Evaluation of oral health attitude and behaviors in medical science students of Shahed University

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Abstract

Introduction: Medical staffs are important and accessible source for gathering health information such as oral health. As a result, their increased Knowledge can lead to improvement of their own and their patients' health habits. The purpose of this study was to evaluate Oral Hygiene Index simplified (OHI-S) and its relationship with attitudes toward oral health behaviors of medical science students.
Materials and Methods: In this cross-sectional study, the Persian version of the Hiroshima University Dental Behavioral Inventory (HU-DBI) and OHI-S evaluation were used. The questionnaire was completed by 118 medical Science students of Shahed University in 2018 and then the teeth were examined. Chi-square and Mann-Whitney tests were used to analyze the data.
Results: Dental students with an average score of 6.06 had the highest average compared to other fields ($P < 0.05$). Average scored of clinical dental students higher than preclinical students. According to the results, people with a more favorable OHI-S are less bothered by the color of their gums and spend more time examining their teeth in the mirror.
Conclusion: Compared to other fields, dental students had better attitudes toward oral health and scored higher. Better oral health-related behaviors were observed in this group. Oral health education should be emphasized for other disciplines.

Keywords: HU-DBI, OHI-S, Oral health, Student

Introduction

Today, oral health is as important as general health of the body (1). Oral health is a personal concept that is highly influenced by culture, economic and social status (2). According to World Health Organization (WHO) oral health is an essential component of physical and mental health, which is influenced by the values and attitudes of people and communities (3). Oral health attitudes and behaviors in early life are influenced by parents (4,5). Media and dentists are common sources for obtaining oral health information (6,7). Medical staffs are important and accessible source for gathering health information such as oral health. (8). As a result, their increased information can lead to improvement of their own and their patients' health habits (9). Dentists are a great example of oral health attitudes and behaviors for their patients, family and friends (10). Therefore, dental students should change their misconceptions during their study and become a perfect model for patients. Dentists' knowledge of oral disease prevention methods helps them to play a

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key role in educating and encouraging patients to have appropriate health habits (11). To examine the dental students' attention to their oral health, annual evaluation has been emphasized (12,13). Medical staff who has a positive attitude towards oral health can be a great help to patients. Therefore, measuring the attitude and behavior of oral health in the medical staff has been emphasized (9).

There are various questionnaires to assess oral health attitudes, one of them is Hiroshima University Dental Behavioral Inventory (HU-DBI), which was first designed by Kawamura to measure patients' attitudes and behaviors in Japan (14,15). According to validation by 517 Japanese students, its coefficient was determined to be 0.73 (16). Since 1993, several articles have been published in different countries on measuring and comparing students of dentistry and other fields. The Persian version of this questionnaire was translated by Khami et al (2010). Its validity and reliability by test/retest method had a kappa coefficient ranging from 0.68 - 0.93 (17).

Studies have confirmed the effect of education on oral health attitudes and behaviors. Based on these studies, the attitudes and behaviors towards oral health in students of pre-clinical and clinical years are different (18).

In a cross-sectional study in Tehran, the HU-DBI questionnaires were distributed among 6^{th} and 10^{th} semester dental students and the data were collected. The results indicated that the attitude to prevention of dental students is associated to their gender and educational level and more attention should be given to the prevention in their education (15). In another study that compared dental and pharmacy students in Romanian University by using HU-DBI, Oral Health Index-Simplified (OHI-S) and Decay, Missing, Filling (DMFT), Teeth evaluations, it was suggested that these three factors were interrelated (19).

Most studies examined students' attitudes toward oral health, but studies that examined this questionnaire along with other indicators were few. Accordingly, in this study, in addition to examining students' attitudes toward oral health using the HU-DBI questionnaire, we assessed their behavior based on the OHI-S. OHI-S is a rapid method for assessing oral health status. This index is a useful tool in dental epidemiology and evaluation programs (20). By conducting this clinical evaluation, students' oral health behavior was assessed more accurately.

