European Annals of Dental Sciences
Official Publication of Ankara University, Faculty of Dentistry

EADS, 2024, 51 (3), 155–161

e-ISSN : 2757-6744
doi : 10.52037/eads.2024.0025

Article Received/Accepted : August, 13 2024 / November, 5 2024
Ethical Committee No : 2022/241

ORIGINAL RESEARCH ARTICLE

Oral Health Knowledge, Attitudes, and Behaviors in Dental and Oral Health Program Students: A Descriptive Cross-Sectional Study

Zeynep Taştan Eroğlu [1, *] and Tuğce Yıldız [2]

[1]Necmettin Erbakan University, Dentistry Faculty, Department of Periodontology, Konya, Turkey and [2]Necmettin Erbakan University, Dentistry Faculty, Konya, Turkey

[*]Corresponding Author; dt.zeyneptastan@gmail.com

Abstract

Purpose: The objective of this study was to assess the oral health attitudes, knowledge, and behaviors of students in dental and oral and dental health programs before and after periodontology clinical training, and to investigate the correlations between these variables and sociodemographic factors.
Materials and Methods: In this study conducted at the end of the spring semester in 2022, we utilized the Turkish version of the Hiroshima University Dental Behavioral Inventory (HU-DBI). Sociodemographic data, oral hygiene practices, and smoking habits were collected through a questionnaire. Higher HU-DBI scores reflect improved oral health attitudes and behaviors. Non-normally distributed data were analyzed with Mann-Whitney U and Kruskal-Wallis H tests, and categorical data with Pearson's chi-square and Bonferroni Z tests, using $p < 0.05$ for significance.
Results: This study involved 295 students: 151 preclinical dental, 76 clinical dental, 34 preclinical, and 34 clinical oral and dental health program students. In all groups, female participants were more numerous than male participants ($p < 0.05$). Across all participants, females had higher overall HU-DBI scores ($p < 0.05$). Clinical dental students had significantly higher HU-DBI scores (7.25 ± 1.63) than preclinical dental students (6 ± 1.57). No significant difference was found between preclinical (6.38 ± 1.41) and clinical oral and dental health program students (6.62 ± 2.09). There was no statistically significant difference in the overall HU-DBI scores between oral and dental health program students and dental students. No significant correlations were found with other sociodemographic factors, such as parental education, alcohol, or cigarette use.
Conclusions: Integrating preventive dentistry components into the early-stage curriculum may facilitate an earlier enhancement of fundamental knowledge and awareness among future dentists and auxiliary personnel in the oral and dental health field, irrespective of sociodemographic factors.

Key words: dental student; education; health; knowledge; oral hygiene

Introduction

Maintaining oral health is a crucial aspect of an individual's overall health and general welfare. However, the prevalence of oral diseases remains a significant societal concern. The state of the oral cavity is influenced by an individual's attitudes toward oral health. The behavior and attitudes of oral health care providers towards their oral health can potentially impact their ability to deliver effective oral health care, thus influencing the oral health outcomes of their patients. Dental care providers must exemplify proper oral hygiene practices by upholding their oral health and serving as role models for their patients. It is reasonable to assert that dental students undergo a process of developing and adapting their oral health-related behaviors and attitudes throughout their undergraduate education. This development has the potential to impact the oral health of their future patients.[1]

The Hiroshima University-Dental Behavioral Inventory (HU-DBI), developed by Kawamura, was designed to evaluate individuals' oral health behaviors and attitudes, particularly concerning tooth brushing. This inventory comprises twenty dichotomous responses, categorized as agree or disagree.[2] The HU-DBI demonstrates favorable test-retest reliability, rendering it valuable not only for comprehending patients but also for prognosticating clinical outcomes.[2,3] In contrast, the utilization of this assessment

How to cite: Tastan Eroglu Z, Yildiz T. Oral Health Knowledge, Attitudes, and Behaviors in Dental and Oral Health Program Students: A Descriptive Cross-Sectional Study. EADS. 2024;51(3): 155-161

revealed notable disparities in oral health practices across nations, primarily attributable to variations in health education systems and cultural distinctions.[4–8] Furthermore, the research findings indicate a positive correlation between the level of education and improvements in oral health behavior and attitudes.[9–12]

In many dentistry faculties in Turkey, students of oral and dental health programs, who are educated to be auxiliary personnel in the oral and dental health field, receive clinical education alongside dental students. The heightened level of awareness exhibited by oral and dental health program students, who play a crucial role in delivering oral health services alongside dentists, is related to the order and continuity of the clinical workflow. A healthy continuation of the workflow necessitates teamwork and the sharing of responsibilities among all dental staff working alongside the dentist. The training of the staff who assist the dentist at the patient's bedside will have a favorable impact on the overall quality of service.[13]

Nevertheless, a comprehensive investigation assessing the oral health attitudes and behaviors of oral and dental health program students has not yet been conducted.

