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# Oral Health Status of Undergraduate Dental Students Pursuing their Career at a Dental Institution in India

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**Objective:** *To assess the oral health status and oral hygiene habits of undergraduate dental students in India and to analyse the influence of dental education on their oral health status.*

**Methods:** *The target population comprised all first-, second-, third- and fourth-year students at a private dental college, among which 281 students participated in this study with 75.5% response rate. Clinical examination was conducted by two trained examiners according to the methodology recommended by World Health Organization oral health surveys (1997). Bivariate analysis and analysis of variance tests were performed on the data.*

**Results:** *Mean decayed, missing or filled teeth score was found to be highest (1.70) for the first-year students and lowest (1.03) for the second-year students, with gingival bleeding prevalence rates of 19% and 20% respectively. As the study year progressed there was a constant improvement in their oral health.*

**Conclusion:** *Oral health was significantly improved for fourth-year students compared with first-year students, implying that constant exercise and growing knowledge in the field of the profession reflects a growing capability to perform an adequate self-assessment of dental state, oral hygiene habits and oral health condition.*

**Key words:** *caries, periodontal status, dental students, oral hygiene habits*

One of the general objectives of dentistry teaching is to train experts to motivate patients to adopt good oral hygiene practices and status. They are more likely to be able to do this if they themselves maintain a good oral health status<sup>1</sup>. Teaching in dental schools will become less effective unless it leads to a profound change in the dental student's behaviour and attitude towards improvement of their own personal oral health. Earlier studies have shown clinicians lacking in self-motivation to practice basic preventive oral health habits<sup>2</sup>.

Reports on the impact of education on the oral hygiene of dental students differ. Both Lang et al<sup>3</sup> (in a study on Danish students) and Cavaillon et al<sup>4</sup> (in an investigation of students at the University of Paris during a longitudinal study) noted a clear improvement in the oral hygiene practices of students during their studies. On the other hand, Ainamo and Ainamo<sup>5</sup> (in a study on Finnish and Indian students), El-Mostehy et al<sup>6</sup> (in an investigation of 100 Egyptian students) and Meister et al<sup>7</sup> (in a study at the University of Marquette [Michigan] in the United States of America) all showed the absence of improvement in the practices of oral hygiene in students, in spite of having received dental education. This might be due to the difference in education pattern and system in various countries. However, we believe that constant exercise in the dental field should improve dental students' own oral hygiene habits, dental condition and capability of an adequate self-assessment of their own dental condition. Therefore, the objective of the present

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study was to analyse the effects of dental education on dental students' own oral health status in the Indian dental education scenario.

## Materials and Methods

This study was conducted in Darshan Dental College, Rajasthan State Health University, located in the southernmost part of Rajasthan State. Dental students have been enrolled for a bachelor degree course of 5 years. The curriculum in the first 2 years comprises preclinical and basic medical subjects, the next 2 years are clinical oriented and the last year is a compulsory rotary internship. During the 5-year period the students obtain knowledge and skills in various fields of dentistry and general medicine. The students have many opportunities not only to check their dental condition, but also to get necessary and proper treatment done free of cost.

The study subjects included all first-, second-, third- and fourth-year students, with sample sizes of 79, 61, 74, and 67 students respectively. The total sample consisted of 124 males and 157 females. The students were aged from 21 to 25 years, with a mean of 22.7 years. The study was done in the first quarter of the academic session 2006–2007. Ethical clearance was obtained prior to the survey from the ethical committee of Darshan Dental College and health authorities. The students were requested to participate voluntarily in the study, and verbal consent from students was obtained.

To assess the prevalence of oral diseases, the students were examined by two clinicians who are lecturers in the Department of Preventive and Community Dentistry, along with a postgraduate guide in the department. They were calibrated for inter-examiner variability prior to the study and the inter-examiner consistency accounted for 91.2% and 89% respectively for the community periodontal index (CPI) and the decayed, missing, or filled teeth (DMFT) score.

The clinical examination was performed according to the World Health Organization (WHO) criteria using normal dental examination instruments (mouth mirrors and CPI probe) in the Department of Preventive and Community Dentistry on a dental chair with an artificial light source. Data were recorded on a simplified WHO form<sup>8</sup>. The DMFT score and the CPI were recorded. The CPI probe is a specially designed lightweight probe with a 0.5 mm ball tip, with a black band between 3.5 and 5.5 mm and rings at 8.5 and 11.5 mm from the ball tip. A probing force of 20 g was used to detect bleeding response, calculus and probing depths. If bleeding was observed directly or by probing, a score of 1 was assigned. A score of 2 meant the presence of calculus during prob-

ing when the black band of probe was fully visible. A pocket of 4–5 mm where the gingival margin was within the black band of the probe was considered as a score of 3. A pocket depth of 6 mm or more where the black band on the probe was not visible was considered as a score of 4.

Demographic information (such as age, sex, along with course, year of studying) and oral hygiene habits (such as brushing frequency, use of extra oral hygiene aids, and visits to the clinician) were recorded. The results of this study are to be used in the planning and evaluation of oral health promotion activity for students.

