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ORIGINAL RESEARCH ARTICLE

Assessment of Self-Reported Oral Health Attitudes and Behaviors of a Group of Dental Students using the Hiroshima University - Dental Behavioural Inventory in Turkey

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Abstract

Purpose: Dental students play a crucial role in promoting positive oral health attitudes and behaviors among their relatives and patients. Students' self-reported oral health behaviors may tend to improve as they progress in their dental education. Therefore, this study aimed to assess the difference in self-reported oral health behavior and attitudes of a group of Turkish first and final-year students using the Hiroshima University Dental Behavioural Inventory.

Materials and Methods: In this cross-sectional study, 237 students, including first and final-year, studying at Marmara University Faculty of Dentistry, were invited. Of these, 187 students (108 first, 73 final-year) agreed to participate. Eleven students (7 first-year, 4 final-year) who did not fill out the questionnaire were excluded. The Hiroshima University Dental Behavioural Inventory was used to measure the behaviors and attitudes of the students regarding oral and dental health. Additionally, three items other than HU-DBI were added to the questionnaire. The analysis was conducted using the Chi-square test, and Independent samples t-test.

Results: The responses of 178 students (107 first-year, 69 final-year; 122 female, 54 male) were analyzed. The self-reported oral health behavior scores of the final-year students (6.21 ± 1.54) were statistically higher than the scores of the first-year students (5.03 ± 1.76) ($p < 0.001$). Although the score was slightly higher in females (5.57 ± 1.96) compared to males (5.33 ± 1.27), the difference was not statistically significant ($p = 0.334$).

Conclusions: According to the results of this study, education may have a significant positive effect on self-reported oral health behavior and attitude of dental students. Based on the findings of university-based evaluations as this study, curricula that can gain positive attitudes to students and oral hygiene programs aimed at improving students' self-care should be developed from the early years. However, further studies that also evaluate the effect of possible confounding variables on oral health behavior should be done to clearly highlight the impact of education.

Key words: dental student; education level; health-behavior

Introduction

Oral and dental health is a crucial aspect of general health and a significant determinant of quality of life.[1] The most commonly preferred sources of oral and dental health information are dentists and/or written and visual media.[2] Dentists and healthcare teams convey their knowledge and positive attitude regarding oral health to their patients, which they acquired during their undergraduate education. In other words, as future healthcare providers, dental students become role models for their patients and their families in terms of motivational behavior change skills.[3–5] Increasing the awareness and practices of patients regarding oral health habits constitutes the fundamental framework of preventive dentistry.[4]

Previous studies have reported that dental students' attitudes and thoughts about oral health in the last years of their education

have improved compared to the first years.[6–8] Students with a positive attitude towards oral health in dentistry education are more likely to recommend preventive treatments to patients and contribute to the improvement of the oral health of the community.[9] It has been shown that the knowledge and attitudes of Japanese and Greek dental students in the last years of their education have changed positively compared to the first years.[8] In addition, there are also studies indicating that there is no difference in oral health attitudes between clinical and preclinical students.[2,10] In this context, further research on this topic is still needed in the literature.[11]

Hiroshima University Dental Behavioural Inventory (HU-DBI) is a questionnaire developed by Kawamura in Japanese to examine patients' tooth brushing behaviors and their thoughts on oral health.[12] HU-DBI has been previously translated into English[13], Finnish[14], Chinese[15] and Korean[16], and Turkish[11] for assessment in different cultures. Since the reliability of HU-DBI in test-retests is quite high, it helps not only to understand the patient but also to predict clinical outcomes.[12,16] Cross-cultural studies have presented that self-reported oral health behaviors vary in different cultures.[13,14] Although there are studies evaluating dental students' oral health attitudes and behaviors in the literature[3,8,10,14], there is still a need for research on the attitudes and behaviors of dental students in Turkey.[11] The objective of this study is to evaluate the self-reported oral health attitudes and behavior of a group of first-year and final-year dental students in Turkey using HU-DBI. The study's null hypothesis was that there was no difference between first and final-year students regarding self-reported oral health attitudes and behavior.

