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Knowledge and Awareness of Obstructive Sleep Apnea and Its Related Complications Among Patients Visiting Outpatient Departments in a Tertiary Care Center: A Cross-Sectional Study

Adarsh Babu
MBBS student 2021 batch
Dr SMCSI Medical College, Karakonam, Trivandrum (Dist).
Dr Prem Kumar Battina
Associate Professor,
Department of General surgery,
Dr SMCSI Medical College,
Karakonam, Trivandrum (Dist)
Dr Dishan Y
Professor, Department of Respiratory medicine,
Dr SMCSI Medical College,
Karakonam, Trivandrum (Dist)
Dr Ani Mol Iyyankutty
Assistant Professor
Department of Anaesthesiology
Dr SMCSI Medical College,
Karakonam, Trivandrum (Dist)
Dr Ananya S W
Assistant Professor
Department of Community Medicine,
Travancore Medical College Hospital, Kollam
Kerala

Abstract

Background

Obstructive Sleep Apnea (OSA) is a common but often underdiagnosed sleep disorder with serious health implications, including cardiovascular disease, metabolic disorders, and neurocognitive impairment. Despite its high prevalence, public knowledge and awareness remain poor in most populations.

Objective

This study aimed to assess the level of knowledge and awareness of OSA and its related complications among patients attending outpatient departments in a tertiary care hospital in South Kerala.

Methods

A hospital-based, cross-sectional study was conducted over a six-month period from June to December 2024. A total of 84 participants aged 18 years and above were recruited using convenient sampling. Data collection was done using a semi-structured questionnaire, incorporating demographic details, the STOP-BANG score for OSA risk assessment, and the OSAKA questionnaire to evaluate knowledge and attitude. Statistical analysis was performed using SPSS v26.0, with chi-square tests applied for association and $p < 0.05$ considered statistically significant.

Results

The study revealed that only 31% of the participants had adequate knowledge regarding OSA, while 38.9% demonstrated good awareness. Knowledge and awareness were found to be significantly associated with age group ($p = 0.005$), educational qualification ($p = 0.001$), and occupation ($p = 0.002$). Gender, BMI, and comorbidities did not show statistically significant associations. A considerable proportion of high-risk individuals (as per STOP-BANG) lacked adequate awareness, underscoring the public health gap.

Conclusion

The findings highlight a concerning lack of awareness and knowledge about OSA among the general population, even among those at high risk. There is an urgent need to implement structured community education and screening programs to improve early identification, reduce complications, and promote overall health literacy about sleep-related disorders.

Keywords

Obstructive Sleep Apnea (OSA); Knowledge; Awareness; STOP-BANG; OSAKA; Sleep Disorders; Risk Factors; Tertiary Care; South Kerala; Cross-Sectional Study

Introduction

Obstructive Sleep Apnea (OSA) is a common but frequently underdiagnosed disorder characterized by repeated episodes of partial or complete obstruction of the upper airway during sleep, leading to intermittent hypoxia, fragmented sleep, and daytime somnolence. Globally, OSA is recognized as a significant public health problem due to its well-established association with cardiovascular diseases, type 2 diabetes mellitus, metabolic syndrome, stroke, cognitive dysfunction, and impaired quality of

life. Despite its increasing prevalence—estimated to affect nearly 1 billion people worldwide OSA remains poorly recognized, particularly in developing countries, including India.

The burden of OSA in India is believed to be substantial, with community-based studies suggesting that between 10% and 30% of adults may be at risk, particularly those with obesity, hypertension, or craniofacial anatomical predispositions. However, public awareness and knowledge about the condition remain alarmingly low, limiting early diagnosis and timely intervention. In most cases, individuals suffering from symptoms such as snoring, fatigue, or unrefreshing sleep are unaware of the underlying pathology and tend to neglect these signs or attribute them to stress or aging.

