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ORIGINAL ARTICLE

The level of education and oral health attitudes of the dental students in a governmental university - A cross-sectional study

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Keywords
Behavior, dental students, educational level, knowledge, oral health attitude

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Abstract

Background: Dental student educational knowledge has an important role in the oral health education of their patients, families, and friends as well as their community by transmitting the correct oral habits and raising the awareness on how to prevent oral diseases.

Aim: This study was conducted to evaluate the knowledge, attitude, and behavior toward the oral health of students studying dentistry in Cairo University, Egypt, using Hiroshima University - Dental Behavioral Inventory (HU-DBI) questionnaire.

Methodology: The HU-DBI questionnaire was developed by Kawamura to evaluate oral health attitude, behavior, and self-reported knowledge. This questionnaire involves 20 items in a dichotomous response format (agree/disagree). As the English version of the questionnaire was used, and an Arabic version was adopted (mother tongue of the participants). It was distributed among 896 undergraduate students at the beginning or end of the practical section and was given a full explanation of the study. Each participant allowed 7–15 min to fill the questionnaire. The score of each item was analyzed and then a mean score was calculated.

Results: There was a statistically significant difference in attitude and knowledge, while there was no statistically significant difference in behavior among dental student. The attitude and knowledge of clinical students are higher than that of preclinical, while behavior showed no statistically significant difference. Furthermore, oral health attitude of males was better than females, while oral health behavior of female dental students was better than males, as well as there was no statistically significant difference in knowledge between males and females in all levels.

Conclusion: The oral health attitude and knowledge of clinical dental students are higher than that of preclinical students; however, oral health behavior was the same for all levels.

Clinical Significant: The improvement of the dental student behavior and knowledge has a direct effect on the oral health of their patients, families, and their community that will lead to improvement of the general health.

Introduction

Oral health has a direct effect on the general health through maintaining a good nutrition of the physical body and enhancing the social interaction[1] that, in turn, will improve the quality of life.[2]

The oral health behavior and attitudes of undergraduate dental students play an important role in their capacity to deliver oral health to their patients.[3] Oral health behaviors regarding teeth cleaning methods are necessary to avoid accumulation of plaque that can lead soft and/or soft tissue problems and eventually result in tooth loss.[4] However, most of the populations are unable to comply oral hygiene effectively, and as a result, they develop dental caries and periodontal disease depending on patient's personality, attitude, lifestyle, education, and other social and demographic factors.[5]

With improvements of the dental students' knowledge, the preventive measures delivered to their patients will be more effective and those students will be expected to be a role model for his or her patients,[6] so that, the patterns of oral health behavior, beliefs, and attitudes of dental students may, therefore, be particularly significant.[7]

Unfortunately, rare data regarding oral health attitudes and behavior among dental students in Egypt have been published. Hence, the aim of the study was to evaluate the knowledge, attitude, and behavior toward the oral health of students studying dentistry in Cairo University using Hiroshima University Dental Behavioral Inventory (HU-DBI).

Participants and Methods

This observational (cross-sectional study) revealed the differences in dental health behaviors and attitudes of clinical and preclinical dental students. The HU-DBI questionnaire was used in this study [Table 1].

Participants eligibility criteria

The undergraduate dental students from all levels in the Faculty of Dentistry, Cairo University, were included in the study. Only students who refused to participate were excluded from the study.

The data were based on a collection of responses to 20 items questionnaire in the academic year 2015–2016 after obtaining permission from an ethical review board of Faculty of Dentistry, Cairo University.

Sample size calculation

We applied a convenience consecutive sampling included all enrolled students from all educational levels on the planned study day.

Attendance number of students was reported in questionnaire and response rate calculate.

Variables

Respondents asked to indicate their gender (male or female) and level in dental university (year).

Questionnaire

The questionnaire in the study based on the HU-DBI that consisted of 20 items. The English version of the questionnaire was used in this survey as English is the teaching language at the dental school at Egypt University, beside that the English version of this questionnaire was translated into an understandable Arabic language (mother tongue language).

