Knowledge and Awareness of Parents about pediatric obstructive sleep apnea in KSA, cross-section study, 2019

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Abstract

Background: Obstructive Sleep Apnea (OSA) is a chronic disorder defined as frequent episodes of complete and partial obstruction of the upper airway during sleep. Eventually, untreated OSA causes severe morbidities such as neurobehavioral, cardiac, and growth deficiency. Most of these are reversible via early detection and therapy. Unfortunately, studies in Saudi Arabia that promote the general public's awareness about OSA in the pediatric age group are limited.

Objectives: This study aims to assess the level of Awareness about pediatric OSA among Saudi parents. Additionally, we wanted to study the relationship between parents' knowledge and their educational level and determine the best method for increasing the public's awareness.

Methods: A cross-sectional study was done on 675 parents and data were collected randomly through a self-administered online questionnaire. An awareness score level was calculated to assess the level of participants' knowledge.

Results: Most of the parents had a medium level of knowledge, 6.2% had a high level of awareness and 50.7% stated that awareness campaigns should be done to increase public awareness about pediatric OSA. Parents who were more educated had more knowledge about the disease.

Conclusion: There is a high rate of missed awareness and knowledge about pediatric OSA which highlights the need for further studies in the future.

Key words: Knowledge, Awareness, pediatric, sleep, apnea, KSA.

Introduction

Obstructive Sleep Apnea (OSA) is a chronic sleeping disorder defined as frequent episodes of complete and partial obstructions of the upper airway during sleep (1). These breathing gaps result in low oxygen supply to the brain and an accumulation of carbon dioxide in the blood (2). As a result, nocturnal sleep will be disturbed and eventually lethargy and day time tiredness will ensue. With knowledge improvement regarding the pathophysiology and clinical complications of the disorder, most affected patients could be diagnosed (2). By history taking from the patient or bed partner about the signs and symptoms of the disease including loud snoring, observed episodes of breathing pauses during sleep, daytime fatigue and sleepiness, identification of patients who need further diagnostic assessment could be done (3).

According to the American Sleep Association (ASA) OSA is the most common type of sleep apnea (4). Furthermore, its prevalence in the pediatric age-group was 5% (5). Additionally, another article illustrated that the most common cause for OSA in children is adenotonsillar hypertrophy with a peak range between 3-6 years old (6). Although the condition is not acutely life-threatening, if left untreated it may cause many complications such as high blood pressure, metabolic and cardiovascular disease (7).
A study on young school-aged children showed that the risk increased according to severity, which leads to reduced cognitive and behavioral capabilities that likely impact optimal health development. As a consequence, those who have moderate to severe OSA were harmed in their social and academic life (8), in patients' families and the community as a whole (7). The prevalence of OSA in Saudi Arabia was initially assessed by Bahammam et al, nearly a decade ago on 400 middle-aged women by using the Berlin Questionnaire stratification for risk of OSA. The results showed that 39% of women were considered as high risk for OSA (9).

Additionally, in another Bahammam study on Saudi primary school-children, they stated that the prevalence of habitual snoring was 17% (10). Furthermore, a survey conducted in Jeddah city included 65 children with Sickle cell disease at a tertiary hospital where they assessed the prevalence of OSA among them, revealed that it's prevalence was high at 80% (52 patients) using an apnea-hypopnea index cutoff of ≥1 (11). A study by Scott J et. al recommended increasing awareness of sleep-disordered breathing (SDB), particularly in children with more severe OSA as it will help in decreasing the burden on families with an affected child as well as the community (8).

In Kingdom of Saudi Arabia (KSA), studies which encourage the awareness of the general population about OSA in the pediatric age group are limited. This study aimed to assess the level of Awareness about pediatric OSA among Saudi parents, and the relationship of this knowledge to their educational level.

Methodology

A cross-sectional study was done to assess Pediatric Obstructive Sleep Apnea (POSA) awareness among Saudi parents during the period from October 2019 to April 2020. The sample included all Saudi parents from both genders who agreed to participate. We excluded non-Saudi participants. The sample size was around 700 subjects.

