

KNOWLEDGE AND AWARENESS OF PARENTS ABOUT PEDIATRIC OBSTRUCTIVE SLEEP APNEA IN URBAN POPULATION- DESCRIPTIVE CROSS-SECTIONAL STUDY

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Abstract:

Background: Paediatric obstructive sleep apnoea (OSA) is a common but often under-recognised condition. Early detection and treatment are important to prevent serious health problems. Parents play a key role in recognising symptoms and seeking timely care, but their level of knowledge may vary depending on their education, occupation, and access to information. **Objective:** To assess parents' knowledge and awareness of childhood OSA and to identify associated demographic factors, such as education and occupation. **Methods:** A descriptive cross-sectional study was conducted over three months with 150 parents attending outpatient departments at a tertiary care hospital. A validated questionnaire consisting of demographic details, symptom recognition, risk factor awareness, and beliefs about OSA was used for data collection. Responses were analysed using descriptive statistics, and associations were tested using chi-square and t-tests. **Results:** Among the participants, 68% were female, and most were aged 31–50 years. Over half had a bachelor's degree, and the majority worked in unspecified jobs, followed by teachers and health workers. Only 12.7% of the respondents showed good knowledge of OSA. The most common symptoms were restless sleep (71.3%), mouth breathing (60%), and snoring (56.7%). Enlarged tonsils, allergic sinusitis, and obesity were identified as the common risk factors. Education and occupation were significantly associated with knowledge levels ($p < 0.05$). The Internet was the most reported source of information. **Conclusion:** Parental knowledge and awareness of paediatric OSA in this urban population were generally poor, with most parents unable to identify key symptoms and risk factors. Education level and occupation were significantly associated with higher knowledge scores.

Keywords: Paediatric OSA, Parental Awareness, Knowledge, Risk Factors, Symptoms, Education Level.

INTRODUCTION

Obstructive Sleep Apnoea (OSA) is a breathing disorder that occurs during sleep. It is caused by repeated partial or complete blockage of the upper airway, resulting in interrupted breathing. These blockages disrupt sleep, causing frequent awakenings along with low oxygen and high carbon dioxide levels. Over time, untreated OSA can affect a child's daily functioning and lead to various health problems.¹

OSA is relatively common in children, affecting approximately 1% to 5%.² The main causes are enlarged tonsils and adenoids (adenotonsillar hypertrophy) and being overweight.³ Children with OSA may snore loudly, sleep restlessly, or appear very tired during the day. They may also have trouble focusing, face learning difficulties, or exhibit behaviours such as hyperactivity, impulsiveness, defiance, or aggression.⁴ These signs may resemble symptoms seen in attention deficit hyperactivity disorder (ADHD), making diagnosis more difficult.⁵

Parents are usually the first to notice changes in their child's sleep or behaviour. Early recognition of these signs can lead to timely medical care. However, when parents are unaware of the symptoms, diagnosis and

treatment may be delayed. Knowing how much parents understand about paediatric OSA is important, as it helps guide education programs to increase awareness.⁶ OSA in children can be effectively treated. However, if not treated in time, it can lead to serious problems, such as high blood pressure, poor brain development, learning difficulties, and other health issues.^{2,7} Studies have shown that children with untreated OSA may develop subclinical right and left ventricular dysfunction, indicating early cardiovascular involvement before symptoms appear. Early identification and proper management of paediatric OSA are essential to reduce its impact on physical and mental growth.⁸

Parents living in cities may have different levels of knowledge about health issues, such as OSA, due to variations in education, income, or access to health services. Urban families may also be influenced by lifestyle changes or lack of awareness, affecting how quickly they seek help.⁹ These differences must be studied to identify which groups need more support and information. Although paediatric OSA is manageable, not all parents are familiar with its warning signs or long-term impact. This lack of understanding can delay

diagnosis and treatment, leading to avoidable health risks.¹⁰

The purpose of this study was to find out how much urban parents knew about the symptoms, causes, and effects of OSA in children. It also examines how their understanding is influenced by factors like income and education. This study can help guide more effective public health awareness campaigns by identifying these knowledge gaps.