Materials and Methods

In this cross-sectional study, the HU-DBI questionnaire, which was translated into Persian by Khami et al. (17), was used. Based on Morgan's table, it was decided to perform the study on 118 people out of 180 people. The study was performed on students in the clinical and pre-clinical yards of operating room expert, nursing, medicine and dentistry fields at Shahed University in 2018. For better evaluation of the impact of training on the attitude of dental students, the 2^{nd} semester students who had not yet passed the oral health course were compared to 10^{th} semester students. In order to match the samples, medical students of the 2^{nd} and 10^{th} semesters and the operating room expert and nursing students of the 2^{nd} and 6^{th} semesters were participated in the study. After obtaining the code of ethics and the relevant permits, data collection was beginning. This study was approved and registered in the ethics committee of Shahed University with the number IR.Shahed.Rec.1398.044. First, the questionnaire and items were answered by the students and then the OHI-S assessment was done by a fifth-year dental student and later the validity and reliability of the assessment were confirmed by a community-based specialist. In order to standardize the clinical examination conditions for all disciplines, a disposable dental explorer and mirror were used for

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the examinations on a normal chair with a lamp mounted on the examiner's forehead at 9-12 o'clock. Data collection in this study took about a month from mid-May to late June. According to the OHI-S evaluation principles, one surface of 6 teeth (buccal surfaces of upper right central incisor, lower left central incisor and upper right and left first molar and lingual surface of lower right and left first molar) were examined. If there was no plaque or calculus, the score was zero, if there was plaque or calculus on 1/3 surface of the tooth, the score was 1, if there was plaque or calculus on 2/3 surface of the tooth, the score was 2, and if the whole surface of the tooth had plaque or calculus, the score was 3. The calculus and plaque scores were then added separately and divided by the number of levels. To obtain OHI-S, the mean obtained from the Calculus Index and the Plaque Index were added together and divided by 2. The mean was classified between 0 - 1.2 good index, 1.3 - 3 moderate index and 3.1 - 6 weak index.

The HU-DBI questionnaire consisted of 20 yes/no items. The answer "yes" to each of the items 4, 9, 11, 12, 16 and 19 and the answer "no" to each of the items 2, 6, 8, 10, 14 and 15 received a score. The closer the total score to 12, showing the better attitude of the person. After collecting the samples, the data was processed with SPSS 21. To data analysis, Chi-square and Mann-Whitney tests were used.

Results

Out of 118 sample participated in this study, 31 participants (26.3%) were in the field of dentistry, 48 participants (40.7%) were in the field of medicine, 18 participants (15.3%) were in the field of nursing and 21 participants (17.8%) were in Operating room expert discipline. In this study, 58 participants (49.2%) were in semester 2, 18 participants (15.3%) were in semester 6 and 42 participants (35.6%) were in semester 10.

Most of the participants (74 participants or 62.7%) had moderate OHI-S status. The number of semester 10^{th} dental students who agreed the following items was significantly higher than 2^{nd} semester students; "there is less bleeding in gums when brushing, receiving professional training for brushing, no need to feel the pain for them to go to the dentist, not using a hard toothbrush with too much force" (P values, 0.044, 0.044, 0.001, 0.041, 0.009, and 0.018, respectively). The OHI-S for 10^{th} semester students was better than 2^{nd} semester ones. Therefore, it can be said that there is a statistically significant difference between the attitudes toward oral health in these items and also the OHI-S in terms of semesters. There was a significant relationship between attitudes toward oral health behaviors and the OHI-S in questions 7 and 12.

There was a significant relationship between medical groups and attitudes toward oral health behaviors in items 1, 4, 8, 17 and 18; dental students for items 1 and 8 ("I think the condition of my teeth is deteriorating despite my daily brushing", "I do not care about visiting a dentist"), the medical science students for items 4 and 18 ("I have noticed sticky white deposits on my teeth and I do not feel that I have brushed my teeth well until I brush hard") and nursing students for item 17 ("I use a hard toothbrush") gave highest number of correct answers (Table 1).

Out of 42 good calculus indicators, 18 were dental students, 17 were medical students, 2 were nursing students and 5 were operating room expert students and out of 74 moderate calculus indicators, 13 were dental students, 30 were medical students, 16 were nursing students and 16 were operating room expert students. The only indicator of poor calculus belonged to medicine.

Since one of two variables is sequential and the other is nominal, we used Chi-square test to measure relationships, which showed a significant relationship between the OHI-S and the semester. ($P < 0.026$).

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The field of dentistry with the highest number of good OHI-S compared to the total population was at the top, followed by medicine, operating room expert and nursing, respectively.

The mean scores of the HU-DBI questionnaire in the field of dentistry was the highest with a score of 6.06 (Table 2). Students have obtained a higher score in the clinical years. Clinical students obtained 7.13 score that was higher than of preclinical students.

