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DOES INCREASING DENTAL EDUCATION IMPROVE THE ORAL HYGIENE STATUS OF DENTAL STUDENTS?

Purnima V. Nadkerny[1], Thilagarani P. R[2], Pramod V[3], Vidyesh Durga Nadkerny[4], Nitin Suvarna[5], Ravishankar P. L[6], Anil Sharma[7], Amit Upadhyay[8]

ABSTRACT: OBJECTIVES: The purpose of this study was to assess the impact of increased knowledge acquired by the dental student in preventive aspects of dental education during his curriculum on his own health attitude, oral hygiene and gingival status. **METHODS:** A total of 240 students pursuing the undergraduate course (B.D.S) at the New Horizon Dental College and Research Institute, Bilaspur (Chhattisgarh) were recruited for the study and divided into 4 groups based on the year of study. All participants answered a self-administered questionnaire and then this reported oral health behavior was compared to the actual clinical situation using the clinical parameters of Plaque Index, Gingival Index and Oral Hygiene Index simplified. **RESULTS:** The dental attitude became more positive and improved with each advancing year of education. There was a statistically significant decrease in the CPI score (P=0.04) and OHI-S score (P=0.01) with each advancing year of education but plaque score was insignificant (P=0.06). Females showed better dental care than their male counterparts. **CONCLUSION:** The oral health attitude and behavior of the dental students improved with increasing level of dental education. Preventive courses providing apt information on proper techniques of plaque control must be included in the first and second year curriculum of the dental students.
KEYWORDS: Oral health attitude, Behavior, Dental students.

INTRODUCTION: Plaque control is one of the key elements of the practice of dentistry. It permits each patient to assume responsibility for his or her health on a daily basis. It is absolutely essential for attaining and preserving oral health through periodontal treatment. Thus every patient should be educated about daily plaque control and encouraged to adopt it. Dentists play a very important role in the public's oral health improvement.[1] Acquiring knowledge and attitudes related to dental health and prevention of oral diseases is very important during future dentist's training period.[2] One of the main objective of dental education is to train students who can motivate patients to adopt good oral hygiene.

Thus the behavior of the oral health providers and their attitudes towards their own oral health reflects their understanding of the importance of the preventive dental procedures and improving the oral health of their patients. The dental students themselves are expected to be a good example for oral health behavior. They are more likely to be able to do this, if they themselves are motivated.[3] Moreover they should beable to apply this knowledge and attitude to their own dental care.[4] A dental student should thus acquire knowledge, believes, attitudes and practices which positively affect the oral health of their patients, families and colleagues from other disciplines.[5]

Bilaspur (Chhattisgarh) lies in Central India where in the dental institutions follow the norms set by the Dental Council of India, where by the dental institutions accept candidates from various

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socio-economic backgrounds who become eligible to study dentistry based on their score in the state entrance exams. The dental curriculum comprises four years, divided into two parts: preclinical years (1 and 2) and clinical years (3 and 4). Indian dental students are introduced to the preventive aspects of oral health in the latter half; hence their level of dental education can affect the oral health behavior. Oral health attitudes and behavior of dental and /or dental hygiene students have been evaluated frequently in several countries.

Conflicting results have been reported by various researchers regarding the impact of education on the attitude, behavior and oral hygiene of dental students. Studies done by Cortes et al,[3] Lang et al,[6] Cavaillon et al,[7] Yildiz et al[8] noted a clear improvement in the oral hygiene practicesof students during their studies. On the other hand, El- Mostehy et al[9] in an investigation of 100 Egyptian students noted the absence of an improvement in the practices of oral hygiene in students, in spite of having received information and education.

However there is insufficient data with this regards among Indian dental students. Hence the purpose of the present study was not only to evaluate the oral health attitudes and behavior of the dental students but also to assess and compare the focus of the curriculum, so as to decide whether the dental students in India should be introduced to the philosophy and practice of preventive dentistry earlier in their four year dental program.

