



Original Research Article

Periodontal awareness in medical students of Andhra Pradesh, India - A Survey

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ABSTRACT

Objective: To assess the awareness of periodontal disease, its treatment modalities and its possible association with systemic diseases/conditions, in medical students.

Materials and Methods: A customized questionnaire was designed for circulating among medical students (Interns & post-graduates) of colleges in Andhra Pradesh and the data collected was analyzed.

Results: 493 medical students responded to the survey. Of these, a significant number understood that there could be a probable link between periodontal disease and systemic illness/conditions, role of smoking in periodontal disease as well as the treatment modalities of this disease.

Conclusion: The medical students surveyed demonstrated a moderate knowledge of periodontal disease, and its role in the etiology and progression of systemic diseases.

Key Messages: To Evaluate the awareness of significance of periodontal health and disease in medical students. Results demonstrate a moderate knowledge of periodontal disease in medical students.

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1. Introduction

Periodontitis is a chronic inflammatory disease which, if left untreated, may eventually lead to tooth loss. It contributes significantly to the global burden of chronic diseases and constitutes a major public health problem. This can be reversed and effectively managed by meticulous oral hygiene measures (Darby and Walsh, 2010). Periodontal health is important for good overall health. Documented evidence exists for an interdependent equation between periodontitis and other systemic diseases such as cardiovascular disease (Demmer and Desvarieux, 2006), diabetes mellitus (Mealey, 2006), and poor pregnancy outcomes (Scannapieco et al., 2003). Periodontitis could promote systemic inflammation which would affect overall health. Management of periodontal disease mandates an understanding of etiological factors, signs and symptoms and treatment protocols of these conditions. Medical

professionals can be in the forefront of identifying such diseases. To date no survey has been conducted among the medical students in Andhra Pradesh, which helps to assess their periodontal awareness.¹

This study was undertaken to evaluate the awareness of periodontal disease, its possible association with systemic disease/conditions and its treatment modalities amongst medical students in Andhra Pradesh. The information obtained could then be applied in developing a focused module on periodontal diseases for medical students, which would in turn allow early detection and informed referral, thus aiding in the promotion of improved oral and general health of our population.

1.1. Methods (study design, sampling and sample size, ethical consideration, collection of data, statistical analysis)

This cross-sectional study involved medical students (interns and postgraduates) from colleges in Andhra

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Pradesh. The study was conducted from September 2019 to February 2020. The rationale for the survey was explained to the students and questionnaires were distributed in person during their break times and were collected thereafter. The students were assured of confidentiality.

1.2. The survey form comprised of three parts/components:

Section A sought information on the students' demographic characteristics, like age, gender, designation and source of knowledge regarding oral and dental health.

Section B evaluated respondents' understanding of periodontal disease its primary cause, earliest symptom/sign, and frequency of visit to dentist, cause for gingival enlargement, whether periodontal disease runs in families and effect of smoking on the periodontium.

Section C contained questions assessing respondents' awareness of various periodontal treatment modalities including whether gummy smile and gingival recession could be treated, application of lasers in periodontics, dental implants etc.

Section D, assessed the respondents' knowledge of an association between systemic diseases and periodontal disease, both in terms of possible periodontal involvement in individuals with some systemic conditions and vice versa. This section had "yes," "no," and "don't know" response options.

1.3. Ethical consideration

Before commencing the study, permission was obtained from the principals of the medical colleges (no. GITAM 03 0610). Participants were informed of the information sought before including them in this study.

1.4. Statistical analysis

Data were analysed with the Pearson chi-squared test was used to measure significant differences for categorical variables, and analysis of variance was used for continuous variables. The level of significance was set at $p < 0.05$.

2. Results

Questions were asked under four subsections and results were analysed accordingly.

2.1. Demographic characteristics

Of the 500, 497 respondents returned the filled in questionnaires, with 493 being completely filled (99.4% response rate). The socio-demographics were interesting in that the respondents with 50% male and female each (Table 1).

Most of the respondents were within the age range of 23-30 years. Respondents' credited most of their knowledge to

their undergraduate training (62.4%), while others sources included books/journals (17.2%), media/ internet (17.5%), others (2.9%) (Table 2)

2.2. Knowledge of periodontal disease

Respondents' knowledge of periodontal disease is characterized in Table 2. Although 74.5% of respondents understood that the term "periodontal disease" meant gum disease, 21% were aware that gum bleeding was an initial symptom, and 13.7% of the respondents did not know dental plaque was the primary cause for periodontitis.

Of the subjects interviewed, 9.2 % were not aware that enlargement of gingiva could be caused by bacterial deposits, drugs and nutritional deficiencies. 49.7% were not aware that periodontal disease can have genetic basis. 12.2 % were not aware of the effects of smoking on the periodontium.

