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Prevalence and Risk Stratification of Obstructive Sleep Apnoea among Adult Hospital Outpatients Attendees in a Nigerian Tertiary Institution.

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Abstract

Background

Obstructive sleep apnoea (OSA) is increasingly being recognized as a risk factor for many diseases and also a major contributor to cardiometabolic morbidity. Despite this, OSA remains underdiagnosed, especially in middle- and low-income countries.

Objective: To determine the prevalence and risk stratification of obstructive sleep apnoea among medical outpatients in a Nigerian tertiary hospital.

Method:

A cross-sectional study was conducted among 387 adult outpatients at the Barau Dikko Teaching Hospital, Kaduna. Sociodemographic and clinical data were collected. OSA risk was assessed using the STOP-BANG questionnaire. Associations were analyzed using chi-square tests.

Results:

Mean age was 46.6 ± 16.1 years; 65.4% were female. High-risk OSA prevalence was 7.5%, while 36.2% were intermediate risk. Risk of OSA was significantly associated with age ≥ 50 years ($p = 0.016$), male gender ($p = 0.044$), and alcohol use ($p = 0.014$). Age of 50 years and above, males and alcohol use were predictors of risk of OSA aOR 2.548, 95% CI (1.169, 5.556); 9.747, 95% CI (3.090, 30.747); 3.521 95% CI (1.215, 10.202) respectively but current cigarette use had no such effect aOR 0.542, 95% CI (0.089, 3.293).

Conclusion

A significant proportion of medical outpatients are at risk for OSA. Routine screening in Nigerian outpatient clinics is warranted.

INTRODUCTION

Obstructive sleep apnoea (OSA) is a common sleep-related breathing disorder characterized by repetitive collapse of the upper airway during sleep, resulting in intermittent hypoxia and sleep.^{1,2} It is a common medical condition with significant adverse medical and public health consequences and has also been recognised as a risk factor for several diseases including hypertension, metabolic disorders and stroke. Failure to identify it may contribute to reduced quality of life, impaired daytime functioning, and increased healthcare utilization.²

Polysomnography (PSG) is the “gold standard” test for diagnosing this disorder but in resource poor countries, the cost, unavailability of the equipment and procedure creating limited access to this test have made the diagnosis a challenge therefore, screening tools will help to stratify patients who may need further evaluations.³

Once considered predominantly a disorder of high-income countries, OSA is now recognized as a global health issue affecting diverse populations across continents. Recent global modelling estimates suggest that approximately 936 million adults aged 30–69 years have some degree of OSA, with nearly 425 million experiencing moderate-to-severe disease.⁴ Although prevalence has been well characterized in Europe and North America, African epidemiological data are sparse, fragmented, and often confined to specific high-risk groups. Despite these alarming global figures, OSA remains under reported, under-recognized and underdiagnosed even among patients that present in the hospital in sub-Saharan Africa.⁵ Limited diagnostic infrastructure, low

awareness among clinicians, and competing infectious disease priorities have contributed to minimal surveillance of sleep disorders.^{6,7} In Nigeria, structured screening for OSA is rarely incorporated into routine hospital practice.

Nigeria, the most populous country in Africa, is experiencing rapid urbanization, lifestyle transitions, and demographic shifts. Increasing life expectancy, sedentary behaviour, and nutritional changes have contributed to a rising burden of noncommunicable diseases. These transitions suggest that OSA prevalence may be increasing in tandem, yet systematic screening is not routinely incorporated into hospital practice.

Previous Nigerian studies have shown varying prevalence among specific subgroups, including hypertensive patients, diabetic cohorts, or occupational groups.^{8,9,10} and few studies have assessed OSA risk across broad hospital-based adult population. Understanding the burden of OSA among hospital attendees is critical since it provides access to large adult populations with multiple risk exposures and early detection of this disease may reduce long-term morbidity and mortality in them.

This study therefore evaluated the prevalence and risk distribution of OSA among adult hospital attendees in a medical outpatients’ department.

MATERIALS AND METHODS

A descriptive cross-sectional study conducted among 387 participants attending the medical outpatient department of Barau Dikko Teaching Hospital, Kaduna over 8 weeks. Kaduna metropolis is the capital of Kaduna State in the Northwestern part of

Nigeria, and it covers 12,347sq km, approximately 25% of the state.

