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Knowledge and Awareness regarding Obstructive Sleep Apnea among Orthodontic Practitioners and Orthodontic Post Graduate Students

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Abstract

Aim: This study aims to summarize the current state of knowledge and awareness regarding OSA among Orthodontic practitioners and Orthodontic post graduate students.

Method: A self-designated questionnaire which was specifically made for this study, comprising of total 20 multiple choice type questions was circulated with online networking medium to orthodontic practitioners and orthodontic post graduate students.

Statistical Analysis: The data was analysed with IBM SPSS 25 for windows statistical software. Statistical analysis was analysed using a Chi Square test/Fisher's Exact test and for quantitative data. For all statistical analyses, probability levels of $P < 0.05$ was considered statistically significant.

Results: The total responses were 100 for this study. 86% orthodontic practitioners come across OSA patient occasionally. 98% orthodontic practitioners and 88% orthodontic post graduate students are familiar with Epworth Sleepiness scale.

Conclusion: The study concludes that the orthodontic practitioners are relatively more aware comparatively to the orthodontic post graduates included in this survey about OSA and is statistically significant. There was no statistical significance in comparison with the other knowledge factors.

Introduction: The practice of dentistry has seen a paradigm shift not only in the provision of quality dental care but also in the diagnosis of diseases that adversely affect the general health of a patient. With advances in medical and dental sciences, people are living longer as a result of treatment for chronic disorders, although these disorders may ultimately result in mortality.

It is important for dental surgeons to be aware of a wide range of medical conditions in order to take appropriate measures in recommending medical and lifestyle modifications to improve patients' prognosis and health in general. The key to the successful management of any patient is performing a thorough evaluation, which can help ensure the early diagnosis of any diseases the patient might have.[1]

Obstructive sleep apnea (OSA) is a chronic medical condition and well-defined as repetitive obstruction of the upper airway during sleep. It can be complete or partial. It is recognized by snoring, hypoxia, hypercapnia and insomnia.

Untreated OSA can cause many medical problems such as hypertension, diabetes, cardiovascular diseases, cognitive dysfunction and depression. 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. Most of the OSA patients are unaware of their problem due to lack of knowledge and improper guidance from their dentist or physician.[3]

Thorough clinical evaluation using a basic questionnaire helps us to diagnose the condition at an early stage, to successfully manage the patient. Orthodontist scan play a vital role in detecting and treating OSA patients. This study aims to summarize the current state of knowledge and awareness regarding OSA among Orthodontic practitioners and Orthodontic Post Graduate students.

Methodology: This was a cross-sectional questionnaire-based study carried out among Orthodontic practitioners working in various setup such as Government health care facilities, private/corporate health care facilities, private clinic and trust funded health care centers and Orthodontic post graduate students. A self- designated questionnaire written in English language was made specifically for the study. The questionnaire was divided in 2 parts with a total 20 closed ended multiple- choice type questions. First part of the survey solicited professional background information of the respondents and then in second part knowledge and awareness regarding obstructive sleep apnea was collected.

Ethical clearance: The approval of the institutional review board (IRB) and Practitioner's/ Post Graduate Student's consent to participate was taken to obtain the data for this questionnaire-based cross-sectional study.

Data Collection: The Power of the sample was decided by the Statistician. The Questionnaire was distributed via online networking media. The Practitioner's Consent was taken before his/her participation in the study.

