

Evaluation of the Oral Health Knowledge, Attitude and Behavior of the Preclinical and Clinical Dental Students

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Abstract:

Background: Dentists play very important role in the oral health education of the community. Thus it is important to know the status of knowledge, attitude, and behavior toward the maintenance of oral health at the student level. The aim of the present study was to evaluate the oral health knowledge, attitude, and behavior among preclinical and clinical dental students.

Materials and Methods: A cross-sectional study was conducted on 147 dental students from 1st to 4th year of Malabar Dental College, Kerala, in the year of March-June 2010 and was carried out with the help of 30 questionnaires. Age, gender and academic year data were recorded. Statistical analysis was performed with the help of SPSS version 20 using the Student's t-test and one-way ANOVA tests.

Results: The difference in scores of oral health knowledge, attitude and behavior between preclinical and clinical dental students was found statistically highly significant (Student's t-test, $P < 0.001$). The variation of scores of knowledge, attitude, and behavior also showed highly significant increase with the year of study (one-way ANOVA, $P < 0.001$). While the difference in scores between males and females showed that females have better oral health knowledge than males, but the difference was not statistically significant (Student's t-test, $P > 0.01$). The present study thus showed improvement of knowledge, attitude and behavior with the academic years and there was no bias of gender with reference to oral health.

Conclusions: Although oral health knowledge, attitude and behavior showed improved results from 1st to 4th year dental students, it should be improved in order to serve better for the community in the future.

Key Words: Dental students, health professionals, oral health

Introduction

Steptoe *et al.* defined health behavior as "the activities undertaken by people in order to protect, promote or maintain health and to prevent disease."¹ The personal health behavior is important in individual for the maintenance of general health or total health of the body and this depends to some or more extent on the oral health behavior. Many systemic diseases are related to oral conditions and thus general health requires efforts of both medical and dental health professionals.^{2,4}

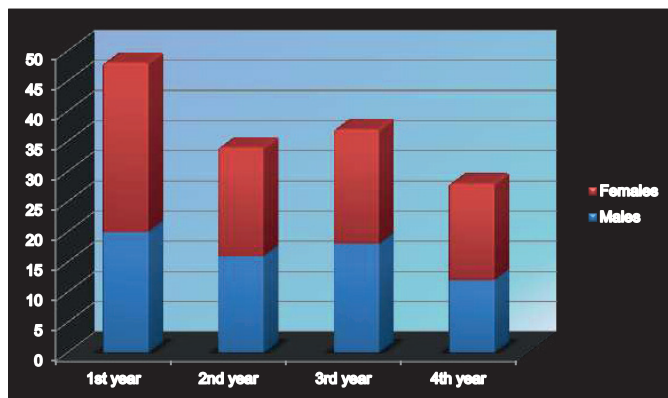
The dental health professionals can play an important role in the oral health education of their patients, families, and friends; and also at the community levels. However before dental health professionals play a role as oral health educators, it is important to know the level of their own knowledge, attitude, and behavior toward oral health.^{2,5}

It is of primary need that, as the dental students are specialists in conditions related to oral regions, they have good knowledge and expertise in oral health behaviors according to professional criteria.³ The attitude and behavior toward oral health maintenance of the dental professionals reflect their understanding of the preventive oral health measures, and this is very important for the improvement of their patient's oral health.^{5,6}

Hence, the present study was carried out to assess the oral health knowledge, attitude and behavior among the dental students. The dental students in India spend their first 2 years in preclinics and next 2 years in clinics and last year of rotatory internship. This study was formulated to study and comparatively evaluate between preclinical and clinical students about oral health knowledge, attitude and behavior.

Materials and Methods

This cross-sectional study was conducted on total 147 voluntarily participated 1st to 4th year students of Malabar Dental College, Kerala. The study was carried out in the month of March-June 2010. It included 48 of 1st year, 34 of 2nd year, 37 of 3rd year and 28 of final year students. Out of these 147 students, 81 students were female and 66 were male (Table 1 and Graph 1). First pilot study was carried out using a self-administered structured questionnaire written in English and which was later applied to the study



Graph 1: Distribution of dental students according to academic year of study and gender.