MATERIAL AND METHODS

This descriptive cross-sectional study included 150 parents of children in the Department of ENT at SRM Medical College Hospital and Research Centre, with data collected over three months. Ethical approval was obtained from the Institutional Ethics Committee before starting the study.

Sample size calculation

To estimate the population proportion with 95% confidence and 8% margin of error. Assuming the highest variability ($p = 0.5$), the required number of participants was approximately 150, and the formula used was as follows: $n = (Z^2 \times p \times (1 - p)) / d^2$.

Inclusion and exclusion criteria

Parents who provided informed consent and could comprehend the questionnaire were included. Parents who did not complete the questionnaire, declined consent, or had intellectual disabilities affecting their ability to understand or respond were excluded. Only fully completed questionnaires were included in the final analysis.

Methods

After obtaining approval, a previously published and validated questionnaire was administered. The questionnaire was reviewed and revised by a statistician. A pilot study was conducted with 24 participants to check its reliability, and the Cronbach's alpha value was found to be 0.82. Data were collected by directly administering the questionnaire to the parents after obtaining written informed consent. The questionnaire consisted of two sections. Part I collected basic information such as age, nationality, gender, marital status, education, occupation, number of children, and whether any child had been diagnosed with OSA. Part II focused on assessing awareness of childhood OSA. It included 23 questions with "Yes" or "No" responses. These questions asked about the effects of the condition on school performance, mood, attention, and behaviour. It also asked about causes such as genetics and risk factors such as enlarged adenoids, tonsils, allergic sinusitis, asthma, obesity, low birth weight, Down syndrome, and parental smoking. The questions also covered awareness of symptoms such as snoring, mouth breathing, restless sleep, and daytime sleepiness, and only completed questionnaires were included in the final analysis.

Statistical analysis

Data were analysed using SPSS version 24.0. Descriptive statistics, including frequencies and percentages, were used to summarise participants' demographic details. The Chi-square test was applied to examine the relationship between the level of knowledge and variables: $p < 0.05$ was considered statistically significant.

RESULTS AND OBSERVATIONS:

The study included 68% females and 32% males. Most of the respondents were between 31 and 40 years (35.3%) and 41 and 50 years (34%), while 16% were aged 51–60, 10% were between 18 and 30, and only 4.7% were above 60. Regarding education, more than half held a bachelor's degree (55.3%), followed by 21.3% with postgraduate qualifications, 12.7% with a high school education, and 10.7% with an undergraduate diploma. In terms of occupation, most participants (59.3%) were from other professions not specifically listed, followed by teachers (22%), health sector employees (12%), engineers (5.3%), and soldiers (1.3%) (Table 1).

Most participants had poor knowledge of childhood OSA (87.3%), while only 12.7% had good knowledge. Regarding the definition of the condition, 44% answered correctly, 47.3% did not know, and 8.7% were unsure. When asked about the source of their information, 34.7% mentioned the Internet or social media, 20.7% referred to medical articles, 18.7% received information from other parents or patients, and 42.7% had no source or were unaware of the condition (Table 2).

Among the symptoms of OSA, restless sleep was reported by 71.3% of the participants, followed by mouth breathing (60%) and snoring (56.7%). Less frequently recognised symptoms included bedwetting (18.7%) and hyperactivity (16%). Regarding risk factors, enlarged tonsils or adenoids were identified by 68% of respondents, allergic sinusitis by 58%, and asthma by 55.3%. Obesity was acknowledged as a contributing factor by 51.3% of the respondents. Fewer participants recognised sickle cell anaemia (8%) and diabetes mellitus (10%) as associated risk factors for childhood OSA (Table 3).

Table 1: Socio-demographic characteristics

Variable		Frequency (%)
Gender	Male	48 (32%)
	Female	102 (68%)
Age Group (years)	18–30	15 (10%)
	31–40	53 (35.3%)
	41–50	51 (34%)
	51–60	24 (16%)
	>60	7 (4.7%)
Education Level	High School	19 (12.7%)
	Undergraduate Diploma	16 (10.7%)
	Bachelor's Degree	83 (55.3%)
	Higher Education (PG)	32 (21.3%)
Occupation	Health Sector Employee	18 (12%)
	Engineer	8 (5.3%)
	Teacher	33 (22%)
	Soldier	2 (1.3%)
	Other	89 (59.3%)