The questionnaire was designed to record the following:

Self-reported oral health and dental visits (knowledge)
It included five items (No: 2, 8, 10, 15, and 19) on the basic knowledge of the oral health practices and purpose of maintaining oral health.

Table 1: HU-DBI questionnaire

Place (√) in front one answer only		
Questionnaire	Agree	Disagree
I do not worry much about visiting dentist		
My gums tend to bleed when I brush my teeth		
I worry about the color of my teeth		
I have noticed some white sticky deposits on my teeth		
I used a child-sized toothbrush		
I think that I cannot help having false teeth when I am old		
I am bothered by the color of my gums		
I think my teeth are getting worse despite my daily brush		
I brush each of my teeth carefully		
I have never been taught professionally how to brush		
I think I can clean my teeth well without using toothpaste		
I often check my teeth in a mirror after brushing alone		
I worry about having bad breath		
It is impossible to prevent gum disease with tooth brushing alone		
I put off going to the dentist until I have a toothache		
I have used a dye to show how clean my teeth are		
I used a toothbrush which has a hard bristles		
I do not feel I have brushed well unless I brush strong strokes		
I feel I sometimes take too much time to brush my teeth		
I have had my dentist tell me that I brush very well		

HU-DBI: Hiroshima University - Dental Behavioral Inventory

Oral health attitude
It included three items (No: 6, 11, and 14) based on the attitude of the students for the maintenance of the oral health.

Oral hygiene behavior
It included four items (No: 4, 9, 12, and 16) on the basic behavior of the oral health practices taken by the students toward the maintenance of the oral health.

Each "agree" response for items 4, 9, 11, 12, 16, and 19 was given one point, and one point was given for each "disagree" response to items 2, 6, 8, 10, 14, and 15. Hence, the maximum possible score is of 12 and the minimum score is 0. The higher the score means the better the oral health attitude and behavior for each student.

The remaining eight questions were used as dummy questions and not included in the final scoring system.

Procedures
The permission was taken from the vice dean for students affairs, a number of registered students obtained from student affairs. Permission was taken from the chief departments.

All participants provided with a questionnaire at the beginning or end of the practical section depending on the approval of professor and were given a full explanation of the study; they were asked to write exactly what they do, behave and feel to respond the best of their knowledge.

Each participant allowed 7–15 min to fill the questionnaire. The score of each item was analyzed, and then, a mean score was calculated.

Limitations of this study

- Some professors and lectures refused the distribution of questionnaire during the section.
- Some students refused to be included in the study.

Bias

The main advantage of a self-administered questionnaire applied in this study is eliminating the source of bias because this questionnaire is not affected by interviewer or variability. However, as with all self-administered questionnaires, there is a chance of bias from the respondents themselves regarding the degree of truthfulness of their answers.

This problem addressed by explaining the purpose of the study and making it very clear to the students that there are no right or wrong answers and to respond to the best of their knowledge.

The students interacted with the researcher for an understanding question without leading their answers.

Statistical methods

Data management and statistical analysis were performed using SPSS version 20.

The difference between preclinical and clinical students assessed by Mann–Whitney *U*-test. The variation of the scores from 1st to 5th year students of each of knowledge, attitude, and behavior analyzed using Kruskal–Wallis test and Steel-Dwass method. The difference between males and female students of preclinical and clinical students assessed using Mann–Whitney test. The assessment of the total score of the oral health knowledge, attitude, and behavior between preclinical and clinical students will be done using Mann–Whitney test, $P < 0.05$ will consider statistically significant.

Results

A number of 896 dental students completed the HU-DBI questionnaire, of which 308 (35%) were male and 583 (65%) were female. Five students were excluded from analysis because they did not complete the questionnaire, leaving a total of 891. Participated students were ranging between 18 and 25 years. A convenient consecutive sampling approach was used to select the preclinical (1st, 2nd new, 2nd old, and 3rd new year) and clinical (3rd old and 4th old year) dental students to assess their attitude, behavior, and self-reported (knowledge) toward dental health.

