had been sought.

Data management and analysis

At the end of each day of the study, the questionnaires were sorted out, manually cleaned, carefully cross-checked, and coded serially for data management using Microsoft Excel Spreadsheet. It was then exported to SPSS (Statistical Package for Social Science), (Version 23) for analysis. The results were presented in frequency and percentage. A Pearson Chi-square test was used to explore the association between insomnia and socio-demographics of the respondents. A p-value <0.05 was considered statistically significant.

respondents; 127 (27.1%) were aged >65 years, 299 (63.8%) were females and 293 (62.5%) were living with a partner at the time of this study. The mean age of the respondents was 44.3±13.21 years.

Table 1: The Socio-demographic characteristics of the respondents (N = 469)

Variable	Frequency	Percentage
Age		
18-29	93	19.8
30-39	78	16.6
40-49	73	15.6
50-59	98	20.9
≥60	127	27.1
Gender		
Male	170	36.2
Female	299	63.8
Marital Status		
Single	160	34.1
Married	309	65.9
Number of children		
0	59	12.6
1-4	335	71.4
≥5	75	16.0

Household living arrangement		
Alone	56	11.9
Living with partner	293	62.5
With children/grandchildren	60	12.8
With relations/friends	60	12.8
Educational Qualification		
No Formal Education	77	16.4
Primary	86	18.3
Secondary	170	36.2
Post-secondary	136	29.0
Occupation		
Seeking opportunities currently	25	5.3
Employed Part-time	18	3.8
Employed Full-time	84	17.9
Self-employed	283	60.3
Retired	59	12.6
Monthly income		
Below the poverty line (<\$2.15 per day)	107	22.8
Above the poverty line (≥\$2.15 per day)	362	77.2

Table 2 presents the medical characteristics and lifestyles of the respondents. Many of the respondents (113; 24.1%) had hypertension and heart-related diseases and 347 (74.0%) did not engage in physical exercise. Slightly above half of the respondents (52.6%) who have family history of sleep disorder had insomnia in this study while many (56.7%) who had experienced stressful emotional events in the past month

had insomnia. Many respondents (268; 57.1%) had used a sleeping pill in the past one year, 96 (35.8%) of this proportion used an over-the-counter sleep medication while 26 (9.7%) used a prescription only sleep medication. Fifty-four of the respondents (11.5%) had used an herbal medication for sleeping problems

Table 2: Lifestyle and medical characteristics of the respondents (n=469)

Variable	Frequency	Percentage %
Medical morbidity		
Fever/pain	183	39.0
Ulcer/abdominal discomfort	54	11.5
Hypertension/heart disease	113	24.1
Diabetes	65	13.9
Arthritis	30	6.4
Thyroid disease	13	2.8
Asthma	11	2.3
Frequency of physical exercise		
No exercise	347	74.0
once a week	83	17.7
2-3 times a week	20	4.3
4-5 times a week	4	0.9
5-6 times a week	2	0.4
Everyday	13	2.8
Coffee drinking		
yes	60	12.8
no	409	87.2
Alcohol drinking		
yes	116	24.7
no	353	75.3

Prevalence of insomnia among the respondents

Table 3 shows the frequency distribution of Insomnia scale items. Using 6 as the cutoff, 198 (42.2%) of the respondents had insomnia. Awakening during night

time was the most commonly reported insomnia symptom among the respondents (322; 68.7%).

Table 3: Frequency distribution of Insomnia scale items. (N=469)

Scale items	Frequency	Percentage
Sleep induction		
No difficulty	202	43.1
Moderately delayed	154	32.8
Remarkably delayed	100	21.3
Extremely delayed or did not sleep at all	13	2.8
Awakenings during the night		
No problem	147	31.3
Minor problem	199	42.4
Considerable problem	116	24.7
Serious problem or did not sleep at all	7	1.5
Final awakening earlier than desired		
Not before	229	48.8
Little earlier	157	33.5
Remarkably earlier	80	17.1
Much earlier or did not sleep at all	3	0.6
Total sleep duration		
Sufficient	217	46.3
Slightly insufficient	175	37.3
Markedly insufficient	77	16.4
Very insufficient or did not sleep at all	0	0.0
Overall quality of sleep		
Satisfactory	195	41.6
Slightly unsatisfactory	210	44.8
Markedly unsatisfactory	54	11.5
Very unsatisfactory or did not sleep at all	10	2.1
Sense of well-being during the day		
Normal	275	58.6
Slightly decreased	124	26.4
Remarkably decreased	66	14.1
Extremely decreased	4	0.9
Functioning (physical and mental) during the day		
Normal	288	61.4
Slightly decreased	114	24.3
Markedly decreased	67	14.3
Very decreased	0	0.0
Sleepiness during the day		
None	211	45.0
Moderate	211	45.0
Remarkable	42	9.0
Extreme	5	1.1