Table 2: Knowledge level, awareness, and information sources on childhood OSA

Variable		Frequency (%)
Knowledge Level	Good Knowledge	19 (12.7%)
	Poor Knowledge	131 (87.3%)
Response to OSA Definition	Correct	66 (44%)
	Did Not Know	71 (47.3%)
	Uncertain	13 (8.7%)
Information Source	Internet/Social Media	52 (34.7%)
	Medical Articles	31 (20.7%)
	Other Parents/Patients	28 (18.7%)
	No Source/Unaware	64 (42.7%)

Table 3: Recognition of symptoms and risk factors associated with childhood OSA

Variable		Frequency (%)
Symptom	Restless Sleep	107 (71.3%)
	Mouth Breathing	90 (60%)
	Snoring	85 (56.7%)
	Bedwetting	28 (18.7%)
	Hyperactivity	24 (16%)
Risk Factor	Enlarged Tonsils/Adenoids	102 (68%)
	Allergic Sinusitis	87 (58%)
	Asthma	83 (55.3%)
	Obesity	77 (51.3%)
	Sickle Cell Anaemia	12 (8%)
	Diabetes Mellitus	15 (10%)

Most participants believed that OSA is manageable (85.3%) and that early treatment can reduce complications (86.7%). An equal number (86.7%) of respondents felt that increasing parental awareness could lessen the overall burden. Nearly half of the respondents (45.3%) thought that OSA could negatively affect school performance, while 46.7% believed it could influence attention and behaviour. Approximately one-third (32.7%) of the respondents felt that children with OSA are more likely to experience depression, and 34.7% agreed that genetic factors could play a role in its development (Table 4).

Table 4: Parental beliefs regarding childhood OSA

Statement	Frequency (%)
Believe OSA affects school performance	68 (45.3%)
Believe children with OSA have higher depression prevalence	49 (32.7%)
Believe OSA affects attention and behaviour	70 (46.7%)
Believe genetic factors play a role	52 (34.7%)
Believe OSA is manageable	128 (85.3%)
Believe early intervention reduces complications	130 (86.7%)
Believe parental awareness helps reduce the burden	130 (86.7%)

The mean overall knowledge score was 14.8 ± 5.2 . A significant difference in knowledge was observed based on occupation ($p = 0.037$) and education level ($p = 0.041$) (Table 5).

Table 5: Association of knowledge score with occupation and education level

Variable	Mean Score ($\pm$ SD)	P-value
Overall Knowledge Score	14.8 ± 5.2	—
Occupation (significant difference)	—	0.037
Education Level (significant difference)	—	0.041

DISCUSSION

Our study assessed parental awareness, knowledge, symptoms, and risk factors of paediatric OSA and related influencing factors, which are discussed as follows. Females comprised 68% of the participants, with most aged between 31 and 40 years (35.3%) and 41 and 50 years (34%). The majority (59.3%) were in unspecified occupations, followed by teachers (22%) and health workers (12%), and most (58%) held a bachelor's degree. Alosaimi et al. reported that out of 462 participants, 72.9% were females, and the highest age group was 41–50 years (34.4%).¹¹ Al-Makramani et al. with 393 participants, noted 39.4% belonged to the other occupation group, teachers accounted for 20.6%, followed by health sector employees (16.3%), soldiers (13%), and engineers (9.4%).¹²

In our study, 87.3% of the participants had poor knowledge of OSA, and only 44% could define it correctly. The Internet/social media (34.7%) was the main source of information, while 42.7% had no source or awareness. Similarly, Alosaimi et al. reported a mean knowledge score of 15.38 ± 6 among 146 participants; only 20% had good knowledge, and 60% correctly defined OSA.¹¹ Bashir et al. found that among 675 parents, 58.7% had moderate knowledge.¹³ Alkhalifah et al. observed that out of 838 parents, only 59 (7%) misidentified paediatric OSA as a natural process.¹⁴ Sia et al. conducted 1,306 interviews and found that 21.5% had heard of OSA, but only 13% could define it.¹⁵ Xu

et al. found that among 1,123 respondents, 49.9% learned about childhood OSA through the Internet.¹⁶ Participants had limited knowledge of OSA, mainly relying on the Internet, and many lacked awareness or an accurate understanding.

