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Original Research Article

Awareness & Knowledge Regarding Periodontal Perspectives of Obstructive Sleep Apnea (Osa) Among General Dentists: A Cross-Sectional Study

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Abstract

Background: Lack of knowledge among general dentists regarding periodontal perspectives & its associated link in cases of Obstructive Sleep Apnea (OSA), considering various tactic theories, could be one of the reason for attenuated increase of periodontitis and early tooth loss in the current scenario. Hence, the periodontist should play a major role in creating awareness regarding the importance of identifying & screening of OSA cases for its early intervention and prevention of development of periodontitis.

Objective: This cross-sectional baseline survey study aimed to assess the knowledge regarding periodontal perspectives of OSA among general dentists & evaluate their attitude towards OSA screening, early diagnosis, referral & its management.

Methodology: An online e-questionnaire was prepared using Google form platform that included three main sections: Demographics characteristic details, Knowledge statement questions & Attitude statement questions. A total of 287 general dentists were subjected to e-questionnaire & proportional quota sampling was used to ensure that all the participants were representative of general population, based on specific region and speciality. The knowledge and attitude scoring system was independently applied. Percentage mean score was calculated. Data was subjected to descriptive statistics, independent t tests & pearson's correlation.

Results: Out of 287 general dentists, 127 (44.25%) responded to the e-questionnaire. Based on the Bloom's cutoff values, 78.31% earned a total knowledge score below 12 (<54%) indicating low level of OSA related knowledge & 73.22% showed high positive attitude score (4-5) indicating willingness among general dentists to learn about this condition.

Conclusion: Insufficient knowledge & positive attitude regarding periodontal perspectives of OSA was found, hence, suggesting that more awareness & educational programmes by periodontists needs to be conducted among general dentists with inclusion of clinical guidelines on management of periodontitis in OSA patients.

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Keywords: Obstructive sleep apnea, Knowledge, Attitude, Periodontitis, Tooth loss, General dentists, Role of Periodontist in OSA.

1. INTRODUCTION

Obstructive Sleep Apnea (OSA) is a common chronic sleep related breathing disorder with associated comorbidities and severe life threating complications. Involving 5% to 20 % of the general population, it has raised concern among all health care professionals regarding its early diagnosis and intervention with multidisciplinary approach so as to reduce its morbidity & mortality index. [1] Being considered as a major global health issue, it affects more than a billion individuals and often goes unnoticed, under diagnosed and untreated with high prevalence rate of about 80%-90% among the general population. More than 70% of dentists could not identify and diagnose the specific signs & symptoms of this condition. [2, 3] The reason could be attributed to lack of awareness and knowledge among general dentists regarding OSA & its associated comorbidities. Regarding gender predilection, it is estimated to be more common among males (3%-7%) than females (2%-5%) especially among the Hispanic, Black & Asian geographic populations.[4] The aetiology is contemplated to be multifactorial in origin involving anatomical risk factors (micrognathia, retrognathia, mandibular hypoplasia, ankyloglossia, inferior displacement of hyoid bone, adenoid & tonsillar hypertrophy, nasal asymmetries), non-anatomical risk factors (obesity, middle age, elderly males, ethnic minorities, down syndrome, sleep bruxism, individuals with large neck circumference of >16'' in females & >17'' in males) and associated confounding medical risk factors (endocrinopathies, GERD, allergic rhinitis) that play a significant role in creating negative pressure (Pressure -flow relationship phenomena/Bernoulli Effect) and affecting the biomechanics by destabilizing the upper airway during sleep leading to severe consequences such as cardiac arrest & death.[5,6] The earliest sign & symptom range from high intensity loud disruptive snoring followed by gasping, snorting & choking sounds with sudden jerky, bodily movements. Characterised by short, temporary, complete or partial cessation of breathing, this condition results in upper airway obstruction (UA) that usually last for 10 to 30 seconds, to more than 60 seconds at times.[7] Associated symptoms such as daytime hypersomnolence, headache issues especially after waking up & mouth breathing are few other manifestations of OSA resulting in poor work performance, poor quality of life (QoL) and road traffic and /or work-related accidents/injuries.[8] Various indices such as Apnea-Hypoapnea Index (AHI) / Respiratory Disturbance Index (RDI) index, Desaturation Index (DI) & Oxygen saturation Index (SpO2 nadir), diagnostic screening tools such as Polysomnography (PSG) & Pulse oximetry & questionnaires such as STOP, STOP-BANG, ASA Checklist, Epworth Sleepiness Scale, Hawaii Sleep Questionaries, FOSQ & Grenoble Sleep Apnea QoL test have been applied for screening, early diagnosis & prevention of this condition.[9] Continuous Positive Air Pressure (CPAP), Oral Appliance Therapy (OAT), surgical intervention using MMA are the most common treatment modalities currently available for OSA.[10,11]

