

An Investigation of the knowledge of Snoring and Obstructive Sleep Apnoea affecting patients amongst GDPs by means of a questionnaire".

Abstract:

Background: The connection between sleep disorders and lifestyle, economy, and health is becoming more widely acknowledged. General dentists, or GDPs, can be extremely helpful in both managing patients with disorders that put them at risk and identifying at-risk patients through screening.

Aim: This study set out to evaluate GDPs based in India's understanding of sleep-related breathing problems (SRBDs).

Material and methods: A questionnaire was developed to assess GDPs' knowledge of SRBDs and their current practice in relation to the management of SRBDs, and identify the factors associated with improved knowledge and management. A volunteer sample was recruited from Google form.

Results: In total, 192 GDPs completed the questionnaire; the knowledge and attitude domain showed almost a statistically difference between the responses for the population.

Conclusion: Although GDPs' knowledge of SRBDs was better than anticipated, they clearly felt a need for further information and training.

Key-words: SRBDs, Sleep apnoea, Obstructive sleep apnoea, general dental practitioner.

Introduction:

"Disorders in breathing related to sleep are common and can range widely in severity, from habitual snoring to obstructive sleep apnea" (OSA)[1]. This falls under the category of "repeated episodes of decreased or arrested respiratory airflow during sleep"[2]. This general term includes both snoring and OSA, the latter of which may present as a potentially dangerous medical condition. Patients who suffer from sleep-related disordered breathing (SRDB) frequently report snoring, breathing pauses, disrupted sleep, and daytime drowsiness[3].

"Fluttering sound created by the vibrations of pharyngeal tissues or more generally a sound produced by the upper aerodigestive tract during sleep" is the definition given to what is commonly referred to as "simple snoring."⁴ There is little consensus over what constitutes "clinically relevant snoring," therefore this definition is by no means recognised by

everybody. The debate is further enhanced by the differences in research approaches and the proposed physiological and anatomical connections within each category of snoring.[4]

When a dentist diagnoses "simple snoring," they should be alerted to look into the potential of SRBD. The hallmark of SRBD-induced disturbed sleep is a ten-second or longer

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decrease in inspiration, which can be partial (hypopnea) or entire (apnoea). The frequency of these episodes each hour, or the apnea/hypopnea index (AHI), indicates how severe this illness is. Individuals with snoring likely to be classified as primary or habitual snorers if their AHI is less than 5.[4]

An increase in the frequency of apnea/hypopnea episodes per hour may result in OSA, a serious breathing disruption. While not every snorer will receive an OSA diagnosis, the majority of individuals who do snore do so. The effects of this on a person's health are dire⁵. The act of snoring is not considered to be harmful in and of itself, but rather as a component of a higher chance of developing OSA, and this risk factor alone calls for further research.[4,6]

A sample of non-institutionalized UK citizens between the ages of 18 and 100 was studied by Lechner et al. (2019), who discovered that "30.4% of women and 38% of men self-reported that they snore at night; furthermore, 8.7% of men and 5.6% of women report that they have episodes when they stop breathing at night." Of the study participants, 3.43% were unaware of whether they snored or had breathing pauses while they slept. In the UK, the prevalence of obesity and sleep apnea have significantly increased over the past 20 years. It was concluded that sleep-related breathing is significantly underdiagnosed in the UK, mainly due to sociodemographic and behavioural changes.[7]

There is a lack of agreement over precise diagnostic standards for snoring, which frequently rely on self- or partner-reported snoring instead of the more stringent standards associated with OSA. Even while people have long been aware of how much noise snoring causes in many bedrooms, many still think it's only a social annoyance that doesn't have any negative effects on the snorer's health.[8]

General dental practitioners (GDPs) can play three roles in managing SRBD:

- i) to act as gatekeepers by screening and supporting triage;
- ii) to make referrals onwards to medical colleagues; and
- iii) to be able to treat snoring and OSA with oral appliances.[9,10,11]

