Original Research Article

DENTIST'S KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS OBSTRUCTIVE SLEEP APNEA IN CENTRAL INDIA: A QUESTIONNAIRE BASED SURVEY

Running title: Survey on Obstructive sleep apnea in dentistry

ABSTRACT

Context: Obstructive sleep apnoea is a common sleep disorder that often goes undiagnosed. Sleep disorders aren't given adequate importance in dental education. Dentists play a significant role in evaluating, diagnosing, referring and management of OSA patients.

Aim: To assess the knowledge, attitude and practice regarding different domains of obstructive sleep apnea among dentists in Central India.

Study design, place and duration of study: This cross-sectional study was conducted in Central India from January 2021 to June 2021 for duration of six months at Nagpur.

Methodology: 185 dentists participated in the survey. A questionnaire consisting of 23 items, assessing the knowledge, attitude, and practice regarding nine different domains of obstructive sleep apnea and circulated through a web designed program. Knowledge and practice was categorized question wise as good/poor, while attitude as favorable/unfavorable. Data was analyzed using descriptive and inferential statistics using chi square test.

Results: Dentists were observed to have good knowledge for domains of awareness, general findings and risk factors. MDS has good knowledge for domains of screening and diagnosis (64.65% and 50.51%) and treatment and referral (65.66% and 57.58%) while BDS has poor knowledge for same. Favorable attitude for all the domains was reported while poor practice in all domains.

Conclusion: Dentists had favorable attitude towards OSA but poor knowledge in certain domains about OSA which may be linked to lacked clinical experience and hurdle in their practice. They were enthusiastic about further education on OSA.

Keywords: (Obstructive sleep apnea, Knowledge, Attitude, Practice Management, Dentist's, Questionnaires)

INTRODUCTION

Obstructive sleep apnea (OSA) is a sleep-related breathing disorder characterized by repetitive episodes of partial or complete collapse of the upper airway during sleep, resulting in reduced (hypopnea) or complete absent (apnea) of breathing for ten seconds or more and associated with either frequent cortical arousal or a fall in blood oxygen saturation.[1,2] The prevalence of OSA is 2.4% - 4.9% in men and 1%–2% in women.[3]

The symptoms include snoring, witnessed apnoea, daytime sleepiness, depression and risk of cardiovascular diseases.[4] Risk factors includes male gender, middle age, menopause, obesity, sedentary lifestyles and large neck circumference, retro- or micrognathia, nasal obstruction, enlarged tonsils/ adenoids, macroglossia and low-lying soft palate.[5-7]

The gold standard method of diagnosing OSA is overnight polysomnography (PSG).[8,9] BANG, STOP-BANG, ARES, Berlin, Epworth Sleepiness Scale and STOP questionnaires for adults allow the practitioners to screen the patients and refer only the positively screened patients for final diagnosis through PSG.[2,10]

CPAP is the current gold standard for the treatment of patients with moderate to severe OSA, and an option of

treatment for patients with mild OSA.[11-14] Flemons et al has reported that high risk OSA patients have increased palatal vault depth, large tongue and Class 3 and 4 Mallampati scores of uvula.[16] Dentist's role is becoming progressively significant to evaluate, beginning with the diagnosis, referring the patients to another physician for evaluation, and assisting in the management of sleep disorders.[15]

Hence the purpose of the study is to assess the knowledge, attitude and practice regarding different domains of obstructive sleep apnea (OSA) among dentists including BDS and MDS in Central India.

METHODOLOGY:

This cross-sectional study was conducted in Central India from January 2021 to June 2021 for duration of 6 months at Nagpur. The ethical approval was obtained from Institutional Ethics Committee prior to starting the study with ethical clearance number – SDKS/PG/STRG/Pros2.