The Quality of Life (QoL) as measured using Quality Adjusted Life Years (QALYs) parameters demands the need for its early diagnosis and prompt screening, thereby preventing other complications such as neurocognitive, metabolic, hormonal, immunological, dental complications & even cancer. [12-14] "Periodontitis" is considered to be one of the oral manifestations of OSA resulting in loss of tooth and its associated structures.[15] Being a chronic inflammatory condition, it involves subsequent loss of clinical attachment (CAL) & alveolar bone loss (ABL) due to the presence of persistent inflammatory state releasing various inflammatory cytokines and molecules that cause severe destruction of tooth and its associated

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structures, thereby resulting in early loss of teeth.[13] Scientific evidence-based studies have documented that patients with moderate to severe OSA have high prevalence of periodontitis with increased levels of interleukin 6 (IL 6), C-reactive protein (CRP) & gingival crevicular fluid interleukin-1β that are implicated in periodontal damage.[16] Various metanalytical studies [15, 17,18] have hypothesised that patients with OSA usually tend to breathe through mouth so as to compensate the upper airway obstruction caused due to partial or complete collapse resulting in oral respiratory compensatory mechanism that in turn leads to xerostomia, poor oral hygiene, increased plaque accumulation, and development of periodontitis.
Recent scientific evidences have identified increased surge in dental complications due to lack of knowledge and awareness of periodontal perspectives and OSA among general dentists in Indian populations and subsequent loss of teeth [19-21]. Hence, the periodontist should play a major role in creating awareness regarding the importance of identifying & screening of OSA for its early intervention and prevention of development of periodontitis. Based on this platitude, we intended to bridge this research gap by planning & executing this cross-sectional baseline survey study with the aim to assess the knowledge regarding periodontal perspectives of OSA among general dentists & evaluate their attitude towards OSA screening, early diagnosis, referral & its management.

2. METHODOLOGY

A cross-sectional baseline survey study was conducted during the period of August 2023 till September 2023 among general dentists residing in Kalaburagi, Karnataka, India. The inclusion criteria were registered clinical practitioners in the discipline of dentistry. The exclusion criteria were non-registered dental practitioners, academicians and other medical professionals. The study was initiated after due approval from ethical committee & consent agreement for participation was duly taken from all the respondents. The confidentiality of all the study participants was maintained and no threat or pressure was imposed on the participants who denied participation in the study.
A self-administered e-questionnaire was prepared in English language applying the Google Form Platform and delivered via email with attached survey link https://docs.google.com/forms/d/e/1FAIpQLSenp07NL_LqR6BqkCfMgLT_DvK0Z49BFxzqEyVdcybGeq-2w/viewform?usp=header among the general dentists residing in Kalaburagi, Karnataka, India. The e-questionnaire included three main sections: demographic characteristic details, knowledge statement and attitude statement questions. The required total sample size was derived by setting 5% margin error and 95% confidence interval. The minimum required sample size estimated was about 125. Based on this sample size, a total of 287 general dentists were included in the study. Proportional quota sampling was used to ensure that all the participants were representative of general population based on specific region and speciality. The validity and reliability of the e-questionnaire were evaluated by senior professionals in the research domain & experts and a pilot study was initiated to review the readability, clarity and comprehensiveness of each item in the e-questionnaire.
The demographic characteristics included were age (D1), sex (D2) professional title: BDS/MDS/PhD (D3) and practice sector: private clinic/ multispeciality hospital/affiliated dental college (D4). The knowledge section included three open-ended questions (K1-K3) with “Yes” or “No” options followed by 21 open ended questions (K4-K24) with “True”, “False” & “Do not know” option, so as to evaluate the exact depth of knowledge regarding periodontal perspectives & OSA among general dentists. Each question was designated with 1 point score for the correct answer and 0-point score for wrong answer. The “Do not Know” option was

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included to avoid guessing effect bias and the score was designated as wrong option. The total knowledge score for each respondent was calculated and Blooms cut off scale was applied as shown in Table 1. The attitude section included five main open-ended questions (A1-A5) with three questions (A1-A3) based on importance parameter and two questions (A4-A5) based on confidence parameter so as to assess the importance of identifying, screening & treating OSA respectively. Possible choice of response for each question was "Yes" and "No "options. Each question was designated with 1 point score for the correct answer and 0 point score for wrong answer. The total attitude score for each respondent was calculated and Blooms cut off scale was used as shown in Table 1. Both, total knowledge score and total attitude score was summed for final cumulative scores. The knowledge and attitude scoring system was independently applied and percentage mean score was calculated. Data was subjected to descriptive statistics, independent t tests & Pearson's correlation