The distribution of participated dental students according to their academic levels in level 1 new, 2 new, 2 old, and 3 new was 151, 208, 26, and 162, respectively, while in level 3 old and 4 old was 210 and 134, respectively, as shown in Chart 1.

There was no statistically significant difference between both the academic years and gender with $P = 0.13729$ ($P > 0.05$).

The percentage of agree responses of HU-DBI questionnaire

In (item-2) bleeding gums, the percentage of agree response to the HU-DBI questionnaire was higher in preclinical students, level 1, 2 new, 2 old, and 3 new were 35.1%, 29.0%, 23.1%, and 19.6%, respectively, then clinical students (level 3 old and 4 old) were 18.9% and 17.9%, respectively, as shown in Table 2.

White sticky deposits (item-4) were reported in level 1 new, 2 new, 2 old, 3 new, 3 old, and 4 old with 38.4%, 50%, 30.8%, 30.5%, 30.5%, and 26.3% of the participants, respectively. In item-6 said that "they cannot help having false teeth when they are old," a higher proportion of preclinical students was reported, level 1, 2 new, 2 old, and 3 new were 18.0%, 16.9%, 28.0%, and 21.6%, respectively, compared to clinical students level 3 old and 4 old were 9.5% and 8.3%, respectively, as shown in Table 2.

In item-8, they stated that "think their teeth are getting worse despite their daily brushing," in level 1 new, 2 new, 2 old, 3 new, 3 old, and 4 old were 16.7%, 17.7%, 26.9%, 27.0%, 20.8%, and 17.3%, respectively. As well as item-9, "brush each of my teeth carefully" was reported in level 1, 2 new, 2 old, 3 new, 3 old, and 4 old with 65.1%, 63.2%, 61.5%, 79.6%, 69.3%, and 72.2%, respectively, as shown in Table 2.

In item-10 reported that "they have never been taught professionally how to brush" in level 1 new, 2 new, 2 old, 3 new, 3 old, and 4 old were 48.3%, 29.7%, 26.9%, 38.4%, 30.8%, and 27.8%, respectively, as shown in Table 2.

A higher agree response with item-11 "I think I can clean my teeth well without using toothpaste" in clinical student was observed in level 3 old and 4 old with 23.4% and 42.5%, respectively, then preclinical student in level 1 new, 2 new, 2 old, and 3 new was 18.7%, 15.9%, 15.4%, and 16.7%, respectively, as shown in Table 2.

In item-12 reported that "checking the teeth in the mirror after brushing" in level 1 new, 2 new, 2 old, 3 new, 3 old, and 4 old were 82.8%, 85.1%, 80.8%, 78.4% 74.6%, and 79.1%, respectively, as shown in Table 2.

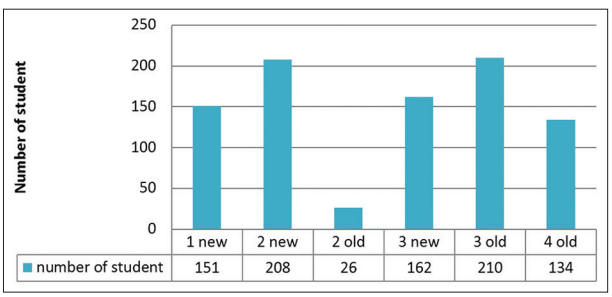

Chart 1: Distribution of dental students according to academic years of study

Table 2: HU-DBI questionnaire item, number, percentage of agree response, and level of dental education (agree/[agree + disagree]*100)