Data collection methods and procedure:
The data was collected randomly through a self-administered online questionnaire. We conducted the survey in Arabic language and directed it to all parents in Saudi society through (WhatsApp, Twitter, Facebook, Path, Telegram, Tumbler, Instagram). The questionnaire contained two parts: The first part contained items on socio-demographic data like: Age, Nationality, gender, marital status, region of origin, education, and specialty.

The second part included some questions of knowledge about OSA. About 14 questions attempted to assess the respondent's awareness, and understanding of pediatric obstructive sleep apnea, starting with "Are you aware of a condition known as obstructive sleep apnea?" to see the extent of the society's understanding of OSA, the definition of POSA, risk factors, the most common criteria of POSA, and treatment options of POSA, by the principal investigators. Additionally we assessed which media helped the community to obtain their information about POSA, an to report the community's needs to know more about POSA in the future. Finally, we asked if they think they are in need of further awareness about POSA.

Statistical analysis: The data were entered using Microsoft Excel 2010; they were coded and analyzed by the (SPSS) Package for the Social Sciences program version 25. Data analysis included descriptive statistics frequency. The percentage was used to describe the demographic information and variables and Chi-Square (X2) test was done to asses the relationship between variables. A p-value less than 0.05 was considered significant.

Ethical Consideration: The survey of this study was on the social media websites to reach a large number of respondents. Thus, there was no need for data collectors in this situation. Then electronic consent was obtained from those who agreed to participate in the study and all were informed that the information required would be used for research purposes only.

Results

Table 1 shows the socio-demographic data of our sample. Their age ranged from 18 to more than 66 years, with the most common age group range from 31 to 40 years old. Most of our sample (N=620), (91.9%) were female. Most of them (N=271), (40.1%) lived in the western region; (N=633), (93.8%) were married. (N=429), and 63.6%of participants hold a bachelor's degree. (N=415), (61.5%) were teachers.

More than three quarters (77.8%) of the participating parents knew about sleep apnea from a medical article. As shown in Table 2 most of the participants (N=532), (78.8%) correctly defined sleep apnea as "Repeated episodes of obstruction of breathing during sleep". While 18.1% incorrectly thought that OSA is a normal phenomenon during sleeping.

Figure 1 describes the frequencies of correct answers for questions about OSA symptoms among children affected by the disease. The chart shows that mouth breathing is the most prevalent symptom with 43.1%, while bedwetting is the less frequent symptom with only 3.1%.

When participants were asked about the risk factors of OSA, most of the parents expressed their agreement to all the mentioned factors (enlarged tonsil, adenoid, Down syndrome, asthma, diabetes mellitus, allergic sinusitis, cerebral palsy, sickle cell disease, history of low birth weight and smoking), where the "Yes" answers ranged between 64.1% to 68.9% except for obesity, for which 90.7% of them answered "No" as shown in Figure 2.

We conducted a knowledge score level according to the frequency of the correct answers about the definition, symptoms, and risk factors' knowledge. Then we categorized them into three groups as follows, low score from (0-5), medium knowledge score (6-11), and high score from (12-16). As shown in Figure 3 most of the parents (N=369), (58.7%) had a medium knowledge score with the mean score of 6.74, SD=3.25. However only (N=42), (6.2%) scored a high score, and a significant percentage of low knowledge score with (N=237), (35.1%) of the parents.

When participants were asked, "Do you think you need more information about POSA?". (N=46), (68.4%) of them stated they do need more information about POSA, while only (N=33) parents (4.9%) answered they did not need more information.

Figure 4 illustrates what further information the parents would like to know about the disease, which showed that the majority (74.4%) would like to gain knowledge about the disease in general.

We asked parents about the best method to increase public awareness about pediatric OSA. As shown in Figure 5 more than half (50.7%) of them stated that a volunteer awareness campaign is the best method to increase public awareness about pediatric OSA.

As shown in Table 3 the percentage of the parents who answered the OSA definition question according to their educational level and the relationship between knowing the correct definition of OSA and their educational level, which revealed a significant correlation ($X2= 20.440$, $P<0.05$). Accordingly parents who had a higher degree had the highest percentage in answering the correct answer (92.1%). On the other hand, there was no significant association between awareness of POSA and Age group. Additionally, there was no statistically significant association between any of the assessed OSA risk factors.