3. RESULTS

Figure 1: Depicts The Total Knowledge Score & Total Attitude Score as per the Bloom's Cut off Values

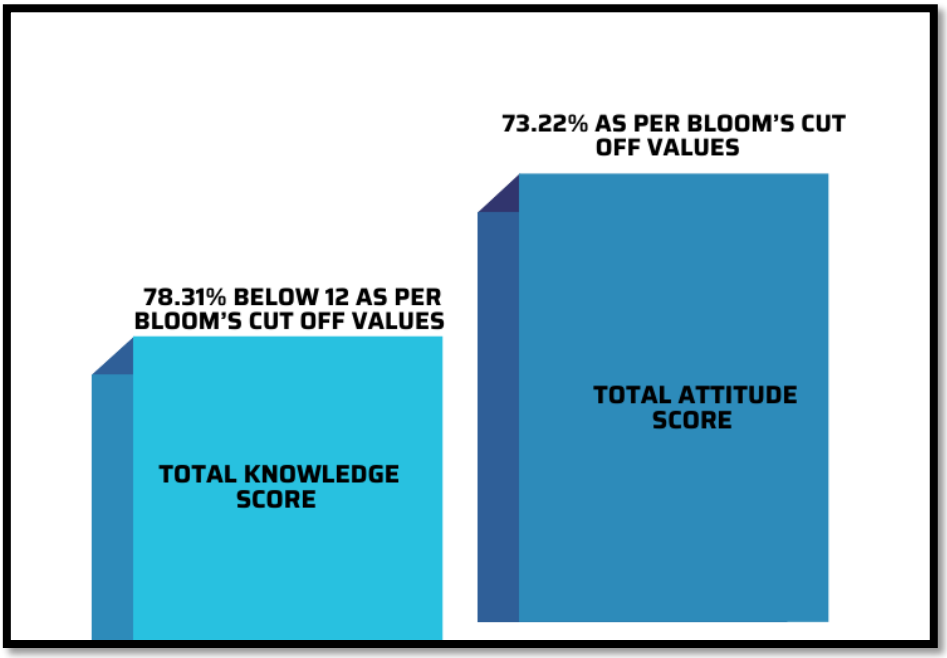

Table 1: Depicts Bloom's Cut off Values for Total Knowledge Score & Total Attitude Score

	Level	Score (%)	(%)
Total Knowledge Score	High level	18-22 (81%-100%)	6 (7.2%)
	Moderate level	13-17 (59%- 77%)	12 (14.4%)
	Low level	<12 (< 54%)	65 (78.31%)
Total			n=83
Total Attitude Score	Positive Attitude	4-5 (80%-100%)	93 (73.22%)
	Neutral Attitude	3 (60%-79%)	24 (18.89%)
	Negative Attitude	<3 (<60%)	10 (7.87%)
Total			n=127

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Table 2: Demographic Characteristics of Study Participants/ Respondents (N=127)

Demographic details	n (%)	Total knowledge score (mean ± SD)	p value	Total attitude score (mean ± SD)	p value
Age					
21-30 yrs	22 (17.3%)	75 ± 10	0.04	78 ± 9	0.02
31-40 yrs	96 (75.5%)	80 ± 8		82 ± 7	
41-50 yrs	6 (4.7%)	70 ± 12		75 ± 10	
Above 50 yrs	3 (2.3%)	65 ± 15		70 ± 12	
Sex					
Male	87 (68.5%)	75 ± 10	0.04	80 ± 8	0.03
Female	40 (31.4%)	70 ± 12		78 ± 9	
Professional Degree					
BDS	74 (58.26%)	78 ± 9	0.03	80 ± 8	0.01
MDS	51 (40.15%)	82 ± 7		84 ± 6	
PhD	2 (1.5%)	85 ± 5		88 ± 4	
Practice Sector					
Private	87 (68.5%)	80 ± 8	0.04	82 ± 7	0.02
Multispeciality	25 (19.68%)	75 ± 10		78 ± 9	
Affiliated college	15 (11.81%)	70 ± 12		74 ± 11	

Table 3: Percentage and Frequencies of Respondents for Total Knowledge on Periodontal Perspectives & Osa

Knowledge Statement Questions Code	Knowledge Statement Questions	Yes n (%)	No n (%)
K1	Have you heard or read about Obstructive Sleep Apnea (OSA)?	83 (65.35%)	44 (34.64%)
K2	Are you aware about the periodontal perspectives and its correlation in OSA Cases?		
K3	Are you aware that "Periodontitis" is one of the signs & symptom in OSA cases?		