Table 1. Relation between medical groups and attitude to oral health behaviors.

	Medical groups								
	Dentistry		Medicine		Nursing		Operating room expert		
Questions	Yes	No	Yes	No	Yes	No	Yes	No	P
I don't worry much about visiting the dentist	3	28	16	32	3	15	8	13	0.04
My gums tend to bleed when I brush my teeth	7	24	14	34	6	12	8	13	0.66
I worry about the color of my teeth	29	2	44	47	17	1	19	2	0.95
I have noticed some white sticky deposits on my teeth	16	15	19	29	14	4	9	12	0.04
I use a child-sized toothbrush	2	29	0	48	1	17	0	21	0.22
I think that I cannot help having false teeth when I am old	28	3	41	7	16	2	16	5	0.52
I am bothered by the color of my gums	3	28	6	42	3	15	2	19	0.88
I think my teeth are getting worse despite my daily brushing	6	25	23	25	11	7	10	11	0.2
I brush each of my teeth carefully	22	9	28	20	9	9	10	11	0.31
I have never been taught professionally how to brush	7	24	14	34	7	11	5	16	0.63
I think; I can clean my teeth well without using toothpaste	6	25	5	43	3	15	3	18	0.72
I often check my teeth in a mirror after brushing	25	6	35	13	18	0	18	3	0.08
I worry about having bad breath	25	6	37	11	17	1	17	4	0.45
It is impossible to prevent gum disease with tooth brushing alone	18	13	28	20	12	6	12	9	0.92
I put off going to dentist until I have a toothache	14	17	36	12	12	6	12	9	0.06
I have used a dye to see how clean my teeth	4	27	6	42	3	15	2	19	0.93
I use a toothbrush that has hard bristles	4	27	15	33	0	18	6	15	0.02
I don't feel; I've brushed well unless I brush with strong strokes	9	22	28	20	4	14	10	11	0.02
I feel I sometimes take too much time to brush my teeth	12	19	18	30	12	6	4	17	0.05
My dentist tells me that I brush very well	12	19	19	29	5	13	3	18	0.18

Table 2. The mean scores of Hiroshima University Dental Behavioral Inventory (HU-DBI) questionnaire by the medical science students in the study.

Medical science group	Number	Mean ± SD
Dentistry	31	6.06 ± 1.69
Medicine	48	5.02 ± 1.86
Operating room	21	5.05 ± 1.94
Nursing	18	4.50 ± 1.82

Discussion

Today, oral health is just as important as general health (1). Two factors play an important role in oral health care; oral health education and culture or the social factor. Given the training and education dental students receive during their

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studies, the first factor is so important, but among students of other medical departments, the social factor plays an important role (12, 13).

The main purpose of this study was to compare medical groups in terms of attitudes toward oral health and OHI-S. The dental group received the highest mean score compared to other fields.

In this study, the average score of the dental students 'questionnaire was lower than that of Indian students. This discrepancy may be due to differences in the educational system and culture of the two countries that affect people's attitudes (2). However, the average score of the dental students' questionnaire of this study was higher than the students of Kuwait (21) and Sudan (22), which is thought to be due to differences in the educational system and cultures of these countries. Another reason for this difference is that in Kuwait, students of preventive and periodontology dental courses are trained for 7 years. As a result, only 1.7 of the statistical population of this study had received complete training, so the mean score decreases (21).

The average score of medical students was lower than medical students in Kuwait in the study of Dena et al., which could be due to the statistical population of 1802 people in this study, about 533 of whom were medical students. In contrast, our study included 48 medical students (21).

Dental students are less anxious about seeing a dentist than other medical students, their daily brushing does not make their teeth worse, and they do not use a hard toothbrush.

Using a toothbrush with hard bristles and worsening the condition of the teeth despite brushing was similar to the results in China. However, in Rong study, a significant difference was observed in 13 questions. Rong reported this study only on 5th year students, while we examined both clinical and pre-clinical students (23). In a similar study in Iran, dental students are less worried about visiting a dentist than medical students, use less hard toothbrushes, and are less concerned about the color of their gums, which was different in our study (23).

Regarding the OHI-S, as it was observed, the students in the field of dentistry achieved the best results compared to the students in other fields, which indicates the effective education of these students, which in addition to improving their attitudes, has improved their health behaviors.