The American Academy of Sleep Medicine (AASM) emphasizes the critical need for increased awareness of sleep disorders, particularly OSA, among both healthcare providers and the general public. Tools such as the STOP-BANG questionnaire have been validated for effective screening of OSA risk in clinical and community settings. Likewise, the Obstructive Sleep Apnea Knowledge and Attitude (OSAKA) questionnaire is a well-established instrument used to assess knowledge and perceptions of OSA.

Given the asymptomatic nature of OSA in its early stages and the serious complications it may lead to if left untreated, improving knowledge and awareness at the population level becomes imperative. Studies evaluating awareness levels in the Indian context remain limited, especially in the southern regions. This study was therefore undertaken to assess the level of knowledge and awareness of OSA and its associated complications among adult patients attending various outpatient departments at a tertiary care center in South Kerala.

By identifying gaps in awareness and their associations with sociodemographic variables, the study aims to provide data that can guide future public health education strategies, early screening programs, and ultimately reduce the burden of undiagnosed OSA in the community.

Aims And Objectives

Primary Objective:

To assess knowledge and awareness of obstructive sleep apnoea among patients visiting clinical outpatient departments in a tertiary health center.

Secondary Objectives:

- To identify symptoms of OSA using the STOP BANG questionnaire.
- To evaluate associations between knowledge and selected sociodemographic details of the study participants.

Materials and Methods

Study Design and Setting

This was a hospital-based, cross-sectional study conducted at a tertiary care teaching hospital in South Kerala. The study was carried out over a period of six months, from June 2024 to December 2024, among patients attending various outpatient departments (OPDs) of the institution.

Study Population

The study population included adult patients aged 18 years and above, irrespective of gender, who were attending the OPDs during the study period and consented to participate.

Sample Size and Sampling Technique

A total of 84 participants were included in the study. The sample size was determined based on the expected prevalence of OSA awareness in similar populations, with consideration of available time and resources. A convenient sampling method was employed to recruit participants.

Based on a 70% awareness rate from previous studies, 84 participants were selected using non probability sampling According to Vignesh et al, a study conducted among Chennai Population shows 70% of them know about Obstructive Sleep Apnoea.[2]

Substituting this in the formula,

$$N = \{(Z(1-\alpha/2))^2 x\ P\ x\ (1-P)\}/d^2$$

Z1-α/2 - two tailed probability for 95% confidence interval = 1.96

P (%) –proportion of individuals know about OSA
= 70% d (%) - precision or allowable error = 10%

$$N = 4\ x70x30/10x10= 84$$

So, this study was conducted among 84 individuals seeking health care from the hospital.
Sampling justification due to hospital based recruitments probability sampling was infeasible. However, efforts were made to include diverse socio demographic groups to minimize bias.

SAMPLING TECHNIQUE:

Non probability sampling.

STUDY VARIABLE

- Socio-demographic variables: Age, height, weight and BMI
- Co-morbidities: Obesity, Diabetes, Hypertension, CAD, CKD, malignancy

Knowledge on obstructive sleep ap

Inclusion Criteria

- Adults aged 18 years and above.
- Patients attending OPDs who gave informed written consent.
- Patients able to understand and respond to the questionnaire.

Exclusion Criteria

- Patients with previously diagnosed OSA.
- Patients with known psychiatric illness or cognitive impairment.
- Critically ill or emergency cases.

Study Tools

A semi-structured, pre-validated questionnaire was used for data collection. It comprised three sections:

1. **Demographic Profile:** Age, gender, education, occupation, BMI, and comorbidities.
2. **STOP-BANG Questionnaire:** To assess the risk of OSA based on eight parameters—Snoring, Tiredness, Observed apnea, high blood Pressure, BMI, Age, Neck circumference, and Gender.
3. **OSAKA Questionnaire:** To assess participants' knowledge and awareness regarding OSA and its associated complications.

The questionnaire was prepared in English and translated into the local language (Malayalam) for better comprehension. The translation was verified by language experts to ensure accuracy and clarity.

Scoring System

- **STOP-BANG Score:** A score of 3 or more indicates high risk for OSA.
- **Knowledge and Awareness Scores:** Based on the OSAKA questionnaire, responses were scored and categorized as poor, moderate, or good awareness depending on the total percentage score.