Material and Methods

Ethical Approval and Participants

A total of 237 first-year (146) and final-year (91) students studying at Marmara University Faculty of Dentistry were invited to this cross-sectional study. The study complied with the principles of the Declaration of Helsinki for medical research involving human subjects. The study protocol was assessed and approved by the Ethics Committee of the Institute of Health Sciences, Marmara University, with approval number 23.03.2015-5. Using the G*power Version 3.1.9.6 program, the minimum sample size per group was determined as 75, with a confidence level of 95% (1-α), test power of 85% (1-β), and effect size (d) of 493 obtained by dividing the difference in HU-DBI scores between preclinical and clinical students in Baseer et al.'s study[10] by the pooled standard deviation. The participation in the research was voluntary. After the informed consent documents were read, 187 students (108 first-year, and 73 final-year students) who agreed to participate were included in the study. Eleven students (7 first-year, and 4 final-year students) who did not complete the questionnaire were excluded from the study.

Questionnaire

Turkish translation of the HU-DBI questionnaire was used to measure the students' behaviors and attitudes about oral and dental health.[11] The linguistic equivalence of the translated version has been validated[11] and it has been reported that each item has a Cohen's Kappa coefficient of 1.0 for its validity.[2] In addition to the 20-item of HU-DBI questionnaire[14] in dichotomous response format (agree/disagree), 2 demographic items including sex and age, and three more items in dichotomous response format (agree/disagree) from a study by conducted Dogan et al.[11] were added. The items added were about smoking, use of dental floss, and the frequency of tooth brushing. The average time for the face-to-face questionnaire was determined as 10 minutes.

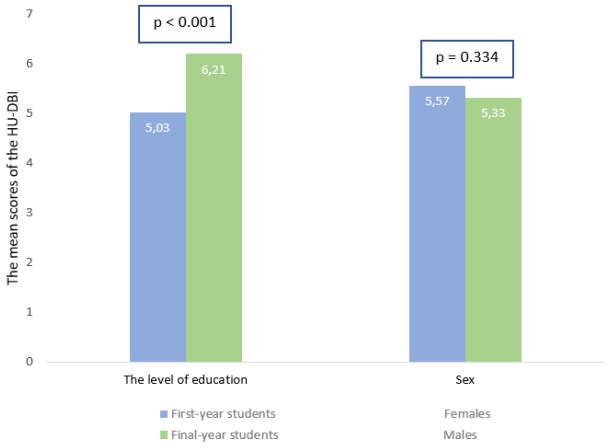

Figure 1. The mean scores of the HU-DBI of the students according to the level of education and sex

Twelve out of the 20 items are used in the score calculation of HU-DBI. In the literature, the HU-DBI score was calculated by including 11 items in some studies[8,13,14] and 12 questions in other studies.[2,10,17] In this study, the 4th item was also scored and a total of 12 items were scored for calculation. Each agree response was scored as zero points, and each disagree response was scored as one point for items 2, 6, 8, 10, 14, and 15. For items 4, 9, 11, 12, 16, and 19, each agree response was scored as one point, and each disagree response was scored as zero. The maximum score of the questionnaire representing the best oral health behavior is 12.[14]

Statistical Analysis

Descriptive statistics were presented as mean ± standard (mean ± SD) deviation for numerical variables; frequencies and percentages for categorical variables. The Pearson Chi-square test with the Continuity Correction and Fisher's Exact Test was performed to analyze categorical variables. The Shapiro-Wilk test was used to evaluate whether the normality of continuous variables and the numerical variables were analyzed using the Independent samples t-test. Data analysis was performed using the SPSS Version 26.0 (IBM Corporation, Chicago, Illinois, United States of America) software. The significance level was considered as $P < 0.05$.

Results

The responses of 107 first-year and 69 final-year students who completed the questionnaire were analyzed. 69.32% (n = 122) of the students included in the evaluation were female, and 30.68% (n = 54) were male. The mean scores of HU-DBI by the level of education and sex are presented in Figure 1. The mean (± SD) HU-DBI score of all participants was 5.50 (± 1.77). The self-reported oral health behavior scores were higher in females (5.57 ± 1.96) than in males (5.33 ± 1.27), but were not statistically different (P = 0.334). The scores of the final-year students (6.21 ± 1.54) were statistically higher than the scores of the first-year students (5.03 ± 1.76) (P < 0.001).