Comparing the questionnaire questions with the OHI-S showed that the better the students have the OHI-S, the more satisfied they are with the color of their gums and after brushing their teeth in the mirror. Although the best result is obtained when more questions in the HU-DBI questionnaire have a significant relationship with the OHI-S, which is a penetration of attitudes toward oral health in the behavior of individuals, but the result of this relationship showed that students used the right attitude to improve their behavior.

Statistical analysis showed that the mean score of HU-DBI questionnaire of clinical students was significantly higher than pre-clinical students, which indicates an improvement in oral health attitudes of dental students during their educational years with Kuwaiti students (21), Another was in Iran with Khami et al. (17). Contrary to the results of our study, in the studies of India (2), Sudan (22) and Germany (26) we see the prevalence of preclinical students over clinical students. In the study of Al-Shiekh et al. (22), the author considers the reason for the difference in the results of his study as one of the less important studies of preventive dentistry for students. One of the reasons for this discrepancy is the difference between educational and cultural protocols of Sudan and India. In addition, at the end of all of studies, they called for changes and improvements in comprehensive educational programs if our study is evidence of the process of improving oral

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health by increasing the semester and the effectiveness of the educational system in raising oral health attitudes of the students. Studies have shown that clinical dental students bleed less than pre-clinical students when brushing their gums; Trained in professional brushing; Pain is not the reason they go to the dentist; Do not use hard toothbrushes; And they do not brush hard.

Also, in Turkey, the clinical dental students do not use hard-bristled toothbrushes compared to pre-clinical students; their gums do not bleed when brushing; Pain is not the reason they go to the dentist. Which in these three cases has something in common with our study (25). Considering that dental students receive preventive education during their education; they should have a better attitude during this period so that they can encourage their patients to observe oral health; therefore, dentists act as a model for their patients. As a result, the annual evaluation of dental students is an important step towards monitoring both students and the educational system.

Because children make their first appointment with a doctor earlier than a visit to the dentist, and in some areas access to a dentist is impossible or very difficult; As a result, physicians and other medical groups should know the basic oral health training to provide the necessary benefits to their patients, but such a course is not included in the training protocol of these groups. Hence, the attitude of these students is only influenced by the culture, social and economic level of their families, which is not enough. Therefore, it is better for medical groups to receive the necessary training in this field.

One of the limitations of the study was the lack of students' time in completing the questionnaires and determining the time for the clinical examination, so it was planned to collect the questionnaires and performing the clinical examination at agreed times on favorable days for the students.

Conclusion

Based on the findings of this study, dental students had a better attitude toward oral health than other medical groups, and their attitude improved during their education. The education factor compared to social and economic factors in improving their attitude to oral health acted more effectively.

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References

1. Dilip CL. Health status, treatment requirements, knowledge and attitude towards oral health of police recruits in Karnataka. J Ind Assoc Pub Health Dent. 2005; 5:20-1.
2. Vangipuram S, Rekha R, Radha G, Pallavi S K. Assessment of oral health attitudes and behavior among undergraduate dental students using Hiroshima University Dental Behavioral Inventory HU-DBI. J Ind Assoc Public Health Dent. 2015; 13: 52-7. doi: 10.4103/2319-5932.153587.
3. Gift HC. Social factors in oral health promotion. Oral health promotion. New York: Oxford University Press Inc. 1993; 65-102.
4. Okada M, Kawamura M, Kaihara Y, Matsuzaki Y, Kuwahara S, Ishidori H, et al. Influence of parents' oral health behavior on oral health status of their school children: an exploratory study employing a causal modelling technique. Int J Paediatr Dent. 2002; 12:101-8. doi: 10.1046/j.1365-263.