Data Collection Process

After obtaining informed consent, participants were interviewed using the questionnaire. Data were collected anonymously to ensure confidentiality. Assistance was provided for participants with literacy or vision difficulties.

Ethical Considerations

The study was conducted after obtaining ethical clearance from the Institutional Ethics Committee. Participation was voluntary, and confidentiality of data was strictly maintained.

Statistical Analysis

Data were entered and analyzed using IBM SPSS version 26.0. Descriptive statistics such as frequency and percentage were used to describe categorical variables. Associations between knowledge/awareness scores and sociodemographic variables were tested using the Chi-square test, with $p < 0.05$ considered statistically significant.

Results

Demographic Profile of Participants

A total of **84 participants** were enrolled in the study. The majority belonged to the **41–60 years** age group (41.7%), followed by those aged **20–40 years** (34.5%) and **above 60 years** (23.8%). Females constituted **58.3%** of the sample. Most participants were married (86.9%). Regarding educational

status, **35.7%** had completed high school, while **25%** were graduates or above. A large proportion were **homemakers (53.6%)**, followed by employed individuals (29.8%).

Table 1: Demographic Characteristics of Study Participants (n = 84)

Characteristic	Category	Frequency (%)
Age	20–40 years	29 (34.5%)
	41–60 years	35 (41.7%)
	>60 years	20 (23.8%)
Gender	Male	35 (41.7%)
	Female	49 (58.3%)
Education	Illiterate	7 (8.3%)
	Primary	17 (20.2%)
	High School	30 (35.7%)
	Graduate & above	30 (35.7%)
Occupation	Homemaker	45 (53.6%)
	Employed	25 (29.8%)
	Unemployed	14 (16.6%)

Anthropometric and Comorbidity Profile

The assessment of BMI revealed that **39.3%** of participants were either overweight or obese. Regarding comorbidities, **35.7%** were hypertensive, **20.2%** had diabetes, and a smaller number (6%) had thyroid disorders.

Table 2: BMI and Comorbidities of Participants

Parameter	Category	Frequency (%)
BMI	Normal (<25)	51 (60.7%)
	Overweight (25–29.9)	22 (26.2%)
	Obese (≥30)	11 (13.1%)
Hypertension	Present	30 (35.7%)

Diabetes Mellitus	Present	17 (20.2%)
Thyroid Disorders	Present	5 (6.0%)

STOP-BANG Score Analysis

Based on STOP-BANG scoring, **20.2%** of respondents were categorized as being at **high risk** for OSA. **33.3%** were at intermediate risk, while **46.4%** were considered low risk. These results reflect that nearly one in five participants may have undiagnosed OSA based on clinical risk assessment.

Table 3: Risk of OSA Based on STOP-BANG Scoring

Risk Level	Score Range	Frequency (%)
Low Risk	0–2	39 (46.4%)
Intermediate	3–4	28 (33.3%)
High Risk	5–8	17 (20.2%)

Knowledge and Awareness Levels

Assessment using the OSAKA questionnaire revealed that **31%** of participants had adequate knowledge, while **38.1%** demonstrated good overall awareness. A concerning **32.1%** had poor awareness, which is significant in a population at risk.

Table 4: Knowledge and Awareness Levels Regarding OSA

Level of Awareness	Frequency (%)
Poor	27 (32.1%)
Moderate	25 (29.8%)
Good	32 (38.1%)

Association Between Sociodemographic Factors and Awareness

Statistical analysis showed a **significant association** between awareness levels and **education (p = 0.001)**, **occupation (p = 0.002)**, and **age group (p = 0.005)**. No significant relationship was observed with gender or BMI.

Table 5: Association of Awareness with Selected Variables

Variable	p-Value	Significance
Age Group	0.005	Significant
Gender	0.184	Not Significant
Education	0.001	Significant
Occupation	0.002	Significant
BMI	0.463	Not Significant

Knowledge Level in Relation to OSA Risk

Among individuals identified as **high risk** by STOP-BANG, **41.2%** had **poor knowledge**, showing a serious disconnect between clinical risk and disease understanding. Even in the low-risk group, 20.5% lacked basic knowledge.