It is important to note that such treatment should be in coordination with the appropriate sleep physicians. Certain traits, such as those that raise the risk of inflammation or upper airway infection, can make someone more likely to

snore. Male gender, alcoholism or smoking, nasal blockage, and a person's body mass index (BMI; of at least 25 kg/m²)The neck circumference (17+ inches) have a substantial correlation with SRBD.[12,13] During a standard dental examination, four factors can be evaluated, including the size of the surrounding soft tissue structures and the craniofacial morphology (tongue, soft palate, lateral pharyngeal walls).¹⁴ This has probably been influenced by behavioural changes, and breathing associated to sleep is commonly .This has probably been exacerbated by lifestyle changes, and in the India, sleep-related breathing is frequently underdiagnosed.[7]

The Epworth Sleepiness Scale (ESS), a popular and straightforward questionnaire, can be completed at home or in the operating room and is useful in determining the degree of SRBD for both GDP and the patient. The "STOP-Bang" inquiry is an additional option. This can be applied in a therapeutic context and with patients who may have OSA symptoms. The score system considers gender, age, neck circumference, and BMI.[15]

The results of the questionnaires serve as a gauge for the effectiveness of the treatment and notify both the GDP and the patient about the impact of snoring. Although most adult patients attend dental appointments alone, it can be worth questioning the patients' sleeping partners.

The aim of this study was to investigate india GDPs' knowledge regarding diagnosis and treatment of SRBDs.

Methods

Study population

A bespoke cross-sectional questionnaire was developed based upon previous studies.[16]

The questionnaire was designed to elicit information from GDPs in the india about: i) demographics; ii) their knowledge of treating snoring and OSA; and iii) their current clinical practices. Potential respondents were assured of complete confidentiality and anonymity.

Questions for the survey were distributed under five major headings:

1. Knowledge
2. Opinions
3. Education
4. Health professional and clinical practice
5. Demographic information.

Respondents were asked about their knowledge of current guidelines for SRBDs, clinical practice and educational experiences, all of which can be classified under the heading of 'sleep dentistry'.

A five-point Likert scale was used for some questions, where the opinion of respondents was sought.

Sample size calculation:

Due to the paucity of previous studies, the sampling parameters for this study were designed around the calculation of a suitable sample size and the predicted confidence interval (CI).

we estimated that 90% of GDPs will not ask about their patients' sleep habits. The same proportion will have a poor knowledge of SRBDs. A sample of 192 GDPs was required.

Sample recruitment:

An opportunist sample was recruited from Google form
 Inclusion Criteria- General dental practitioner
 Exclusion Criteria- Non practicing dentist.

Statistical analysis:

The present study will be conducted to Investigate knowledge of Snoring and Obstructive Sleep Apnoea affecting patients amongst GDPs by means of a questionnaire. The sample size was calculated using the following formula suggested by Charan and Biswas (2013)1:

$$n = (Z_{1-\alpha/2})^2 * p * (1-p) / d^2$$

where, n: Sample size

$Z_{\alpha/2}$: critical value of z at 95% confidence = 1.96

p: Expected proportion based on previous study= 0.66

d: Absolute error (decided by the researcher)= 0.07

$$n = (1.96)^2 * 0.66 * (1-0.66) / (0.07)^2$$

= 175.92 ~ 176 patients

Keeping a provision of data loss @ 10 %, the proposed sample size is 193.6.

Approximating to nearest tens the proposed sample size is 192.

Result:

:MS Excel 2016 was used to fabricate the data sheet. IBM SPSS Corp. in Armonk, New York for Windows, Version 25.0, was used for the statistical analysis. Descriptive statistics were presented in the form of Frequency (n) and Percentage (%). Chi Square statistics were applied to

calculate the inferential statistics of the different variables between the different groups. The statistical constant was fixed at p<0.05. The distribution of the study sample was not normally distributed.

1. Demographic characteristics of the study population

a. Gender distribution of the study population

The gender distribution of the study population was noted and seen that females were more (104) as compared to males (88).

Chi Sq 1.333 P Value 0.248	Frequency	Percentage
Male	88	45.8
Female	104	54.2
Total	192	100.0

b. Working environment:

The working environment was noted and seen that participants were more from the private sector (147) as compared to the governmental sector (45). There was a statistically significant difference between the groups.

Chi Sq 54.188 P Value <0.0001*	Frequency	Percentage
Private	147	76.6
Government	45	23.4
Total	192	100.0

2. Knowledge domain :

The knowledge domain showed almost a statistically significant difference between the responses for the population.