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Knowledge Statement Questions Code	Knowledge Statement Questions	True n (%)	False n (%)	Do not know n (%)
K4	The prevalence rate of OSA is about 5% to 20 % of general population	47 (56.62%)	24 (28.91%)	12 (14.47%)
K5	About 80% to 90% of OSA cases go unnoticed & underdiagnosed among adults	81 (97.59%)	1 (1.2%)	1 (1.2%)
K6	According to the American Thoracic Society and the American Academy of Paediatrics database, approximately 50% of childrens are affected by OSA with peak incidence reported to be between 2 to 8 years of age	21 (25.3%)	58 (69.87%_	4 (4.81%)
K7	Obesity is one of the etiological factor in OSA	24 (28.91%)	46 (55.42%)	13 (15.66%)
K8	As per the Quetelet's index, individuals with BMI ≥ 30 kg/m2 are seven times more susceptible to have OSA	21 (25.30%)	49 (59.06%)	13 (15.66%)
K9	Based on the conceptualization of "*Pressure Flow Relationship"* phenomena/ *"Bernoulli effect",* the pathophysiological mechanism for OSA involves the dynamic interplay of negative pressure and biomechanics that destabilizes the patency of UA resulting in fluctuation of intrathoracic pressure and collapse	54 (65.06%)	19 (22.89%)	9 (10.84%)
K10	The earliest sign & symptom of OSA is high intensity loud disruptive *snoring followed by gasping, snorting & choking sounds* with sudden jerky, bodily movements and arousal from sleep	34 (40.96%)	46 (55.42%)	3 (3.61%)
K11	Untreated OSA can lead to cardiovascular complications and cardiac arrest	21 (25.30%)	32 (38.55%)	30 (36.14%)
K12	The Apnea-Hypoapnea Index (AHI) / Respiratory Disturbance Index (RDI) index is not an objective assessment tool for diagnosing OSA	54 (65.06%)	21 (25.30%)	8 (9.6%)
K13	Questionnaires such as STOP, STOP-BANG, ASA Checklist, Epworth Sleepiness Scale, Hawaii Sleep Questionaries, FOSQ & Grenoble	12 (14.45%)	31 37.34%)	40 (48.19%)

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	Sleep Apnea QoL test are not considered as diagnostic tools for OSA			
K14	Polysomnography (PSG) & pulse oximetry are used as screening tools for diagnosis of OSA	21 (25.30%)	58 (69.87%)	4 (4.81%)
K15	Continuous Positive Air Pressure (CPAP) is considered to be the gold standard treatment option for OSA	24 (28.91%)	46 55.42%)	13 (15.66%)
K16	In 2021, AADSM accepted the OAT therapy that works on the principle of mandibular advancement technique wherein the forward movement of the mandible reopens the UA during sleep.	21 (25.30%)	49 (59.06%)	13 (15.66%)
K17	OAT appliances are available as Custom-Made (titratable/nontitratable) and Noncustom Made or “boil and bite” devices (titratable/nontitratable)	21 (25.30%)	32 (38.55%)	30 (36.14%)
K18	Patient compliance and poor tolerance for CPAP have resulted in mitigating the risk of discontinuation of the appliance	54 (65.05%)	21 (25.30%)	8 (9.6%)
K19	OAT appliance is considered to be 100% more effective than CPAP appliance	21 (25.30%)	49 (59.06%)	13 (15.66%)
K20	In 2022, the American Academy of Sleep Medicine (AASM), American Academy of Dental Sleep Medicine (AADSM) & National Institute of Clinical Excellence UK, together proposed specific clinical guidelines & recommendation for OAT therapy in OSA patients especially for those who were intolerant to CPAP or/and those who willingly opted for custom made or semi-custom-made OAT as an alternative therapy	12 (14.45%)	31 (37.34%)	40 (48.19%)
K21	Patients with moderate to severe OSA have high prevalence of periodontitis	21 (25.30%)	58 (69.87%)	4 (4.81%)
K22	Patients with OSA usually tend to breathe through mouth so as to compensate the upper airway obstruction resulting in oral respiratory compensatory mechanism leading to dry mouth (xerostomia), reduced cleansing mechanism, more plaque accumulation, thereby evoking a	54 (65.-6%)	21 (25.30%)	8 (9.6%)

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	chronic inflammatory condition and development of periodontitis.			
K23	Patients with mild to moderate OSA have high prevalence of periodontitis	10 (12.04%)	34 (40.96%)	39 (46.98%)
K24	Patients with poor oral hygiene status with active periodontal pathologies, untreated dental caries, severe loss of dentition and generalized seizures were considered unsuitable for OAT therapy.	12 (14.45%)	31 (37.34%)	40 (48.19%)

Table 4: Percentage and Frequencies of Respondents for Total Attitude on Periodontal Perspectives & Osa