## Statistical analysis

The Statistical Package for Social Sciences (SPSS) software was used for data processing and data analysis. Mean values and standard deviations were calculated. Analysis of variance (ANOVA) was used to compare variations in the mean scores of DMFT indicators, namely decayed, missing and filled teeth, along with independent variables, such as gender, year of study, brushing frequency, visits to the clinician and extra oral hygiene aids.

## Results

Table 1 shows the results of bivariate analysis between the DMFT component as dependent variable and the year of study, gender, brushing frequency, visits to the clinician and extra oral hygiene aids as independent variables. Bivariate analysis revealed a definite trend in the mean DMFT score, in addition to decayed and filled components with highest amongst the first-year students gradually decreasing with the year of study. There was a significant variation between the years of study for decayed component with an F value of 5.005. The fourth-year students had the highest mean score of filled. The decayed component (D) in females was found to be higher than in males. For the filled component (F), mean values of 0.48 and 0.58 were observed in males and females respectively. The mean DMFT was greater for females than for males ( $1.51 \pm 2.10$  versus  $0.55 \pm 1.00$ ), but the variation observed was not significant. There seemed to be a slightly higher DMFT in subjects with less brushing frequency, but no statistical significant differences. Use of extra oral hygiene aids influenced the mean scores for all the DMFT components, with users presenting a mean DMFT score of 1.28 compared with non-users, who had a score of 1.37. A very small number of subjects reported using extra oral hygiene aids, which was inversely related with the decayed component of DMFT.

**Table 1 Bivariate analysis with DMFT indicators as dependent variable and gender, year of study, brushing frequency, visit to dentist, extra oral hygiene aids as independent variables**

	Decayed Mean (SD)	F value	Filled Mean(SD)	F value	DMFT Mean(SD)	F value
Year						
1	1.27(1.65)	5.005*	0.43(1.52)	0.144	1.70(2.16)	2.075
2	1.18(1.25)		0.45(1.00)		1.63(1.49)	
3	0.97(1.51)		0.47(1.62)		1.45(2.13)	
4	0.50(1.17)		0.55(1.00)		1.06(1.45)	
Sex						
Male	0.73(1.25)	1.21	0.38(1.00)	1.46	1.11(1.54)	0.3078
Female	0.92(1.59)		0.58(1.54)		1.51(2.10)	
Brushing frequency						
Twice or more	0.83(1.21)	0.004	0.46(1.14)	0.073	1.29(1.77)	0.072
Once	0.84(1.55)		0.51(1.30)		1.36(1.93)	
Visit to dentist last year						
Yes	0.85(1.50)	0.024	0.51(1.39)	0.158	1.36(1.96)	0.181
No	0.82(1.30)		0.44(1.16)		1.25(1.62)	
Extra oral hygiene aids						
Yes	0.69(1.42)	1.802	0.59(1.67)	0.926	1.28(2.07)	0.150
No	0.93(1.47)		0.43(1.08)		1.37(1.76)	

As the M (missing) score is zero in all the groups, it is omitted in the table. \*  $P < 0.01$ .

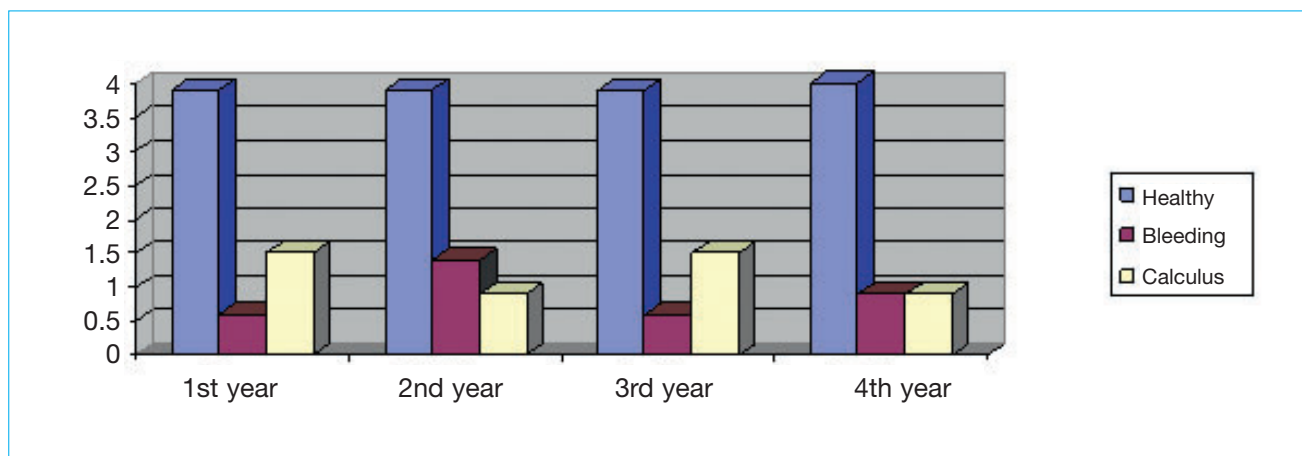
**Table 2 Periodontal condition of the subjects according to the year of study and gender**

