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Original Research Article

Understanding sleep apnoea: Prevalence, awareness, and readiness for orthodontic treatment in adults and children

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ABSTRACT

Aim: This cross-sectional study aimed to assess the prevalence of Obstructive Sleep Apnoea (OSA) while investigating awareness and readiness for orthodontic treatment. The primary objectives were to understand the burden of OSA and explore the potential role of orthodontic interventions in managing this condition.
Materials and Methods: The study employed a cross-sectional design, including a sample of 48 adults and 46 children from various geographical areas in Chennai. Craniofacial morphology assessments and validated questionnaires (Berlin Questionnaire for adults, Pediatric Sleep Questionnaire for children) were utilized for OSA risk assessment. Participants were screened for risk factors and symptoms, and their awareness of OSA and willingness to pursue orthodontic treatment were evaluated. Ethical guidelines were adhered to, and data were collected through standardized forms and electronic databases.
Results: Among the surveyed adults, 85.7% were identified as loud snorers, and significant proportions experienced daytime fatigue (53.6%) and choking during sleep (46.4%). Findings also revealed disrupted sleep patterns in 57.1% of adults, with 32.1% seeking medical consultation. Notably, 25% were aware of OSA, and none were familiar with orthodontic treatments. However, 53.6% expressed willingness to undergo orthodontic appliance treatment. In the pediatric population, 31% of children were loud snorers, and 34.5% experienced tiredness at school. While 17.2% of parents were familiar with OSA, only 3.3% knew about orthodontic treatments. Nevertheless, 34.5% expressed a willingness to pursue orthodontic appliance treatment for their children.
Conclusion: The study reveals a significant prevalence of OSA symptoms in both adults and children. Despite a high prevalence of symptoms, awareness of OSA and knowledge about orthodontic treatment options are notably low. Overall, enhancing public understanding of OSA and its treatment options can pave the way for more diverse and effective interventions.

1. Introduction

Obstructive Sleep Apnoea (OSA) is a sleep-related breathing disorder characterized by recurrent partial or complete upper airway obstruction during sleep, leading to disrupted breathing patterns, intermittent hypoxia, and sleep fragmentation.[1] OSA has garnered increasing attention in recent years due to its profound impact on overall health and quality of life. It affects individuals across the age spectrum, from children to adults, and its prevalence varies widely among different populations.[2,3]

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With rapid urbanization, changing lifestyles, and an evolving healthcare system, the prevalence of OSA is of paramount importance to public health.[4] OSA is associated with a range of comorbidities, including cardiovascular disease, metabolic disturbances, cognitive impairments, and a diminished quality of life. Early detection and management of OSA can mitigate these adverse outcomes and improve overall well-being.[5]

This study endeavors to comprehensively assess the prevalence of OSA, considering both adult and pediatric populations, and also aims to provide a holistic understanding of the OSA burden within this region and its potential implications for healthcare resource allocation.[6,7] Furthermore, the study delves into an aspect of OSA that has received less attention in the literature: the awareness and willingness of affected individuals to pursue orthodontic treatment modalities as a means of addressing their condition.

Orthodontic treatment modalities, such as oral appliances and orthognathic surgery, can play a crucial role in alleviating OSA symptoms by repositioning or augmenting the anatomy of the upper airway.[8] Despite their potential benefits, these treatment options are often underutilized, possibly due to a lack of awareness among patients or a hesitance to undergo orthodontic interventions.

By assessing awareness and willingness to seek orthodontic treatment, this study aims to bridge the gap between OSA diagnosis and effective intervention, ultimately improving the quality of life for those affected. Additionally, it seeks to identify socio-demographic, economic, and lifestyle factors that may influence individuals' attitudes and choices regarding OSA management.

2. Materials and Methods

2.1. Study design

This research employs a cross-sectional study design to assess the prevalence of Obstructive Sleep Apnoea (OSA) in adults and children in Chennai, India, and to investigate their awareness and willingness to pursue orthodontic treatment modalities for OSA management.

