

## Assessing the ability of house surgeons in screening and diagnosis of periodontal diseases – A cross sectional study

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### Abstract

**Introduction:** Diagnosis of periodontal problems in dental colleges are mostly done by the interns and may not be timely diagnosed. The aim of the present study is to assess the knowledge and diagnosis of periodontal disease pathogenesis by the interns of various dental colleges from the southern most states of India.

**Materials and Method:** 780 participants from 30 dental colleges in South India filled a structured questionnaire consisting of 15 knowledge and 10 practice based questions related to periodontal disease. The variables such as period of internship (0-3, 4-6, 7-9 and 10-12 months) and working status in private dental clinics were recorded. The mean total knowledge and practice scores were calculated and statistical significance was based on probability values of less than 0.05.

**Results:** There was a statistically significant difference in the knowledge and practice scores among the interns according to their duration of internship ( $p < 0.001$ ,  $p < 0.002$  respectively). When the knowledge and practice scores were correlated with the working status, the non working interns had better knowledge scores when compared to the working interns ( $p < 0.001$ ). The knowledge scores were more in the interns during the period of 4-6 months and the practice score were more during 0-3 months.

**Conclusion:** During the last phase of internship, students showed a decrease in scores of knowledge and practice pertaining to periodontal diagnosis and treatment plan. Hence a short refreshing seminar/course on periodontal diagnosis and treatment planning topics could be recommended to reinforce and facilitate them as good clinicians in future.

**Keywords:** Periodontal disease, Diagnosis, Treatment plan, Referral, Questionnaire

### Introduction

Periodontal disease is a chronic inflammatory disease resulting in the destruction of tissues and structures surrounding the teeth and is one of the most prevalent dental diseases in Indian population.<sup>(1)</sup> Diagnosing the periodontal problems at an early stage may prevent further destruction of the periodontium and if left untreated may result in tooth loss.

The dental professionals are expected to be well conversant with issues of health and disease and must be motivated and knowledgeable to impart appropriate attitudes in their patients. Positive attitudes towards health promotion need to be developed during student days rather than afterward. Diagnosis in dental colleges are often done by house surgeons who have completed four years of academic curriculum. Frequently early periodontitis patients might not be timely diagnosed and hence not referred to periodontology clinics. Furthermore proper oral hygiene instructions may not be given to patients, leading to lack of awareness among the patients regarding their periodontal status and by the time patients perceive symptoms of periodontitis, the disease might have progressed into advanced stages. Regeneration of lost periodontal tissues is still a challenge, hence early diagnosis and prevention of periodontal diseases is desired.

The present study aims to assess knowledge and practicing skills of students pursuing internship in the dental colleges of southern most states of India for diagnosis of periodontal diseases. The objectives were, assessing knowledge, regarding influence of systemic

diseases and conditions on periodontal tissues. The diagnostic methods, treatment modalities and preventive measures like oral hygiene instructions were also assessed.

### Materials and Methods

The study was approved by the Institutional Review Board (IRB NO: SRMDC/IRB/2015/SP-OS/NO.101) and informed consent was obtained by the willing participants. This was a cross sectional study and the sampling design was a two stage cluster random sampling with a design effect of two. Each dental college across the Southern most states of India (Kerala and Tamil Nadu) were considered a cluster. From the total number of dental colleges, a sample of 30 clusters (dental colleges) was selected randomly and from each selected cluster (dental college) 26 interns were selected randomly. Sample size calculation was done from results obtained by Bader et al. 2005<sup>(2)</sup> with 5% level of significance. The total sample size was 780.

The participants were provided with full explanation of the study and a written informed consent was obtained following which the willing participants filled the structured questionnaire. The questionnaire consisted of a total of 25 questions comprising of 15 questions assessing their knowledge of etiology, pathogenesis, diagnosis and treatment planning of periodontitis. 10 practice based questions gauging their clinical acumen in identifying signs of periodontal disease and imparting appropriate patient education (Table 2 and 3). The reliability of the questionnaire was assessed using

Cronbach  $\alpha$  ( $\alpha=0.8$ ). Once completed, each questionnaire was double-checked to make sure that all the questions were answered and participants were requested to complete any missing data. All the 780 participants completed the questionnaire.