Table 1: Distribution of dental students according to academic years and gender.

Year of study	Male	Female	Total
1 st year	20	28	48
2 nd year	16	18	34
3 rd year	18	19	37
4 th year	12	16	28
Total	66 (44.89%)	81 (55.11%)	147

group. No other academic records except year of study were obtained of the participant study group students. Standard procedures of informed consent were taken from the study group students.

A total of 30 questions were designed to evaluate the oral health knowledge, attitude and behavior of students between male and female students; and between preclinical and clinical students. The questionnaire was in the format multiple choice questions and yes/no type questions. The students were told to pick up only one answer for each question. The students were allowed to interact with the study committee for the meaning of any word or question.

Questionnaire and scoring criteria

The questionnaire included 30 items for the evaluation of oral health knowledge, attitude and behavior of the students:

I. Oral health knowledge:

- It included 10 questions on the basic knowledge of the oral health practices and purpose of maintaining oral health
- The questions were in the form of multiple choice questions and student told to select the correct response. Each correct answer was given "one" score while wrong answer and don't know the answer given "zero" score (Appendix I).

II. Attitude towards oral health:

- It includes seven questions based on the attitude of the students for the maintenance of the oral health
- In this section, yes/no answer type questions were selected. For the scoring, yes answer given score "one," except for the questions with marked as (N), for which score "one" was given for the answer no (Appendix II).

III. Behavior or practices of the student towards oral health maintenance:

- 13 questions were included in this section, which cover the basic behavior or measures taken by the students towards maintenance of the oral health.
- Out of 13 questions selected, some were of multiple choice questions and each correct answer was given score "one." In this section also some yes/no answer type questions were selected. For the scoring, yes answer given score "one," except for the questions with marked as (N) were given score "one" for the answer no (Appendix III).

Statistical analysis

Scores were calculated according to the options selected by the students. The data was analyzed using the statistical analysis software SPSS version 20. The individual scores were summed up to yield a total score. Descriptive statistics was calculated, and mean scores, standard deviation, and frequency distribution were obtained.

The difference of the oral health knowledge, attitude and behavior between preclinical and clinical students was assessed by Student's *t*-test. The variation of the scores from 1st to 4th year students of each of knowledge, attitude, and behavior was analyzed using one-way ANOVA test. The difference between males and female students of preclinical and clinical students was assessed by using Student's *t*-test. The assessment of the total score of the oral health knowledge, attitude and behavior between preclinical and clinical students were also done by using Student's *t*-test.

Results

Totally 147 students were participated in the study, of which 66 (44.89%) were males and 81 (55.11%) were females. The male to female ratio was 1:1.25 and most of the study group students belong to the age between 18 and 25 years. The distribution of the students according to the academic year was 48, 34, 37 and 28, respectively (Table 1 and Graph 1).

Table 2 shows the mean scores; and a score of males and females, of the knowledge, attitude and behavior of the 1st-4th year students. The difference between each of knowledge, attitude and behavior scores between preclinical and clinical students was analyzed, which had shown statistically highly significant difference in all cases (Student's *t*-test; $P < 0.001$) (Table 3).

Total score (of knowledge, attitude and behavior together) differences between preclinical and clinical students were analyzed by Student's *t*-test, which also shown statistically highly significant difference ($P < 0.001$) (Table 4).

The difference of total scores of male and female students according to academic years; of knowledge, attitude and

behavior was analyzed. These shown females were better than males, but this was found to be statistically insignificant in all three categories i.e., knowledge (Student's *t*-test, $P > 0.01$), attitude (Student's *t*-test, $P > 0.01$) and behavior (Student's *t*-test, $P > 0.01$) (Table 5 and Graph 2).

The analysis of variation in the scores from 1st to 4th year students in each of the knowledge, attitude and behavior questionnaires was done by one-way ANOVA test, which

shown highly significant increase with the increasing academic year of study (Table 6 and Graph 3).