2.2. Sample selection

2.2.1. Adult population

A random sample of adult males aged 18 years and older drawn from various geographical areas within Chennai. A total of 50 adult Samples size were included in the study

2.2.2. Pediatric population

For the pediatric segment, children aged 2 to 17 years will be randomly selected from schools and pediatric healthcare facilities across Chennai. A total of 50 adult Sample sizes were included in the study.

2.3. Data collection

Both adult and Pediatric participants undergo craniofacial morphology assessment through clinical examination and cephalometric analysis to determine the risk of obstructive sleep apnea.[9] These participants were screened for OSA risk factors and symptoms using validated questionnaires, such as the Berlin Questionnaire for adults[10] (Fig 1) and the Pediatric Sleep Questionnaire for children.[11] (Fig 2) These structured interviews and questionnaires will be conducted to assess participants' awareness of OSA and their willingness to consider orthodontic treatment modalities as part of OSA management.

This study adheres to ethical guidelines, and informed consent was obtained from all participants or their legal guardians. Confidentiality of participant information will be maintained throughout the study. The Data were collected using standardized forms and electronic databases. The quality of the data obtained and accuracy will be ensured through regular validation checks.

2.4. Data analysis

Statistical evaluation of the data was performed using the IBM SPSS statistics software. The prevalence of OSA was calculated separately for the adult and pediatric populations. Descriptive statistics were used to summarize the findings. Data on awareness and willingness to seek orthodontic treatment were also analyzed.

3. Results

The investigation targeted individuals meeting the specified inclusion criteria. Utilizing Google Forms, the Questionnaire for Adult Sleep Apnea was distributed, yielding a total of 50 responses from adults. However, two responses were excluded as they did not meet the inclusion criteria, leaving 48 valid responses for analysis. Simultaneously, the Questionnaire for Pediatric Sleep Apnea was distributed through Google Forms, garnering 50 responses. Four responses were subsequently excluded for not meeting the inclusion criteria therefore 46 valid responses were used for analysis.

Among the 48 valid responses from the adult cohort, a significant 85.7% were identified as loud snorers. Additionally, 53.6% of respondents frequently experienced daytime fatigue, while 46.4% were observed to choke during sleep. A notable 57.1% reported disrupted sleep patterns at night, with 32.1% seeking medical consultation for the issue. Among those, 21.4% were prescribed sedative medications. (Figure 1) Furthermore, findings revealed that 25% of respondents were aware of obstructive sleep apnea, while none were familiar with orthodontic treatment modalities for the condition. Intriguingly, 53.6% expressed willingness to undergo treatment using orthodontic appliances. (Table 1)

Within the children population comprising 46 responses, 31% were identified as loud snorers, 34.5% experienced tiredness at school. A small percentage (6.9%) of children were observed to choke during sleep, and 27.6% were found to have interrupted sleep patterns. Additionally, 24.1% reported that their disturbed sleep negatively impacted their daily activities. Notably, 13.8% of the children sought medical attention for their abnormal sleep patterns, with none being prescribed sedative medication. (Table 1)

Moreover, 17.2% of parents were familiar with obstructive sleep apnea, while only 3.3% were aware of orthodontic treatment modalities for the condition. Interestingly, 34.5% of parents expressed a willingness to pursue orthodontic appliance treatment for their children. (Figure 2)