MATERIALS AND METHODS: A total of 240 students between the ages of 18-25 years pursuing the undergraduate program (B.D.S) at the New Horizon Dental College and Research Institute, Bilaspur were recruited for this study. Participation was voluntary and informed consent was collected from all participants.Out of the total 240 dental students, 98 were males and 142 females. The study population was divided into 4 groups of 60 students each based on the year of study as under:

Group I: First year B.D.S.
Group II: Second year B.D.S.
Group III: Third year B.D.S.
Group IV: Fourth year B.D.S.

All the participants had to answer a self-administered questionnaire which collected demographic information regarding age, gender and year of study. The questionnaire consisted of a total of 24 questions which were divided into 4 sections such as:

Section I: Life style: Seven questions addressed habits such as Smoking, Alcohol Intake, Regular physical exercise (≥ or ≤5 days a week), assessing body weight(weekly/monthly/annually), sleep (≤ 6 hours/ 6-8 hours), Eating breakfast every day, Eating in between meals, Diet (Vegetarian/Non vegetarian).

Section II: Dental Knowledge: Seven questions were addressed to assess the knowledge of the student about the later mentioned terminologies with dichotomous responses (yes/no) such as Dental Plaque, Calculus, floss, Sealant, Periodontal disease, Temperomandibular disorders, Fluoride containing mouth wash.

Section III: Dental Attitude: Three questions were included in this section as Visit to the dentist, Frequency of the visit (≥6 months, ≤6months), Treatment undertaken in case of dental pain (Visit the dentist, Take self-medication, Ignore).

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Section IV: Oral health behaviour: Four questions were asked here such as Brushing frequency (Once/twice/more than twice), Type of tooth brush (Soft/ medium/hard), Type of toothpaste (Fluoridated/Non fluoridated/ herbal) and Use of mouthwash/Interdental aids (Floss, Toothpick, Interdental brush).

To compare the self-reported oral health behavior with the actual clinical situation of the participants, clinical parameters were measured using the following indices: Plaque index (Loe and Sillness 1967),[10] CPITN index (WHO 1977)[11] and OHI-S index (Greene and Vermillion 1960).[12]

The data was tabulated and analyzed using SPSS software v.21. After descriptive analysis, paired sample t test and one way ANOVA test was applied to the data. A p value less than 0.05 were considered statistically significant, and a P value less than 0.001 were considered strongly significant.

RESULTS: As cited in Table 1, Item 1 represented smoking habit which showed an increase with each increasing year of education i.e., 9 males and no females reported smoking in 1st year whereas by 4th year 12 males and 3 females reported a positive smoking habit (p=0.03) which is statistically significant. Item 2 represented alcohol intake which showed an increase with each increasing year of education i.e. 6 males and no females reported alcohol intake in 1st year whereas by 4th year 5 males and 6 females reported a positive alcohol intake habit (p=0.013) which is statistically significant. Item 3 represents regular physical exercise which showed a decrease with each increasing year of education i.e 10 males and 3 females reported physical exercise in 1st year whereas by 4th year 2 males and 12females reported a positive physical activity habit (p=0.022) which is statistically significant. Item 4 represents assessing body weightwhich showed an increased awareness with each increasing year of education i.e., 8 males and 6 females reported in 1st year whereas by 4th year 13 males and 29females reported a positive weight assessing habit (p=0.07) but it is statistically insignificant. Item 5 is represented by sleep hours per student. In first year 29 males and 25 females reported ≥6 hours of sleep while by 4th year there was a decrease in the number of hours with 20 males and 37 females reporting more than 6 hours sleep. (p=0.08).

This is statistically insignificant. Item 6 was eating breakfast. In first year 20 males and 22 females reported intake of breakfastwhile by 4th year there was a decrease in the habitwith 16 malesand 35females reporting the same (p=0.09). This was however statistically insignificant. Item 7 represents diet. Students were assessed whether following vegetarian or non-vegetarian diet. In first year 2 males and 8 females reported intake of non-vegetarian dietwhile by 4rth year there was an increase in the habitwith 4 malesand 18females reporting the same (P=0.07). This was however statistically insignificant.

As cited in Fig 1: graph shows number of students from 1st to 4th year answering dichotomous responses (Yes/No) for variable lifestyle changes.

As cited in Table 2, Item 1 represents "Dental Plaque". There was a definite increase in the knowledge among the dental students with males 14 and females 11 in 1st year knowing the term while 20 males and 40 females knowing the same by final year (p=0.01) which is statistically significant.