Questionnaire	Level 1 total (%)	Level 2 new total (%)	Level 2 old total (%)	Level 3 new total (%)	Level 3 old total (%)	Level 4 old Total (%)	Total (%)
2 - My gums tend to bleed	53	60	6	32	40	24	215
when I brush my teeth. (D)	35.1	29.0	23.1	19.6	18.9	17.9	24.1
4 - I have noticed some	58	66	8	50	64	35	281
white sticky deposits on my teeth. (A)	38.4	31.7	30.8	30.5	30.5	26.3	31.5
6 - I think that I cannot help	27	35	7	35	20	11	135
having false teeth when I am old. (D)	18.0	16.9	28.0	21.6	9.5	8.3	15.2
8 - I think my teeth are	25	37	7	44	44	23	180
getting worse despite my daily brush. (D)	16.7	17.7	26.9	27.0	20.8	17.3	20.2
9 - I brush each of my teeth	97	132	16	129	147	96	617
carefully. (A)	65.1	63.2	61.5	79.6	69.3	72.2	69.2
10 - I have never been	73	62	7	63	65	37	307
taught professionally how to brush. (D)	48.3	29.7	26.9	38.4	30.8	27.8	34.3
11 - I think I can clean my	28	33	4	27	49	57	198
teeth well without using toothpaste. (A)	18.7	15.9	15.4	16.7	23.4	42.5	22.3
12 - I often check my teeth	125	177	21	127	156	106	712
in a mirror after brushing alone. (A)	82.8	85.1	80.8	78.4	74.6	79.1	80.0
14 - It is impossible to	88	126	19	102	130	74	539
prevent gum disease with tooth brushing alone. (D)	58.3	61.2	73.1	63.0	62.8	55.2	60.8
15 - I put off going to the	99	114	16	82	133	73	517
dentist until I have a toothache. (D)	66.0	55.1	61.5	50.9	63.3	54.9	58.3
16 - I have used a dye to	9	9	0	8	18	11	55
show how clean my teeth are. (A)	6.0	4.3	0.0	5.0	8.6	8.2	6.2
19 - I feel I sometimes take	52	72	8	63	86	47	328
too much time to brush my teeth. (A)	34.4	34.6	30.8	38.9	41.0	35.1	36.8

HU-DBI: Hiroshima University - Dental Behavioral Inventory

In item-14, "it was impossible to prevent gum disease with only tooth brushing alone," the agree response of student was reported in level 1 new, 2 new, 2 old, 3 new, 3 old, and 4 old with 58.3%, 61.2%, 73.1%, 63.0%, 62.8%, and 55.2%, respectively, as well as dental students reported that "they postponed going to the dentist until they had a toothache" (item-15) in level 1 new, 2 new, 2 old, 3 new, 3 old, and 4 old with 66.0%, 55.1%, 61.5%, 50.9%, 63.3%, and 54.9%, respectively, as shown in Table 2.

In item-16, student reported that "they have used a dye to show how clean their teeth," a higher agree response in clinical student level (3 old and 4 old) was (8.9% and 8.2%) compared to preclinical student in level 1 new, 2 new, 2 old, and 3 new was 6.0%, 4.3%, 0.0%, and 5.0%, respectively, as shown in Table 2.

In item-19, student reported that "they feel they sometimes take too much time to brush their teeth," the agree response of student was reported in level 1 new, 2 new, 2 old, 3 new, 3 old, and 4 old with 34.4%, 34.6%, 30.8%, 38.9%, 41.0%, and 35.1%, respectively, as shown in Table 2.

Chart 2 shows a Penta histogram for the attitude of all academic levels, the yellow lines show that there was a statistically significant difference in attitudes of students between level 4 old and level 1, 2 new, 2 old, 3 new, and 3 old with $P = 0.0002$, 0.001, 0.001, 0.0003, and 0.0004, respectively.

Chart 3 shows a Penta histogram for the behavior of all academic levels; there was no significant difference in behaviors of students between all levels. The values of all levels are equal.

Chart 4 shows a Penta histogram for the knowledge of all academic levels, the yellow lines show that there was a statistically significant difference in knowledge of students between level 1 and 2 new, 3 new, and 3 old with $P = 0.03$, 0.034, and 0.024, respectively, as well as level 1 and 4 old with $P = 0.0001$ while there was no significant difference with level 2 old.

Discussion

This study was conducted to evaluate the oral health knowledge, attitude, and behavior of students studying dentistry at Cairo

University using HU-DBI due to the presence of non-clear data regarding this aspect among dental students in Egypt. Furthermore, to assess if sufficient attention is paid to the curricula of dental school to encourage constructive oral health practices and positive behavioral attitude of the dental student, so this might allow policymakers to reform and modify their curricula at all levels of dental education.[8] This study can be considered as a key factor for developing programs for dental student attitude and behavior.

