

# Knowledge of Obstructive Sleep Apnea among Dental Fraternity in Riyadh

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## Abstract

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**AIM:** To assess and compare the knowledge of obstructive sleep apnea (OSA) among final years dental students, interns, dental practitioners and faculty working in and around Riyadh.

**METHODS:** A questionnaire-based study comprising of 16 questions was conducted among final year dental clinical students, interns, dental practitioners and faculty working in and around Riyadh. Statistical Package for Social Sciences software (SPSS version 21) was used to analyse the statistical data. The  $p < 0.05$  was considered statistically significant.

**RESULTS:** A total of 450 respondents took part in the study. When gender comparison was done regarding the awareness of OSA, statistically significant differences were noted for the majority of questions. The response rate for the knowledge-based questions varied statistically concerning their speciality and educational qualifications. 65% of the participants admitted that they were unaware of the diagnostic tests performed for diagnosing these patients. It was noted that 85% of the participants wanted to attend a CDE program to know more about OSA.

**CONCLUSION:** The study concludes that there is a significant lack of knowledge among final year students, interns and general dentists. This study emphasises the need for all dental professionals to regularly update their knowledge and equip themselves to identify and treat such patients at an early stage.

## Introduction

Apnea in Greek means without breath [1]. Obstructive sleep apnea (OSA) is a chronic medical condition [2] and well-defined as a repetitive obstruction of the upper airway during sleep. It can be complete or partial. It is recognized by snoring, hypoxia, hypercapnia and insomnia [3]. OSA is broadly classified into 3 types central, obstructive and mixed and can be graded as mild, moderate and severe [1].

Untreated OSA can cause many medical problems such as hypertension, diabetes, cardiovascular diseases, cognitive dysfunction and depression [4]. It leads to tiredness, anxiety, depression, daytime sleepiness, also with increased risk of motor vehicle accidents and impairment of function in those who have it [2], [3], [4], [5]. The snoring noise can cause serious marital and social

problems as well. Hence it is a serious problem and requires immediate management [5]. The main predisposing factor for OSA is obesity [1]. It is considered to be associated with older age, hereditary, smoking, alcohol, and periodontal disease, orofacial anatomical abnormalities such as mandibular micrognathia, macroglossia, and hypertrophy of palatine tonsils and enlarged uvula [3]. Most of the OSA patients are unaware of their problem due to lack of knowledge and improper guidance from their dentist or physician as well as expensive diagnostic tests which are involved in diagnosing the disease [3]. Polysomnography (PSG) still serves as the gold standard or confirmatory test in the diagnosis of OSA. It involves the overnight recording of sleep breathing patterns and oxygen saturation. A patient is diagnosed to be suffering from OSA if there is occurrence of at least five apneas or hypo apneas per hour, causing sleep fragmentation and decline in blood oxygen saturation.

Thorough clinical evaluation using a basic questionnaire helps us to diagnose the condition at an early stage, to successfully manage the patient [4]. Dentists can play a vital role in detecting, advising, referring and treating OSA patients [5], [6]. Previous studies proved the competence of simple modern imaging techniques which are promising in identifying the disease process at an initial phase [2], [4]. Treatment of OSA is governed by the severity of symptoms, degree of clinical complications, and aetiology of upper airway obstruction. The most effective therapy considered until today is continuous positive airway pressure (CPAP), but it has suboptimal patient compliance. In 1900, Pierre Robin for the first time introduced the use of oral appliances for glossoptosis, and later the appliance was modified to treat sleep disorders [1], [2]. Of late American Academy of Sleep Medicine (AAOSM) has recommended oral appliances (OA) to treat mainly snoring and mild-to-moderate OSA and patients who cannot tolerate to CPAP or those who reject the surgery [2].

Previous studies done in the Saudi Arabian population reported 39% prevalence of OSA among females and 33.3% in males [7], [8]. So, it is important for us to recognize how well the present-day dental practitioners are equipped to identify these patients at an early stage. Many studies have evaluated the level of knowledge about OSA among medical students. However, to our knowledge, none has evaluated the same among dental students, academicians and dental practitioners in Saudi Arabia. Therefore, this study was aimed to assess the level of knowledge, awareness and attitude of Saudi dental students, interns, general dentists, specialists and academicians in and around Riyadh towards treating OSA patients.