Attitude Statement Questions Code	Attitude Statement Questions	Yes n (%)	No n (%)	Mean ± SD
A1	Do you agree that there is lack of knowledge regarding the periodontal perspectives of OSA among genera dentists?	95 (74.80%)	32 (25.91%)	
A2	Do you feel the need to conduct patient education & awareness programmes through telemonitoring & tele dentistry on large scale community extension field programmes for early diagnosis & prevention of OSA?	102 (80.31%)	25 (19.68%)	0.635±0.0427
A3	Do you agree that Dentists should be aware of OSA and its potential life threating complications?	87 (68.50%)	40 (31.49%)	
A4	Do you feel the dentist are competent enough regarding the OSA screening tools & appliances while treating the patients?	29 (22.83%)	98 (77.16%)	
A5	Do you feel the need for special clinical training programmes to be conducted for proper selection and application of OSA screening tools and appliances?	104 (81.88%)	23 (18.11%)	

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Table 5: Pearson's Correlations Coefficient Amongst Total Knowledge Scores and Toal Attitude Scores.

	1	2	3	4
Importance	1			
Confidence	0.920	1		
Total attitude score	0.074	0.667	-1	
Total knowledge score	0.039	0.150	0.437	-1

Participant Demographic Characteristics: Out of 287 dentists, 127 (44.25%) participated in the study. Most of the respondents (75.5%) belonged to the age group of 31 -40 years and were males (68.5%). About 58.26% were entitled with BDS degree and 68.5% worked in private sector. Table 2 illustrates demographic details of total number of respondents with mean, standard deviation and p value for each demographic characteristics individually for assessing the total knowledge score and total attitude score among the participants.

Knowledge Assessment Results: About 65.35% (n=83) respondents selected "Yes" option and 78.31% earned a total knowledge score below 12 (<54%) indicating low level of OSA related knowledge. The source of knowledge accusation was considered to be internet (55.12%) & conferences (42.14%). The most correct response (97.59%) was seen in question K5 and the lowest percentage of correct response (12.04%) was seen in K23, indicating that most of the respondents were unaware that "periodontitis" could be one of the oral manifestations of OSA. About 34.64% dentists agreed regarding paucity of any previous knowledge regarding "Periodontitis & OSA". About 78.31% participants revealed low level of total knowledge score <12 (< 54%) as per the Bloom's Cut off value for total knowledge scoring system (Table 1, Figure 1). Table 3 demonstrates knowledge statement questions with their specific codes and the frequency and percentage of responses for each statement question.

Attitude Assessment Results: About 80.31% (n=102) inferred positive attitude regarding the perception of knowledge on periodontal aspects in OSA, thereby acknowledging the importance of OSA in dental practice. Only 22.83% were confident regarding the application of oral appliances in clinical practice. About 81.88% showed positive attitude of considering the importance of early diagnosis and adaptation of prompt clinical skills in patients with OSA. About 73.22% showed high positive attitude score 4-5 (80%-90%) as per the Bloom's Cut off value for total attitude scoring system. (Table 1, Figure 1) Table 4 demonstrates attitude statement questions with their specific codes and frequency and percentage of responses for each statement question.

The total knowledge score & total attitude score was 75 ± 10 and 80 ± 8 respectively among males & was 70 ± 12 & 78 ± 9 respectively among females. Most of them belonged the age group of 31-40 years. However, statistically insignificant correlation was observed between male & female respondents regarding professional degree and practice sector. Moreover, Pearson correlation coefficient showed a weak positive and statistically significant correlation between total knowledge score and total attitude score ($r = 0.39$, $p = 0.05$) (Table 5)

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4. DISCUSSION

The economic burden of "OSA & Periodontitis" has shown increased surge in recent years in Indian population.[3, 22] This could be attributed to increased number of undiagnosed cases of OSA due to lack of knowledge and awareness, lack of screening & lack of suboptimal education programmes regarding this silent disease.[7, 23] This cross-sectional survey study elucidates baseline characteristic information regarding the existing knowledge about OSA and its correlation with periodontal aspects and attitude of perception of dentists towards considering the importance of early diagnosis of this condition.