Table 4 presents the means of Athens Insomnia scale items among the respondents. The mean of respondents with awakenings during the night was

0.96±0.79 while functioning (physical and mental) during the day ranked lowest at 0.53±0.73

Table 4: Summary statistics for Athens insomnia scale (N= 469)

S/N	Scale items	Mean	SD
1	Sleep induction (0 = No difficulty; 3 = Extremely delayed)	0.84	0.854
2	Awakenings during the night (0 = No problem; 3 = Serious problem)	0.96	0.788
3	Final awakening earlier than desired (0 =Not before; 3 = Much earlier)	0.70	0.770
4	Total sleep duration (0 = Sufficient; 3 = Very insufficient)	0.70	0.734
5	Overall quality of sleep (0 = Satisfactory; 3 = Very unsatisfactory)	0.74	0.742
6	Sense of wellbeing during the day (0 = Normal; 3 = Extremely decreased)	0.57	0.761
7	Functioning (physical and mental) during the day (0 = Normal; 3 = Very decreased)	0.53	0.732
8	Sleepiness during the day (0 = None; 3 = Intense)	0.66	0.684

The association between sociodemographic characteristics of the respondents and insomnia is presented in Table 5. Marital status was significantly

associated with the presence of insomnia (p=0.012) while the age of the respondents was not significantly associated (p=0.133).

Table 5: Socio-demographic characteristics and the prevalence of insomnia (n=469)

	Insomnia 198(42.2%)	No insomnia 271(57.8%)	x ²	p-value
Age groups (years)				
18-29	45 (48.4)	48 (51.6)	7.058	0.133
30-39	38 (48.7)	40 (51.3)		
40-49	34 (46.6)	39 (53.4)		
50-59	34 (34.7)	64 (65.3)		
≥60	47 (37.0)	80 (63.0)		
Gender				
Males	80 (47.1)	90 (52.9)	2.562	0.109
Females	118 (39.5)	181 (60.5)		
Marital status				
Single	82 (51.3)	78 (48.7)	8.122	0.004
Married	116 (37.5)	193 (62.5)		

Educational level				
None	18 (23.4)	59 (76.6)		
Primary	39 (45.3)	47 (54.7)	14.023	0.003
Secondary	75 (44.1)	95 (55.9)		
Post-secondary	66 (48.5)	70 (51.5)		
Occupation				
Seeking opportunities currently	15 (60.0)	10 (40.0)		
Employed part-time	8 (44.4)	10 (55.6)		
Employed full-time	37 (44.0)	47 (56.0)	3.884	0.422
Self-employed	114 (40.3)	169 (59.7)		
Retired	24 (40.7)	35 (59.3)		
Living arrangement				
Alone	31 (55.4)	25 (44.6)		
living with partner	105 (35.8)	188 (64.2)	18.166	0.001
With children/grandchildren	25 (41.7)	35 (58.3)		
With relations/friends	37 (61.7)	23 (38.3)		
Number of children				
0	34 (57.6)	25 (42.4)		
1-4	141 (42.1)	194 (57.9)	9.847	0.007
≥5	23 (30.7)	52 (69.3)		
Income				
Below the poverty line (<\$2.15 per day)	53 (49.5)	54 (50.5)	3.041	0.081
Above the poverty line (≥\$2.15 per day)	145 (40.1)	217 (59.9)		

DISCUSSION

This study aimed to determine the prevalence of insomnia and associated socio-demographics among adults in a Nigerian teaching hospital. This study found that more than half of respondents reported at least one insomnia symptom with night awakening being the most commonly reported. The disorder was associated with marital status and living arrangements among the study population.

In this study, more than 2 out of 5 respondents had insomnia which is in line with community-based study among Ethiopians (42.9%) and Chinese (39.4%) (Ali *et al.*, 2019; Wong and Fielding, 2011). The prevalence in this study was however higher than 27.3% earlier reported in Ile-Ife and 27.5% in Ibadan, Nigeria (Ogunbode *et al.*, 2014; Adewole *et al.*, 2017). This difference could be due to the study population. In this study, a heterogeneous group of patients (both older and younger adults) was included unlike Ogunbode *et al.* (2014) which focused on elderly (≥60 years) patients only. Also, the type of instrument employed to assess insomnia may be another reason for the variation. Athens Insomnia Scale was used in this study while the Epworth sleepiness scale was used in the Ile-ife study (Adewole *et al.*, 2017). The worsening economic situation in the country and the excessive use of mobile phones by the new generation

may also have contributed to the high prevalence observed in the present study.

