Original Research

A Comparative Study of Oral Health Attitude and Behavior of Dental and Public Health Students in Ardabil, Iran Using the Hiroshima University-Dental Behavioral Inventory

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Abstract

Aim: This study aimed to evaluate the self-reported oral health attitude and behavior of undergraduate dental and public health students, in Ardabil city, Iran to analyze the differences based on the field of education, gender, and level of education. **Materials and Methods:** This descriptive, cross-sectional study was performed on 195 (119 dental and 76 public health) students using Hiroshima University Dental-Behavioral Inventory (HU-DBI). Demographic questions including gender, educational field, and level of education were added to the questionnaire. The frequency of responses to the questions in the questionnaire was separately analyzed, tabulated, and reported. The effect of educational field and gender and level of education of students on their oral health attitude and behavior was analyzed using the chi-square test and Pearson correlation coefficient. The value of $P < 0.05$ was considered statistically significant. **Results:** There were some differences in oral health behavior between dental and public health students. Public health students showed more frequent use of hard toothbrush ($P = 0.05$) and hard strokes ($P = 0.02$). Overall, there were no statistically significant differences between female and male students ($P > 0.05$). No change in attitude occurred by an increase in the level of education ($P > 0.05$). **Conclusion:** There were some differences in dental health attitude and behavior of dental and public health students.

Keywords: Attitude, Behavior, Oral Health, Student

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Introduction

In September 2016, a new definition of oral health was accepted by the food and drug administration. According to this definition, oral health is multifaceted and includes the ability to speak, smile, smell, taste, touch, chew and swallow, and convey emotions by facial expressions with no pain, discomfort, or craniofacial complex disease. Oral health is considered an important part of general health.[1] Personal care and lifestyle practices constitute an important part of preventive oral health care.[2] Empowering the individuals in this respect is a major goal in community dentistry.[3]

Oral health attitude of oral health-care workers including dentists plays an important role in their dental care behavior and potentially affects their ability to encourage others to practice preventive measures. It also affects the public perception of preventive methods.[2] Public health technicians also play a major role in the implementation of oral health programs in health centers and can significantly promote the oral health of the community.[4] On the contrary, the role of non-dental professionals in general health of individuals is more prominent than dentists.[5]

Dental students and other members of the health-care team acquire adequate knowledge and a positive attitude

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toward oral health during their education and eventually become a role model for their patients in the community.[6] Creation of a positive attitude toward oral health should be emphasized in universities. Thus, it is imperative to assess the attitude of students toward oral health care to determine the efficacy of the current educational programs and curricula of universities in this regard. By doing so, the shortcomings can be identified and eliminated to enhance the knowledge and improve the attitude of the graduates and the public toward oral health directly and indirectly.[7,8]

This study aimed to assess the oral health attitude and behavior of public health and dental students of Ardabil University of Medical Sciences as they play a role in public health. The Hiroshima-University Dental Behavioral Inventory (HU-DBI) standard was used for this evaluation. This valid and reliable questionnaire was designed by Makoto Kawamura in 1987 in Japanese[9] and has been used in many studies.[7-12] It was translated into Farsi by Khami *et al.*[13]

Materials and Methods

Study design

This descriptive, cross-sectional study was performed on all dental and public health students of Ardabil University of Medical Sciences in the academic year 2016–2017 using the HU-DBI.

Sampling method and criteria

All of the students who fully fit the criteria were asked to participate in this study. The inclusion criteria of the study were students studying in the field of dentistry or public health in Ardabil University of Medical Sciences in the academic year 2016–2017 (224 students). Sampling was carried out in a voluntary and full-census manner and no attempt was made to fill the questionnaire by absent students on the day of survey. The incompletely filled or unreadable questionnaires were excluded from the study. A total of 195 students filled out the questionnaire. The percentage of the students participated in the study was 87%.