The responses of the students to the questionnaire items were presented in Table 1. The percentage of final-year students who answered that they were professionally trained in toothbrushing was statistically higher (P = 0.001). The responses of the final-year students who stated that they brushed their teeth carefully (P < 0.001) and thought that they could clean their teeth without toothpaste (P = 0.006) were significantly more than the first-year students. More final-year students also reported that they use dental floss every day (P = 0.010), and said their dentists told them they

Table 1. The responses of the students to the questionnaire items according to the level of the education

	First-Year Students (n=107)		Final-Year Students (n=69)		
	Agree n (%)	Disagree n (%)	Agree n (%)	Disagree n (%)	P-value
1. I don't worry much about visiting the dentist	94 (87.9)	13 (12.1)	55 (79.7)	14 (20.3)	0.212†
2. My gums tend to bleed when I brush my teeth	32 (29.9)	75 (70.1)	14 (20.3)	55 (79.7)	0.214†
3. I worry about color of my teeth	46 (43.0)	61 (57.0)	21 (30.4)	48 (69.6)	0.130†
4. I have noticed some white sticky deposits on my teeth	18 (16.8)	89 (83.2)	6 (8.7)	63 (91.3)	0.191†
5. I use a child-sized toothbrush	1 (0.9)	106 (99.1)	4 (5.8)	65 (94.2)	0.152†
6. I think that I cannot help having false teeth when I am old	31 (29.0)	76 (71.0)	14 (20.3)	55 (79.7)	0.266†
7. I am bothered by the color of my gums	16 (15.0)	91 (85.0)	6 (8.7)	63 (91.3)	0.252‡
8. I think my teeth are getting worse despite my daily brushing	37 (34.6)	70 (65.4)	14 (20.3)	55 (79.7)	0.061†
9. I brush each of my teeth carefully	55 (51.4)	52 (48.6)	57 (82.6)	12 (17.4)	<0.001†*
10. I have never been professionally taught how to brush	62 (57.9)	45 (42.1)	22 (31.9)	47 (68.1)	0.001†*
11. I think I can clean my teeth without using toothpaste	7 (6.5)	100 (93.5)	15 (21.7)	54 (78.3)	0.006†*
12. I often check my teeth in a mirror after brushing	105 (98.1)	2 (1.9)	59 (85.5)	10 (14.5)	0.003†*
13. I worry about having bad breath	77 (72.0)	30 (28.0)	54 (78.3)	15 (21.7)	0.448†
14. It is impossible to prevent gum disease with toothbrushing alone	76 (71.0)	31 (29.0)	54 (78.3)	15 (21.7)	0.373†
15. I put off going to the dentist until I have a toothache	64 (59.8)	43 (40.2)	26 (37.7)	43 (62.3)	0.007†*
16. I have used a dye to see how clean my teeth are	1 (0.9)	106 (99.1)	2 (2.9)	67 (97.1)	0.562‡
17. I use a toothbrush which has hard bristles	27 (25.2)	80 (74.8)	7 (10.1)	62 (89.9)	0.023†*
18. I don't feel I've brushed well unless I brush with strong strokes	39 (36.4)	68 (63.6)	11 (15.9)	58 (84.1)	0.006†*
19. I feel I sometimes take too much time to brush my teeth	19 (17.8)	88 (82.2)	19 (27.5)	50 (72.5)	0.176†
20. I have had my dentist tell me that I brush very well	19 (17.8)	88 (82.2)	31 (44.9)	38 (55.1)	<0.001†*
21. I brush my teeth twice daily or more	84 (78.5)	23 (21.5)	56 (81.2)	13 (18.8)	0.814†
22. I use dental floss on regular basis everyday	12 (11.2)	95 (88.8)	19 (27.5)	50 (72.5)	0.010†*
23. I smoke cigarettes	25 (23.4)	82 (76.6)	20 (29.0)	49 (71.0)	0.511†

† The Continuity Correction, ‡ Fisher's Exact test, * P < 0.05

brush very well (P < 0.001). However, first-year students checked their teeth more in the mirror after brushing than final-year students (P = 0.003). Moreover, more first-year students used hard-bristled toothbrushes (P = 0.023) and brushed their teeth with hard strokes (P = 0.006) than final-year students. The percentage of first-year students who postponed visiting the dentist until they had a toothache was also higher than the final-year students (P = 0.007).