The self-administered e questionnaire was emailed to 287 dentists, amongst which the response rate of about 44.25% (n=127) was observed that was in concordance with the average response rate for online surveys (50.5%) of other studies. [17-20] About 65.35% (n=83) respondents indicated that they had previous knowledge regarding periodontal perspectives & OSA in the self-assessment knowledge statement questions (K1-K3). Based on the Bloom's cutoff values, 78.31% earned a total knowledge score below 12 (<54%) indicating low level of OSA related knowledge & 73.22% showed high positive attitude score (4-5) indicating willingness among general dentists to learn about this condition for its early diagnosis & treatment. (Table 1). The study inferred statistically insignificant correlation w.r.t the demographic characteristic details (age, sex, professional degree and practice sector). However, 68.5% male respondents & 75.5% respondents belonged to age group of 31-40 years, inferred comparatively better total knowledge score (80 ± 8) & total attitude score (82 ± 7) than other subgroups. This could be correlated to professional qualification where 40.15% & 1.5 % of respondents had achieved master degree and PhD degree respectively, thereby inferring that better knowledge & understanding regarding the concepts of this condition could be due to more educational exposure such as conferences and webinars during academic sessions while pursuing the subsequent degrees. The study results inferred that dentist working in private sector showed increased scores in both individual categories. This was in discordance with the study conducted by Jokubauskas et al [26] who showed no significant difference among general dentists & dental specialists. However, the study was in alignment with Vuorjoki-Ranta et al [27], who concluded that dental specialists knew more about OSA because of their advanced educational levels. The study results were similar to findings from other cross sectional studies conducted by R Kesavan et al [28], Kale et al. [29], Bian et al [19], and Manohar J et al. [30] Although, 97.59% respondents, as per the knowledge statement code K5, inferred that this condition often goes unnoticed, only 25.30% respondents, as per the knowledge statement code K11, knew about its potential complications. This indicated that most of the dentists unaware about its potential complications. This could be correlated to lack of referral of OSA cases from medical fraternities in this specific area, thereby questioning the awareness of this condition among other health care professionals. Future research should be conducted based on identification of this knowledge gap in the same location and the study outcomes can focus on applying multidisciplinary approach for screening & early diagnosis of OSA cases. These results were similar to study conducted by Alrejaye N.S et al [31] where lack of knowledge was observed among general physicians in Saudi Arabia & Kale et al [29] who inferred the importance of multidisciplinary approach involving dentist & sleep physicians.

Only 12.04% & 14.45% respondents knew about periodontal perspectives in OSA as per the knowledge statement question code K23 & K 24 respectively, indicating the importance of role of periodontist to create more awareness regarding this condition. Recent studies conducted by Te´llez-Corral MA et al [32], Natalia Arango Jimenez et al [33], Marco Portelli et al [34], Bianchi E, Segù M [35] & Kim SR[36] have inferred strong significant correlation of

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periodontitis & severity of OSA cases. Hence based on these study outcomes, the importance of role of periodontist needs to be emphasized for treating this condition along with the other disciplines so as to apprehend the indepth understanding and different approaches of treating periodontitis in cases of OSA.

A positively significant attitude score for willingness to learn & treat this condition was shown among all respondents irrespective of the demographic characteristic differences as seen in table 4. Respondents inferred disparate knowledge (59.06%) regarding the knowledge of AADSM & ADA published clinical guidelines [37-39] accounting for low level of knowledge regarding dentist role in OSA, thereby indicating lack of referral & lack of screening of this condition. Most of the respondents (<50%) showed low level of confidence regarding screening and treating this condition with oral appliances, thereby inferring that more clinical training programmes needs to be conducted for dentists. The study results were in agreement with Alansari RA et al [8] who inferred that dentists play a major role in early screening & managing OSA cases with oral appliances.

A high positive attitude score (73.22%) (Table 1) & high significant correlation among the respondents in the present study inferred that specific educational modules and inclusion of "periodontitis & OSA" as curriculum enrichment programmes needs to be considered. Moreover, raising the dentist knowledge about "periodontitis and OSA" can reduce the potential dental & medical complications.

Limitations

Since this study involves self-reported questionnaire through google forms, some participants might have answered each statement question using Chat GPT & AI tools, thus making it liable to bias resulting in inaccurate reporting. The small sample size & non-responder's bias could have resulted in generalizability of the study findings. However, this study may act as a pilot study to similar states in Indian population. Due to the cross-sectional type of study design, it could have imposed cause-and-effect relationship between the predictors of knowledge and attitude (as an exposure) and the levels of knowledge and attitude (as an outcome).

5. CONCLUSION

This cross-sectional baseline survey study conducted among general dentists residing in Kalaburagi, Karnataka, India showed low level of knowledge regarding periodontal perspectives of OSA & positive attitude towards acknowledging the importance of this topic. The need to emphasize the role of periodontist in identifying, screening, diagnosis and treatment of periodontitis in OSA & to organise educational intervention programmes with simultaneous upgradation of dental curriculum should be considered. Inclusion of clinical guidelines on management of periodontitis in OSA patients for general dentists needs to be highly recommended.