Discussion

Healthy sleep is crucial for the central nervous system development in children, particularly infants. However, one of the most typical sleep problems is pediatric obstructive sleep apnea, especially in obese children (12,13). Due to the increasing prevalence of pediatric obesity in the Middle East and gulf area, the incidence of pediatric sleep apnea is also on the rise (14,15). Accordingly, it is essential to understand the knowledge of parents about obstructive sleep apnea in childhood.

The present quantitative study examined parents' knowledge and awareness towards pediatric obstructive sleep apnea in Saudi Arabia through a survey. The study demonstrated that about half of the participants represented the western region in Saudi Arabia and had a university degree. Furthermore, 77.8% of parents read medical articles on POSA, though half of the parents (58.7%) had medium knowledge about the disease, while only 6% had high knowledge about POSA.

Moreover, it was revealed that the level of knowledge was significantly correlated to the parents' level of education, while it was non-significantly associated with their age. Additionally, 68.4% of the parents thought they need further information on POSA.

Healthy sleep patterns and obstructive sleep apnea in childhood have been examined in different settings. A recent review by McDowall et al. (16) examined parents' knowledge of sleep symptoms in childhood and demonstrated poor knowledge of sleep symptoms, with a slightly improved knowledge of healthy sleep practices. Furthermore, McDowall et al. (16) showed a significant correlation between parents' knowledge and the sleep duration of children and sleep symptoms (16).

Another study by Jones et al. (17) evaluated the impact of a training session on POSA and other sleep symptoms in childhood on parents' knowledge. Jones et al. (17) included parents with children aged below 12 years old and demonstrated that educational interventions could be a useful tool to improve parents' knowledge about the disease and reduce symptoms in their children (17).

The present study demonstrated that 35.1% of parents had an insufficient level of knowledge, while only 6.2% had a high level of POSA knowledge. Although the present

Table 1. Demographic data information

Factor		Frequency	Percent
Sex	Male	55	8.1%
	Female	620	91.9%
Age	18-30	126	18.7%
	31-40	310	45.9%
	41-50	192	28.4%
	51-60	42	6.2%
	>60	5	0.7%
Region	Central	107	15.9%
	Southern	75	11.1%
	Northern	183	27.1%
	Eastern	39	5.8%
	Western	271	40.1%
MS	Married	633	93.8%
	Divorced	25	3.7%
	Widowed	17	2.5%
Education	Did not attend school	6	0.9%
	High school degree	136	20.1%
	Some college but no degree	41	6.1%
	Bachelor Degree	429	63.6%
	Higher degree	63	9.3%
Occupation	Health sector	55	8.1%
	Engineer	21	3.1%
	Teacher	415	61.5%
	Pilot	4	.6%
	Soldier	7	1.0%
	Other	173	25.6%

Table 2: Correct definition of OSA

Factor	Frequency	Percent
Repeated episodes obstructions of breathing during sleep	532	78.8%
Total obstruction of breathing during sleep until waking up	21	3.1%
Normal phenomena during sleep	122	18.1%
Total	675	100%