Discussion

Three models of professionalism have been described by the researchers in the literature, which have an impact on the quality of health care provided by the practitioner. This ultimately depends on the knowledge and attitude of the health practitioner about their own profession.²

1. Commercial model: In this, the services are based on patient's ability to buy rather than their need
2. Guild model: In this model, the practitioner is ethically trusted through their knowledge and wisdom by patient to provide best quality care
3. Interactive model: In this model, both the practitioner and the patient decide the care provided through combination of experience and patients values.

Education of oral health of the individual and community has a major impact from the knowledge of the dentists, which ultimately depends on the knowledge, attitude and behavior of the students of the dental colleges. Increased awareness of the oral health care among the dental students through academic learning can motivate their patients for the maintenance of the

Table 2: Mean score of the dental students according to the questionnaires and year of study.

Questionnaire	1 st year (n=48)	2 nd year (n=34)	3 rd year (n=37)	4 th year (n=28)
Knowledge (10 questions)				
Males	4.800	5.060	7.055	8.083
Females	5.107	5.388	7.789	8.125
Mean	4.979	5.235	7.432	8.107
Attitude (07 questions)				
Males	2.250	3.437	4.722	5.083
Females	2.570	3.833	5.578	5.437
Mean	2.430	3.647	5.162	5.285
Behavior (13 questions)				
Males	8.150	8.250	10.833	12.083
Females	8.285	8.944	9.578	11.625
Mean	8.229	8.610	10.189	11.821

Table 3: Student's t-test for comparison of knowledge, attitude and behavior scores of preclinical and clinical students.

Questionnaire	Group	n	Mean±SD	t value	Significance
Knowledge	Preclinical	82	5.09±1.54	10.668	$P < 0.001^{**}$
	Clinical	65	7.72±1.42		
Attitude	Preclinical	82	2.94±1.20	11.921	$P < 0.001^{**}$
	Clinical	65	5.22±1.08		
Behavior	Preclinical	82	8.39±1.37	5.796	$P < 0.001^{**}$
	Clinical	65	10.00±1.99		

****P value is statistically highly significant. SD: Standard deviation**

Table 4: Student's t-test for comparison of total score of knowledge, attitude and behavior of preclinical and clinical students.

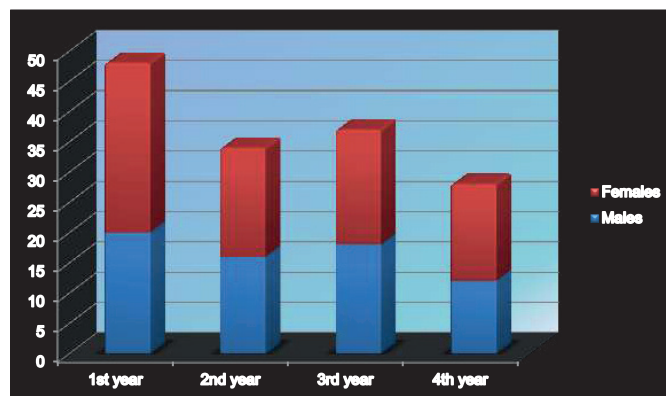
Group	Number of students	Knowledge, attitude and behavior (mean±SD)	t value	Significance
Preclinical	82	16.39±2.51	15.250	$P < 0.001^{**}$
Clinical	65	22.94±2.68		

****P value is statistically highly significant. SD: Standard deviation**

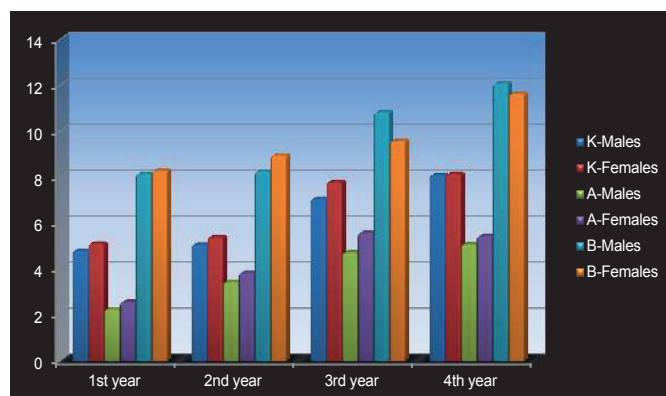
Table 5: Student's t-test for comparison of scores of knowledge, attitude and behavior of male and female students.