Study method

This questionnaire was translated into Persian and the validity and reliability of the Persian version of this questionnaire were confirmed by Khami *et al.*[13] Therefore, we did not attempt to translate it into Persian again. Demographic questions including gender, educational field, and level of education (academic year) were added to this questionnaire. At the end of one of the theoretical or practical classes of students, their professors asked them to stay in the class to participate in the survey. One member of the research team who implemented the design of this survey administered the questionnaire among students. After filling the informed consent, students were asked to fill in the self-reported questionnaire and then completed questionnaire were collected. All of the students that participate in the survey in the first stage, filled the informed consent, that was in parsian and include the identity of participants, design and objectives of the study. Students filled informed written consent for participation in the study and publication of the data for research and students that have no consent were excluded from the survey. The questionnaires were filled out anonymously and voluntarily; thus, there were no ethical obstacles. The study was based on a thesis for a Doctor of Dental Surgery (DDS) degree (#42) submitted to Ardabil University of Medical Sciences, School of Dentistry and recheked and approved ethically by the research ethics committee of Ardabil University of Medical Sciences at 30/06/2019. All the procedures have been performed as per the ethical guidelines laid down by Declaration of Helsinki.

Statistical analysis

Data were analyzed using Statistical Package for the Social Sciences software, version 18.0 (IBM, Chicago, Illinois). The frequency of responses to the questions in the questionnaire was separately tabulated and reported. The effect of educational field, level of education, and gender of students on their oral health attitude and behavior was analyzed using the chi-square test. The value of $P < 0.05$ was considered statistically significant.

Results

A total of 195 students filled out the questionnaires. The demographic profile of the study groups is provided

Table 1: Profile of the study groups of students

Characteristics of students	Number	Percentage
Educational field		
Dental students	119	61.0
Public health students	76	39.0
Gender[a]		
Male	86	54.1
Female	73	45.9
Level of education (academic year) for dental students[b]		
2	10	8.4
3	16	13.4
4	11	9.2
5	11	9.2
6	1	0.8
7	20	16.8
8	3	2.5
9	14	11.8
10	15	12.6
Foreign graduates	18	15.1

[a]Thirty-six students did not respond to this question

[b]As public health students did not respond to this question, they were eliminated from this analysis

Table 2: Frequency percentage of students' responses to questions according to their educational field

Item number and description	Dental students			Public health students			*P* value
	Agree	Disagree	Undecided	Agree	Disagree	Undecided	
1. I do not worry much about visiting the dentist	22.7%	50.4%	26.9%	31.6%	32.9%	35.5%	0.055
2. My gum tends to bleed when I brush my teeth	44.5%	32.8%	22.7%	42.1%	39.5%	18.4%	0.591
3. I worry about the color of my teeth	84.0%	8.4%	7.6%	72.4%	15.8%	11.8%	0.138
4. I have noticed some white sticky deposits on my teeth	32.2%	37.3%	29.7%	40.8%	32.9%	26.3%	0.565
5. I use a child sized toothbrush	21.0%	56.3%	22.7%	21.1%	51.3%	27.6%	0.714
6. I think that I cannot help having false teeth when I am old	60.5%	15.1%	24.4%	38.2%	10.5%	51.3%	0.001
7. I am bothered by the color of my gum	22.7%	49.6%	27.7%	46.1%	23.7%	30.3%	0.000
8. I think my teeth are getting worse despite my daily brushing	26.1%	32.8%	41.2%	56.6%	17.1%	26.3%	0.000
9. I brush each of my teeth carefully	59.7%	16.0%	24.4%	53.9%	26.3%	19.7%	0.203
10. I have never been taught professionally how to brush	40.2%	39.3%	20.5%	42.1%	19.7%	38.2%	0.004
11. I think I can clean my teeth well without using tooth-paste	10.9%	51.3%	37.8%	27.6%	47.4%	25.0%	0.007
12. I often check my teeth in a mirror after brushing	74.6%	9.3%	16.1%	48.7%	30.3%	21.1%	0.000
13. I worry about having bad breath	83.5%	7.0%	9.6%	69.7%	14.5%	15.8%	0.075
14. It is impossible to prevent gum disease with tooth-brushing alone	54.2%	18.6%	27.1%	57.9%	17.1%	25.0%	0.882
15. I put off going to dentist until I have a toothache	36.8%	35.9%	27.4%	53.9%	27.6%	18.4%	0.060
16. I have used a dye to see how clean my teeth are	23.7%	49.2%	27.1%	44.0%	36.0%	20.0%	0.013
17. I use a toothbrush which has hard bristles	44.9%	43.2%	11.9%	57.9%	21.1%	21.1%	0.005
18. I do not feel I have brushed well unless I brush with hard strokes	46.2%	40.3%	13.4%	53.9%	22.4%	23.7%	0.020
19. I feel I sometimes take too much time to brush my teeth	44.5%	26.1%	29.4%	59.2%	15.8%	25.0%	0.104
20. I have had my dentist tell me that I brush very well	33.6%	24.4%	42.0%	44.7%	25.0%	30.3%	0.199