CPI	Male*	Female*	Year**				Total all years (%)
			First	Second	Third	Fourth	
Healthy	72 (59%)	74 (47%)	29 (37%)	45 (73%)	26 (35%)	46 (70%)	52
Bleeding	16 (13%)	27 (17%)	15 (19%)	6 (10%)	15 (20%)	7 (11%)	15.3
Calculus	35 (28%)	55 (35%)	34 (43%)	11 (17%)	32 (43%)	13 (20%)	32.0
Pockets	0	2 (1%)	1 (1%)	0	1 (1%)	0	1.42
Total	123	158	79	62	74	66	

\*  $c^2 = 5.004$ ,  $df = 3$ ,  $p = 0.172$ .  
\*\*  $c^2 = 35.42$   $df = 9$ ,  $p = 0.000$ .

The healthy subjects comprised 52%, with a major proportion contributed by second- and final-year students. There was a clear reduction in the periodontal disease prevalence from year to year: the first-year group presented 63%, which was drastically reduced in the very next year in second-year students, with 27% complaining of periodontal problems. The highest number of cases with gingival bleeding was found in first- and third-year groups, with prevalence rates of 19% and 20%

respectively and lowest in the second-year group with (10%). Calculus was the greatest problem in subjects from the first- and third-year groups (43%). There were no subjects with deep periodontal pockets (so it is omitted in the table), and shallow periodontal pockets comprised a mere 1.42%. The subjects with shallow pockets were found in first- and third-year students. Among the periodontal disease variables, calculus was more prevalent (Table 2).



**Fig 1** Mean number of sextants with periodontal disease indicators in relation to study years.

Healthy sextants without any signs of periodontal disease were found in students of all the years. Sextants were found to be healthy in first-, second- and third-year groups (3.9), whereas in the final-year group this number was observed to be 4. The mean number of sextants that presented bleeding was found to be highest in the second-year group with 1.04. The mean number of sextants with shallow pockets in the total sample was found to be 0.07 (Fig 1).

## Discussion

In the present study, it is demonstrated that caries in dental students decreased with increase of year of study, suggesting that dental education had a significant influence on the caries status of the students. The impact of studying dentistry showed a significant influence on DMFT scores, as revealed by the absence of missing components. This is also due to free availability of dental treatment.

Despite the fact that in dental students one might foresee a professional attitude and knowledge of the problem, periodontal disease prevalence was high, which is in accordance with a previous study by Doubravský<sup>9</sup> on dental students at Palacký University. The prevalence of periodontal disease in the present study amounted to 48%, with a major proportion contributed by the first- and third-year groups. This finding may be due to the strenuous work load of medical and dental subjects in those years which had significant influence on their periodontal health.

It was observed by Maatouk et al<sup>10</sup> that, among first-year dental students in Tunisia, 88% of the students had

periodontal problems and 70% had caries; similar results were observed in the present study, where the prevalence of periodontal disease was found to be 61% and caries prevalence was 51%<sup>8</sup>.

In this study, we found first-year students had two times more untreated caries lesions than that of fourth-year students. This is most likely due to the augmented access and the utilisation of dental health services in the clinical departments in which they work.

There is a decrease trend in (D) decayed component and a clear increase in (F) filled component of DMFT as the year progresses from first year to final year. This must be due to increasing awareness of the students towards their dental health. Previous studies<sup>3-7</sup> noted an absence of improvement in the practices of oral hygiene in dental students, in spite of receiving information and education regarding good oral health.

The predominance of female students in our study is being supported by other studies in different countries, such as Finland<sup>5</sup>, the United States<sup>11</sup> and Japan<sup>12,13</sup>. More girls opted for dental hospital practice than boys, possibly because of less working hours. Winter and Butters<sup>14</sup> noted the same tendency in their study. Regarding frequency of tooth brushing, 70.46% of students brush twice daily and only 29.53% of students brush once daily. Tooth brushing frequency was significantly higher in females, which is in accordance with the study of Polychronopoulou et al<sup>15</sup> in Greece and Maatouk et al<sup>1</sup> in Tunisia.

Available cross-sectional studies on dental students and clinicians point out that poor oral hygiene habits may persist even after many years of practising dentistry<sup>6,16</sup>, which does not correlate with our study, as the oral

health situation improves among the subjects when they reach the final year of their course. The students in

our study were highly motivated towards their oral health condition, and the influence of dental education experiences appeared to have a clear influence on this behaviour. It should be kept in mind that although teaching–learning situations may be changed by modification in teaching programmes, teaching will be effective only if the educator evokes favourable responses regarding the development of skills and desirable attitudes on the part of the learners.

## Conclusion

The results demonstrate that oral health has improved among the final-year dental students when compared with the first-year dental students, implying that constant exercise and growing knowledge in the field of the profession reflects a growing capability to perform an adequate self-assessment of the dental state, oral hygiene habits and oral health condition.

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