The most commonly hypothesized factor predisposing to insomnia is socio-demographics (Bonnet. and Arand. 2018; Mandelkorn *et al.*, 2021). In this study, the young adults aged 30-39 years and 18-29 years were more affected by insomnia than the older age group. This finding is at variance with previously reported findings (Ahmed *et al.*, 2017; Ali *et al.*, 2019; Morin and Jarrin, 2022) but it is similar to a recent report from the United States (Adjaye-Gbewonyo and Black, 2022) where more of the younger ages had insomnia than the older adults. This is probably because younger adults are more likely to engage in behaviours that can disrupt their sleep than the older adults. These habits include using electronic devices before bed, consuming caffeine or alcohol, or having irregular sleep schedules. These behaviours can have a negative impact on sleep quality and duration, which could contribute to the higher prevalence of insomnia among younger adults (Yu *et al.*, 2024). This finding is of socio-economic factor because the it appears the group that constitutes the majority of the workforce of the country is being affected and the man-power and time loss may not be adequately quantified.

In this study, insomnia was more commonly reported among males than females. This finding contradicts many reports that indicate higher prevalence of insomnia among females than males (Mandelkorn *et al.*, 2021; Morin and Jarrin, 2022; Salfi *et al.*;2021). Zeng *et al* (2020) in their meta-analysis found a significant association between female gender and insomnia. Further research may be needed to understand the complex relationship between gender and insomnia. Nevertheless, these findings suggest that healthcare providers should consider gender when evaluating sleep disturbances and tailor interventions accordingly. For example, sleep hygiene education, stress management techniques, and cognitive behavioural therapy for insomnia may be useful interventions for men who experience sleep disturbances (Markwald *et al.*, 2018).

In this study, insomnia was significantly associated with educational level. Higher prevalence of insomnia was found among participants with higher educational qualification in contrast to the report of a similar study among the Norwegian adults. In the Norwegian study, insomnia symptoms were found to be less common among individuals with higher educational qualification (Bjorvatn *et al.*, 2023). The difference in these findings may be due to different socio-economic trajectories of the study populations.

Marital status was found to be significantly associated with insomnia in this study. The majority of the unmarried respondents had higher prevalence of insomnia than their counterparts in a marital

relationship. This indicates that loneliness caused by widowhood, divorce or separation may be a risk factor for insomnia (Gureje *et al.*, 2011). The finding of this study is similar to a report in Nigeria and other countries that have shown a relationship between loneliness and insomnia. (Ogunbode *et al.*, 2014).

In this study living below the poverty line of less than \$2.15 per day was not significantly associated with insomnia, similar to a report among the Koreans where household income was not associated with an insomnia-related symptom (sleep quality) (Lee *et al.*, 2021). The finding of this study contradicts a report from the United States that associated insomnia with living below the poverty level (Center for Disease Control and Prevention, 2013).

Strengths and limitations of the study

This study highlights the prevalence of insomnia among the adult ambulatory patients in Sagamu, Nigeria. This may likely have socio-economic implications for the country. Effective strategies for diagnosis and management may need to be put in place in the healthcare facilities. However, the study was carried out among patients in only one teaching hospital, it may therefore be difficult to generalize the study findings to the entire Nigerian population. The survey was also hospital- based and the situation in the community may not have been adequately captured. The study being cross-sectional is also predisposed to recall-bias. Some lifestyles common among the young adult population in this generation such as the use of mobile phones were not assessed in this study.

ETHICAL CONSIDERATIONS

Ethical approval was received from the Ethics Committee of Olabisi Onabanjo University Teaching Hospital (OOUTH/HREC/575/2023/AP). Permission was obtained from the physicians and nurses on duty

at the GOPD of the study site before the commencement of the study. Written consent from each participant was obtained before the administration of the questionnaire and all information obtained was treated with the utmost confidentiality.

CONCLUSION

Insomnia is common among ambulatory patients in Sagamu, Nigeria, with the younger adults being predominantly affected. This may have socioeconomic implications for the country as significant manpower and economic loss due to the

disorder may not be quantified. Certain Sociodemographic factors including living arrangements and marital status are associated with insomnia in the population.

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