To setup a habit, an important learning to the patients should be given to raising their awareness of how to avoid oral diseases. The knowledge of the dental students has a direct effect on their attitude for patient education.[9]

The HU-DBI has good test-retest reliability and has been translated from Japanese into other languages for cross-cultural comparisons.[10]

Gender differences between males and females have different physiological and psychological behavior, it is possible that their oral health behavior might be different as well.[11]

Convenience sampling is a widely used method, used to collect information and gain a quick understanding and many outcomes. We used it to include all number of students from all educational levels. This study was conducted at Cairo University because it is the oldest and the larger dental college including students from different places.

The questionnaire used the English language and was translated to the Arabic language because the studying language is English, but the mother tongue language is Arabic. The translation was done in simple and easy words to be understandable, especially for the 1st and the 2nd years as they might not be familiar with all medical terms.

Limitations of this study that some professors and lectures refused to distribute the questionnaire because they said that section time is inadequate, also some students refused to fill in the questionnaire because they believe that the questionnaire has no significance or that it is not important at all. In the lecture, the students' attendance was very low; therefore, questionnaires distribution was in the section, to cover a large number of students from all levels.

In item-2 which was concerned about "bleeding gums" agree response decreased through levels from levels 1 to 4. In (item-2) which was concerned about "bleeding gums" agree response decreased through levels from (level 1 to level 4), this might reflect the gingival self-care might have improved during progress in level and probably reflected the sense of self-control and self-efficacy the students experienced through the curriculum.[12] The proportion found in this study was the same as those for Japanese dental students, but lower than those found in Finnish[3] and was higher than those in Bangalore and Australia.[13]

In item-4 regarding sticky deposits on teeth, there was a low percentage of agree responses for all levels and this might reflect low awareness to maintain good oral health. It was probably because this question might be misinterpreted as whether their teeth were clean or not instead of being aware of plaque.[14] A study by Barrieshi-Nusair *et al.*,[1] this item was excluded from the questionnaire totally.

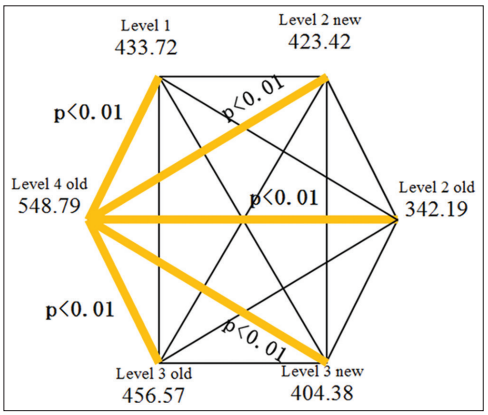

Chart 2: A Penta histogram of the attitude of all academic levels

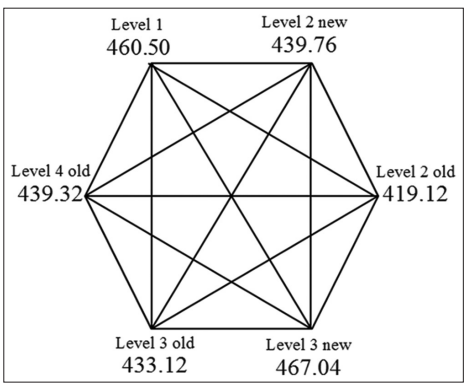

Chart 3: A Penta histogram of the behavior of all academic levels

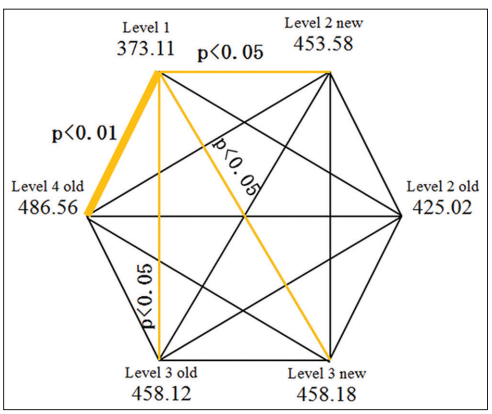

Chart 4: A Penta histogram of the knowledge of all academic levels

The agree response of dental students in item-6 was decreased from preclinical to clinical students and this might be explained by the fact that as educational level progressed, students give more attention for the preservation of their teeth.[15] This percentage is very close to that in Korea.[16]