Questionnaire	Group	n	Mean±SD	t value	Significance
Knowledge	Males	66	6.08±1.90	0.971	$P > 0.01^*$
	Females	81	6.40±2.05		
Attitude	Males	66	3.73±0.52	1.487	$P > 0.01^*$
	Females	81	4.12±1.67		
Behavior	Males	66	9.24±2.05	0.829	$P > 0.01^*$
	Females	81	8.99±1.67		

***P value is not significant. SD: Standard deviation**



Graph 2: Distribution of knowledge, attitude and behavior scores according to year of study and gender.



Graph 3: Variations in the scores of knowledge, attitude and behavior scores according to year of study.

Table 6: One-way ANOVA test for the comparison of scores of knowledge, attitude and behavior of 1st year to 4th year students.

Questionnaire	Mean±SD				F value	P value
	1 st year	2 nd year	3 rd year	4 th year		
Knowledge	4.979±1.536	5.235±1.558	7.432±1.424	8.107±1.342	39.14	P<0.001**
Attitude	2.237±1.008	3.647±1.097	5.162±1.118	5.285±1.049	63.8	P<0.001**
Behavior	8.229±1.356	8.617±1.371	9.756±2.005	10.32±1.963	12.24	P<0.001**

**P value is statistically highly significant. SD: Standard deviation

oral health and prevention of the development of the different oral diseases.⁷

As different health professionals combine work constitute the health team for the provision of the complete medical care including oral health, the variation in the knowledge, attitude and behavior of oral health during the years of university academic study will reflect the variation in the educational training experience of the dental students.^{1,2}

In the present study, the scores of the knowledge, attitude and behavior of clinical students of 3rd and 4th year was compared with that of the preclinical students of 1st and 2nd year, which shown that the scores of the clinical students was higher than the preclinical students ($P < 0.001$). This reflects the awareness of the oral health knowledge; attitude and behavior during the clinical years of university study. The variation of the scores with the years of study i.e., from 1st year to 4th year also showed statistically highly significant increase, which reflects the variation in the educational training experience of the dental students according to years of the study ($P < 0.001$).

This variation of the scores is in accordance to the study done by Neeraja *et al.*,⁸ Sharda and Shetty¹ and Mani *et al.*,⁹ but this was in contrast to the study done by Dagli *et al.*,¹⁰ which showed non-significant increase in the scores of clinical students when compared with preclinical students.

The questions of knowledge like meaning of gum bleeding, effect of fluorides on teeth and reasons for oral cancer had shown much higher frequency (72%, 81% and 78% respectively) of correct answers of clinical students than preclinical. This may be due to the year wise education of the clinical knowledge among dental students.

In the present study, the scores in general, of the knowledge, attitude, and behavior between females was higher than males, but the difference was not significant statistically ($P > 0.01$), which indicates that both males and females were equally aware about their oral health. This was also reported in the study done by Sharda and Shetty¹ and Khami *et al.*¹¹ and in contrast with the results of the study by Al-Omari and Hamasha,¹² Ostberg *et al.*¹³ Fukai *et al.*,¹⁴ Schwarz and Lo¹⁵ and Kawamura *et al.*,¹⁶ which found that female students take better care of their teeth and had better health attitudes than their male colleagues.

When analysis of the individual questions was done, it was found that females (90%) more likely to use dental floss and mouth wash than males (40%). The present result was same as it was in Kawas *et al.*¹⁷ and in contrast with the results of Al-Omari and Hamasha¹² and Khami *et al.*,¹¹ in which male students more frequently use dental floss than female.

Similarly, female students (82%) showed significantly positive attitude to the visit dentist regularly than male students. This result was similar to study done by Baseer *et al.*⁷ and Åström and Masalu¹⁸ The difference between males and females may be explained by habitual personal neglect by males and females caring more about their body and appearance.

The present study thus showed the improvement of knowledge, attitude and behavior with the academic years and there was no bias of gender with reference to oral health. Oral health knowledge, attitude and behavior was expected to be better among the clinical dental students than preclinical students in the present study, since it is a primary content in dental professional education, as they require it to educate their patients and also community, when they start working in health care system.