Table 3: Percentage of "agree" responses to questions according to gender and based on educational field

Item number and description	Dental students			Public health students		
	Female	Male	P value	Female	Male	P value
1. I do not worry much about visiting the dentist	26.5%	20.35	0.596	29.2%	31.8%	0.370
2. My gum tends to bleed when I brush my teeth	55.1%	34.3%	0.087	41.7%	31.8%	0.472
3. I worry about the color of my teeth	81.6%	84.4%	0901	70.9%	77.2%	0.110
4. I have noticed some white sticky deposits on my teeth	29.1%	36.5%	0.465	45.8%	63.6%	0.312
5. I use a child sized toothbrush	20.4%	20.3%	0.959	29.2%	22.8%	0.826
6. I think that I cannot help having false teeth when I am old	69.4%	53.1%	0.154	16.7%	45.4%	0.074
7. I am bothered by the color of my gum	24.5%	23.4%	0.968	45.9%	40.9%	0.873
8. I think my teeth are getting worse despite my daily brushing	26.5%	25%	0.915	66.7%	72.8%	0.855
9. I brush each of my teeth carefully	57.1%	62.5%	0.716	62.4%	50.0%	0.694
10. I have never been taught professionally how to brush	40.8%	38.7%	0.692	45.8%	41.0%	0.050
11. I think I can clean my teeth well without using toothpaste	16.3%	7.8%	0.352	29.2%	36.4%	0.363
12. I often check my teeth in a mirror after brushing	81.6%	67.2%	0.138	58.3%	45.4%	0.516
13. I worry about having bad breath	83.0%	85.5%	0.708	66.7%	63.6%	0.860
14. It is impossible to prevent gum disease with toothbrushing alone	57.1%	52.4%	0.564	66.7%	59.0%	0.832
15. I put off going to dentist until I have a toothache	34.7%	35.5%	0.210	45.9%	50.0%	0.263
16. I have used a dye to see how clean my teeth are	22.4%	25.4%	0.481	39.1%	40.9%	0.852
17. I use a toothbrush which has hard bristles	44.9%	42.8%	0.916	70.9%	59.0%	0.704
18. I do not feel I have brushed well unless I brush with hard strokes	47.0%	43.7%	0.930	50.0%	50.0%	0.574
19. I feel I sometimes take too much time to brush my teeth	51.0%	42.1%	0.632	75.0%	68.2%	0.343
20. I have had my dentist tell me that I brush very well	38.7%	32.8%	0.557	58.3%	36.4%	0.054

Table 4: Percentage of "agree" responses of dental students to questions according to their level of education