In our study, restless sleep, mouth breathing, and snoring were common symptoms, whereas enlarged tonsils/adenoids, allergic sinusitis, asthma, and obesity were key risk factors. Gomes et al. found sleep disturbance scores averaged 18.8 ± 5.19 ; the impact was low in 10.2%, moderate in 55.9%, and high in 33.9%.¹⁷ Bonuck et al. noted habitual snoring in 9.6–21.2%, constant snoring in 3.6–7.7%, and 25% were mouth-breathers by age six.¹⁸ Xu et al. found tonsillar hypertrophy in 79.3% and adenoid hypertrophy in 66% of children with OSAS.¹⁹ Shen et al., in a case–control study of 338 children, found major predictors were adenoid hypertrophy ($OR \approx 8.6$), tonsil hypertrophy ($OR \approx 9.1$), and chronic sinusitis ($OR \approx 27.2$).²⁰ Erdim et al., in a study of 240 children, found that one-third of obese children had OSA, with obesity increasing risk by 4.5 times.

Our study showed that most parents believed that OSA is manageable and that awareness is beneficial, but fewer recognised its effects on learning, behaviour, or genetics. Al-Makramani et al., in 377 participants, reported that 53.7% were unaware that OSA affects

school performance, 57% did not know about its link to depression, while 77.9% believed it is treatable.¹²

Knowledge scores varied significantly with occupation and education, indicating that these factors influence awareness of childhood OSA. Similarly, Alghamdi et al. in a cross-sectional study with 413 participants found a significant relationship between knowledge and both occupation and education ($p < 0.05$), and Alosaimi et al. reported a mean knowledge score of 15.38 ± 6.11 . Our study showed that most parents had limited knowledge of OSA, with awareness influenced by education and occupation, highlighting the need for targeted health education.

Limitations

This study was conducted in a single tertiary care hospital, which may not represent a wider urban population. The use of self-reported questionnaires may have introduced bias due to misunderstandings or inaccurate responses. Additionally, as only literate parents were included, the findings may not reflect the knowledge level of those with limited education.

CONCLUSION

Our study showed that most parents had poor knowledge and limited awareness of childhood OSA, with many unable to identify its key symptoms, causes, and consequences. Restless sleep, mouth breathing, and snoring were the most recognised symptoms, while enlarged tonsils, allergic sinusitis, and obesity were common risk factors. Awareness levels were higher among parents with better education and in specific occupations. Although most believed that OSA is manageable and that early treatment is helpful, few understood its effects on learning and behaviour. The Internet was the main source of information, but many had no reliable sources.