Item 2 represents "calculus". There was a definite increase in the knowledge among the dental students with males 9and females 1 in 1st year knowing the term while 20 males and 40 females knowing the same by final year (p=0.03) which is statistically significant.

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Item 3 represents "floss". There was a definite increase in the knowledge among the dental students with males 1 and females 2 in 1st year knowing the term while 16 males and 37 females knowing the same by final year (p=0.01) which is statistically significant.

Item 4 was the term "sealant". There was a definite increase in the knowledge among the dental students with males 0 and females 1 in 1st year knowing the term while 19 males and 38 females knowing the same by final year (p=0.02) which was statistically significant.

Item 5 represents "periodontal disease". There was a definite increase in the knowledge among the dental students with males 2 and females 1 in 1st year knowing the term while 18 males and 34 females knowing the same by final year (p=0.03) which is statistically significant.

Item 6 represents "Temperomandibular joint disorder". There was a definite increase in the knowledge among the dental students with males 5 and females 6 in 1st year knowing the term while 17 males and 38 females knowing the same by final year (p=0.06) which was statistically insignificant.

Item 7 represents "Fluoride containing mouthwash". There was a definite increase in the knowledge among the dental students with 4 malesand 3 femalesin 1st year knowing the term while 16 males and 30 females knowing the same by final year (p=0.05) which is statistically significant.

As cited in Fig 2: The graphshows the responses of the dental knowledge questionnaire among the two genders and between all the four groups of dental students (1st, 2nd, 3rd and 4th year).

As cited in Table 3, Item 1 represents 'visit to the dentist'. There was a definite increase in the number of students who had visited the dentist. There were16malesand 10femalesin 1st year who had visited the dentist the number increased to18 males and 32 females by final year (p=0.408) which is statistically insignificant. Item 2 represents 'frequency of the dental visit' (≥6months or≤ 6 months). There is a definite increase in the number of students who had visited the dentist within 6 months. There were5malesand 4femalesin 1st year who had visited the dentistwithin 6 months butthe number increased to23 males and 17 females by final year (p=0.176) which is statistically insignificant. Item 3 assessed whether in case of pain the student visited the dentist or took self-medication or chose to ignore. In 1st year only 16 males and 9 females chose to visit the dentist, 9 males and 10 females took self-medication and 6 males and 10 females chose to ignore the pain. By final year, 10 males and 15 females chose to visit the dentist, 9 males and 23 females took self-medication while 1 male and 2 females chose to ignore. But this change was statistically insignificant (p=0.81).

As cited in Fig 3: The graphshows the dental attitude among the two genders and between all the four groups of dental students (1st, 2nd, 3rd and 4th year).

As cited in Table 4, It was seen that the Plaque Index was lower among males (1.33) who brushed twice daily than in females (1.5) who brushed with the same frequency in first year. It reduced in 4th year with plaque score 0.83 in males and 0.83 in females who brushed with the same frequency. This is however not statistically significant (p=0.4).

The CPI score was 2 in both males and females who brushed twice daily in first year and decreased to 1 in both genders who brushed twice daily by final year. But this is statistically insignificant (p=0.201).

The OHI-S score was 1.66 in both males and females who brushed twice daily in first year and decreased to 1.5 in males and 1.33 in females by final year with the same brushing frequency. This difference was not statistically significant (p=0.367).

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As cited in Fig4: The graph shows the mean difference in the Plaque Index, CPI index and OHI-S index for 1st to 4th year students.

DISCUSSION: This study was designed to assess and compare the dental health of the dental students during their academic training and to study the extent to which an increase in this knowledge was reflected in their own dental health. Comparing the lifestyle characteristics among both the genders, both the males and females showed an increase in smoking and alcohol intake (Item 1and Item 2) and a decrease in physical activity and sleep (Item 3 and Item 4). This could be related to changes in lifestyle of students with increasing age, social circles they interact, stress and peer pressure.[13]