Inclusion Criteria: The Participant must be an Orthodontic Practitioner or an Orthodontic Post Graduate Student.
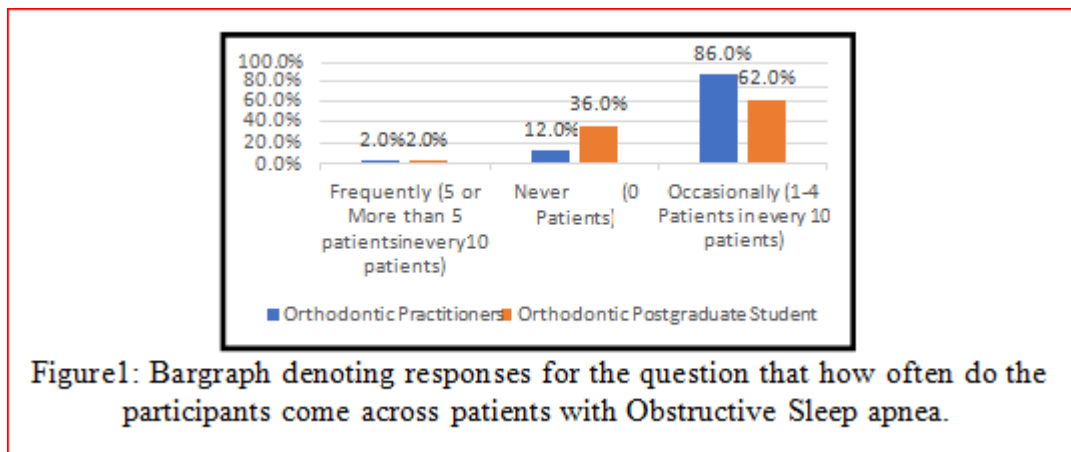
Exclusion Criteria

- Incomplete forms were not included in the study.
- Dental Fraternities other than Orthodontics.
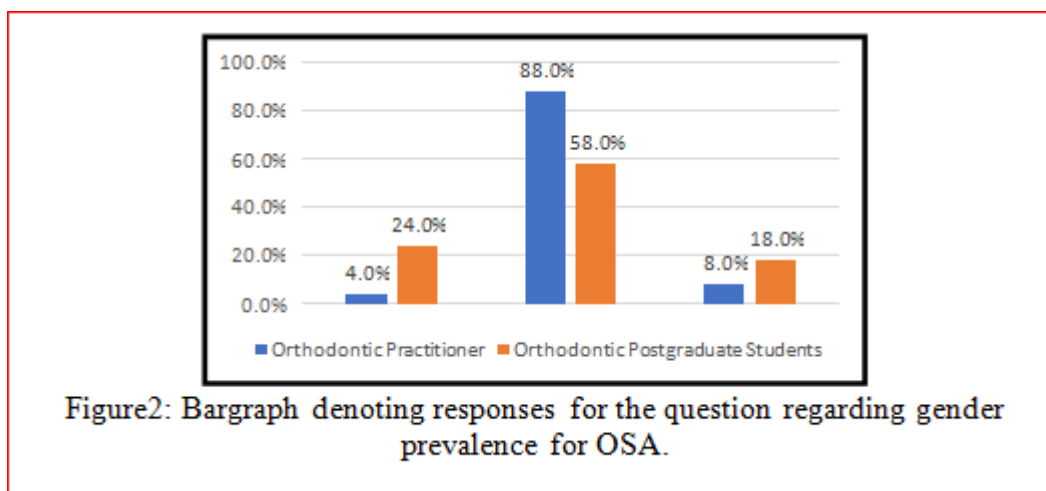
- Under Graduate Students.

Statistical Analysis: The data was analysed with IBM SPSS 25 for windows statistical software. Statistical analysis was analysed using a Chi Square test/Fisher's Exact test and for quantitative data. For all statistical analyses, probability levels of $P < 0.05$ was considered statistically significant.

Results: The total responses were 100 for this study. Out of the 100 respondents, 50 (24 males and 26 females) were orthodontic practitioners and 50 (17 males and 33 females) were Orthodontic post graduate students.

Among the Orthodontic Practitioners, 86% orthodontic practitioners come across OSA patient occasionally, whereas 62% orthodontic postgraduates comes across OSA patients occasionally (Figure 1).

Figure1: Bargraph denoting responses for the question that how often do the participants come across patients with Obstructive Sleep apnea.

According to orthodontic practitioners, OSA is more prevalent in males 88% and according to orthodontic postgraduate students, OSA is more prevalent in males 58% (Figure 2)

Figure2: Bargraph denoting responses for the question regarding gender prevalence for OSA.