The data were processed by the computer after auditing, reviewing and coding the completed questionnaires for data processing and analysis was done using statistical software (STATA). Students who were in their compulsory rotatory internship programs in various dental colleges were included and students who did not complete the questionnaire were excluded.

## Results

The study population consisted of a total of 780 interns from 30 dental colleges across Tamil Nadu and Kerala. The percentage of subjects from state 1 were 60% (n=468) and state 2 were 40% (n=312). 26 interns from 18 colleges in State 1 and 12 colleges from State 2 were selected. 86.3% of participants were almost completing their internship (10-12 months), 4.5% were in the 7-9 months period, 5.9% in the 4-6 months and

3.3% in the 0-3 months of their internship. The percentage of working and non-working interns were 37.3% and 62.7% respectively (Table 1).

The mean knowledge and practice scores of the interns from State 1 were  $11.6 \pm 2.4$  and  $7.69 \pm 1.9$  and that of the interns from State 2 were  $11.41 \pm 1.9$  and  $7.69 \pm 1.8$  respectively. The overall mean knowledge and practice scores of the interns according to their duration of the internship were  $10.03 \pm 0.1$  and  $8.92 \pm 0.3$  during 0-3 months,  $12.08 \pm 2.0$  and  $8.17 \pm 1.4$  during 4-6 months,  $11.11 \pm 2.5$  and  $7.57 \pm 1.8$  during 7-9 months and  $11.57 \pm 2.2$  and  $7.6 \pm 1.9$  for the interns who were almost completing their internship (10-12 months) which was statistically significant ( $p < 0.001$  and  $p < 0.002$  respectively) (Table 1).

The interns who worked in a private clinic had a mean knowledge and practice score of  $11.15 \pm 2.4$  and  $7.54 \pm 2.1$  where as the interns who were not associated with a private dental clinic had a mean knowledge and practice scores of  $11.75 \pm 2$  and  $7.78 \pm 1.6$  respectively. The knowledge scores among the working and the non working interns alone showed a statistical significance ( $p < 0.001$ ) (Table 1).

**Table 1: Over all study population Frequency Tables**

Study population (n=780)		N	%	Knowledge score (Mean $\pm$ S.D)	P value	Practice score (Mean $\pm$ S.D)	P value
State	State 1	468	60.0	$11.60 \pm 2.4$	T-Test 0.226	$7.69 \pm 1.9$	T-Test 0.981
	State 2	312	40.0	$11.41 \pm 1.9$		$7.69 \pm 1.8$	
Internship duration	0-3 months	26	3.3	$10.03 \pm 0.1$	ANOVA 0.001*	$8.92 \pm 0.3$	ANOVA 0.002*
	4-6 months	46	5.9	$12.08 \pm 2.0$		$8.17 \pm 1.4$	
	7-9 months	35	4.5	$11.11 \pm 2.5$		$7.57 \pm 1.8$	
	10-12 months	673	86.3	$11.57 \pm 2.2$		$7.62 \pm 1.9$	
Working in private dental clinics	Yes	291	37.3	$11.15 \pm 2.4$	T-Test 0.001*	$7.54 \pm 2.1$	T-Test 0.113
	No	489	62.7	$11.75 \pm 2.0$		$7.78 \pm 1.6$	

(\* indicates statistical significance)