These findings demonstrate that stress management is an important target for reducing heavy episodic drinking on university campuses. Hence we suggest student counselling must be made mandatory in all dental institutions to help them cope up with the stress related to dental curriculum. Comparing the dental knowledge parameters, female showed a definite increase in dental knowledge with each advancing year as compared to their male dental counterparts which can be attributed to the significant better attitude and more diligent efforts put by females toward their studies and work (Al Wahadni et al,[14] Petersen et al.[15]

The final year students had an apt knowledge of almost all parameters. Our study reported that the dental attitude became more positive and improved with the increase in the educational level which is in accordance with studies done by Al Wahadni et al,[14] Petersen et al.[15] This study reflected a statistically significant decrease in CPI score (p=0.04) and OHI score (p=0.01). The increased dental knowledge with regards to the association of proper oral hygiene measures in maintaining dental health led to a decrease in the above mentioned dental indices.[16] However no statistical significant difference was noticed in plaque scores p=0.06 though there was a 34% decrease, when brushing frequencies (Once/Twice) were compared between both genders.

CONCLUSION: This study was executed on account of limited available literature of oral hygiene practices among Indian dental students. The overall dental knowledge among the students was good but with deficits in certain areas. The oral health attitude and behaviour of dental students improved with increasing level of dental education. Presently, Periodontology is a subject that is introduced to a dental student in the third year of his/her undergraduate curriculum which teaches them precisely about plaque and plaque control.

Thus in order to improve the preventive behaviour among the preclinical students of 1st and 2nd years, it is mandatory to include preventive courses right from the beginning which provides them apt information on proper techniques of plaque control. Also, after a careful evaluation of the dental knowledge among the first year dental students, we stress the need for more effective school dental programs in the state of Chhattisgarh. Thus our dental institutions should provide professional education to the upcoming dentists which not only creates a stable health behaviour but helps them to provide good preventive services to their patients, family and friends.

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Life style		Ist Year		2nd Year		3rd Year		4th Year		
		Male	Female	Male	Female	Male	Female	Male	Female	P value
Item 1	Yes	9	0	11	2	10	2	12	3	0.03
	No	22	29	14	33	12	36	8	37	
Item 2	Yes	6	0	14	4	8	2	5	6	0.013
	No	25	29	11	31	14	36	15	34	
Item 3	Yes	10	3	12	11	9	21	2	12	0.022
	No	21	26	13	24	13	17	18	28	
Item 4	Yes	8	6	13	15	12	14	13	29	0.07
	No	23	23	12	20	10	24	7	11	

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Item 5	Yes	29	25	23	34	21	38	20	37	0.08
	No	2	4	2	1	1	0	0	3	
Item 6	Yes	20	22	16	27	18	30	16	35	0.09
	No	11	7	9	8	4	8	4	5	
Item 7	Veg	2	8	5	11	6	18	4	18	0.07
	Non -veg	29	21	20	24	16	20	16	22	
	P value	0.001		0.012		0.003		0.004		
	t value	0.687		-2.054		-3.072		-3.819		
Table 1										

The above table shows the comparison of the responses of the lifestyle questionnaire among the two genders and between all the four groups of dental students (1st, 2nd, 3rd and 4th year).

Dental Knowledge		Iˢᵗ Year		2ⁿᵈ Year		3ʳᵈ Year		4ᵗʰ Year		
		Male	Female	Male	Female	Male	Female	Male	Female	P value
Item 1	Yes	14	11	12	18	19	35	20	40	0.01
	No	17	18	13	17	3	3	0	0	
Item 2	Yes	9	1	10	14	19	33	20	40	0.03
	No	22	28	15	21	3	5	0	0	
Item 3	Yes	1	2	2	3	6	8	16	37	0.01
	No	30	27	23	32	16	30	4	3	
Item 4	Yes	0	1	1	2	18	31	19	38	0.02
	No	31	28	24	33	4	7	1	2	
Item 5	Yes	2	1	5	10	9	15	18	34	0.03
	No	29	28	20	25	13	23	2	6	
Item 6	Yes	5	6	3	4	11	20	17	38	0.06
	No	26	23	22	31	11	18	3	2	
Item 7	Yes	4	3	8	11	9	18	16	30	0.05
	No	27	26	17	24	13	20	4	10	
	P value	0.258		0		0		0.002		
Table 2										

The above table compares the dental knowledge assessed by questionnaire among the two genders and between all the four groups of dental students (1st, 2nd, 3rd and 4th year).