Table 6: Knowledge Level in Relation to OSA Risk (STOP-BANG)

Risk Group	Poor Knowledge (%)	Moderate (%)	Good (%)
Low	20.5%	33.3%	46.2%
Intermediate	35.7%	35.7%	28.6%
High	41.2%	23.5%	35.3%

Awareness of Specific OSA Symptoms

Participants were asked about awareness of key symptoms of OSA. Snoring was the most recognized symptom (**46.4%**), while other symptoms like daytime fatigue (39.3%), choking at night (26.2%), and mood disturbances (31%) were far less known. This shows that even among those aware of OSA, understanding of its manifestations is limited.

Table 7: Awareness of Specific OSA Symptoms Among Participants

Symptom Known	Yes (%)	No (%)

Snoring	46.4	53.6
Daytime fatigue	39.3	60.7
Choking at night	26.2	73.8
Mood disturbances	31.0	69.0

Sources of Information About OSA

When questioned about their source of knowledge, **television and media (26.2%)** emerged as the most cited source, followed by **friends and relatives (22.6%)**. Only **15.5%** learned about OSA from healthcare professionals, and **25%** had never heard of the condition. This underscores the need for more structured awareness campaigns, particularly within healthcare settings.

Table 8: Sources of Information About OSA

Source	**Frequency (%)**
TV/Media	22 (26.2%)
Friends/Relatives	19 (22.6%)
Health Professionals	13 (15.5%)
Internet/Social Media	9 (10.7%)
Not Aware	21 (25.0%)

Willingness to Undergo OSA Screening

Encouragingly, when asked if they would be willing to undergo screening if found at risk, **73.8%** of participants responded positively. A small portion (11.9%) were unwilling, while 14.3% were undecided. These responses suggest that awareness programs, when implemented, may see good uptake in terms of community participation in screening.

Table 9: Willingness to Undergo OSA Screening if Indicated

Response	Frequency (%)
Yes	62 (73.8%)
No	10 (11.9%)
Not Sure	12 (14.3%)

Table 1: Demographic Characteristics of Study Participants: This table highlights the sociodemographic profile of participants. Most were middle-aged (41–60 years), female, married, and had education levels up to high school or graduation. Homemakers formed the majority occupation group, indicating a largely domestic sample base. **Table 2: BMI and Comorbidities of Participants:** Participants exhibited a considerable burden of metabolic comorbidities. Nearly 40% were overweight or obese, with hypertension (35.7%) and diabetes (20.2%) being the most prevalent conditions. These factors are well-established risks for OSA and support the relevance of screening in this population. **Table 3: Risk of OSA Based on STOP-BANG Scoring:** STOP-BANG scoring categorized 20.2% of participants as high-risk for OSA. The largest group fell under low-risk (46.4%), with a significant intermediate-risk group (33.3%). This indicates that nearly one in five participants could have undiagnosed OSA requiring further diagnostic evaluation. **Table 4: Knowledge and Awareness Levels Regarding OSA:** Only 38.1% of participants demonstrated good awareness of OSA. Nearly one-third had poor awareness, which is concerning given the health implications of untreated sleep apnea. The data reflect a serious educational gap in this population. **Table 5: Association of Awareness with Selected Variables:** Awareness was significantly associated with age, education, and occupation, suggesting that socioeconomic and cognitive factors influence understanding of OSA. No association was found with gender or BMI, indicating that physiological risk does not correlate with knowledge. **Table 6: Knowledge Level in Relation to OSA Risk (STOP-BANG):** Among those at high risk for OSA, over 40% had poor knowledge, indicating a mismatch between clinical risk and disease awareness. Even some low-risk individuals had good knowledge, possibly due to incidental learning or education exposure. **Table 7: Awareness of Specific OSA Symptoms Among Participants:** Snoring was the most recognized symptom (46.4%), while fatigue, mood changes, and choking at night were poorly identified. These findings suggest that the population is familiar with surface-level signs but unaware of deeper systemic manifestations of OSA. **Table 8: Sources of Information About OSA:** Mass media and social networks were the most common information sources. Only 15.5% of participants cited healthcare professionals as their source of knowledge. Notably, one in four had no prior exposure to OSA information, underscoring poor community outreach. **Table 9: Willingness to Undergo OSA**

Screening if Indicated: A promising 73.8% of participants expressed readiness to undergo screening if needed. This shows that with appropriate sensitization, individuals are likely to participate in preventive strategies. The undecided group (14.3%) represents an audience for targeted education.