Sample size calculation- The sample size was calculated using sample size formula for qualitative data for similar type of study conducted in India.[2]

$$n = \frac{4Pq}{L^2}$$

Where p= 68.9% dentists correctly reported the relationship between gender and OSA

L = Allowable error

$= 10\% \text{ of } P = \frac{10 \times 68.9}{100}$

$= 6.89$

$q = 100 - P = 100 - 68.9 = 31.1$

$n = \frac{4 \times 68.9 \times 31.1}{6.89^2}$

$= 180.55$

n = 185 subjects needed in the study

Inclusion criteria – A total of 185 dentists including BDS and MDS across Central India, were included in the survey. Graduated dentists independent of school of origin, gender, graduation year and curriculum content were included in the study.

Exclusion criteria – Undergraduates, Sleep physicians were excluded from the study.

Data collection: specially created web designed survey in Google forms was circulated among Dentists, and the responses were recorded. This questionnaire survey consisted of 23 questions. The questionnaire was prepared considering study conducted by Kale SS, 2020.[2]

- Demographic data consisted of: Gender, Qualification and Speciality.
- Twelve knowledge based questions consisted of five domains: Awareness, Screening and Diagnosis, Treatment and Referral, General findings, Risk factors of OSA.
- Seven attitude based questions consisted of three domains: Screening and Diagnosis, Dental curriculum, Interdisciplinary approach.
- Four practice based questions consisted of one domain: Screening, diagnosis and treatment.

Questionnaire used to collect data on knowledge, attitude, and clinical practice of dentists toward OSA are compiled in Table 1. (Correct answers are mark bold)

Table 1: Questionnaire

Knowledge related questions		
Question Number	Question	Answer
1	Are you aware of Obstructive Sleep Apnea (OSA)?	**a) Yes** b) No
Screening and Diagnosis		
2	Which is the gold standard method for diagnosis of OSA?	a) STOP questionnaire **b) Polysomnography**

		c) Case history d) Don't know
3	Can final diagnosis of OSA be made by a dentist?	a) Yes **b) No** c) Don't know
Treatment and Referral		
4	Which is not the correct choice of treatment for OSA?	**a) Mild OSA does not require treatment** b) Mild OSA treated with Oral appliance c) Moderate to severe OSA treated with CPAP and Orthognathic surgeries d) Severe OSA treated with oral Orthognathic surgeries e) Don't know
5	Disadvantages of CPAP (continuous positive airway pressure) is that, it causes,	a) Proclination of maxillary incisors **b) Retroclination of maxillary incisors** c) Proclination of mandibular incisors d) Retroclination of mandibular incisors
6	Who can prescribe oral appliances for OSA patients	a) Dentist **b) Sleep physician** c) Don't know
General findings		
7	OSA is more common among?	**a) Males** b) Females c) Both d) Don't know
8	Is snoring a symptom seen amongst OSA patient?	**a) Yes** b) No c) Don't know
9	Does the prevalence of OSA increases with age?	**a) Yes** b) No c) Don't know
Risk factors		
10	Factors which contribute to OSA are	**a) Obesity** b) Hypertension c) Obesity and/or hypertension d) Don't know
11	Do you think abnormal maxilla and mandibular development can be a risk factor for OSA?	**a) Yes** b) No c) Don't know
12	Enlarged adenoids are risk factors for OSA.	**a) Yes** b) No c) Don't know
Attitude related questions		
Screening and Diagnosis		
13	Dentist plays a role in diagnosing and providing treatment for OSA.	**a) Strongly agree** **b) Agree** c) Neutral d) Disagree e) Strongly disagree
14	When dentist identifies bruxism habit in his patient it is his role to enquire about snoring and OSA.	**a) Strongly agree** **b) Agree** c) Neutral d) Disagree e) Strongly disagree
15	Is it important for the dentist to enquire about sleep pattern of his patient during history taking?	**a) Strongly agree** **b) Agree** c) Neutral