6. REFERENCES

1. Wali SO, Abaalkhail B, AlQassas I, Alhejaili F, Spence DW, Pandi-Perumal SR. The correlation between oxygen saturation indices and the standard obstructive sleep apnea severity. Ann Thorac Med 2020; 15:70-5.
2. Heinzer R, Vat S, Marques-Vidal P, Marti-Soler H, Andries D, Tobback N, et al. Prevalence of sleep-disordered breathing in the general population: the HypnoLaus study. Lancet Respir Med 2015;3:310-318.

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE01, 2025

3. Borsoi L, Armeni P, Donin G, Costa F, Ferini-Strambi L.The invisible costs of obstructive sleep apnea (OSA): Systematic review and cost-of-illness analysis. PLoS ONE 2022;17(5): e0268677
4. Bonsignore MR, Saaresranta T, Riha RL. Sex differences in obstructive sleep apnoea. Eur Respir Rev 2019; 28(154):190030.
5. Chmura, L.: Sleep apnea: What every clinician (and patient) should know, in Obstructive Sleep Apnea: A Patient's Perspective, ed. J.A. McNamara Jr., A.V. Shelgikar, Craniofacial Growth Series 2018; 54: 175-211
6. Ge L, Guyatt G, Tian J, Pan B, Chang Y, Chen Y, et al. Insomnia and risk of mortality from all-cause, cardiovascular disease, and cancer: systematic review and meta-analysis of prospective cohort studies. Sleep Med Rev. 2019; 48:101215.
7. Vishnudas Dinesh Prabhu, K Saiduth, Sushma Bommanavar, Aboobacker Sidheeque, Alsifa, Abhinandan Kumar. Current Updates & Dental Perspectives on Obstructive Sleep Apnea(OSA):A Comprehensive Review. Afr. J. Biomed. Res. Vol. 27(3s) (October2024); 1618-1626.
8. Alansari RA, Kaki AS. Knowledge of Signs, Symptoms, Risk Factors, and Complications of Obstructive Sleep Apnea among Dental Interns. J Contemp Dent Pract 2020;21(5): 558–561.
9. Moran WB, Orr WC. Diagnosis and management of obstructive sleep apnea. Part II Arch Otolaryngol 1985; 111: 650-658
10. Sutherland, K., Dalci, O., Cistulli, P.A. What Do We Know About Adherence to Oral Appliances? Sleep Med. Clin. 2010; 16 (1):145– 154.
11. Sutherland, K., Phillips, C.L., Cistulli, P.A. Efficacy versus Effectiveness in the Treatment of Obstructive Sleep Apnea: CPAP and Oral Appliances. JDSM. 2015; 02 (04): 175–181.
12. Gall R, Isaac L, Kryger M. Quality of life in mild obstructive sleep apnea. Sleep. 1993; 16(8 Suppl): S59–61.
13. Parish JM, Lyng PJ. Quality of life in bed partners of patients with obstructive sleep apnea or hypopnea after treatment with continuous positive airway pressure. Chest. 2003; 124(3):942–7.
14. Weinstein MC, Torrance G, McGuire A. QALYs: the basics. Value Health. 2009; 12 Suppl 1:S5–9.
15. Keller JJ, Wu CS, Chen YH, Lin HC. Association between obstructive sleep apnoea and chronic periodontitis: a population based study. J Clin Periodontol 2013;40:111-117
16. Cardoso EM, Reis C, Manzanares-Céspedes MC. Chronic periodontitis, inflammatory cytokines, and interrelationship with other chronic diseases. Postgrad Med 2018
17. Zhu J, Yuan X, Zhang Y, Wei F, Hou Y, Zhang Y. A meta-analysis on the association between obstructive sleep apnea and periodontitis. Sleep Breath 2022. doi: https://doi.org/10.1007/s11325- 022-02668-1.
18. Stazić P, Roguljić M, Đogaš Z, Lušić Kalcina L, Pavlinac Dodig I, Valić M, et al. Periodontitis severity in obstructive sleep apnea patients. Clin Oral Investig 2022;26:407-415.
19. Bian H. Knowledge, opinions, and clinical experience of general practice dentists toward obstructive sleep apnea and oral appliances. Sleep Breath 2004;8(2):85–90.
20. Amara Swapna L, Alotaibi NF, Falatah SA, et al. Knowledge of obstructive sleep apnea among dental fraternity in Riyadh. Open Access Maced J Med Sci 2019;7(15):2508–2512.