The comparison of the 'agree' responses of first and final-year students by sex was shown in Table 2 and Table 3, respectively. In the first-year students, the females responded more agree to the items 'I am bothered by the color of my gums' and 'I brush my teeth twice daily or more'. In the final-year students, the females responded more agree to 'I have had my dentist tell me that I brush very well' and 'I use dental floss regularly everyday' items. However, in final-year students, males responded 'I smoke cigarettes' more than females.

Table 2. The comparison of the agree responses of first-year students by sex

HU-DBI Item no	First-Year Students (n=107)		
	Females (n=70)	Males (n=37)	P-value
1	60 (85.7)	31 (91.9)	0.536†
2	22 (31.4)	10 (27.0)	0.636§
3	30 (42.9)	16 (43.2)	0.969§
4	14 (20.0)	4 (10.8)	0.227§
5	1 (1.4)	0	1.000†
6	18 (25.7)	13 (35.1)	0.307§
7	15 (21.4)	1 (2.7)	0.010§*
8	27 (38.6)	10 (27.0)	0.232§
9	37 (52.9)	18 (48.6)	0.679§
10	40 (57.1)	22 (59.5)	0.817§
11	3 (4.3)	4 (10.8)	0.375†
12	69 (98.6)	36 (97.3)	1.000†
13	48 (68.6)	29 (78.4)	0.283§
14	54 (77.1)	22 (59.5)	0.090§
15	41 (58.6)	23 (62.2)	0.719§
16	1 (1.4)	0	1.000†
17	14 (20.0)	13 (35.1)	0.139§
18	24 (34.3)	15 (40.5)	0.523§
19	11 (15.7)	8 (21.6)	0.447§
20	13 (18.6)	6 (16.2)	0.762§
21	60 (85.7)	24 (64.9)	0.013§*
22	7 (10.0)	5 (13.5)	0.821†
23	12 (17.1)	13 (35.1)	0.064†

§ Pearson Chi-square test, † The Continuity Correction, ‡ Fisher's Exact test, * P < 0.05

Discussion

This study aimed to evaluate the self-reported oral health attitudes and behaviors of a group of first and final-year dental students in Turkey using HU-DBI. The final-year students had a higher self-reported oral health behavior score than the first-year students, thus, the null hypothesis of the study was rejected. As highlighted in previous studies [6,7], final-year students are more susceptible to attaining better oral health. The mean HU-DBI score of Turkish first-year students in this study was lower than the Indian and Croatian first-year students in previous studies [6,18] and higher than the Jordanian, Chinese, and British first-year students. [7,19] However, the HU-DBI score of final-year students is lower than Indian, and Croatian final-year students [6,18], as well as Chinese and British final-year students [7], and higher than Jordanian final-year students. [19] However, there was no difference in the HU-DBI score in this study between the sexes. This finding is similar to Chinese, Finnish, and Indian dental students. [14,20]

Table 3. The comparison of the agree responses of final-year students by sex

HU-DBI Item no	Final-Year Students (n=69)		
	Females (n=52)	Males (n=17)	P-value
1	39 (75.0)	16 (94.1)	0.176†
2	9 (17.3)	5 (29.4)	0.465‡
3	14 (26.9)	7 (41.2)	0.268§
4	3 (5.8)	3 (17.6)	0.311†
5	4 (7.7)	0	0.562†
6	11 (21.2)	3 (19.2)	0.972§
7	6 (11.5)	0	0.332†
8	10 (19.2)	4 (23.5)	0.972†
9	44 (84.6)	13 (76.5)	0.689†
10	15 (28.8)	7 (41.2)	0.344§
11	13 (25.0)	2 (11.8)	0.418†
12	45 (86.5)	14 (82.4)	0.977†
13	38 (73.1)	16 (94.1)	0.137†
14	39 (75.0)	15 (88.2)	0.418†
15	18 (34.6)	8 (47.1)	0.358§
16	2 (3.8)	0	1.000†
17	7 (13.5)	0	0.257†
18	9 (17.3)	2 (11.8)	0.873†
19	15 (28.8)	4 (23.5)	0.910†
20	27 (51.9)	4 (23.5)	0.041§*
21	45 (86.5)	11 (64.7)	0.101†
22	18 (34.6)	1 (5.9)	0.047†*
23	10 (19.2)	10 (58.8)	0.005†*