Figure 1: Expected POSA Symptoms

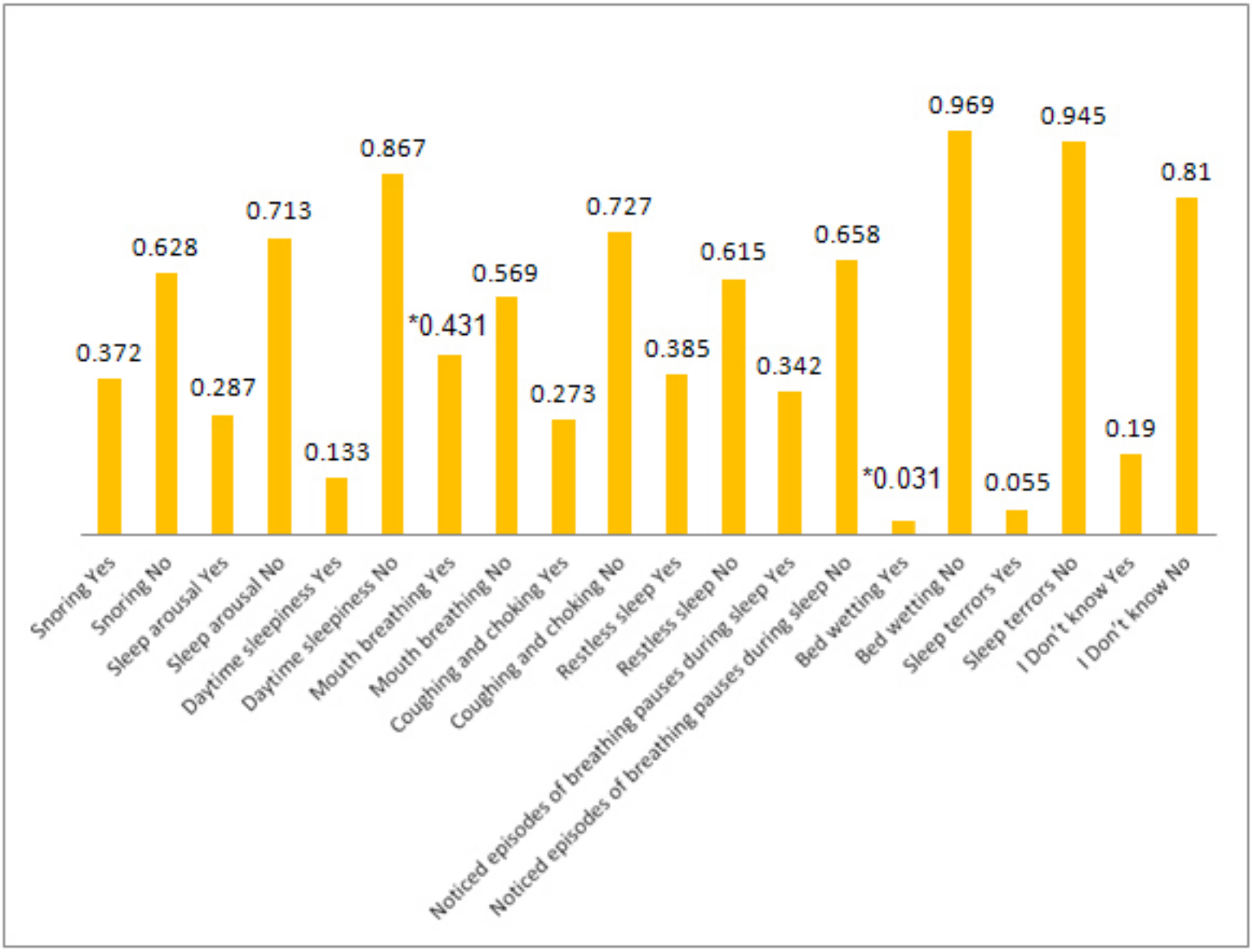

Figure 3. Knowledge score level

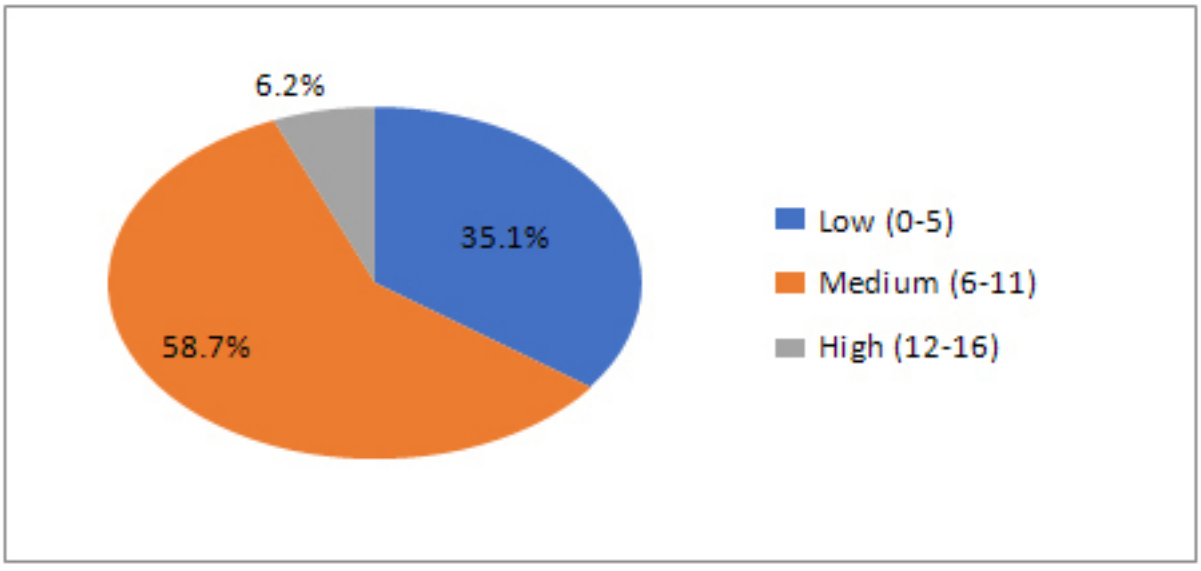

Figure 2: The Risk factors of Obstructive sleep apnea

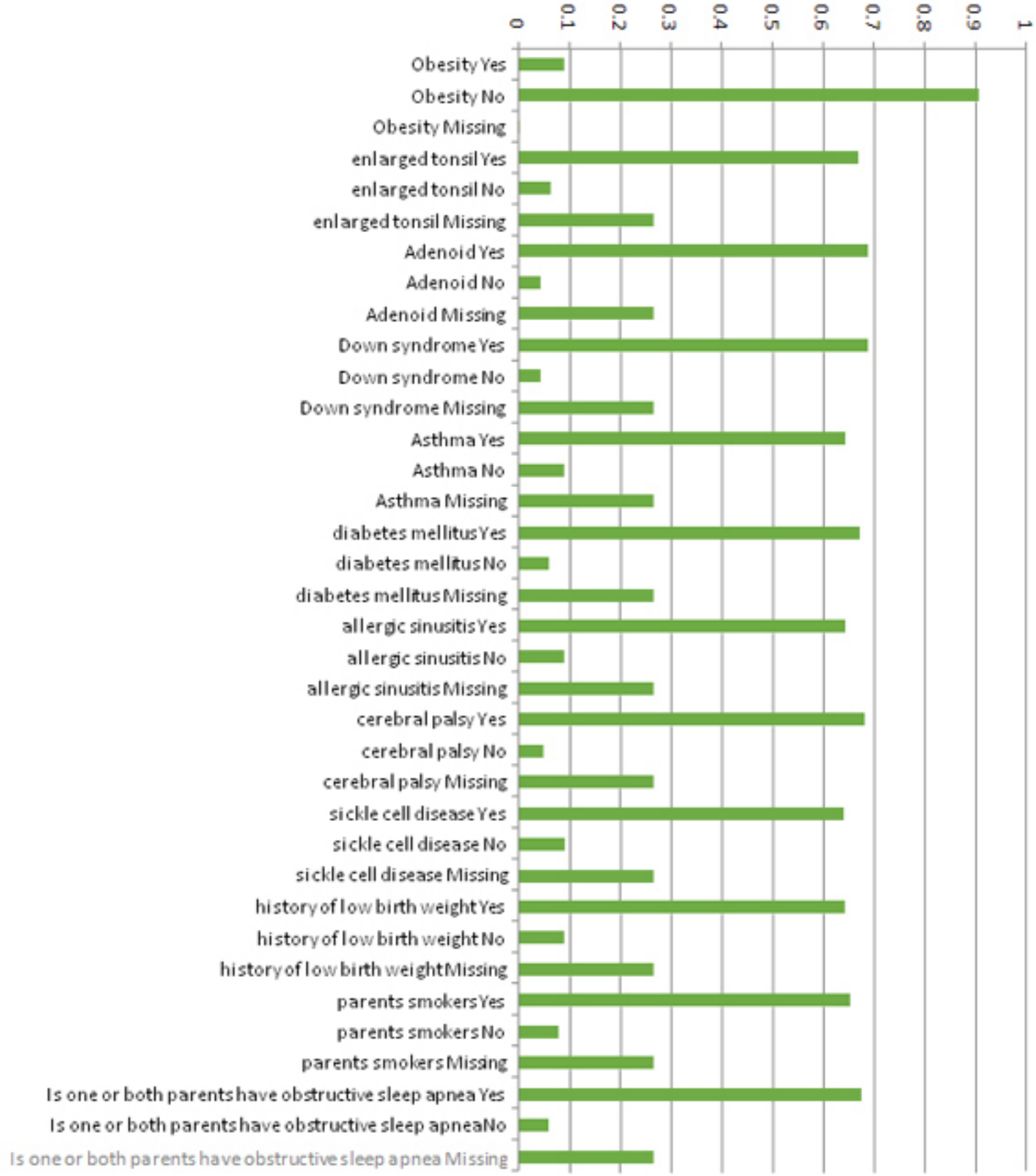

Figure 4. The information parents would like to know more about POSA

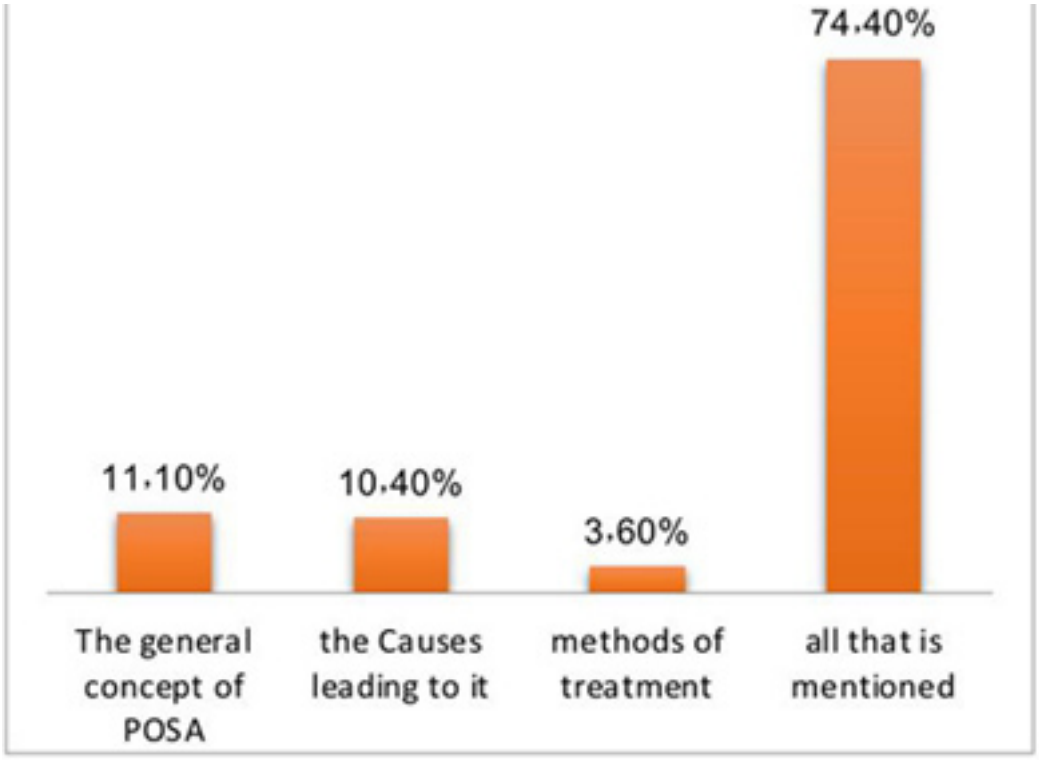

Figure 5: The best methods to increase the public awareness about POSA

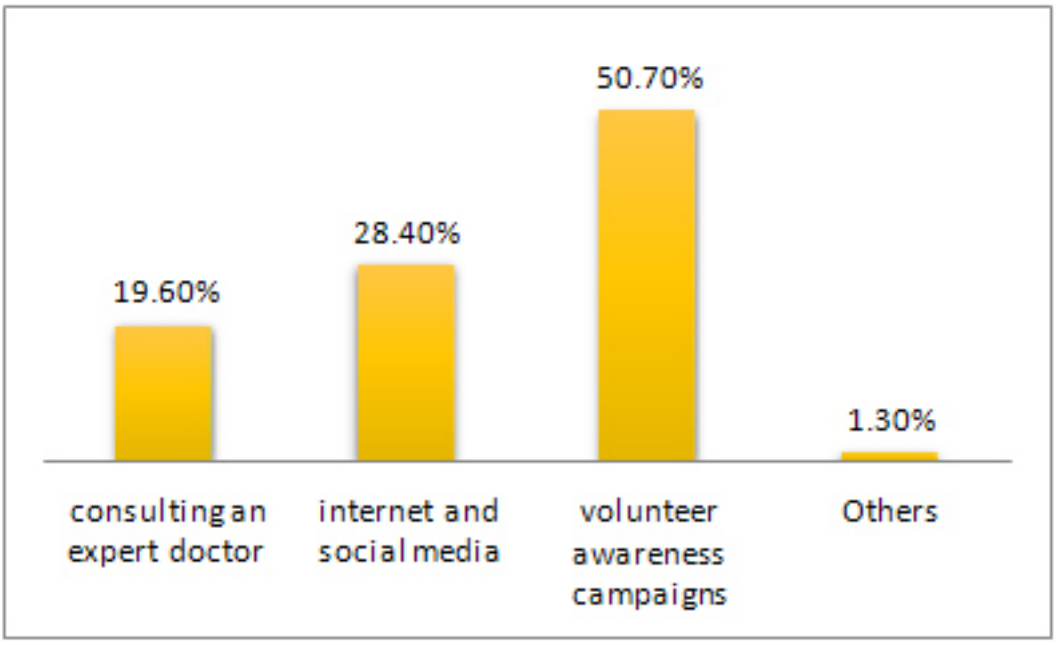

Table 3. The relationship between education and OSA

What is sleep apnea?	Education					Total	X^2 / p
	Did not attend school	High school degree	Some college but no degree	Bachelor Degree	Higher degree		
Repeated episodes obstructions of breathing during sleep	3	97	29	345	58	532	20.440** / 0.009
	50.0%	71.3%	70.7%	80.4%	92.1%*	78.8%	
Total obstruction of breathing during sleep until waking up	0	3	2	15	1	21	
	0.0%	2.2%	4.9%	3.5%	1.6%	3.1%	
Normal phenomena during sleep	3	36	10	69	4	122	