## Material and Methods

A Cross-sectional self-administered questionnaire study was distributed randomly among the final year dental students, interns, academicians, dental practitioners and specialists in around Riyadh, between February 2018 to April 2018. The questionnaire was designed comprising 16 multiple choice questions assessing knowledge and awareness of the participants regarding OSA. The questionnaire also included mentioning their gender, qualification (student or faculty or graduate or master's or PhD) and years of experience. Those who completed the questionnaire form completely and willing to participate were only included in the study. Initially 468 participants were given the questionnaire, and only 450 responded with filled forms. The questionnaire was distributed personally to the individual participants and for few other participants

send through web link through e-mail and personal messages. The instructions were given on how to fill the questionnaire and stated that their participation was purely voluntary. The content authenticity was pretested on a random sample of population to ascertain practicability, strength and clarification of answers. Those who denied filling the questionnaire were excluded from our study. Statistical analysis was performed using SPSS version 21 (SPSS Inc., Chicago, IL, USA). Descriptive data were analysed using frequencies and percentages. The Wilcoxon rank-sum test and chi-square were used to identify the variation between groups. The level of significance was set at  $p < 0.05$

## Results

The study results demonstrated that there were 196 (44%) female respondents and 254(56%) males. Table 1 represents the response percentage for each question by males and females.

**Table: Response percentage for each question by males and females**

Sl. No	Question	Options	Total (100%) (n = 450)	M	F	P Value
1	Are you aware of the term, SLEEP APNEA, complete or partial occlusion of the upper airway during sleep?	YES	80%	45%	35%	0.046*
		NO	20%	9%	11%	
2	How often have you come across a patient with Obstructive Sleep Apnea (OSA)	Frequently	10%	6%	4%	0.041*
		Occasionally	50%	35%	15%	
		Never	40%	23%	17%	
3	What would you offer a patient with sleep apnea	Lifestyle modification	12.5%	7%	5.55	0.03*
		Provide an oral appliance	30%	19%	11%	
		Refer to a physician	57.5%	32%	25.5%	
		In Males	50%	24%	26%	
In Females	7.5%	3%	4.5			
4	Among the patients diagnosed with OSA, which gender has the highest prevalence	No Idea.	42.5%	26	16.5%	0.026*
		YES	35%	20%	15%	
5	Do you know about the investigations or tests prescribed for such patients to diagnose (OSA)?	NO	65%	38%	27%	0.09*
		YES	35%	24%	11%	
6	Have you come across the topic of management of sleep apnea and oral appliances in your Dental course/ curriculum?	YES	65%	33%	32%	0.028*
		NO	35%	20%	17.5%	
7	Are you aware that untreated sleep apnea can cause serious systemic diseases?	YES	62.5%	38%	24.5%	0.036*
		NO	37.5%	20%	17.5%	
		No Idea.	20%	11%	9.5%	
8	Do you believe "OSA" patients suffer from severe snoring?	YES	63.5%	34%	29.5%	0.039*
		NO	18.5%	8%	10.5%	
		No Idea.	20%	9.5%	10.5%	
9	Can children also suffer from obstructive sleep apnea?	YES	63.5%	34%	29.5%	0.043*
		NO	18.5%	8%	10.5%	
		No Idea.	20%	9.5%	10.5%	
10	Can dentists play a major role in identifying such high-risk patients by using extra-oral -radiographs?	YES	50%	23%	27%	0.055
		NO	35%	19%	16%	
		No Idea.	15%	8%	7%	
11	Are you aware of the Berlin Questionnaire to evaluate such patients with sleep apnea?	YES	17.5%	9%	8.5%	0.038*
		NO	82.5%	45%	37.5%	
12	Is there a relation between Body mass index and Obesity with OSA?	YES	80%	43%	37%	0.038*
		NO	12.5%	7%	5.5%	
		No Idea.	7.5%	4%	3.5%	
13	Do you have the knowledge on CPAP (continuous positive airway pressure therapy), which is considered as first-line therapy for severe obstructive sleep apnea?	YES	37.5%	23%	14.5%	0.014*
		NO	63.5%	33.5	30%	
14	Are you aware of the clinical symptoms and Oro-facial characteristics to identify such patients?	YES	47.5%	27.5%	20%	0.12
		NO	52.5%	35%	17.5%	
15	Did you have the idea of Epworth sleepiness scale to assess such patient's?	YES	17.5%	10%	7.5%	0.019*
		NO	82.5%	43%	39.5%	
16	Are you interested in updating your knowledge on sleep medicine by enrolling in a CDE (continuous Dental Education) program?	YES	85%	39%	46%	0.019*
		NO	15%	7%	8%	