This study constitutes the first evaluation of oral health-related attitudes and behaviors among dental students and oral and dental health program students, conducted both before and after periodontology clinical training. Moreover, the objective of this study is to assess the possible associations between these attitudes and behaviors and sociodemographic factors.

Material and Methods

Study design and participants

This study was conducted in the Department of Periodontology from February to May 2023. The study, approved by the Ethics Committee for Non-Pharmaceutical and Medical Device Clinical Research (Decision no: 2022/241), was conducted in compliance with the protocols outlined in the 1975 Declaration of Helsinki, as amended in 2013. All subjects who volunteered to participate in the study provided written and verbal consent. This study was conducted and reported using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) standards for cross-sectional studies.[14]

This cross-sectional study comprised all students who agreed to participate in the study and were enrolled in the spring semester of the 2022-2023 academic year at the Faculty of Dentistry and Oral and Dental Health Program. A total of 295 students consented to participate in the research study. The participants were assessed by categorizing them into four distinct groups according to their educational background and clinical involvement: (1) preclinical dental students, (2) clinical dental students, (3) preclinical oral and dental health program students, and (4) clinical oral and dental health program students. During the completion of the questionnaire, the students were instructed to remain seated in the classroom if they were willing to participate. The students were provided with an explanation of the study's goal, and a signed agreement was obtained from each individual before they filled out the questionnaire.

Based on the outcomes of the nationwide examination for university admissions, students are entitled to enroll in the Faculty of Dentistry and Oral and Dental Health Program. The dentistry curriculum spans five years, with the initial three years dedicated to preclinical training and the subsequent two years focused on clinical training. During the preclinical phase of their education, students are required to participate in basic science lectures and engage in laboratory courses. From the fourth year onwards, students are responsible for administering care to patients. Periodontics theoretical training is provided in the third and fourth years. The completion of clinical training occurs at the end of the fifth year.

The two-year curriculum of the oral and dental health program, which trains assistant personnel for dentists and does not authorize intraoral applications on patients (unlike dental hygienists), is preclinical in the first year and clinical in the second year. By the end of the first year, students will have completed the basic theoretical periodontology courses.

Questionnaire instrument

The questionnaire was used to collect information about the sociodemographic characteristics of the participants, including gender, parental education level, and place of residence. Additionally, the participants were asked about their smoking and oral hygiene habits.

Evaluation of oral health behaviors and attitudes of individuals

The oral health behaviors and attitudes of the individuals participating in the study were measured using the HU-DBI questionnaire translated into Turkish by Yıldız et al.[15]. The HU-DBI is a questionnaire consisting of 20 questions about tooth brushing habits. When determining the HU-DBI scores, one point was given for each response that agreed with items 4, 9, 11, 12, 16, and 19, and one point was given for each response that disagreed with items 2, 6, 8, 10, 14, and 15. The highest possible HU-DBI score was 12, with higher levels suggesting superior oral health behavior[2]. The score for oral health knowledge was influenced by items 2, 8, 10, 15, and 19. Similarly, the score for oral health attitudes was influenced by items 6, 11, and 14. Lastly, the score for oral health behaviors was influenced by items 4, 9, 12, and 16.[16]

Statistical analysis

Considering the HU-DBI results of the reference study, this study was completed with 295 participants with 95% confidence ($1-\alpha$), f = 0.351 effect size, and as a result of post hoc power analysis, the power of the test ($1-\beta$) was obtained as 100%.[17] The data were examined using statistical software (SPSS version 23, IBM, Armonk, NY). The normality of the data was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The Mann-Whitney U test was used to compare pairs of non-normally distributed data. Three or more categories of non-normally distributed data were compared using the Kruskal-Wallis H test, and multiple comparisons were examined using Dunn's test. Pearson's chi-square test was used to compare categorical data, and the Bonferroni corrected Z test was used to examine multiple comparisons. The analysis results were reported in the form of frequency (percentages) for categorical variables, means ± standard deviations for quantitative variables, and medians (minima – maxima) for quantitative variables. The study accepted a statistical significance value of $p < 0.05$.