According to Orthodontic practitioners believe that OSA is generally seen in adults 94% and according to Orthodontic post graduates OSA is generally seen in adults 76% (Figure 3).
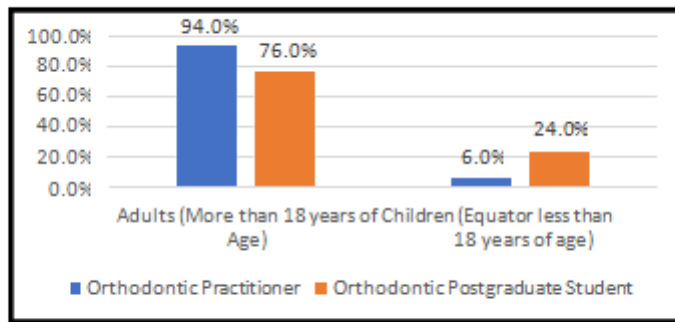
Figure3: Bargraph denoting responses for the question regarding the question that OSA is seen in which age group.

Among the both group, Orthodontists play a major role in identifying such high- risk patient by using extra oral radiographs. In present study we found that 98% Orthodontists and 74% orthodontic post graduates are acquainted with the investigations to diagnose OSA which is statistically significant (Figure 4). Besides present study found that according to Orthodontists 98% OSA patients suffer from severe snoring and according to post graduates believe that OSA patients suffer from severe snoring 96% which is statistically non-significant. Furthermore, 96% orthodontists and 96% post graduates comprehend signs, clinical symptoms and oro facial characteristics to identify OSA.
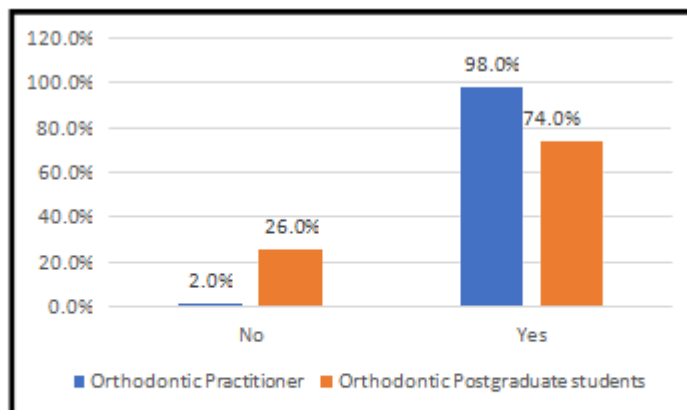

Figure 4: Bargraph denoting responses for the question if the participants are acquainted with the investigations carried out to diagnose OSA.

98% orthodontic practitioners and 88% orthodontic post graduate students are familiar with Epworth Sleepiness scale (Figure 5).
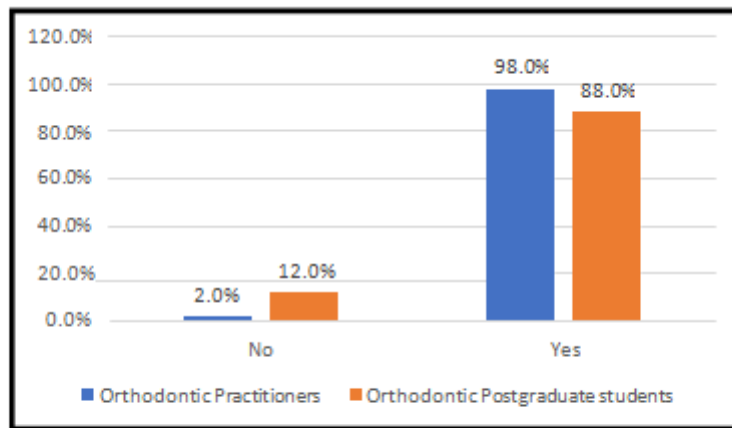
Figure 5: Bargraph denoting responses for the question if the participants are familiar with Epworth Sleepiness Scale.

98% Orthodontic practitioners and 88% post graduates are familiar with Mallampati score method (Figure 6).
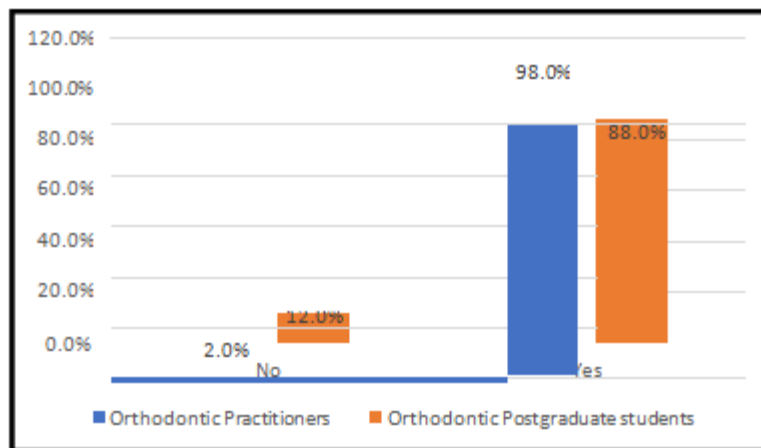

Figure 6: Bargraph denoting responses for the question that if the participants are familiar with Mallampati score method.