Statistical analysis was performed using SPSS version 21 (SPSS Inc., Chicago, IL, USA). Descriptive data were analysed using frequencies and percentages. The Wilcoxon rank-sum test and chi-square were used to identify the variation between groups. The level of significance was set at  $p < 0.05$ .

When gender comparison was made with knowledge responses, statistically significant differences were noted for majority of questions with p-value < 0.05. Figure 1 demonstrates the years of experience of the participants.

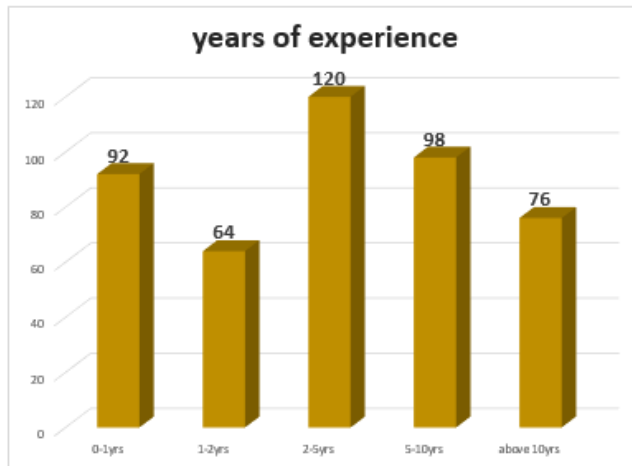


Figure 1: Years of experience in clinics for the participants

Table 2 demonstrates the details of the study population regarding their speciality and their response rate. The questions assessing the awareness of the participants were Q4, Q5, Q8, Q9, Q10, 11, Q12, Q13, 14, Q15. Participants who answered at least 6 correct responses for the above-mentioned questions were categorised to have satisfactory knowledge about OSA. It is noticed that there is significant difference regarding the knowledge on OSA based on the participant's qualification and speciality. The results showed that the specialists in surgery responded with maximum of correct responses scoring of 75% of the participants having adequate knowledge of OSA. 85% of our study population were willing to update their knowledge on sleep medicine by enrolling in a CDE (continuous Dental Education) program?

**Table 2: Participants having satisfactory knowledge- who gave the correct response**

Speciality	Total No of participants	No. of participants who gave the correct response	% of the correct response
Final year students	92	36	39.1%
Dental interns	154	59	38.3%
General Dentists	98	38	38.7%
Pedodontics	20	13	65%
Oral surgery	12	9	75%
Oral medicine	11	6	54.5%
Endodontics	10	5	50%
Operative	14	7	50%
Oral Pathology	7	4	57.1%
Orthodontics	13	9	69.2%
Prosthodontics	11	8	72.7%
Public health	3	2	66.6%
Periodontics	5	3	60%

## Discussion

Among other medical practitioners, practising dentists are more likely to encounter first-of-contact, with such patients or detect potential OSA and other sleep disorders among their patients [9], [10]. Accordingly referring these patients to primary care physicians or sleep specialists or treat these patients with OAs is very important.

In a study done by Janhvi et al among dentists documented that 32% of the participants were not aware of the gender in which OSA was more prevalent [11], similar results were noticed in our study where 43% of our participants did not have an idea as to, in which gender it was more prevalent. In previous study 37% participants stated to provide an oral appliance whereas 29.6% of our subjects chose the option of referring the patient to a physician and 11.1% recognised Continuous Positive Airway Pressure (CPAP) as best treatment plan. Whereas in our study 58% of the participants opted to refer the OSA patients to physician, only 30% were confident to provide and treat with oral appliance, and 12.5% of the participants chose to advise lifestyle modification for these patients. 40% of our participant's declared that they never came across any patient with OSA. Only 10% of the dentists mentioned that they frequently encountered such patients. The results were almost similar to the previous study where 52% of the study population never came across these patients [6], [9]. This data enlightens us regarding the awareness of this issue among both the dentists and their patients. Most of the patients believe that sleep disorders are not in the scope of a dentist and patients might feel uncomfortable to mention about their snoring issue to a dental doctor.