Barau Dikko Teaching Hospital is the only tertiary hospital in this area, and it serves as a referral center to other hospitals around.

Consecutive consenting patients at the clinic were recruited.

Study instrument and administration

A semi structured questionnaire with two parts was used for data collection. Part 1 had sociodemographic data, including history of smoking, alcohol use and other comorbidities. Part 2 was the STOP-BANG questionnaire which is a simple validated 8-item instrument that asks about symptoms of snoring, tiredness, observed apnoea and a history of high blood pressure. It also includes a section to document the body mass index, age, neck circumference, and gender. Each of the question was answered as either Yes (1) or No (0) giving a maximum score of 8. Based on the scoring, they were sub-classified into three risk categories: 0–2: Low risk, 3–4: Intermediate risk, 5–8: High risk. The questionnaire was administered by trained doctors.

Data analysis

Data obtained was analysed using the Statistical Software for Social Sciences (SPSS) version 25. Data was presented using tables with frequencies and percentages. Association between variables was assessed with the Pearson chi-square test. Bivariate logistic regression analysis was used to determine predictors of high likelihood of sleep-disordered breathing. A p-value of <0.05 was taken as significant.

Informed verbal consent was obtained from all patients, and they were adequately informed of their right to decline participation or to withdraw from the study

at any point in time with no negative consequence.

RESULTS

Among 387 adult hospital attendees, mean age of participants was 46.57 ± 16.08 years, females constituted about 65.4%, only about 6.5 % were current users of cigarette and alcohol as shown in table 1. Table 2 shows the prevalence of high-risk OSA was 7.5%, while 36.2% were categorized as intermediate risk. Thus, 43.7% of participants demonstrated at least moderate probability of OSA.

In table 3, age demonstrated a graded relationship with OSA risk with participants aged ≥ 51 years being more likely to fall within the high-risk category compared with younger adults. Although females constituted the majority of the clinic attendees (65.4%), there was significant association of gender, alcohol use with high-risk OSA. Table 4 shows that those 50 years and above had 2.5 times odds of having OSA, male gender were 9.7 times odds of OSA risk compared to their female counterparts and alcohol use contributed about 3.5 times risk of having OAS while cigarette smoking did not demonstrate statistically significant risk for OSA.

DISCUSSION

The prevalence of high-risk OSA (7.5%) observed in this hospital-based population is clinically significant. Importantly, when intermediate-risk individuals are included, nearly 44% of adult hospital attendees demonstrated some level of OSA risk. This suggests that sleep-disordered breathing may represent a substantial but largely unrecognized burden among patients presenting at this healthcare facility. This is similar to the result from Lagos that showed

a prevalence of 36.3% among the participants and when aggregated between in and outpatients, the value was higher in the in-patients compare to out-patients. The medical patients also had significantly higher prevalence (38%) as compared to their surgical counterparts (25.3%).¹¹ This buttresses the importance of diagnosis and treating OAS which may significantly affect the risk and outcomes of other diseases.^{12,13,14}

The study in Benin showed prevalence as high as 65.7% which could be as a result of the age of the patients studied because their mean age was 55.1 (± 13.6) years as have been already noted that age increases the risk of OSA.¹⁵ This was similar to that in Owo with a prevalence of 73.1% by Adeniyi et al.¹⁶

In comparison with global data, studies from Europe and North America report moderate-to-severe OSA prevalence ranging between 10% and 30% depending on demographic characteristics.^{17,18}

The intermediate-risk group (36.2%) constitutes a particularly important finding. Many individuals within this category may harbor undiagnosed mild-to-moderate OSA. International evidence suggests that intermediate STOP-BANG scores can still correspond to clinically significant apnea-hypopnea indices on polysomnography.¹⁹

Given limited access to sleep laboratories in Nigeria, these individuals may remain undiagnosed, contributing to chronic fatigue, impaired daytime functioning, and decreased quality of life. The magnitude of the intermediate-risk group underscores the need for structured follow-up pathways in subsequent visits for baseline comorbidity.