2.3. Awareness about various periodontal treatment modalities

Respondents' awareness of various treatment modalities in periodontics is characterized in (Table 3). Of the subjects interviewed, 19.2% were unaware of the treatment modalities for gummy smile, while 24.5%, 27.3%, 25.8% were not conversant with treatment protocols for receding gums, LASERs and dental implants.

2.4. Knowledge of association between periodontal disease and systemic illnesses and medications (Table 4)

The following mean percentage of the respondents were unaware of a possible link between periodontal disease and HIV/AIDS (14.6%), diabetes (11.3%), leukemia (17.7%), stress (17%), and chronic kidney disease (16.7%), pregnancy outcomes (24.2%), osteoporosis (16%), rheumatoid arthritis (17%), respiratory disorders (18.7%), cardiac stroke (22.7%), genetic disorders (18.5%).

3. Discussion

The major findings in the survey were that medical students in Andhra Pradesh had adequate knowledge (i.e. >50%) of periodontal disease, modest knowledge of the associations between periodontal disease and many systemic diseases, and limited awareness of periodontal disease as a risk factor for some systemic diseases. With regard to periodontal awareness the results of the present study are in argument with the study conducted by Swathi P et al.²

To the question regarding the source of knowledge about oral health, 63% have acknowledged that their source was undergraduate training. This can be attributed to the knowledge gained by medical students during their MBBS programme, when they have a posting in a dental department/ college, which helps them gain an awareness of

Table 1: Demographic characteristics

		Designation		Chi-square	p-value
		Interns	Postgraduates		
Age	21-22 years	295 (77%)	59 (53.7%)	54.614	0.000*
	23-25 years	62 (16.2%)	47 (42.7%)		
	26-28 years	25 (6.5%)	3 (2.7%)		
	>30 years	1 (0.3%)	1 (0.9%)		
Gender	Males	197 (51.4%)	47 (42.7%)	2.683	0.261
	Females	186 (48.6%)	63 (57.3%)		

Table 2: Knowledge of periodontal disease

		Designation		Chi-square	p-value
		Interns	Post graduates		
Source of knowledge	Undergraduate training	250 (65.7%)	65 (59.1%)	27.583	0.000*
	Books/Journals	58 (15.2%)	21 (19.1%)		
	Media/Internet	61 (16%)	21 (19.1%)		
	others	12 (3.1%)	3 (2.7%)		
what do you understand by the term periodontitis	Same as gum disease	261 (68.1%)	89 (80.9%)	12.676	0.048*
	Same as tooth decay	64 (16.7%)	12 (10.9%)		
	Same as oral cancer	31 (8.1%)	2 (1.8%)		
	Don't know	27 (7%)	7 (6.4%)		

		Designation		Chi-square	p-value
		Interns	Post graduates		
Enlargement of gingiva can be caused by?	Bacterial deposits	49 (12.8%)	9 (8.2%)	9.474	0.149
	drugs	29 (7.6%)	10 (9.1%)		
	Nutritional deficiencies	39 (10.2%)	8 (7.3%)		
	all of the above	266 (69.5%)	83 (75.5%)		
untreated periodontitis leads to bone and tooth loss	Yes	328 (85.6%)	96 (87.3%)	0.251	0.882
	No	55 (14.4%)	14 (12.7%)		
do you think periodontal disease runs in families	Yes	166 (43.3%)	63 (57.3%)	8.112	0.017*
	No	217 (56.7%)	47 (42.7%)		
Periodontal foci of infection can influence other diseases?	Yes	337 (88%)	104 (94.5%)	3.892	0.143
	No	46 (12%)	6 (5.5%)		
Do you think smoking can affect periodontal tissues?	Yes	328 (85.6%)	99 (90%)	1.444	0.486
	No	55 (14.4%)	11 (10%)		
Is there any relation between periodontal disease and systemic disease?	definetely yes	218 (56.9%)	63 (57.3%)	6.328	0.388
	may be	132 (34.5%)	40 (36.4%)		
	no	20 (5.2%)	4 (3.6%)		
	dont know	13 (3.4%)	3 (2.7%)		
Should pathogenesis of periodontitis and its importance in treating patients with metabolic disorders be a topic that all medical students are aware of?	yes	283 (73.9%)	97 (88.2%)	16.149	0.003*
	no, not required	60 (15.7%)	9 (8.2%)		
	no idea	40 (10.4%)	4 (3.6%)		

dentistry and which also shapes their attitude towards this speciality for the future.