§ Pearson Chi-square test, † The Continuity Correction, ‡ Fisher's Exact test, * P < 0.05

In this study, similar to Pacauskiene et al.'s study[21], the percentage of students brushing their teeth carefully in the last years of their education was higher than at the beginning of their education. This finding might show that the awareness of students increases with dental education. On the other hand, Sato et al.[22] and Dagli et al.[23] reported no statistically significant difference between first and final-year students in this item. In addition, in line with the finding that students with higher education levels brush their teeth more carefully, these students checked less in the mirror after brushing. This might be related to the increase in their self-confidence due to careful brushing and the decrease in their need for control.

In the current study, it was found that the percentage of students who told that they were not professionally taught how to brush their teeth was significantly lower in students with higher education levels. Although this finding was similar in the studies of Sato et al.[22] and Yildiz et al.[2], the number of students who stated that they were not educated at both education levels were less than in this study. It was also determined that the rate of postponing dental treatments decreased as a result of the increase in education level, and these findings were similar to the studies of Yildiz et al.[2] and Peker et al.[24] In addition, another result of the increase in the education level of the students and the professional brushing training might be the decrease in the proportion of students who brush their teeth with hard-bristled brushes and hard strokes, as in the present study. The present finding is similar to the study evaluating Peruvian dental students.[22] However, Peker et al.'s study[24] evaluating the self-reported oral health behavior of a group of Turkish dental students, reported that there was no statistically significant difference in the students' hard brushing and brushing habits according to the year of education.

In previous studies, it has been reported that the percentage of regular tooth brushing and bothered by the color of the gums in females are higher than in males.[25,26] In this study, it was observed that while the rate of regular tooth brushing and bothered with the color of the gums of the first-year female students was higher than the rate of the males, there was no gender difference in the final-year students. Females without dental education pay more attention to their teeth, but education might reduce the differences by sex.

The proportion of smoking among the students included in this study was found to be higher in male students in line with previous studies.[19,27] The higher proportion of smoking among male students could be attributed to various factors, such as social norms, peer influence, and targeted tobacco marketing strategies aimed at this demographic. These findings highlight the importance of implementing targeted smoking prevention and cessation interventions specifically.

Participants in this study had an average HU-DBI score of 5.5, which was lower than that of Greek, Japanese, and Finnish dental students.[8,14] Although not all years of dental education were included in the study, the average score of first and final-year students in the present study was also lower than those of first and final-year students of Japanese and Finnish students.[28] One limitation of the study was that only the first and final-year students were included in the present study. Another limitation of the study was that it was a single-centered study. A multi-center study conducted through random sampling from different regions of Turkey would allow for increased sample size and heterogeneity, resulting in a higher scientific validity and robustness of the study findings. Furthermore, to clearly highlight the impact of education on oral health behavior, further studies should be conducted that also evaluate the effect of possible confounding variables. This would provide a more comprehensive understanding of the factors influencing oral health behaviors and help establish stronger causal relationships.

Oral health behaviors may differ in different countries due to the curricula of dental schools and the diversity of cultures.[25,29] Although it differs according to culture, the positive attitude toward oral health reflects their awareness of the strength of preventing these diseases and their determination to improve patients' oral health.[8,23]

Conclusion

In conclusion, the students with higher dental education levels scored higher in self-reported oral health behavior. There were differences between Turkish dental students and other students from different countries when the findings were compared with the literature. The presence of students' education as well as changes in curricula may be causing these differences. For this reason, such studies can be carried out on a university basis to make the oral and dental health behavior of dental students positive and to improve the oral health of the community and the insufficient points in the curriculum can be strengthened.

Author Contributions

Study Idea / Hypothesis: B.S.Y., M.S, N.B., B.K. Study Design: B.S.Y., M.S, B.K. Data Collection: M.S. Literature Review: B.S.Y., M.S., N.B., B.K. Analysis and/or Interpretation of Results: B.S.Y., N.B. Article Writing: B.S.Y., M.S., N.B., B.K. Critical Review: B.S.Y., B.K.

Conflict of Interest

Authors declare that they have no conflict of interest.

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