	50.0%	26.5%	24.4%	16.1%	6.3%	18.1%	
Total	6	136	41	429	63	675	
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
**Chi-Square (X^2) is significant							

study did not involve an assessment before and after an educational session, 77.8% of parents had already read at least an article on POSA. Additionally, 68.4% of parents thought their knowledge needs to be improved.

Also, Wilson et al. (18) evaluated children's sleep symptoms in low-income preschools after providing their parents with training on sleep education, including sleep apnea. The study included 152 families and demonstrated that children's sleep symptoms had been reduced after a noticeable improvement in parents' knowledge after the session (18).

Due to the significantly high percentage of parents with a low level of knowledge on POSA (35.1%) in the present study, it is highly recommended to implement a training program for parents living in Saudi Arabia about POSA and evaluating their awareness and knowledge after the training. Additionally, Owens et al. (19) supported this recommendation through a survey study by including 253 parents who were asked questions to evaluate their knowledge of sleep symptoms and childhood obstructive sleep apnea. Similar to the present study, Owens et al. (19) illustrated that higher educated parents had higher levels of knowledge, yet recommended the implementation of awareness campaigns for parents on POSA due to the gap in knowledge identified in the rest of the cohort (19).

It is worth mentioning that the present study demonstrated some limitations. Almost half of the included sample represents one area in Saudi Arabia, which makes the findings' external validity inapplicable. Furthermore, due to the study's survey nature, the participants' responses depend on their honesty and subjective opinion, which might affect the reliability of the findings. Finally, this is the first study to demonstrate parents' knowledge and awareness in Saudi Arabia about obstructive sleep apnea in childhood.

Conclusion

This study concluded that the level of knowledge and awareness of parents towards POSA is low in almost a third of the population, which requires the attention of healthcare decision makers. National awareness campaigns are one of the best feasible solutions to improve this level of knowledge, which can have a positive implication on children's symptoms. Further studies are also required with better representation for all regions in Saudi Arabia. Furthermore, comparative studies that compare knowledge and awareness of parents before and after training are endorsed by the findings of our study.

Limitations

A limitation of the present study is using a self-reporting questionnaire that may have a recall bias.

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