		Frequency	Percentage	Chi Square	P Value
Had you heard of Sleep Dentistry	Yes	99	51.6	.188	0.665
	No	93	48.4		
ever discussed OSA with your patients	Yes	78	40.6	6.75	0.009*
	No	114	59.4		
consistent risk factor for snoring is being male	True	83	43.2	1.889	0.008*
	False	48	25.0		
	Don't Know	61	31.8		
Snoring is not considered a precursor to the development of OSA	True	81	42.2	63.219	<0.0001*
	False	98	51.0		
	Don't Know	13	6.8		
Association between snoring frequency and cardiovascular risk factors	True	146	76.0	157.625	<0.0001*
	False	24	12.5		
	Don't Know	22	11.5		

Snoring intensity does not predict the likelihood of falling asleep while driving and traffic accidents.	True	78	40.6	7.719	<0.0001*
	False	67	34.9		
	Don't Know	47	24.5		
Snoring is a common worldwide with a prevalence rates ranging from 2% to 85% depending on diagnosis, age, gender and population	True	130	67.7	107.375	<0.0001*
	False	18	9.4		
	Don't Know	44	22.9		
OSA is defined as the temporary cessation in nasal and/or oral airflow coinciding with cessation of respiratory effort	True	167	87.0	250.406	<0.0001*
	False	20	10.4		
	Don't Know	5	2.6		
Hyponoea is known as partial collapse of the upper airway for 10 seconds or more during sleep.	True	123	64.1	88.156	<0.0001*
	False	20	10.4		
	Don't Know	49	25.5		
severity of OSA is measured by the number of these events per hr known as the apnoea/hypopnoea index (AHI)	True	130	67.7	102.375	<0.0001*
	False	28	14.6		
	Don't Know	34	17.7		
Patients who snore but have an AHI less than five are classed as primary or habitual snorers	True	120	62.5	75.500	<0.0001*
	False	28	14.6		
	Don't Know	44	22.9		
Estimated prevalence of OSA in adults is between 2-10%	True	92	47.9	76.156	<0.0001*
	False	7	3.6		
	Don't Know	93	48.4		
Enlarged soft palate and neck diameter do not increase the likelihood of OSA	True	53	27.6	11.344	0.003*
	False	86	44.8		
	Don't Know	53	27.6		
OSA is not associated with hypertension	True	48	25.0	13.031	<0.0001*
	False	87	45.3		
	Don't Know	57	29.7		
Many patients with severe OSA have no daytime sleepiness and actually claim to have good and restful sleep.	True	37	19.3	68.344	<0.0001*
	False	118	61.5		
	Don't Know	37	19.3		

*statistically significant

3. Attitude Domain:

The attitude domain showed almost a statistically significant difference between the responses for the population.

		Frequency	Percentage	Chi Square	P Value
Treating snoring early on does not prevent the development of more serious breathing related difficulties	True	65	33.9	59.156	<0.0001*
	False	107	55.7		
	Don't Know	20	10.4		
Weight reduction is often recommended in the treatment of primary snoring and OSA	True	127	66.1	102.594	<0.0001*
	False	15	7.8		
	Don't Know	50	26.0		
Alcohol consumption may worsen OSA	True	127	66.1	97.156	<0.0001*
	False	21	10.9		
	Don't Know	44	22.9		
Sleep study is the gold standard in diagnosing OSA	True	123	64.1	82.906	<0.0001*
	False	28	14.6		
	Don't Know	41	21.4		
OSA can be diagnosed by a GDP	True	94	49.0	49.219	<0.0001*
	False	19	9.9		
	Don't Know	79	41.1		
Continuous positive airway pressure (CPAP) is the gold standard for treating obstructive sleep apnoea.	True	119	62.0	75.031	<0.0001*
	False	25	13.0		
	Don't Know	48	25.0		
Oral Appliances are a modality of treatment for snorers and OSA patients	True	159	82.8	212.469	<0.0001*
	False	11	5.7		
	Don't Know	22	11.5		
Appliances can be made by a GDP for patients suffering from snoring / OSA	True	154	80.2	189.844	<0.0001*
	False	19	9.9		
	Don't Know	19	9.9		
Dentists should ask patients about their sleep habits	Agree	81	42.2	172.00	<0.0001*
	Neutral	9	4.7		
	Strongly agree	80	41.7		
	Strongly disagree	22	11.5		
Dentists should be screening patients using methods such as the Epworth sleepiness scale	True	143	74.5	158.156	<0.0001*
	False	5	2.6		
	Don't Know	44	22.9		
Dental college should teach more about OSA	Agree	68	35.4	189.67	<0.0001*
	Neutral	5	2.6		
	Strongly agree	98	51.0		
More information / courses should be provided to help GDPs in this field	agree			132.89	<0.0001*
	Strongly disagree	21	10.9		
	Agree	63	32.8		
	Disagree	3	1.6		
	Neutral	13	6.8		
	Strongly agree	89	46.4		
Strongly disagree	24	12.5			