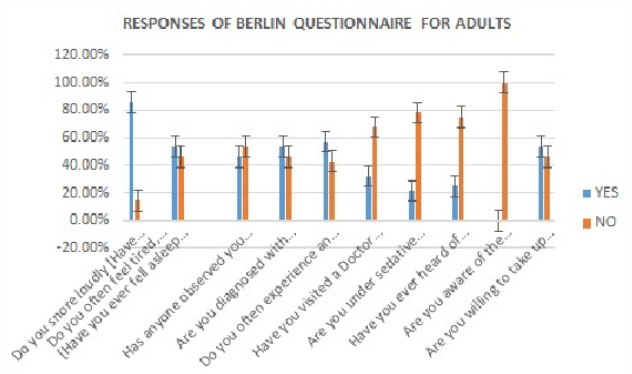

Figure 1: Response of berlin questionnaire for adults

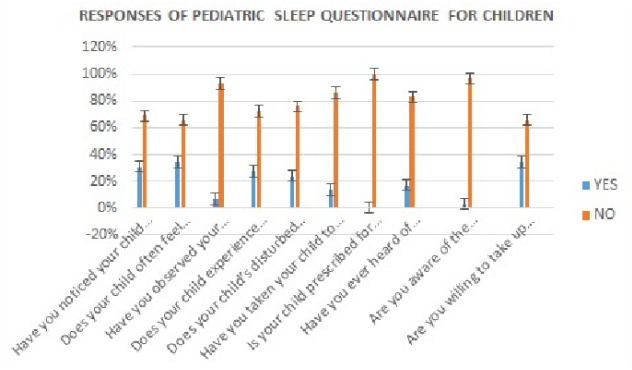

Figure 2: Response of paediatric sleep questionnaire

4. Discussion

Questionnaires play a pivotal role in research by swiftly and effectively gathering pertinent information. They prove particularly valuable in assessing subject behaviour, preferences, intentions, attitudes, and opinions, offering researchers a means to acquire both qualitative and quantitative data, resulting in a more thorough analysis.

In this study, a closed questionnaire was employed to distinctly delineate qualities and opinions. Notably, when examining obstructive sleep apnoea (OSA), prevalent survey tools include the Epworth Sleepiness Scale (ESS),[12] the Berlin Questionnaire (BQ),[10] and The STOP-Bang questionnaire.[13] Comparative analysis revealed that the STOP-Bang questionnaire demonstrated superior sensitivity in identifying high-risk OSA patients within a sleep clinic setting, surpassing both the ESS and BQ.Furthermore, the STOP-Bang questionnaire exhibited heightened efficacy across various demographic groups, including age, gender, and individuals with comorbidities such as hypertension, diabetes mellitus, coronary artery disease, chronic obstructive pulmonary disease, and asthma. While the questionnaire's high sensitivity renders it a valuable screening tool for OSA, adjustments are necessary to enhance its specificity.[14]

Despite the prevalence of obstructive sleep apnoea, recent surveys indicate a persistent lack of improvement in public knowledge and attitudes towards this condition.[15] This study aimed to evaluate the prevalence and awareness of obstructive sleep apnoea and explore the population's understanding of orthodontic treatments for this condition. The insufficient focus on abnormal sleep patterns in recent years may contribute to the overall lack of awareness regarding sleep disorders.

The results obtained from the survey of both the adult and children populations provide valuable insights into the prevalence and awareness of obstructive sleep apnea (OSA) and attitudes toward potential orthodontic treatments. The high percentage (85.7%) of adults identified as loud snorers underscores the prominence of this symptom within the surveyed adult population. Additionally, a significant portion (53.6%) reported experiencing daytime fatigue, and 46.4% were observed to choke during sleep. These findings align with well-established symptoms of OSA, emphasizing the importance of identifying and addressing such concerns.

The substantial percentage (57.1%) of adults reporting disrupted sleep patterns at night further emphasizes the impact of OSA on sleep quality within this group. It is noteworthy that a considerable proportion (32.1%) sought medical consultation for sleep-related issues, with 21.4% being prescribed sedative medications. This highlights the recognition of the severity of the problem and the extent to which individuals are actively seeking medical intervention.However, the awareness levels regarding obstructive sleep apnea appear to be relatively low, with only 25% of respondents indicating familiarity with the condition. Additionally, none of the surveyed individuals were aware of orthodontic treatment modalities for OSA. This indicates a notable gap in public knowledge, suggesting a need for increased education and awareness campaigns regarding both OSA and potential orthodontic interventions.The intriguing finding