98% Orthodontists and 88% Post graduates are familiar with Berlin Questionnaire (Figure 7).
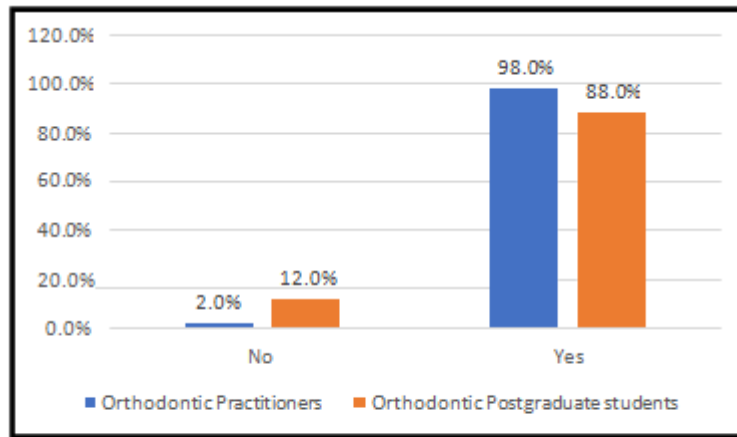
Figure7: Bargraph showing responses for the question if the participants are familiar with Berlin questionnaire.

98% Orthodontists and 94% Post graduates believe that there is a relation between Body Mass Index (BMI) and Obesity with OSA. 98% Orthodontists and 96% Post graduates believe that untreated Obstructive Sleep Apnea can cause serious systemic diseases. 98% Orthodontists and 88% postgraduates are familiar with the management of OSA and oral appliances for its treatment (Figure 8).
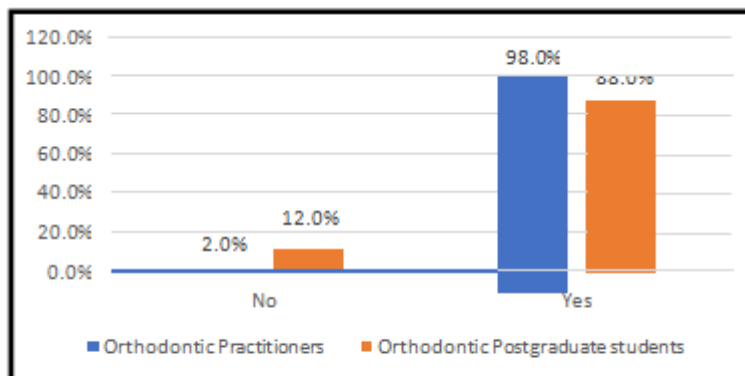

Figure 8: Bargraph showing responses for the question if the participants are familiar with the management of obstructive sleep apnea and oral appliances used to treat OSA.

48% Orthodontists and 52% Post Graduates would manage OSA with Lifestyle Modification & provide an oral appliance. 98% Orthodontists and 74% post graduates have knowledge on CPAP therapy for treating OSA.