In item-8, "think their teeth are getting worse despite their daily brushing," the total agree response was low and this might reflect the awareness of dental student with the importance of brushing technique. The finding is very close to that in UAE.[17]

In item-10, the agree response decreased through levels from levels 1 to 4; this is probably explained by the fact that the students had low oral health awareness and poor knowledge when they started their dental education. A probable cause of this is the dental students is not receiving this before they enter dental school, oral health programs should be included in the preclinical curriculum to promote oral health awareness and knowledge.[18] The finding is very close to that in UAE.[17]

The higher percentages of total agree responses in item-9 which included "brush each of my teeth carefully" and item-12 which included "checking the teeth in the mirror after brushing." This might reflect the awareness of dental student in esthetic as well as the importance of brushing their teeth and careful tooth brushing. This finding is in agreement with a study in India which had nearly the same response of "agree" for item-12 for all levels.[19]

A higher proportion of clinical students reported that "I think I can clean my teeth well without using toothpaste" (item 11) than did the preclinical students; this might reflect the awareness of clinical students about tooth brushing techniques. Also, it may be due to separate topics of brushing techniques was taken in level 4old, but the total agree response of all levels was lower than half, this may due to there are no programs concerned about improving students oral health. This proportion is higher than that in Japan, Hong Kong, and West China.[20]

The high percentage of total agree response for all levels was in item-14 which involved "it was impossible to prevent gum disease with only tooth brushing" and this possibly because of their belief that brushing is the most effective method to prevent dental caries. This is very close to the total percentage of agree responses in Peker *et al*.[19]

In item-15, half of dental students agreed that they went to the dentist only when there is a pain, which is in agreement with studies conducted in Kuwait,[21] United Arab Emirate,[22] Japan, Hong Kong, Korea, and China.[13] The cost of dental services, fear of pain, previous bad dental experiences, and the time required for frequent visits may be the causes for that behavior.[3,12]

The least percentage of agreement from all levels was in item-1 which reported the using of dye to show the cleaning of teeth. This behavior may be due to material not easily available or it may be the lack of knowledge about its importance. This is lower than those reported in Turkey.[19] Moreover, the finding is very close to that in UAE.[18]

Less than half of dental students agreed with that they take more time to brush their teeth (item-19), this may be due to lack of awareness about tooth brushing techniques. This is very close to that in UAE.[18]

There was a statistically significant difference in attitude and knowledge, while there was no statistically significant difference in behavior among dental student, in accordance to Bangalore dental student reported that behavior was not improved with increased levels of education. While in contrast to our result, Bangalore dental student reported that attitude was not improved with increased levels of education.[14] That may imply translation of the acquired knowledge into positive attitude, but there are defects or difficulties in change behaviors which necessitates modification of oral health programs.

Conclusion

The oral health attitude and knowledge of clinical students are higher than that of preclinical; however, oral health behavior was the same for all levels. The oral health knowledge was the same between both genders.

The oral health attitude for males was higher than that of females, and in contrast, the oral health behavior for females was higher than males.