		d) Disagree e) Strongly disagree
Dental curriculum		
16	Do you think during under graduation the dental curriculum should include information about OSA and role of dentist?	**a) Strongly agree** **b) Agree** c) Neutral d) Disagree e) Strongly disagree
17	Should OSA screening of patient be a mandatory part of clinical examination for the dentists?	**a) Strongly agree** **b) Agree** c) Neutral d) Disagree e) Strongly disagree
Interdisciplinary approach		
18	Dentist and sleep physicians should deal together with OSA patients	**a) Strongly agree** **b) Agree** c) Neutral d) Disagree e) Strongly disagree
19	If the dentist encounters abnormal anatomical oral structures then he should further investigate for OSA and refer the patient to sleep physician.	**a) Strongly agree** **b) Agree** c) Neutral d) Disagree e) Strongly disagree
Practice related questions		
Screening, diagnosis and treatment		
20	Have you ever asked your patient about sleep history after observing attrition of teeth in his mouth?	**a) Yes** b) No
21	Have you ever screened patient for OSA who has given history of snoring?	**a) Yes** b) No
I)	If Yes, How have you screened the patient for OSA?	
II)	Have you referred your patient to physician for sleep disordered diagnosis after noticing oral findings related to OSA?	**a) Yes** b) No
III)	Have you ever fabricated any oral appliance for treating your patient with OSA?	**a) Yes** b) No
22	Have you ever attended any course on management of OSA patients?	**a) Yes** b) No
23	Would you be interested in attending course on dental management of sleep related oral diseases?	**a) Yes** b) No

Knowledge and practice was categorized question wise: Good for ≥50% correct responses; poor for ≤ 50% correct responses, while attitude as favorable for 50% responding to agree and strongly agree; unfavorable for 50% responding to neutral, disagree and strongly disagree.

Statistics: Data was analyzed descriptively and inferential statistics using chisquare test and presented in the form of graphs and software used in the analysis was SPSS 27.0 version and (P = 0.05) is considered as level of significance.

RESULTS:

Total 185 dentists completed and returned questionnaire. Of these 86 (46.49%) were the BDS and 99 (53.51%) were the MDS. Table 2 depicts the distribution of dentist percentage according to the correct knowledge for each question. More than 50% dentists including BDS and MDS correctly responded for question regarding awareness (Q.No.1), gender predilection (Q.No.7), symptoms of OSA (Q.No.8), prevalence of OSA with age (Q.No.9), risk factors for OSA (Q.No.11,12), More than 50% of MDS correctly responded for methods of

diagnosing OSA (Q.No.2,3) , treatment modalities (Q.No.4) and disadvantages of CPAP (Q.No.5). Poor knowledge was reported by BDS regarding; methods of diagnosing OSA (Q.No.2,3), treatment modalities (Q.No.4,5,6) and risk/contributing factors for OSA (Q10) .

Overall good knowledge was found for domains like awareness, general findings and risk factors while poor knowledge of BDS was found for domains on screening and diagnosis and treatment and referral of OSA.

Table 2: Frequency distribution of dentists as per their knowledge regarding obstructive sleep apnea (OSA).

Question number	Knowledge (Correct responses)		Interpretation	
	BDS (%)	MDS (%)	BDS	MDS
1	88.37	100	Good	Good
2	17.44	64.65	Poor	Good
3	20.93	50.51	Poor	Good
4	40.70	65.66	Poor	Good
5	34.88	57.58	Poor	Good
6	8.14	47.47	Poor	Poor
7	56.98	69.70	Good	Good
8	81.40	90.91	Good	Good
9	80.23	90.91	Good	Good
10	24.42	47.47	Poor	Poor
11	80.23	86.87	Good	Good
12	79.07	88.89	Good	Good

Favorable attitude regarding role of dentist in treatment of OSA (Q.No.13), in referral of the patients after identifying relevant oral findings (Q.No.14,19), enquiring about patient's sleep pattern (Q.No.15), incorporating OSA related knowledge in dental curriculum to undergraduates (Q.No.16), screening of patients coming to clinics (Q.No.17), and interdisciplinary approach (Q.NO.18) (Table 3). Overall, dentists including BDS and MDS presented favorable attitude for all the domains regarding, screening and diagnosis, dental curriculum and interdisciplinary approach.

Table 3: Frequency distribution of the dentists as per their attitude towards obstructive sleep apnea (OSA).