SR.NO.	QUESTIONS	OPTIONS	ORTHODONTICP RACTITIONER	ORTHODONTIC POSTGRADUAT ESTUDENT	PVALUE
1	How often do you come across patients with Obstructive Sleep Apnea (OSA)?	Frequently	2.00%	2.00%	0.019
		Occasionally	12.00%	36.00%	
		Never	86.00%	62.00%	
2	Among the patients diagnosed with OSA, according to you, which gender has the highest prevalence for OSA?	Male	88.00%	58.00%	0.002
		Female	4.00%	24.00%	
		No idea	8.00%	18.00%	
3	Obstructive Sleep Apnea is generally seen in which age group?	Children	6.00%	24.00%	0.012
		Adults	94%	76.00%	
4	Do you think Orthodontists play a major role in identifying such high-risk patients by using extra-oral -radiographs?	Yes	96.00%	96.00%	1
		No	4.00%	4.00%	
5	Do you believe "OSA" patients suffer from severe snoring?	Yes	98.00%	96.00%	0.558
		No	2.00%	4.00%	
6	Do you comprehend signs, clinical symptoms and Oro-facial characteristics to identify such patients?	Yes	96.00%	96.00%	1
		No	4.00%	4.00%	
7	Are you know acquainted with the investigations carried out to diagnose OSA?	Yes	98.00%	74.00%	0.001
		No	2.00%	26.00%	
8	Are you familiar with "Ep worth sleepiness scale"?	Yes	92.00%	64.00%	0.001
		No	8.00%	36.00%	
9	Are you familiar with "Mallampati" score method?	Yes	98.00%	86.00%	0.027
		No	2.00%	14.00%	
10	Are you familiar with the "Berlin Questionnaire" to evaluate OSA	Yes	84.00%	54.00%	0.001
		No	16.00%	46.00%	
11	Is the rear elation between Body Mass Index (BMI) and Obesity with	Yes	98.00%	94.00%	0.307
		No	2.00%	6.00%	

12	**In your opinion, can untreated Obstructive Sleep Apnea cause serious systemic diseases?**	Yes	98.00%	96.00%	0.558
		No	2.00%	4.00%	
13	**Are you familiar with the management of obstructive sleep apnea and oral appliances used to treat OSA?**	Yes	98.00%	88.00%	0.05
		No	7.00%	12.00%	
14	**How would you manage a patient with Obstructive Sleep Apnea in your acquaintance?**	Life style Modification and provide an oral appliance	48.00%	52.00%	0.352
		Refer to physician	0.00%	4.00%	
		Refer to an oral surgeon	2.00%	0.00%	
		Multidisciplinary Approach	50.00%	52.00%	
15	**Do you have the knowledge on CPAP (continuous positive airway pressure) therapy for treating severe obstructive sleep apnea?**	Yes	98.00%	74.00%	0.001
		No	2.00%	6.00%	

Table1: Response Percentage for each question by orthodontic practitioner and orthodontic post graduate student

Discussion: OSA is a potentially life threatening disorder characterized by repeated collapse of the upper airway during sleep with periodic cessation of breathing (for more than10s). These events usually result in fragmented sleep. Sleep ranks the three most important considerations in maintaining good health, so the presence of fragmented sleep has a negative effect on patients' overall health.4

A study of the American adult society showed the OSA syndrome prevalence of 2%–4% in two decades ago; however, its outbreak is increasing internationally along with obesity and aging, and in some Asian countries, it affects 7.5% - 27% of adult population.5,6

The etiology is multifactorial, genetic, and endocrine factors have been linked to OBSA. Gross anatomic factors such as mandibular malformation, micrognathia, tonsillar and adenoidal hypertrophy, and nasal septal deviation play a major contributory role. OBSA is an independent risk factor for hypertension, diabetes mellitus, cardiovascular diseases, and stroke leading to increased cardiometabolic morbidity and mortality. The key step in the management of OBSA is to firmly establish the diagnosis.7

Not only a medical practitioner but also the dental practitioner in general and the orthodontist, in particular, have an ever-increasing role in the recognition of a patient who may be at a risk for sleep disorder.

The most common orofacial characteristics of OSA patients include a maxillary and mandibular retrognathia, narrow palate, large neck circumference, long soft palate, tonsillar hypertrophy, nasal septal deviation, and relative macroglossia.

Orthodontists need to correlate the initial screening procedures of OSA with the orofacial characteristics, and the dentist has to refer the suspicious patient for further medical evaluation to the physician. Overnight polysomnography is the goldstandardforthedetectionofOSA–hypopneasyndrome.Thefinaldiagnosis of sleep disorder, its severity, and comorbidities are made by a physician according to polysomnography findings. Based on apnea–hypopnea index, the severity of OSA is made and the treatment management is planned.[4]

There are several recent advances in diagnostic technology of OBSA such as use of

cone beam tomography in airway imaging,[8] computational fluid dynamics,[9,10] to accurately diagnose the airway obstruction. Hence, it is important for the medical and dental practitioners to recognize and identify those affected patients for early and appropriate treatments as the majority of affected are still undiagnosed. Hence, issues regarding the OBSA are questioned to the Orthodontic practitioners and the orthodontic post graduates to identify their knowledge and awareness regarding the Obstructive Sleep Apnea.