References

1. Barrieshi-Nusair K, Alomari Q, Said K. Dental health attitudes and behaviour among dental students in jordan. Community Dent Health 2006;23:147-51.
2. Halawany HS. A review on miswak (*Salvadora persica)* and its effect on various aspects of oral health. Saudi Dent J 2012;24:63 9.
3. Kawamura M, Honkala E, Widström E, Komabayashi T. Cross-cultural differences of self-reported oral health behaviour in japanese and finnish dental students. Int Dent J 2000;50:46-50.
4. Tonetti MS. Periodontitis and risk for atherosclerosis: An update on intervention trials. J Clin Periodontol 2009;36 Suppl 10:15-9.
5. Öhrn K, Sanz M. Prevention and therapeutic approaches to gingival inflammation. J Clin Periodontol 2009;36 Suppl 10:20 6.
6. Khalid K, Naidoo S, Elamin F. Oral health behaviours and attitudes using the modified arabic version of hiroshima university – Dental behavioural inventory (HU-DBI) among sudanese. Dental Stud 2016;3:326-30.
7. Komabayashi T, Kwan SY, Hu DY, Kajiwara K, Sasahara H, Kawamura M, *et al.* A comparative study of oral health attitudes and behaviour using the hiroshima university - dental behavioural inventory (HU-DBI) between dental students in britain and china. J Oral Sci 2005;47:1-7.
8. Sato M, Camino J, Oyakawa HR, Rodriguez L, Tong L, Ahn C, *et al.* Effect of dental education on Peruvian dental students' oral health-related attitudes and behavior. J Dent Educ 2013;77:1179 84.
9. Sharda AJ, Shetty S. A comparative study of oral health knowledge, attitude and behaviour of first and final year dental students of Udaipur city, Rajasthan, India. Int J Dent Hyg 2008;6:347-53.
10. Komabayashi T, Kawamura M, Kim KJ, Wright FA, Declerck D, Goiâs Mdo C, *et al.* The hierarchical cluster analysis of oral health attitudes and behaviour using the hiroshima university – dental behavioural inventory (HU-DBI) among final year dental students in 17 countries. Int Dent J 2006;56:310-6.
11. Kateeb E. Gender-specific oral health attitudes and behaviour among dental students in Palestine. East Mediterr Heal J 2010;16:329-33.
12. Dagli RJ, Tadakamadla S, Dhanni C, Duraiswamy P, Kulkarni S. Self reported dental health attitude and behavior of dental students in india. J Oral Sci 2008;50:267-72.
13. Kim KJ, Komabayashi T, Moon SE, Goo KM, Okada M,

Kawamura M, *et al.* Oral health attitudes/behavior and gingival self-care level of korean dental hygiene students. J Oral Sci 2001;43:49-53.
14. Vangipuram S, Pallavi S, Radha G, Rekha R. Assessment of oral health attitudes and behavior among undergraduate dental students using Hiroshima University dental behavioral inventory HU-DBI. J Indian Assoc Public Heal Dent 2015;13:52-7.
15. Yildiz S, Dogan B. Self reported dental health attitudes and behaviour of dental students in Turkey. Eur J Dent 2011;5:253-9.
16. Al-Wahadni AM, Al-Omiri MK, Kawamura M. Differences in self-reported oral health behavior between dental students and dental technology/dental hygiene students in jordan. J Oral Sci 2004;46:191-7.
17. Kawamura M, Spadafora A, Kim KJ, Komabayashi T. Comparison of united states and korean dental hygiene students using the hiroshima university-dental behavioural inventory(HU-DBI). Int Dent J 2002;52:156-62.
18. Rahman B, Kawas SA. The relationship between dental health behavior, oral hygiene and gingival status of dental students in the united arab emirates. Eur J Dent 2013;7:22-7.
19. Peker K, Uysal O, Bermek G. Dental training and changes in oral health attitudes and behaviors in istanbul dental students. J Dent Educ 2010;74:1017-23.
20. Kawamura M, Yip HK, Hu DY, Komabayashi T. A cross-cultural comparison of dental health attitudes and behaviour among freshman dental students in japan, hong kong and west china. Int Dent J 2001;51:159-63.
21. Al-Hussaini R, Al-Kandari M, Hamadi T, Al-Mutawa A, Honkala S, Memon A, *et al.* Dental health knowledge, attitudes and behaviour among students at the kuwait university health sciences centre. Med Princ Pract 2003;12:260-5.
22. Al Kawas1 S, Fakhruddin KS, Rehman BU. A comparative study of oral health attitudes and behavior between dental and medical students : The impact dental education in united arab emirates. J Int Dent Med Res 2010;3:6-10.

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