Table 1: Results of berlin questionnaire for adults

S.No	Questions	Yes	No
1.	Do you snore loudly [Have you ever been told by someone or your spouse about you snoring at sleep]?	85.7%	14.3%
2.	Do you often feel tired, fatigued or sleepy during day time? [Have you ever fell asleep during driving or talking to someone]	53.6%	46.4%
3.	Has anyone observed you stop breathing or choking/ gasping while sleeping?	46.4%	53.6%
4.	Are you diagnosed with hypertension or under medication for hypertension?	53.6%	46.4%
5.	Do you often experience an interrupted/ disturbed sleep pattern at night?	57.1%	42.9%
6.	Have you visited a Doctor for your abnormal sleep pattern?	32.1%	67.9%
7.	Are you under sedative medication?	21.4%	78.6%
8.	Have you ever heard of Obstructive Sleep Apnoea?	25%	75%
9.	Are you aware of the orthodontic multi-disciplinary management for obstructive sleep Apnoea?	0%	100%
10.	Are you willing to take up the treatment for Obstructive Sleep Apnoea using orthodontic treatment modalities?	53.6%	46.4%

Table 2: Results of pediatric sleep questionnaire for children

S.No.	Questions	Yes	No
1.	Have you noticed your child snoring loudly during sleep?	31%	69%
2.	Does your child often feel tired, fatigued or sleepy during day time or at school?	34.5%	65.5%
3.	Have you observed your child stop breathing or choking/ gasping while sleeping?	6.9%	93.1%
4.	Does your child experience an interrupted/ disturbed sleep pattern at night?	27.6%	72.4%
5.	Does your child's disturbed sleep pattern affects their daily activities?	24.1%	75.9%
6.	Have you taken your child to a physician for abnormal sleep pattern?	13.8%	86.2%
7.	Is your child prescribed for continuous medication by a physician?	0%	100%
8.	Have you ever heard of Obstructive Sleep Apnoea?	17.2%	82.8%
9.	Are you aware of the orthodontic multi-disciplinary management for obstructive sleep Apnoea?	3.3%	96.7%
10.	Are you willing to take up the treatment for Obstructive Sleep Apnoea using orthodontic treatment modalities?	34.5%	65.5%

that 53.6% of respondents expressed a willingness to undergo orthodontic appliance treatment is noteworthy. This suggests a potential avenue for addressing OSA symptoms, and it underscores the importance of exploring and promoting alternative treatment options beyond traditional medical interventions.

The results from the children population, the prevalence of loud snoring (31%), and tiredness at school (34.5%) reflect similar patterns observed in the adult group. The detection of interrupted sleep patterns in 27.6% of children highlights the potential impact of OSA on the quality of sleep in this demographic.[16] The lower percentage (6.9%) of children observed to choke during sleep suggests that certain symptoms may manifest differently or be less pronounced in the pediatric population. Notably, a significant proportion of parents (34.5%) expressed a willingness to pursue orthodontic appliance treatment for their children, indicating a potential acceptance of alternative approaches to addressing sleep-related issues in this age group. However, the low awareness levels regarding both obstructive sleep apnea (17.2%) and orthodontic treatment modalities (3.3%) among parents underscore the need for increased education and awareness initiatives targeted at caregivers.

The survey results shed light on the prevalence of OSA symptoms in both adults and children, as well as the existing gaps in awareness, particularly concerning orthodontic treatment options. The findings suggest a potential role for orthodontic interventions in addressing OSA symptoms,[17] emphasizing the importance of comprehensive education and awareness campaigns to better inform the public about the condition and available treatment modalities.

5. Conclusion

The survey findings reveal a significant prevalence of obstructive sleep apnea (OSA) symptoms in both adults and children. While symptoms like loud snoring and daytime fatigue are prominent, awareness of OSA and knowledge about orthodontic treatment options are notably low among respondents. The willingness of a considerable percentage of adults and parents to consider orthodontic appliances suggests a potential acceptance of alternative interventions.

These results emphasize the urgent need for targeted educational campaigns to bridge knowledge gaps, improve awareness, and foster a more informed approach to managing OSA symptoms. Overall, enhancing public

understanding of OSA and its treatment options can pave the way for more diverse and effective interventions.

6. Conflict of Interest

None.

7. Source of Funding

None.

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