High-risk OSA prevalence was significantly associated with older participants especially in those 50 years and above in collaboration

with several other studies. This age-related gradient is consistent with global epidemiologic patterns demonstrating increased OSA prevalence with advancing age.^{15,20} Age-related structural changes in upper airway anatomy, reduced muscle tone and sleep architecture may contribute to increased vulnerability. Nigeria is experiencing a gradual demographic transition with increasing life expectancy. As older age groups expand, the burden of OSA and sleep-related disorders may correspondingly increase thereby becoming prominent contributors to morbidity.

Although females predominated in this outpatient cohort, males exhibited significantly higher high-risk prevalence. Global epidemiologic studies consistently report higher OSA prevalence among men approximately two to three times higher in men compared to premenopausal women, however, postmenopausal women may experience increasing risk.¹⁵ Heinzer using polysomnography, found that males were twice as likely to have moderate to severe sleep-disordered breathing than females.¹⁶ The findings of this study support targeted screening among male hospital attendees despite their low clinic attendance.

Alcohol use was associated with higher prevalence of high-risk OSA. Alcohol is known to exacerbate upper airway collapsibility during sleep [16].²¹ This may be because alcohol acts as a central nervous system depressant and reduces upper airway muscle tone, thereby increasing airway collapsibility.

Although patterns of alcohol consumption vary regionally across Nigeria, its association with OSA risk suggests a modifiable behavioural contributor which underscores the need for lifestyle counselling within outpatient settings.

RECOMMENDATIONS

The findings of this study have important implications for national and institutional health policy. Including Routine Hospital-Based Screening using screening tools, Integration of sleep screening into Noncommunicable Disease Frameworks, Public Awareness.

Multicenter Nigerian studies are required to determine national prevalence and validate screening thresholds.

disordered breathing is likely to increase, necessitating proactive policy responses which may include integration of structured OSA screening into hospital practice. This is feasible and may significantly improve detection in resource-limited settings.

CONCLUSION

This study demonstrates that obstructive sleep apnea risk is prevalent among adult hospital attendees in a Nigerian tertiary institution. Although 7.5% were categorized as high risk, more than one-third demonstrated intermediate risk, suggesting a substantial hidden burden. Age, male gender, and alcohol use were associated with significant increased risk.

As Nigeria undergoes demographic and lifestyle transitions, the burden of sleep-

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Table 1: Sociodemographic and clinical Characteristics of participants (N=387)

Variables	No (%)
Age (years)	
<20	24 (6.2)
21-30	46 (11.9)
31-40	76 (19.6)
41-50	83 (21.4)
51-60	73 (18.9)
61-70	67 (17.3)
>70	18 (4.7)
Mean age	46.57 ± 16.08
Gender	
Male	134 (34.6)
Female	253 (65.4)
Yes	191 (49.4)
Alcohol	
No	362 (93.5)
Yes	25 (6.5)
Cigarette	
No	362 (93.5)
Yes	25 (6.5)

Table II: STOP-BANG risk distribution

Risk Category	n	(%)
Low risk	218	56.3%
Intermediate risk	140	36.2%
High risk	29	7.5%

Table III: Factors associated with high-risk OSA in participants

Variables	Obstructive sleep apnoea		χ^2	<i>p</i> -value
	Low risk <i>n</i> (%)	High risk <i>n</i> (%)		
Age (years)				
<50	218 (95.2)	11(4.8)	5.855	0.016
≥51	140(88.6)	18 (11.4)		
Gender				
Male	119 (88.8)	15(11.2)	4.049	0.044
Female	239 (94.5)	14 (5.5)		
Alcohol				
No	338 (93.4)	24 (6.6)	6.030	0.014
Yes	20 (80.0)	5 (20.0)		
Current Cigarette Use				
No	337 (93.1)	25 (6.9)	2.790	0.106*
Yes	21 (84.0)	4 (16.0)		

*Fisher's exact test

Table IV: Predictors of OSA

Variables	aOR	95% CI	<i>p</i> -value
Gender			
Male	9.747	3.090 - 30.747	<0.001
Female	1		
Age (years)			
<50	2.548	1.169 – 5.556	0.019
≥51	1		
Current Cigarette Use			
No	0.542	0.089 - 3.293	0.506
Yes	1		
Alcohol			
No	3.521	1.215 – 10.202	0.020
Yes	1		