*statistically significant

Discussion:

Knowledge and attitude domain:

The 15 knowledge and 12 attitude domain questions are created for the questionnaire mainly focused on snoring, as this is more common and has a greater potential to be treated by a GDP. It was interesting to observe that many knowledge questions had been answered correctly. This would indicate that GDPs have some theoretical knowledge about snoring but this may come from a variety of non-evidence-based sources including the patient, their family members and the media. The theoretical knowledge exhibited by the respondents may be because of previous interest in this topic; this is consistent with the positive relationship between knowledge and age. Nearly all GDPs were aware of the impact that lifestyle choices can make on SRBDs; 66.1% correctly answered that weight loss is advised in the treatment of snoring and OSA. When asked whether patients who snore but have an AHI less than five are classed as primary or habitual snorers, some GDPs were unaware of this, indicating a lack of technical knowledge; they were unaware of this simple breathing scale (AHI) and significance of the figure.

It was unsurprising to find that only a small number of respondents had any knowledge of 'sleep dentistry', which can be defined as the role a GDP, with appropriate training, can undertake to support both patients suffering from SRBDs and sleep physicians treating these patients. There is very little literature available, particularly in the India dental press, regarding SRBDs and this subject is unlikely to be spoken about at dental conferences.

GDPs without relevant clinical information about snoring may be unable to identify key features of this condition and thus play a role in its management. When questioned, 81 (42.2%) GDPs either agreed or strongly agreed that they should be asking about the sleep habits of their patients. However, it is most likely that patients do not perceive the management of snoring and OSA as being within the scope of practice of the dentist.

Many GDPs (n = 44; 22.9%) were unsure about the efficacy of screening methods such as the use of the ESS. These results suggest that GDPs are interested in knowing more about the management of SRBDs and view it as important, but are unsure of the role they should/could play and the use of screening tools they can use during routine examinations

(clinical features and questionnaires). As a health professional, the GDP should be adopting a more holistic approach to screening which will inevitably include the signs and symptoms of SRBDs.

Advice:

Lifestyle modification including reducing alcohol, smoking and reducing weight have been shown to have a positive outcome on the severity of OSA and snoring. When taking a more holistic approach, the GDP is in the ideal position to discuss this with the patient and make the appropriate referral if needed. This precedent has been previously used in connection with smoking cessation.

Mandibular advancement devices Mandibular advancement (MA) devices provide opportunities for dentists to actively participate in SRBD care. It was interesting to note that 154 (80.2) respondents reported that making an OA for a patient with a diagnosed SRBD would be appropriate. Most patients who snore and use an MA report a reduction in excessive daytime sleepiness and improvements in sleep quality. This suggests that through further education, even more GDPs will understand the importance of the role of the GDP in managing SRBDs for patients¹¹ and how they can do this in general practice. The qualified dentist should be encouraged to continue their education in sleep dentistry and seek appropriate accreditation.

Study limitations:

The lack of data currently available, particularly reflective of the India dental community, needs to be increased to enable more predictable parameters for calculating the likely outcomes for future studies.

Despite explicit instructions to complete all the questions, some participants did not answer all the questions or complete the demographic information. Their responses were included in the data set.

Conclusion:

It reveals a lack of knowledge among GDPs who are at the frontline treating patients on a regular basis. More educational courses should be available for GDPs to encourage them to incorporate screening into their daily practice. Despite its limitations, this research provides an interesting insight looking at the role GDPs can play within the wider health community to help support and treat these patients appropriately. The authorities to include this subject in the

undergraduate dental curriculum and to work cooperatively with the india-based sleep societies to raise awareness and standards.

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