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Dental Attitude		I[st] Year		2nd Year		3rd Year		4th Year		
		Male	Female	Male	Female	Male	Female	Male	Female	P Value
Item 1	Yes	16	10	18	25	16	23	18	32	0.408
	No	15	19	7	10	6	15	2	8	
Item 2	Yes	5	4	12	19	13	19	12	23	0.176
	No	26	25	13	16	9	19	8	17	
Item 3	Yes	16	9	12	20	12	20	10	15	0.81
	No	9	10	12	12	10	16	9	23	
	Ignore	6	10	1	3	0	2	1	2	
	P value	0.623		0.01		0		0.003		

Table 3

The above table compares the dental attitude questionnaire among the two genders and between all the four groups of dental students (1st, 2nd, 3rd and 4th year).

Year of student		Plaque Index		CPI Index		OHI-S Index	
		Male	Female	Male	Female	Male	Female
Ist Year	OD	1.66	1.83	3	2	2	1.83
	BD	1.33	1.5	2	2	1.66	1.66
2nd Year	OD	1.33	1.5	2	2	1.83	1.66
	BD	1.16	1.16	1	1	1.66	1.33
3rd Year	OD	1.5	1.33	2	2	1.83	1.66
	BD	0.83	1.16	1	1	1.33	1.16
4th Year	OD	1.16	1.33	2	2	1.83	1.66
	BD	0.83	0.83	1	1	1.5	1.33
P value	Comparing year wise	0.4		0.201		0.367	
	Comparing M/F	0.06		0.04		0.01	
	% Change	34.81%		33.50%		11.24%	

Table 4

The above table shows the clinical parameters in male and female students of all four years OD once day brushing, BD – twice a day brushing.
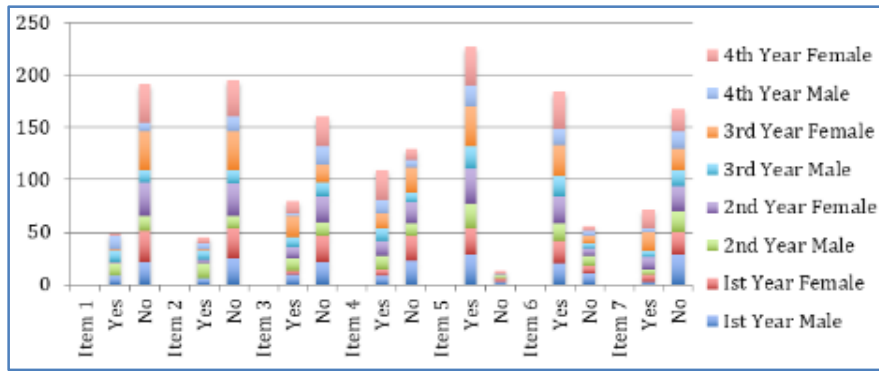
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Fig. 1

The above graph shows number of students from 1st to 4th year answering dichotomous responses (Yes/No) for variable lifestyle changes.
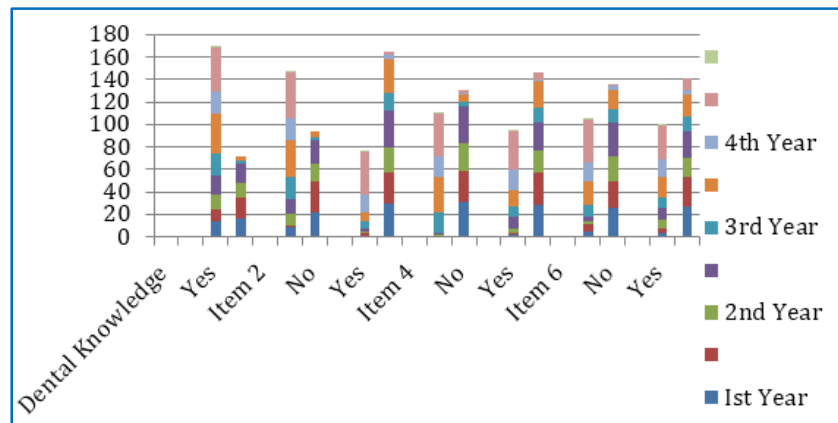