Item number and description	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Foreign graduates	*P* value
1. I do not worry much about visiting the dentist	30%	37.5%	63.6%	27.2%	100.0%	5.0%	0.0%	14.3%	6.7%	16.7%	0.000
2. My gum tends to bleed when I brush my teeth	40.0%	62.5%	45.5%	18.1%	100.0%	45.0%	33.3%	21.4%	60%	50.0%	0.000
3. I worry about the color of my teeth	100.0%	75.0%	81.8%	100.0%	0.0%	80.0%	66.7%	71.4%	93.3%	88.9%	0.029
4. I have noticed some white sticky deposits on my teeth	30.0%	50.0%	20.0%	45.4%	0.0%	20.0%	33.3%	21.4%	26.7%	44.4%	0.050
5. I use a child sized toothbrush	20.0%	25.0%	45.4%	36.4%	0.0%	5.0%	66.7%	7.1%	26.7%	11.1%	0.059
6. I think that I cannot help having false teeth when I am old	70.0%	37.5%	63.6%	63.6%	100.0%	65.0%	100.0%	71.4%	66.7%	44.4%	0.539
7. I am bothered by the color of my gum	20.0%	18.8%	45.4%	27.3%	100.0%	10.0%	66.7%	7.1%	20.0%	27.8%	0.012
8. I think my teeth are getting worse despite my daily brushing	0.0%%	18.8%	54.5%	36.4%	0.0%	30.0%	66.7%	0.0%	20.0%	38.9%	0.000
9. I brush each of my teeth carefully	40.0%	50.0%	45.4%	45.4%	100.0%	70.0%	66.7%	50.0%	60.0%	88.9%	0.035
10. I have never been taught professionally how to brush	30.0%	56.2%	54.5%	50.0%	0.0%	52.6%	33.3%	14.2%	40.0%	27.8%	0.002
11. I think I can clean my teeth well without using toothpaste	0.0%	12.5%	9.1%	9.1%	0.0%	15.0%	0.0%	0.0%	20.0%	16.7%	0.003
12. I often check my teeth in a mirror after brushing	100.0%	68.7%	63.6%	54.5%	100.0%	65.0%	100.0%	84.6%	80.0%	77.8%	0.033
13. I worry about having bad breath	90.0%	75.0%	100.0%	100.0%	0.0%	75.0%	100.0%	84.6%	86.7%	77.8%	0.218
14. It is impossible to prevent gum disease with toothbrushing alone	50.0%	50.0%	81.8%	81.8%	0.0%	15.0%	100.0%	53.8%	53.3%	66.7%	0.001
15. I put off going to dentist until I have a toothache	10.0%	43.8%	27.3%	36.4%	0.0%	40.0%	66.7%	28.6%	61.5%	33.3%	0.010
16. I have used a dye to see how clean my teeth are	10.0%	33.3%	9.1%	36.4%	100.0%	15.0%	100.0%	28.6%	26.7%	11.1%	0.001
17. I use a toothbrush which has hard bristles	30.0%	56.2%	54.5%	20.0%	100.0%	50.0%	100.0%	28.6%	53.3%	38.9%	0.027
18. I do not feel I have brushed well unless I brush with hard strokes	40.0%	43.8%	72.7%	45.4%	0.0%	70.0%	33.3%	21.4%	46.7%	33.3%	0.004
19. I feel I sometimes take too much time to brush my teeth	30.0%	50.0%	81.8%	36.4%	0.0%	25.0%	66.7%	35.7%	40.0%	61.1%	0.000
20. I have had my dentist tell me that I brush very well	20.0%	37.5%	36.3%	9.1%	100.0%	30.0%	33.3%	50.0%	13.3%	55.6%	0.010

in Table 1. Table 2 shows the frequency percentage of students' responses to questions according to their educational field. The analysis of students' responses to each question according to gender using the chi-square test showed that there were no significant differences in this regard [Table 3]. The Pearson correlation coefficient was used to assess the oral health attitude and behavior of students according to their level of education. Every 6 months is determined as one level of education, called a semester. Dental students of the second to tenth semesters were recruited in this study. Also, foreign graduate dentists completing a complementary course in this university were evaluated and analyzed separately [Table 4]. As public health students did not respond to this question, they were eliminated from this analysis.

Discussion

One important responsibility of health-care professionals is to teach proper oral hygiene habits to patients to prevent oral and dental diseases.[11] To serve this purpose, dental students and those studying in other health-care-related fields must acquire evidence-based knowledge about oral health behaviors and attitude. The first step in achieving this goal is to assess the oral health knowledge, attitude, and behavior of students.[6] This study showed that the oral health attitude and behavior of students, particularly public health students, were not favorable, which may indicate poor social background or inefficient educational system. Poor oral health behavior and attitude of dental, medical, and nursing students have also been reported in studies conducted in China,[10] Sudan,[14] and Yemen,[6] which is different from the results of some other studies.[11,15-17] The difference in the efficacy of educational systems and some other factors involved in behavioral change in different communities and cultures may explain this controversy in the results. In a well-designed educational system, students must be able to use the acquired knowledge to improve their attitude and behavior.[6]

Dental students receive more focused instructions on preventive dentistry and periodontal health, and are constantly interacting with patients. Thus, they are expected to have a more positive attitude and behavior with regard to oral health as compared to non-dental students.[6,18] This pattern was seen in responses of students to nine questions in our study.