The most classic orofacial features noticed in OSA patients include a maxillary and mandibular retrognathia, narrow palate, and large neck circumference, long soft palate, tonsillar hypertrophy, macroglossia, and deviation of nasal septal. In our study, 53% of the participants were unaware of these characteristic findings in OSA patients. A previous study documented that 81% of dental practitioners had no idea regarding Epworth sleep scale [9]. Similar results were identified among our dentists where 83% were unaware of Epworth sleep scale, and 86% of our study population did not know Berlin's questionnaire. We can see in Table 1 that 20% of our dentists were not having idea if OSA patients suffer from severe snoring, and 63.5% of our participants believe that OSA can be seen in children also.

Many studies discussed extensively regarding the use and implications of oral appliances in OSA. However, they overlooked the dentists' role in detecting OSA patients and making proper recommendations or referrals [12], [13]. Essentially all practitioners in dentistry, regardless of their speciality, should be prepared to detect and manage potential

OSA patients.

Julia-Serda et al. stated that cephalometric radiographs combined with clinical features like physical examination, and nocturnal oximetry were valuable in the diagnosis of OSA, and recommended that practising these methods can significantly reduce the number of polysomnography studies undergone by patients. Forty-five % of our study population admitted that they don't know if dentists can play a vital role in identifying such patient at an early stage by using extraoral radiographs [14]. Reddy et al., in their study confirmed that thorough clinical examination, risk factor analyses and standard cephalometric analyses help to identify the high-risk patients with OSA [4]. Almost 65% of our participants were unaware of the investigations that are indicated for a suspected OSA patient.

### **Treatment options for OSA**

They range from behaviour modification to diet modification, medications, continuous positive airway pressure (CPAP), Oral appliance, as well as surgery [1]. The main aim of treating OSA is to increase the life expectancy and decrease the other systemic complications that would arise because of untreated OSA and to improve the quality of life. It is wise to select for the less invasive treatment options whenever possible. Behaviour modification is to train the patient to alter the sleep position to a lateral position instead of supine position by using a pillow, advising patients to abstain from alcohol and to control on a diet. Encourage them to do regular exercise and monitor the body weight and motivate the patients to reduce if they are overweight [16], [17], [18], [19]. Some studies suggested the use of mild sedative 3hours before sleep which are helpful to promote sound sleep, other medication advised for OSA are antibiotics, topical intranasal application of corticosteroid, leukotriene receptor antagonist and anti-inflammatory therapy to a mild to moderate case and during maintenance therapy after surgery [18], [19].

Still (CPAP) is considered as the standard treatment for patients with moderate-to-severe OSA. It acts by nonstop pumping of air under pressure through a sealed face mask into upper airway which is connected to a device with electric power. Because this is very complex to carry and use, it has less patient compliance. 64% of our contributors in our study were unaware of the use of CPAP and its function in treating sleep apnea. 83% of the participants in our study were not having knowledge about Epworth sleepiness scale to identify such patients at an early stage.

There are many other oral appliances (OAs) used to treat obstructive sleep apnea like the mandibular advancement or mandibular retaining devices with names such as snore guard, silencer (tongue retaining device) and Snor Ex (soft palate Lifter) Dentists should frequently update the

guidelines and recommendations for the use of OAs in the treatment of obstructive sleep apnea (OSA) and snoring [20].

The results in our study indicate the need to enlighten the dentists in and around Riyadh with the basic knowledge about (OSA) and the clinical features to identify inpatients, the investigations helpful to diagnose such patients. Dental practitioners truly play a major role in diagnosing the suspected (OSA)patient at an early stage and to treat them. It is crucial for the dental fraternity to participate in the education programs, research and treatment of this serious and inescapable health problem.

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