To the questions regarding the cause of periodontal disease, 265 (58.5%) of them answered that plaque is the cause for periodontal disease. In the study by Srinidhi et al. 73.3% of the respondents were aware that plaque and calculus were the primary factors in the etiology of periodontal disease, whereas in the study conducted

by Wong and Elischwartz et al., where 27% of medical students were so aware. Plaque being the primary cause of periodontal diseases, it is important to emphasize its role among medical students.³

Only 21% of the students surveyed were aware that bleeding gums is an early sign of periodontal disease. Since bleeding is the first objective sign, it is important for the medical students to understand the significance of bleeding

Table 3: Awareness about various periodontal treatment modalities

		Designation		Chi-square	p-value
		Interns	Post graduates		
Do you think gummy smile can be treated?	Yes	319 (83.3%)	86 (78.2%)	9.803	0.007*
	No	64 (16.7%)	24 (21.8%)		
Are you aware that alveolar bone can be regenerated by using bone substitutes (artificial bone)	Yes	257 (67.1%)	69 (62.7%)	2.571	0.277
	No	126 (32.9%)	41 (37.3%)		
Can receding gums be treated?	Yes	300 (78.3%)	80 (72.7%)	6.727	0.035*
	No	83 (21.7%)	30 (27.3%)		
Are you aware that LASERs can be used for treatment of periodontal disease?	Yes	282 (73.6%)	79 (71.8%)	17.096	0.000*
	No	101 (26.4%)	31 (28.2%)		
Dental implants are	RPD	118 (30.8%)	18 (16.4%)	12.563	0.014*
	FPD	87 (22.7%)	23 (20.9%)		
	Artificial tooth fixed into bone	178 (46.5%)	69 (62.7%)		

Table 4: Knowledge of association between periodontal disease and systemic illnesses and medications

		Designation		Chi-square	p-value
		Interns	Post graduates		
HIV	Yes	246 (64.2%)	85 (77.3%)	8.005	0.091
	No	60 (15.7%)	12 (10.9%)		
	Don't know	77 (20.1%)	13 (11.8%)		
Diabetes	Yes	270 (70.5%)	93 (84.5%)	18.571	0.001*
	No	68 (17.8%)	5 (4.5%)		
	Don't know	45 (11.7%)	12 (11%)		
Stress	Yes	270 (70.5%)	67 (60.9%)	4.095	0.393
	No	58 (15.1%)	21 (19.1%)		
	Don't know	55 (14.4%)	22 (20%)		
Osteoporosis	Yes	262 (68.4%)	73 (66.4%)	4.813	0.307
	No	71 (18.5%)	19 (17.3%)		
	Don't know	50 (13.1%)	18 (16.4%)		
pregnancy outcomes	Yes	196 (51.2%)	57 (51.8%)	1.277	0.865
	No	95 (24.8%)	31 (28.2%)		
	Don't know	92 (24%)	22 (20%)		
Leukemia	Yes	232 (60.6%)	74 (67.3%)	7.871	0.096
	No	90 (23.5%)	18 (16.4%)		
	Don't know	61 (15.9%)	18 (16.4%)		
chronic kidney disease	Yes	210 (54.8%)	86 (78.2%)	32.737	0.000*
	No	100 (26.1%)	5 (4.5%)		
	Don't know	73 (19.1%)	19 (17.3%)		
rheumatoid arthritis	Yes	239 (62.4%)	76 (69.1%)	12.415	0.015*
	No	81 (21.1%)	11 (10%)		
	Don't know	63 (16.4%)	23 (20.9%)		
respiratory disorders	Yes	199 (52%)	81 (73.6%)	23.553	0.000*
	No	102 (26.6%)	14 (12.7%)		
	Don't know	82 (21.4%)	15 (13.6%)		
		Designation		Chi-square	p-value
cardiac stroke	Yes	186 (48.6%)	66 (60%)	11.503	0.021*
	No	100 (26.1%)	30 (27.3%)		
	Don't know	97 (25.3%)	14 (12.7%)		
Genetic disorders	Yes	217 (56.7%)	78 (70.9%)	10.677	0.030*
	No	87 (22.7%)	16 (14.5%)		
	Don't know	79 (20.6%)	16 (14.5%)		

gums.