The students' responses to questions regarding tooth brushing with a toothbrush with hard bristles and hard strokes showed that public health students were not well aware of the adverse effects of hard toothbrush and hard strokes and used outdated brushing techniques.[5] Moreover, difference in response of public health students and dental students to questions regarding the gingival status such as tendency to bleeding during tooth brushing, dissatisfaction with gingival color, and worsening of dental status despite daily tooth brushing indicates that the proper oral hygiene measures are not practiced and there is an obvious need for further instructions on periodontal health. This finding was further confirmed by the students' responses to question 10, declaring that they never received professional instructions on correct tooth brushing.

No significant difference was found in students' responses to 11 questions in our study. These questions were mainly related to attitude of students and reflected the taught topics prior to university education related to personal care and behavior. These findings indicate the presence of relatively positive sensitivity and attitude toward oral health parameters, which can be considered as an opportunity for further education and instruction.

Another important finding with regard to public health students' responses was that a considerable percentage of them said that they would not visit a dentist as long as they have no toothache. Absence of regular dental visits deprives the individuals from encouragement and instructions provided by dentists. Absence of regular dental visits is a common pattern reported by dental students, hygienists, medical students, and engineering students.[6,8,19-21] High cost of dental care services, fear of pain, having a bad dental experience, and inadequate knowledge about dental procedures are among the factors responsible for this finding. A previous study showed a different pattern between Americans and Asians in this respect and this difference was attributed to different behavior and reaction of individuals to health and disease in different communities.[19] In this study, no significant difference was noted in behavior and attitude of male and female dental and public health students, which was different from the results of Peker and Alkurt[21] in Turkey and a meta-analysis conducted in Greece.[22] It is believed that females have better oral health behaviors as they pay more attention to their body and appearance.[21] In the study by Khami *et al.*, on Iranian students, no significant difference was noted between males and females in oral health behaviors (except for a few parameters), which was in good agreement with our findings. This may be due to the fact that both males and females receive equal oral health instructions.

Students often have low level of knowledge when entering the university. By an increase in their academic education, their level of knowledge improves and this knowledge leads to a change in attitude and behavior.[23] In this study, public health students did not mention their academic year; thus, this variable was eliminated from statistical analysis. No significant difference was noted in attitude and behavior of dental students in different academic years for most questions, which was in contrast to the results of some previous studies.[7,15,19,23] Khatoon *et al.*[24] showed that there was no significant difference in dental behavior among nursing students of different years and education program. This finding may indicate the inefficacy of the educational

curriculum in changing the attitude and behavior of students or may reflect other social obstacles against behavioral change. However, our results in this respect were not highly reliable as the number of students in some academic years was too low and this might have affected the results.

Studies showed that different factors, such as personality profile of individuals, can affect their behaviors, for example, oral health behavior.[25] In our study, the sample size was limited and we can say that performing similar studies in different universities of Iran and analysis of the personality factors, educational systems' factors, and socioeconomic factors can be helpful in complete understanding of problem and can be helpful in revision of educational systems if needed.

Conclusion

Considering the results of this study, revision of educational curricula in universities, more efficient instruction of oral health care to non-dental students studying in health-related fields, and use of novel educational systems are recommended to promote the knowledge, attitude, and behavior of students. This can directly and indirectly affect the oral health knowledge, attitude, and behavior of the public. The oral health knowledge and attitude of students, assessed by the HU-DBI, was correlated with their educational field but had no correlation with gender or academic year of students. Both dental and public health students require further instructions on preventive dentistry to reinforce their behaviors.

Ethical policy and institutional review board statement

This study was previously approved by the university research council, the approval of which is equivalent to approval by the research ethics committee of Ardabil University of Medical Sciences on June 30, 2019. All the procedures performed in the study were in accordance with the ethical guidelines laid down by the Declaration of Helsinki (2013).

Data availability statement

The data supporting the findings of this study are available within the article and on request from Haleh Valizadeh Haghi (hvh_haleh@yahoo.com).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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