REFERENCES

- Slowik JM, Sankari A, Collen JF. Obstructive sleep apnoea. Stat Pearls, Treasure Island (FL): Stat Pearls Publishing; 2025. <https://www.ncbi.nlm.nih.gov/books/NBK459252/>.
- Tan H-L, Gozal D, Kheirandish-Gozal L. Obstructive sleep apnea in children: a critical update. *Nat Sci Sleep* 2013; 5:109–23. <https://doi.org/10.2147/NSS.S51907>.
- Ryan CM, Pillar G. Adolescent obesity, adenotonsillar hypertrophy, and obstructive sleep apnea. *Am J Respir Crit Care Med* 2015; 191:1220–2. <https://doi.org/10.1164/rccm.201504-0677ED>.
- Mutchler C. Sleep apnea in children: Types, what it looks like, and treatment. Very well, Health 2024. https://www.verywellhealth.com/sleep-apnea-in-children-8668347?utm_source=chatgpt.com.
- Blesch L, Breese McCoy SJ. Obstructive sleep apnea mimics attention deficit disorder. *J Atten Disord* 2016; 20:41–2. <https://doi.org/10.1177/1087054713479664>.
- Hosokawa R, Tomozawa R, Fujimoto M, Anzai S, Sato M, Tazoe H, et al. Association between sleep habits and behavioral problems in early adolescence: a descriptive study. *BMC Psychol* 2022; 10:254. <https://doi.org/10.1186/s40359-022-00958-7>.
- Al-Shamrani A, Alharbi AS. Diagnosis and management of childhood sleep-disordered breathing. Clinical approach: Clinical approach. *Saudi Med J* 2020; 41:916–29. <https://doi.org/10.15537/smj.2020.9.25262>.
- Chan JYS, Li AM, Au C-T, Lo AFC, Ng S-K, Abdullah VJ, et al. Cardiac remodelling and dysfunction in children with obstructive sleep apnoea: a community-based study. *Thorax* 2009; 64:233–9. <https://doi.org/10.1136/thx.2007.094904>.
- Park JW, Hamoda MM, Almeida FR, Wang Z, Wensley D, Alalola B, et al. Socioeconomic inequalities in pediatric obstructive sleep apnea. *J Clin Sleep Med* 2022; 18:637–45. <https://doi.org/10.5664/jcsm.9494>.
- Gouthro K, Slowik JM. Pediatric obstructive sleep apnea. StatPearls, Treasure Island (FL): StatPearls Publishing; 2025. <https://www.ncbi.nlm.nih.gov/books/NBK557610/>.
- Alosaimi RM, Alqarni G, Musslem MT, Filfilan FF, Alazmi EA, Alsaedi JR, et al. Knowledge and awareness of parents about pediatric Obstructive sleep apnea in Jeddah: A cross-sectional study. *Cureus* 2023;15: e38960. <https://doi.org/10.7759/cureus.38960>.
- Al-Makramani A, Shawish AM, Albarrati AM, Akkam MM, Hakami NM, Omar RN, et al. Awareness and knowledge of parents and caregivers regarding pediatric obstructive sleep apnea in Jazan, Saudi Arabia: A cross-sectional study. *Cureus* 2024;16:e64297. <https://doi.org/10.7759/cureus.64297>.
- Alkhalifah KM, Allabun FS, Alsughayyir AA, Alharbi WO, Almagushi SA, Alwabel MS, et al. The knowledge and awareness of parents regarding pediatric obstructive sleep apnea in the Central Region of Saudi Arabia. *Healthcare (Basel)* 2025;13. <https://doi.org/10.3390/healthcare13090968>.
- Bashir AF, Al-Ghamdi A, Alsaadi AS, AlQahtani BG, Alshihri SA, Alshahrani HA, et al. Knowledge and awareness of parents about pediatric obstructive sleep apnea in KSA: A cross-sectional study. *World Family Medicine*. 2021;19(1):206–214. <https://doi.org/10.5742/MEWFM.2021.93971>.
- Sia C-H, Hong Y, Tan LWL, Van Dam RM, Lee C-H, Tan A. Awareness and knowledge of obstructive sleep apnea among the general population. *Sleep Med* 2017; 36:10–7. <https://doi.org/10.1016/j.sleep.2017.03.030>.
- Xu P, Zhang S, Yang J, Chu H, Li D, Zhao H, et al. Survey of parental awareness of obstructive sleep

- apnea among children in Guangdong province, South China. *Auris Nasus Larynx* 2021; 48:690–6. <https://doi.org/10.1016/j.anl.2020.10.018>.
17. Gomes A de M, Santos OM dos, Pimentel K, Marambaia PP, Gomes LM, Pradella-Hallinan M, et al. Quality of life in children with sleep-disordered breathing. *Braz J Otorhinolaryngol* 2012; 78:12–21. <https://doi.org/10.5935/1808-8694.20120003>.
 18. Bonuck KA, Chervin RD, Cole TJ, Emond A, Henderson J, Xu L, et al. Prevalence and persistence of sleep disordered breathing symptoms in young children: a 6-year population-based cohort study. *Sleep* 2011; 34:875–84. <https://doi.org/10.5665/SLEEP.1118>.
 19. Xu Z, Wu Y, Tai J, Feng G, Ge W, Zheng L, et al. Risk factors of obstructive sleep apnea syndrome in children. *J Otolaryngol Head Neck Surg* 2020;49:11. <https://doi.org/10.1186/s40463-020-0404-1>.
 20. Shen L, Lin Z, Lin X, Yang Z. Risk factors associated with obstructive sleep apnea-hypopnea syndrome in Chinese children: A single center retrospective case-control study. *PLoS One* 2018;13: e0203695. <https://doi.org/10.1371/journal.pone.0203695>.