In addition to recommending regular dental visits, the American Dental Association (ADA) also recommends that these dental visits be tailored by the dentist in view of the current health status and dental history of the patient. This follows the suggestions made in an article entitled "Patient Stratification for Preventive Care in Dentistry," in the journal of dental research. In the present study, 236 (48.6%) respondents claimed that they advised their patients to consult their dentists at six months intervals. Studies by Srinidhi et al. in Chennai, Chandra et al. in Mangalore and Mehrotra V et al. in Kanpur City, demonstrated that a greater percentage of medical practitioners in these places advised their patients to attend a dental clinic at least once in six months.⁴

The bidirectional relationship between periodontal disease and many systemic diseases has been established (Otomo-Corgel et al., 2012). A more simplistic explanation is that periodontitis is a focus of infection from which pathogenic bacteria can spread via the blood. It is good to know that 91% of the respondents had a knowledge of periodontal foci of infection; also, a considerable number (57%) understood the relation between periodontal and systemic diseases. A more acceptable explanation is that the periodontal pathogens, their metabolic by-products and the inflammatory mediators generated in the periodontal tissues could enter the blood stream and cause systemic effects/systemic disease. This mechanism forms the background by which chronic periodontitis can be considered a risk factor for cardiovascular diseases associated with respiratory disease, atherosclerosis, diabetes mellitus, preterm delivery, bacterial endocarditis, and, recently, rheumatoid arthritis, pancreatic cancer, osteoporosis, obesity, neurodegenerative diseases such as Alzheimer's disease, metabolic syndrome, renal diseases. This is the basis for periodontal medicine and this study was also designed to assess the medical students awareness regarding this, as these students will be practicing medical professionals in the future.^{5,6}

Even though 88% of the doctors surveyed knew about the impact of smoking on periodontal tissues, they were unsure of the frequency of dental visits or the need for periodontal treatment.⁷ Most of the students surveyed voted for the inclusion of the etio-pathogenesis of periodontal diseases in their curriculum and this can help to increase awareness amongst medical professionals.

Responses regarding knowledge about treatable periodontal problems like gummy smiles and recession were poor, suggesting that there is a need for awareness on these aspects. Also, there was poor awareness of the use of LASERS in periodontal therapy, even though it was higher in the study by Swathi P et al.²

In our survey only half of those interviewed knew about dental implants (55%) which was slightly less compared to the study on medical students by Apoorva M et al.,

which showed 74% awareness of dental implants. With implantology emerging as a sub-specialty, it is necessary that information about implants be disseminated among the public and also the other health professionals.

Regarding periodontal disease and its association with systemic diseases/ conditions like HIV, diabetes, stress, osteoporosis, leukemia, rheumatoid arthritis, the awareness was moderate i.e. > 60%. Periodontopathic microorganisms have been seen in the prosthetic valves and respiratory tract of medically compromised patients. Also, females with chronic periodontitis have a greater chance of premature labour and low-birth weight babies. Awareness should be developed among the healthcare professionals for planning joint ventures in reducing low birth weight deliveries and perinatal morbidity. K.A. Umeizudike et al. who evaluated the awareness in Nigeria, found similar awareness of the association between periodontitis and systemic diseases.¹

Post graduate medical students were found to have better oral health awareness compared to house surgeons. The probable reasons could include more clinical exposure, more experience and knowledge of post graduate medical students when compared to interns. The general awareness on oral health among the medical students in our study appeared to be moderate. There is a need to further educate health professionals and medical students on oral and periodontal health to enable them to improve their awareness of these issues as they are often the first contact for patients. This education will help them identify oral/periodontal problems and refer patients accordingly as well as guide patients in developing positive dental attitudes.^{8,9}

This knowledge in medical students can help reduce the morbidity and mortality which result from oral disease and improve quality of life for the patient. Hence, it is important that physicians need to be well informed as to the need for dental care and treatments available, which calls for a joint advocacy between the medical and dental professionals.⁹⁻¹¹

It is recommended that oral health awareness of the medical students can be improved by incorporating more basic information about oral health in their academic curriculum, conducting various inter-disciplinary workshops, CDE programs and conferences, increasing the clinical exposure of the students to oral findings as most of the systemic diseases manifests in the oral cavity. Special study modules or electives in oral health and disease should be created by involving the dental faculty, emphasizing the importance of oral health.¹⁰⁻¹²

Medical practitioners should play an active role in oral health promotion. Proper knowledge of oral diseases is crucial in medical practice due to the following reasons (a) Periodontal diseases are associated with multiple systemic conditions of medical interest; (b) A large number of systemic diseases have oral manifestations; (c) Many drugs

are associated with oral adverse drug reactions; and (d) majority of the population approach medical practitioners for their oral health problems.¹³

4. Conclusion

The information obtained from such knowledge, attitude and practice surveys could be utilized to enable change in lifestyle of dental patients and to counsel them to befriend dental clinics. The authors believe that the inputs of this survey will help the medical professionals promote periodontal awareness in the patients.

5. Limitations of the study

1. The scoring of the answers received was done quantitatively, there was no standardization in evaluating the answers, for e.g. likert scale.
2. The number of questions in the questionnaire was limited to important topics only as it was thought that medical students may find it difficult to spare more time during their clinical postings.
3. A larger sample size is preferred.

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None.

8. Conflict of Interest

None.

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