Various previous researchers showed conflicting results of the studies on oral health knowledge, attitude and behavior among health professionals, but the results of these studies can be helpful in the planning of different oral health education programs, preventive measures and other activities related to the improvement of the community level oral health. These studies can be taken as a guide to improving the oral health among the dental students, which ultimately helpful at the community level.

One of the limitations in these types of studies, as the scores depends on self-reported data; the results may be biased though over- and underreporting due to social desirability, though the confidentiality is maintained.

Conclusion

Knowledge of the dental health professionals reflects in the community they are practicing. Thus we recommend that oral health awareness should be increased among dental students, which are the future health professionals. For this purpose, we suggest that oral health and preventive dentistry topics should be stressed in the curriculum of students and also continuing dental education programs on these topics can be helpful.

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Appendix I: Knowledge questions (Multiple choice questions)

- Number of dentition sets in life of an individual:
 - 1
 - 2
 - 3
 - Don't know
- Total number of deciduous and permanent teeth:
 - 5 and 24
 - 20 and 32
 - 32 and 32
 - Don't know
- Main purpose of tooth brushing:
 - Prevention of tooth decay and gum disease.
 - Achievement of cleaner and brighter teeth.
 - To remove stains on teeth.
 - Don't know.
- Meaning of dental plaque:
 - Discoloration of teeth
 - Soft deposits on teeth
 - White patches on teeth
 - Don't know
- Meaning of gum bleeding:
 - Gum disease (inflammation of gums)
 - Infection of tooth
 - Calcium deficiency
 - Don't know
- Effect of retention of sweet food on teeth:
 - Can lead to decaying of teeth
 - Calcium deficiency
 - Leads to bleeding gums
 - Don't know
- Effects of fluorides on teeth:
 - Prevention of gum disease
 - Prevention of tooth decay
 - Cleaning of teeth
 - Don't know
- Can health of teeth and mouth affect health of body:
 - Yes
 - No

- c) Don't know
- 9. Reasons of oral cancer:
 - a) Calcium deficiency
 - b) Gutkha and tobacco chewing, smoking.
 - c) Vit. C deficiency
 - d) Don't know.
- 10. Is it possible to correct irregularly placed teeth:
 - a) Yes
 - b) No
 - c) Don't know.

Appendix II: Attitude questions: (Yes/NO type)

1. Dentists should be visited regularly?
2. Gutkha and tobacco chewing is a bad habit? (N)
3. Smoking in any form is a bad habit? (N)
4. Well cleaning of teeth can be done without using toothpaste? (N)
5. Hardness of bristles of teeth has any effect on teeth and gums?
6. Immediate replacement of missing teeth by artificial teeth is necessary?
7. Dentists plays role only in treatment part and not in the prevention? (N)

Appendix III: Behavior questions: (Multiple Choices and Yes/No type questions)

1. Brushing of teeth:
 - a) Yes
 - b) No
2. Minimum brushing habit:
 - a) Once in a day
 - b) Twice in a day
 - c) Thrice and more
3. When you rinse your mouth:
 - a) In the morning

- b) In the morning and before going to bed
- c) In morning, before going to bed and after eating sweet foods.
- 4. Ideal brushing material:
 - a) Tooth paste and finger
 - b) Tooth paste and brush
 - c) Don't know
- 5. Brush each your teeth carefully:
 - a) Yes
 - b) No
- 6. Cleaning of tongue:
 - a) Yes
 - b) No
- 7. Use of oral hygiene aids like dental floss and mouth wash:
 - a) Yes
 - b) No
- 8. Any other habits like gutkha and tobacco chewing or smoking: (N)
 - a) Yes
 - b) No
- 9. Bleeding from gums while brushing teeth: (N)
 - a) Yes
 - b) No
- 10. Noticed anytime – white sticky deposits on teeth: (N)
 - a) Yes
 - b) No
- 11. Presence of bad breath: (N)
 - a) Yes
 - b) No
- 12. Visit to dentist only after having toothache: (N)
 - a) Yes
 - b) No
- 13. Use of dye to check cleaning of teeth:
 - a) Yes
 - b) No