**Table 2: Knowledge based questions**

Knowledge Questions		N	%	
Q01	What is the initiating factor of periodontal disease?	Bacterial plaque	655	84.0
		Calculus	104	13.3
		Malnourishment	21	2.7
		Hereditary	0	.0
Q02	Which instrument do you use for diagnosing periodontal status/condition?	Periodontal probe	722	92.6
		Straight probe	32	4.1
		Tweezer	7	.9
		Explorer	19	2.4
Q03	Which one of the following is the first clinical sign of periodontal disease?	Bleeding on probing	729	93.5
		Gingival over growth	12	1.5
		Pain in gums	14	1.8
		Bad breath	25	3.2
Q04	Do we get rid of bad breath by using mouth washes?	Yes	418	53.6
		No	362	46.4
Q05	What do you understand by gingival recession?	Movement of gingiva coronally	42	5.4
		Movement of gingival apically	187	24.0

		Exposure of root	6	.8
		Both b and c	545	69.9
Q6	In case of periodontal pocket, what sulcus depth defines a pocket?	Sulcus depth >3mm	700	89.7
		Absence of sulcus depth (0mm)	29	3.7
		Sulcus depth 2 mm	31	4.0
		Sulcus depth 2 mm with gingival recession	20	2.6
Q7	What instrument do you use to assess furcation involvement?	CPITN probe	56	7.2
		Nabers probe	530	67.9
		Explorer	72	9.2
		Williams periodontal probe	122	15.6
Q8	Are radiographs essential for periodontal diagnosis?	Yes	688	88.2
		No	92	11.8
Q9	What type of radiographs are ideal for periodontal diagnosis?	IOPA	392	50.3
		CBCT	14	1.8
		Bitewings	56	7.2
		OPG	318	40.8
Q10	Do you feel periodontal problems have significant impact in causing systemic diseases like diabetes, heart diseases etc?	Yes	696	89.2
		No	84	10.8
Q11	Do you think diabetes can influence the periodontium?	Yes	766	98.2
		No	14	1.8
Q12	Do you think smoking can have an impact on the periodontium?	Yes	762	97.7
		No	18	2.3
Q13	Healthy periodontal tissues are recommended in a pregnant woman to prevent	Pregnancy tumors	224	28.7
		Pre-term delivery	73	9.4
		Low birth babies	67	8.6
		All the above	416	53.3
Q14	What is the most effective measure to prevent periodontal disease?	Regular use of tooth brush and dental floss	670	85.9
		Regular use of mouthwashes	37	4.7
		Have a sugar free diet	16	2.1
		None of the above	57	7.3
Q15	Do you keep yourself updated with any periodontal journals?	Yes	361	46.3
		No	419	53.7
		Total	780	100.0

Table 3: Practice based questions

	Practice Questions	N	%	
Q16	Do you examine the oral cavity for gingival recession?	Often	579	74.2
		Sometimes	169	21.7
		Rarely	18	2.3
		Never	14	1.8
Q17	Do you routinely examine the lingual/palatal regions for gingival recession	Yes	595	76.3
		No	185	23.7
Q18	Do you check for mobility while examining the oral cavity?	Yes	732	93.8
		No	48	6.2
Q19	How do you assess a periodontal pocket clinically?	Visual examination	48	6.2
		Probing the sulcus using appropriate instrument	706	90.5
		Radiographs	8	1.0
		By checking for mobility	18	2.3
Q20	Do you perform a full mouth probing while examining the oral cavity?	Often	258	33.1
		Sometimes	342	43.8

		Rarely	96	12.3
		Never	84	10.8
Q21	Do you check for any furcation involvement during periodontal examination?	Yes	724	92.8
		No	56	7.2
Q22	How often are you educating patients regarding OHI?	All patients	552	70.8
		Only for periodontitis patients	160	20.5
		Rarely	59	7.6
		Never	9	1.2
Q23	Do you suggest interdental cleansing aids such as floss, inter dental brushes etc to the patients	Often	399	51.2
		Sometimes	312	40.0
		Rarely	49	6.3
		Never	20	2.6
Q24	In case of any habits causing harm to the periodontium and oral health, do you educate the patient to quit the habit?	Yes	738	94.6
		No	42	5.4
Q25	In case of periodontitis, do you refer the patient to a periodontist?	Yes	721	92.4
		No	59	7.6
		Total	780	100.0

## Discussion

The present study was the first to assess the ability of the interns in screening and diagnosing periodontal disease in the south India. More than 80% of the participants had adequate knowledge regarding the etiology, pathogenesis, symptoms and diagnosis of periodontal diseases.