Fig. 2

The above graph shows the responses of the dental knowledge questionnaire among the two genders and between all the four groups of dental students (1st, 2nd, 3rd and 4th year).
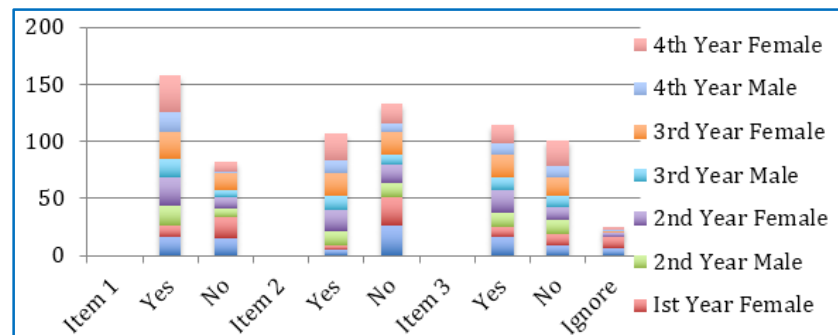

Fig. 3

The graph above shows the dental attitude among the two genders and between all the four groups of dental students (1st, 2nd, 3rd and 4th year).
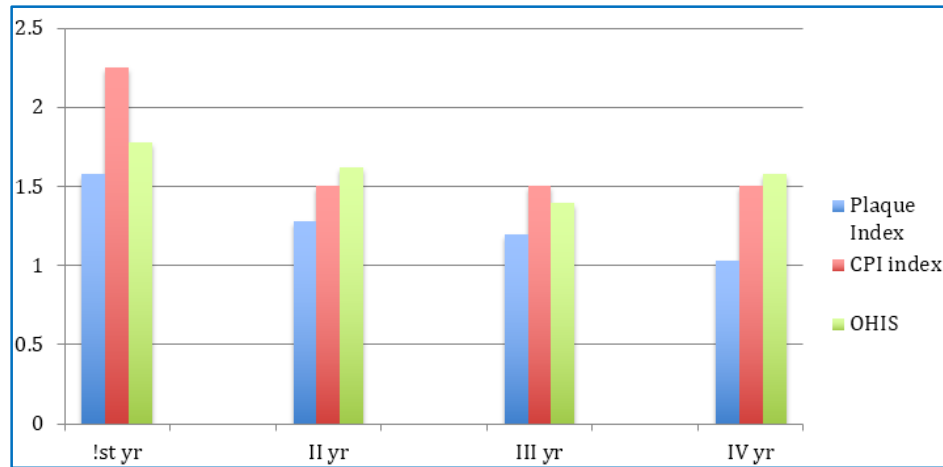
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Fig. 4

The graph showing the mean difference in the Plaque Index, CPI index and OHI-S index for 1st to 4th year students.

AUTHORS:
1. Purnima V. Nadkerny
2. Thilagarani P. R.
3. Pramod V.
4. Vidyesh Durga Nadkerny
5. Nitin Suvarna
6. Ravishankar P. L.
7. Anil Sharma
8. Amit Upadhyay

PARTICULARS OF CONTRIBUTORS:
1. Professor & HOD, Department of Periodontics, NHDCRI, Bilaspur.
2. Professor & HOD, Department of Orthodontics, NHDCRI, Bilaspur.
3. Senior Lecturer, Department of Periodontics, NHDCRI, Bilaspur.
4. Post Graduate Student, Department of Periodontics, NHDCRI, Bilaspur.

FINANCIAL OR OTHER COMPETING INTERESTS: None

5. Professor, Department of Conservative & Endodontics, Yanapoya Dental College, Mangalore.
6. HOD, Department of Periodontics, SRM Dental College, Katangalathur, Chennai.
7. Post Graduate Student, Department of Periodontics, NHDCRI, Bilaspur.
8. Post Graduate Student, Department of Periodontics, NHDCRI, Bilaspur.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Pramod V,
Flat No. 410, Anand Altair Apartments,
Raghuvanahalli, Kanakpura Road,
Bangalore-560062.
E-mail: pramdm@gmail.com