Jahnvi (2017)[11] conducted a study in which 32% of the subjects did not know the gender being most susceptible to OSA. In the present study 88% Orthodontic practitioner believes OSA is prevalent in Males whereas only 56% Orthodontic post graduates believes that OSA is prevalent in Males. This is statistically significant suggesting that Orthodontist are aware regarding the gender prevalence than orthodontic post graduates.

Minakshi (2017)[4] conducted a study in which it was found that 81% of dental and 53.9% of medical practitioners have no idea regarding Epworth sleep Scoring. In this study it was found that 81.6% Orthodontic practitioner and 72.6% Orthodontic postgraduates were aware of the Epworth Sleepiness Scale which is statistically significant.

Triggs (2022)[12] conducted a study which showed that 38.5% of the responding orthodontists did not routinely screen their patients for OSA during their orthodontic consultation. In the present study 96% Orthodontic practitioner are acquainted with the investigations carried out to diagnose OSA whereas 74% Orthodontic post graduates are acquainted with the investigations to diagnose OSA.

Conclusion: The descriptive data suggests that the orthodontic practitioners are relatively more aware comparatively to the orthodontic post graduates included in this survey about OSA and is statistically significant. There was no statistical significance in comparison with the other knowledge factors. This awareness scan improve the diagnosis, prevention and treatment of OSA and the morbidity and mortality associated with it.

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Annexure
Questionnaire

1. Name of the Practitioner: _____ (Optional)
2. Age:
3. Gender
    i.   Male
    ii.   Female
4. E-mail address: _____
5. Qualification :
    i.   Orthodontic Practitioner
    ii.   Post Graduate Student
6. If you are an Orthodontic Practitioner, then type of practice?
    i.   Private practice
    ii.   Government job
    iii. Academic job
    iv.   Academic job + Private Practice
7. If you are an Orthodontic Student, then which year are you in currently?
    i.   First Year
    ii.   Second Year
    iii. Third Year

Knowledge and Awareness
1. How often do you come across a patient with Obstructive Sleep Apnea (OSA)?
    a) Frequently (5 or more than 5 patients in every 10 patients)
    b) Occasionally (1-4 patients in every 10 patients)

  c) Never (0 patients)

2. Among the patients diagnosed with OSA, according to you, which gender has the highest prevalence for OSA?

  a) Male

  b) Female

  c) No idea

3. Obstructive Sleep Apnea is generally seen in which age group?

  a) Children (Equal to or less than 18 years of age)

  b) Adults (More than 18 years of age)

4. Do you think Orthodontists play a major role in identifying such high- risk patients by using extra-oral -radiographs?

  a) Yes

  b) No

5. Do you believe "OSA" patients suffer from severe snoring?

  a) Yes

  b) No

6. Do you comprehend signs, clinical symptoms and Oro-facial characteristics to identify such patients?

  a) Yes

  b) No

7. Are you know acquainted with the investigations carried out to diagnose OSA?

  a) Yes

  b) No

8. Are you familiar with "Epworth sleepiness scale"?

  a) Yes

  b) No

9. Are you familiar with "Mallampati" score method?

  a) Yes

  b) No

10. Are you familiar with the "Berlin Questionnaire" to evaluate OSA patients?

  a) Yes

  b) No

11. Is there a relation between Body Mass Index(BMI) and Obesity with OSA?

  a) Yes

  b) No

12. In your opinion, can untreated Obstructive Sleep Apnea cause serious systemic diseases?

  a) Yes

  b) No

13. Are you familiar with the management of obstructive sleep apnea and oral appliances used to treat OSA?

  a) Yes

  b) No

14. How would you manage a patient with Obstructive Sleep Apnea in your acquaintance?

  a) Life style modification

    b)   Provide an oral appliance

    c)   Refer to a physician

    d)   Refer to an Orthodontist

15. Do you have the knowledge on CPAP (continuous positive airway pressure) therapy for treating severe obstructive sleep apnea?

    a) Yes

    b) No