Discussion

The present study was undertaken to evaluate the knowledge and awareness of Obstructive Sleep Apnea (OSA) and its complications among patients attending outpatient departments in a tertiary care center in South Kerala. The findings of this study reveal significant gaps in awareness, with only a third of participants demonstrating adequate knowledge of OSA and its risk factors, despite a considerable proportion being at moderate to high risk as per the STOP-BANG scoring.

A notable observation is that while 20.2% of participants were found to be at high risk for OSA, over 40% of them lacked basic knowledge about the condition. This disconnect between risk status and disease awareness reflects a critical public health concern. It emphasizes the need for better screening strategies and awareness initiatives at the primary care and community levels. Many individuals continue to perceive snoring and daytime fatigue as trivial complaints, often failing to recognize them as potential markers of a serious underlying sleep disorder.

The demographic analysis suggests that age, education, and occupation had a statistically significant association with awareness levels. Participants with higher educational qualifications demonstrated better knowledge scores, which reinforces the importance of health literacy in disease awareness. Homemakers and unemployed individuals were less likely to be informed about OSA, indicating that health education campaigns must be tailored to reach all socioeconomic groups, particularly those not routinely exposed to health information.

Interestingly, the study did not find a significant relationship between BMI and awareness levels, despite obesity being one of the strongest risk factors for OSA. This finding highlights the limited understanding of the link between lifestyle diseases and sleep disorders among the general population. It is also reflective of the lack of communication between healthcare professionals and patients regarding the multisystem implications of obesity, hypertension, and diabetes.

Symptom-specific awareness was alarmingly low in this study. While nearly half the participants recognized snoring as a symptom of OSA, very few were aware of other symptoms such as choking during sleep, mood disturbances, and daytime somnolence. This indicates that even among those who

have heard of OSA, there is a superficial understanding of the condition. Such limited awareness may delay help-seeking behavior and contribute to the underdiagnosis of OSA.

Media and peer networks were identified as the most common sources of information, whereas only a small proportion of respondents had received information from healthcare providers. This finding points toward an underutilized opportunity within clinical settings to educate patients. OPD visits and routine health checks should be leveraged as platforms to disseminate structured information about OSA, particularly among at-risk groups.

Encouragingly, the study revealed that a majority of participants expressed willingness to undergo OSA screening if found at risk. This indicates a positive attitude toward health once individuals are sensitized to potential problems. It further reinforces the role of primary care physicians, nurses, and allied health staff in initiating conversations about sleep health and screening during outpatient visits.

In summary, the study reveals that despite the high prevalence and serious consequences of OSA, awareness and understanding remain inadequate in the general population. Sociodemographic factors such as education and occupation significantly influence knowledge levels, and even high-risk individuals often remain unaware of their vulnerability. The findings underscore the importance of community-level education, provider-patient communication, and integration of sleep assessments into routine health screenings. If addressed appropriately, such measures can improve early diagnosis, reduce complications, and enhance the overall quality of life of individuals affected by sleep-disordered breathing.

Conclusion

This study highlights a significant gap in the knowledge and awareness of Obstructive Sleep Apnea (OSA) among the outpatient population, despite a substantial proportion being at moderate to high risk. Educational status and occupation were found to be key determinants of awareness, indicating the need for targeted health literacy initiatives. Strengthening patient education, incorporating routine OSA screening in clinical practice, and leveraging media and community outreach can play a pivotal role in early detection and prevention of OSA-related complications.

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