When the patients were asked regarding the association of bad breath and mouth washes, 46.4% of participants did not respond correctly. Only 67.9% of participants assessed furcation involvement and 50.3% responded for the use of IOPA as ideal radiograph for periodontal diagnosis. 53.3% of interns were aware about the consequences/complications regarding poor periodontal health during pregnancy. American Academy of Periodontology (AAP) has recommended that pregnant women or women planning pregnancy should undergo periodontal examination and receive appropriate treatment if indicated because of the likelihood of its positive effects on pregnancy outcomes.<sup>(3)</sup> In a recent study by Tarannum et al, only 56.4% of general dental practitioners reported awareness of the association between periodontal status and pre-term low birth weight.<sup>(4)</sup> Nettleton et al. emphasized the need for offering patients accurate information so that they can make an educated decision about their own behaviour and actions.<sup>(5)</sup> Nasir et al. in a study on medical interns concluded that the level of awareness regarding systemic effects of periodontal disease is limited and hence this aspect should be included in the curriculum to improve the medical practitioners ability to contribute towards oral health.<sup>(6)</sup> Among the subjects, 46.3% updated themselves with periodontal journals. Pacauskiene et al. in a study concluded that the attitude of dental students should be further improved by initiating a comprehensive program that would

emphasize the importance of oral hygiene before the start of the clinical program.<sup>(7)</sup>

A paradigm shift from a 'surgical approach' to a 'medical prevention strategy' in the management of preventable oral problems was emphasized by Mani et al.<sup>(8)</sup> In this context, educating and motivating patients gain the importance for which care providers form the role models. 70% of the participants educated all the patients regarding OHI, but only 51.2% often suggested interdental cleansing aids to their patients. 94% of the interns educated the patients to quit habits causing harm to the periodontium.

Lee et al. observed that general dentist may be underdiagnosing periodontal disease in its early stages.<sup>(9)</sup> In the present study, 74.2% participants often examined the oral cavity for gingival recession, whereas 76.3% participants examined the lingual and palatal regions for gingival recession. Majority (90%) of the participants checked for periodontal pockets using appropriate instrument and mobility, but only 33.1% often performed full mouth probing while examining the oral cavity leading to misdiagnosis about the distribution and extent of periodontal disease.

92.4% of the interns referred the patients to periodontist. Dockter et al.<sup>(10)</sup> and Cobb et al.<sup>(11)</sup> stated in their study that general dentist may not be referring their patients early enough for successful periodontal intervention. Williams et al. found that only 40% of dental students reported confidence in diagnosing, treating and appropriately referring patients with periodontal diseases.<sup>(12)</sup> It was observed that the patients were referred to the specialist too late which could have negative effects on the specialists ability to treat the disease. Patients at risk for periodontal disease can often be overlooked during a routine dental examination because they appear in a state of periodontal health.

In the present study, the knowledge scores were more in the interns who belong to the 4-6 months where as the practice scores were higher in the interns during the first three months of their internship. The practice scores then decreased and was the least among interns in their 7-9 months of completion. Knowledge of risk factors, identification of systemic conditions and medication affecting the periodontium, increased with advanced training. The knowledge scores were higher in the interns who did not work in any private dental clinics. This could have been due to their involvement in preparing for their post graduation programmes. A limitation of the study could be the uneven distribution of the sample according to their duration of internship and working status.

### Conclusion

Dental interns at the time of completion of their professional course, do not possess the required knowledge and awareness regarding periodontal diagnosis and treatment. Hence, a comprehensive dental program highlighting the importance of various local and systemic effects of periodontal disease could be included in their internship program.

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