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5. Okada M, Kawamura M, Hayashi Y, Takase N, Kozai K. Simultaneous interrelationship between the oral health behavior and oral health status of mothers and their children. J Oral Sci. 2008; 50:447-52. doi:10.2334/j.50.447.
6. Lin HC, Wong MC, Wang ZJ, Lo EC. Oral health knowledge attitudes, and practices of Chinese adults. J Dent Res. 2001; 80(5):1466-70. doi:10.1177/00220345010800051601.
7. Paik DI, Moon HS, Horowitz AM, Gift HC, Jeong KL, Suh SS. Knowledge of and practices related to caries prevention among Koreans. J Public Health Dent. 1994; 54(4):205-10. doi:10.1111/j.1752-7325.
8. Andersen R, Marcus M, Mahshigan M. A comparative systems perspective on oral health promotion and disease prevention. In: Cohen, L.K. and Gift, H.C., Eds., Disease Prevention and Oral Health Promotion. Socio-Dental Sciences in Action, 3rd Edition, Copenhagen, 307-340.
9. Freeman R. The determinants of dental health attitudes and behaviour. Br Dent J. 1999; 187(1): 15-8. doi: 10.1038/sj.bdj.4800192.
10. Cortes FJ, Nevot C, Ramon JM, Cuenca E. The evolution of dental health in dental students at the University of Barcelona. J Dent Educ. 2002; 66(10): 1203-8. doi :10.1055/s-0039-1697402.
11. Leadbeatter D, Madden J, Ross B, Russell E. Transition to dental practice: Newly graduated dentists' views of being successful in dental practice. Eur J Dent Educ. 2020;24(4):753-762. doi: 10.1111/eje.12565.
12. Brown G, Manogue M, Rohlin M. Assessing attitudes in dental education: Is it worthwhile? Br Dent J. 2002; 193(12):703-7. doi: 10.1038/sj.bdj.4801665.
13. Arnljot HA, Barmes DE, Cohen LK, Hunter PBV, Ship II. Oral health care systems. An international collaborative study. London: Quintessence. 1985; 136-137. doi:10.2334/josnusd.47.
14. Kawamura M, Honkala E, Widstrom E, Komabayashi T. Cross- cultural differences of self-reported oral health behavior in Japanese and Finnish dental students. Int Dent J. 2000; 50: 46-50. doi: 10.4103/ejgd.ejgd_85_17.
15. Kawamura M. Dental behavioral science. The relationship between perceptions of oral health and oral status in adults. Hiroshima Daigaku Shigaku Zasshi. 1988; 20(2):273-86. PMID: 3271802.
16. Kawamura M, Sasahara H, Kawabata K, Iwamoto Y, Konishi K, Wright FA. Relationship between CPITN and oral health behaviour in Japanese adults. Aust Dent J. 1993 Oct; 38(5):381-8. doi:10.1111/j.1834-7819.
17. Khami M, Ghadimi S, Zare H, Rabbani M. Attitudes towards oral health behavior among students of dental schools in Tehran. J Islam Dent Assoc Iran. 2011; 4(77):223-32.
18. Frazier PJ. Public health education and promotion for caries prevention: the role of dental schools. J Public Health Dent. 1983; 43(1):28-42. doi:10.1111/j.1752-7325.
19. Vigu AL, Stanciu D, Lotrean LM, Campian RS. Complex interrelations between self-reported oral health attitudes and behaviors, the oral health status, and oral health-related quality of life. Patient Prefer Adherence. 2018; 12:539-549. doi: 10.2147/PPA.S159621.
20. Greene J C, Vermillion J R. The simplified Oral Hygiene Index. J Am Dent Assoc. 1964; 68:7-13. doi: 10.14219/jada.archive.1964.0034.
21. Ali, Dena A. Assessment of oral health attitudes and behavior among students of Kuwait University Health Sciences Center. Journal of International Society of Preventive & Community Dentistry. 2016; 6(5):436-46. doi:10.4103/2231-0762.

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22. AlShiekh, Lubna & Tawfig, Nada & Muhammed, Magd & Muhammed, Abd & ElHuda, Muhammed. Evaluation of dental students' oral hygiene attitude and behavior using HU-DBI in Sudan. Sci Postprint. 2015; 1(2). doi:10.14340/spp.2015.01A0001.
23. Rong WS, Wang WJ, Yip HK. Attitudes of dental and medical students in their first and final years of undergraduate study to oral health behaviour. Eur J Dent Educ. 2006; 10(3):178-84. doi:10.1111/j.1600-0579.
24. Ghadimi S, Razaghi S, Khami MR, Zare H. Oral health attitudes and behaviour among medical and dental students in Tehran, Iran. Iraqi J Public Health. 2017; 1(2):30-4. doi:10.22317/ijph.09201702.
25. Yildiz S, Dogan B. Self-reported dental health attitudes and behaviour of dental students in Turkey. Eur J Dent. 2011; 5(3):253-9. doi:10.1055/s-0039-1698889.
26. Mekhemar M, Conrad J, Attia S, Dörfer C. Oral Health Attitudes among Preclinical and Clinical Dental Students in Germany. Int J Environ Res Public Health. 2020;17(12):4253. doi:10.3390/ijerph17124253.

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