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE01, 2025

21. Khodadadi N, Khodadadi M, Zamani M. Is periodontitis associated with obstructive sleep apnea? A systematic review and metaanalysis. J Clin Exp Dent 2022;14:e359-e365
22. Young T, Palta M, Dempsey J, Peppard PE, Nieto FJ, Hla KM. Burden of sleep apnea: rationale, design, and major findings of the Wisconsin Sleep Cohort study. WMJ 2009;108:246-249
23. Van Thai Nguyen. (2023) Knowledge, attitude, and clinical practice of dentists toward obstructive sleep apnea: A literature review. CRANIO® 41:3, pages 238-244
24. Simmons, M.; Sayre, J.; Schotland, H.M.; Jeffe, D.B. Obstructive Sleep Apnea Knowledge among Dentists and Physicians. J. Dent. Sleep Med. 2021, 8, 1–12.
25. Swapna, L.A.; Alotaibi, N.F.; Falatah, S.A.; Joaithen, M.S.A.; Koppolu, P. Knowledge of Obstructive Sleep Apnea among Dental Fraternity in Riyadh. Open Access Maced. J. Med. Sci. 2019, 7, 2508–2512.
26. Jokubauskas L, Pileicikiene G, Zekonis G, Baltrusaityte A. Lithuanian dentists' knowledge, attitudes, and clinical practices regarding obstructive sleep apnea: a nationwide cross-sectional study. Cranio 2019;37(4):238–45.
27. Vuorjoki-Ranta TR, Lobbezoo F, Vehkalahti M, Tuomilehto H, Ahlberg J. Treatment of obstructive sleep apnoea patients in community dental care: knowledge and attitudes among general dental practitioners and specialist dentists. J Oral Rehabil 2016;43(12):937–42.
28. Kesavan R, Mary VA, Ranjani D, Uzra Khanam Y, Vaishnavi S, Vitharsana Mary S. Assessment of knowledge, attitude and practice about obstructive sleep apnea among dental health care providers and students: A cross sectional study. International Journal of Applied Dental Sciences. 2023;9(4):218-222
29. Kale SS, Kakodkar P, Shetiya SH. Obstructive sleep apnea domains: Knowledge, attitude and practice results of dentists from a dental college in India. Sleep Sci. 2020;13(1):3-9.
30. Dhanraj MJ. Rakshagan Knowledge, awareness and practice among dental practitioners regarding oral appliances in treatment of obstructive sleep apnea. Int. J Curr. Res. 2017;9(2):46378-46381.
31. Alrejaye, N.S.; Alfayez, K.M.; Al Ali, H.H.; Bushnaq, Y.M.; Bin Zaid, R.S.; Alobaid, F.K.; Abolfotouh, M.A. Awareness and Attitude of Physicians on the Role of Dentists in the Management of Obstructive Sleep Apnea. Int. J. Environ. Res. Public Health 2022, 19, 16126.
32. Te´ llez-Corral MA, Herrera-Daza E, Cuervo-Jimenez HK, Arango-Jimenez N, Morales-Vera DZ, Velosa-Porras J, Latorre-Uriza C, Escobar-Arregoces FM, Hidalgo-Martinez P, Corte´ s ME, Roa-Molina NS, Otero L and Parra-Giraldo CM (2022) Patients with obstructive sleep apnea can favor the predisposing factors of periodontitis by the presence of P. melaninogenica and C. albicans, increasing the severity of the periodontal disease. Front. Cell. Infect. Microbiol. 12:934298
33. Natalia Arango Jimenez, Darena Z. Morales Vera, Catalina Latorre Uriza1, Juliana Velosa-Porras, Mayra A. Téllez Corral, Francina Maria Escobar Arregocés Alzahrani, M.H.; Alghamdi, A.H.; Alghamdi, S.A.; Alotaibi, R.K. Knowledge and Attitude of Dentists Towards Obstructive Sleep Apnea. Int. Dent. J. 2022, 72, 315–321.
34. Portelli, M.; Russo, I.; Bellocchio, A.M.; Militi, A.; Nucera, R. Correlations between Obstructive Sleep Apnea Syndrome and Periodontitis: A Systematic Review and Meta-Analysis. Dent. J. 2024, 12, 236.
35. Bianchi E, Segù M, Toffoli A, Razzini G, Macaluso GM, Manfredi E. Relationship between periodontal disease and obstructive sleep apnea in adults: A systematic review. Dent Res J 2024;21:15

ISSN: 0975-3583, 0976-2833 VOL16, ISSUE01, 2025

36. Kim SR, Son M, Kim YR. Risk of chronic periodontitis in patients with obstructive sleep apnea in Korea: a nationwide retrospective cohort study. Epidemiol Health. 2023;45:e2023032
37. ADA. Proposed policy statement on the role of dentistry in the treatment of sleep-related breathing disorders. 2017:5-6.
38. Addy N, Bennett K, Blanton A, et al. Policy statement on a dentist's role in treating sleep-related breathing disorders. J Dent Sleep Med 2018; 5(1):25–6.
39. Epstein LJ, Kristo D, Strollo Jr PJ, et al. Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. J Clin Sleep Med 2009;5(3):263–76