Question number	Attitude (Correct responses)		Interpretation	
	BDS (%)	MDS (%)	BDS	MDS
13	81.39	96.97	Favorable	Favorable
14	75.58	93.94	Favorable	Favorable
15	76.75	95.95	Favorable	Favorable
16	82.55	91.91	Favorable	Favorable
17	80.23	91.91	Favorable	Favorable
18	80.23	91.92	Favorable	Favorable
19	80.23	89.89	Favorable	Favorable

Good practice among dentists was reported for two questions, regarding dentists contribution in asking the patients about sleep history after noticing attrited teeth (Q.No.20) of MDS (54.55%) and their interest in attending OSA management courses (Q.No.23) of BDS (88.37%) and of MDS (93.94%) While the other two questions based on screening the patients with snoring history (Q.No.21) and their record on attending OSA management sessions in past (Q.No.22) were responded poorly for both BDS and MDS.

Figure 1: Have you ever screened patient for OSA who has given history of snoring?

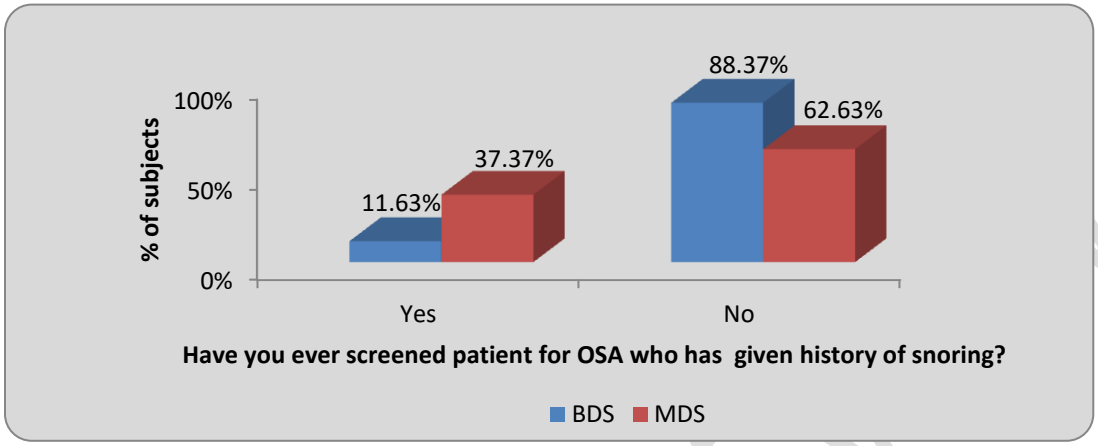
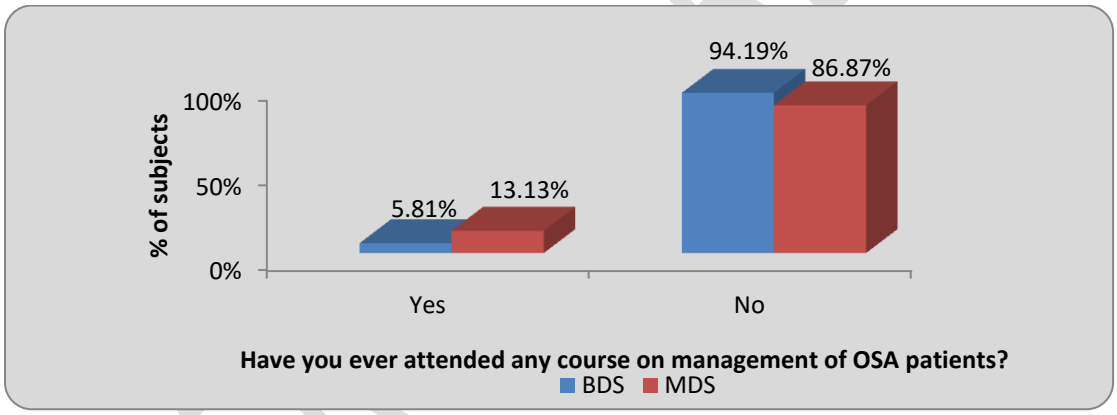


Figure 2: Have you ever attended any course on management of OSA patients?



≥50% of dentists both BDS and MDS reported to have not screened OSA patients. These dentists had performed screening by taking detail history, by dentition face profile, by polysomnography, malocclusion of teeth (Q No. 21 i). Further, 12.79% of BDS and 35.35% of MDS referred the screened patients (Q.No.21 ii), while only 10.47% of BDS and 27.27% of MDS among them fabricated oral appliances for the screened OSA patients (Q.No.21 iii). Largely it was found that more than 50% dentists had poor practice in the domains concerning screening, diagnosis, treatment and continuing dental education.

DISCUSSION:

Of the five domains in the knowledge section the dentists have poor knowledge for the two domains which were about screening and diagnosis and treatment and referral. The reason for this could be that the dental curriculum does not incorporate learning objective for OSA and hence the dentist would not have enough knowledge of the same. Dentists including 88.37% of BDS and 100% of MDS were aware of OSA. Bian found that 75% of the GDPs were aware of OSA as a disease.[17]

In general findings domain, OSA and gender predilection, 56.98% of BDS and 69.70% of MDS were aware about its relation which was in accordance with Jokubauskas et al.[12] They reported that around 68.9% dentists correctly reported the relation between gender and OSA. 43.02% of BDS and 30.3% of MDS were not aware of gender predilection of OSA; this was again in accordance with Manohar et al.[11]

The results indicate that there is lack of knowledge for both BDS and MDS regarding screening, diagnostic aids, risk factors such as obesity as well as a proper treatment along with the correct time and condition for referral to the sleep physician; regarding their role in final diagnosis and that they themselves cannot prescribe oral appliances to OSA patients directly. Similar kind of result was reported in a study wherein, 60% of the dentists were not aware about the oral appliances to treat OSA and 21.15% of the dentists could not identify different tests which are carried out for diagnosing OSA.[10]

The results of the present study were also in accordance with Jokubauskas et al.[12], who reported that 78.8% dentists responded that they and medical practitioner can together deal with OSA similar findings with Bian study.[17] Moreover 41% dentist agreed of their duty for suspecting OSA cases in their clinic and 70.9% gave a positive opinion on participating in OSA treatment.[14] With favorable attitude of dentists for leaning about OSA during graduation it is strongly recommended that the dental curriculum should include topics on OSA. Similar results were found in study of Kale SS at al.[2]

In the present study, it was observed that the practices of the dentists are poor regarding the domains directed towards screening, diagnosing and treating the OSA patients in their routine dental practice and continuing dental education. Bian[17] reported that 46% of the dentists refer their patients to sleep physician after suspecting for OSA while Manohar et al.[11] reported that only 4% dentist diagnosed the OSA patients correctly. 85% dentist never consulted sleep physicians for the suspected OSA cases in their clinics and 89.8% dentists never fabricated any oral appliances for their OSA patients which is similar to the present study. In the present study, only 5.81% of BDS and 13.13% of MDS attended extra learning course regarding OSA management and 88.37% of BDS and 93.94% of MDS expressed their wish to attend courses on OSA management. The results are comparable with Barnes et al., wherein 90% of the dentists showcased their interest in learning more about OSA while they are contrast with Jokubauskas et al.[12], who conveyed that 47.3% dentists attended continuing dental education courses for OSA learning.

CONCLUSION:

OSA is a highly underdiagnosed condition that may lead to multiple health problems. Despite noticeable prevalence shown in different studies, this disorder still remains underrecognized by different specialties, among them dentists. In the present study dentists had favorable attitude towards OSA but poor knowledge in certain domains about OSA which may be linked to lacked clinical experience and hurdle in their practice. Dentist can thus make a significant contribution to the reduction of serious medical symptoms associated with OSA. Additionally, there is a need to further improve the knowledge among the future dentist, by introducing overall knowledge of OSA in undergraduate and postgraduate dental education Moreover; dentists are required to direct themselves towards continuing dental education programs regarding OSA.

ETHICAL APPROVAL:

The ethical approval was obtained from Institutional Ethics Committee prior to starting the study with ethical clearance number – SDKS/PG/STRG/Pros2.

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