Results

Sociodemographic data

The study was completed with the participation of a total of 295 students. The distribution of students across different levels of dentistry and oral and dental health programs was as follows: 151 preclinical dental students (1st, 2nd, and 3rd level) constituted 51.1% of the total, 76 clinical dental students (4th and 5th level) accounted for 25.7%, 34 preclinical oral and dental health program students (1st grade) included 11.4%, and 34 clinical oral and dental health program students (2nd grade) also constituted 11.4% of the total student population. The mean ages of the preclinical dental students, clinical dental students, preclinical oral and dental health program

Table 1. The distribution of demographic characteristics by educational backgrounds

Participants		Dental students n (%)[X]	Oral and dental health program students n (%)[X]	P value
Gender	Male	71 (31.2)	10 (14.7)	0.001*
	Female	156 (68.7)	58 (85.2)	
Place of Residence	Urban	213 (93.8)	58 (85.2)	0.001*
	Semi-rural	11 (4.8)	5 (7.3)	
	Rural	3 (1.3)	5 (7.3)	
Mother Education Level	Illiterate/ Primary school	84 (36.9)a	42 (61.7)b	0.001*
	Secondary school	27 (11.8)a	19 (32.7)b	
	High school	59 (25.9)a	5 (7.3)b	
	University	57 (25.1)a	2 (2.9)b	
Father Education Level	Illiterate/ Primary school	42 (18.5)a	29 (42.6)b	0.001*
	Secondary school	25 (11.0)	14 20.5)	
	High school	42 (18.5)	18 (26.4)	
	University	118 (51.9)a	7 (10.2)b	

*p<0.05, chi-square test, there is no difference between groups with the same letter

students, and clinical oral and dental health program students were 20.52, 23.03, 19.53, and 20.85 years, respectively.

Table 1 presents the distribution of the students' demographic characteristics by educational background. Within each group, the number of female participants was statistically significantly higher compared to the number of male participants ($p < 0.05$). The educational levels of the mothers of dental students, as well as the educational levels of their fathers and the rates of urbanization, exhibited statistically significant differences when compared to those of oral and dental health program students ($p < 0.05$).

Evaluation of HU-DBI responses

Table 2 displays the HU-DBI statements and the percentage distribution of students who expressed agreement and disagreement with the statements, categorized by group. Notable differences were observed in 6 items (3, 10, 11, 14, 15, and 20) between groups. No significant difference was found between the groups in terms of alcohol use, daily tooth brushing, or dental flossing habits.

Evaluation of HU-DBI scores

The overall HU-DBI scores indicated the highest scores in the clinical dental student group and the lowest in the preclinical dental student group (Table 3). The differences in the overall HU-DBI scores, as well as the HU-DBI knowledge and attitudes indexes between clinical dental students and preclinical dental students, were statistically significant. There was no statistically significant difference in the overall HU-DBI scores or the HU-DBI knowledge, attitudes, and behavior indexes between preclinical oral and dental health program students and clinical dental students, or between these two groups and the other groups. In the HU-DBI behavior index, no significant difference was found among any of the groups.

HU-DBI scores by gender, socio-demographic status, general health behavior, oral hygiene habits

Female students had a significantly higher overall HU-DBI score (6.53 ± 1.68) than male students (6.08 ± 1.85) ($p<0.05$). Students who reported regularly attending dental check-ups (6.92±1.71) and brushing their teeth at least twice a day (2.04±0.65) had significantly higher overall HU-DBI scores ($p<0.05$). The students who consistently reported engaging in daily flossing had a significantly higher overall HU-DBI (6.74 ± 1.54) and knowledge index score (3.28 ± 1.08) ($p < 0.05$). There was no significant relationship between HU-DBI scores and other variables related to sociodemographic status, alcohol, and cigarette use ($p > 0.05$).

Discussion

This study aimed to assess the oral and dental health behaviors and attitudes of students enrolled in dentistry and oral and dental health programs. The results revealed that clinical dental students (7.25 ± 1.63) had the highest HU-DBI score. The overall HU-DBI scores of clinical dental students were significantly higher than those of preclinical dental students (6 ± 1.57). In our study, both dental students and oral and dental health program students were predominantly female. Previous studies have found that the increasing number of female dental students is consistent with global trends.[18–21] This trend is also observable among oral and dental health program students, aligning with previous research conducted on dental hygienist students, a similar professional group.[22]

These findings, indicating that the educational attainment of dental students' parents was considerably higher than that of oral and dental health students' parents, may suggest that dental students tend to come from more educated families. These results are similar to the findings of many other studies.[19,21–23]

Previous research utilizing the HU-DBI scoring system has consistently shown that clinical dental students tend to have higher scores than their preclinical counterparts. This trend has been observed in several countries, including Lithuania, Poland, Croatia, Romania, Jordan, and Turkey.[12,15,24–26] The widely accepted hypothesis regarding this difference suggests that dental education enhances students' knowledge of oral health, which positively influences their attitudes and behaviors.[16] In a study conducted in Estonia, no significant difference was observed between the overall HU-DBI scores of preclinical and clinical dental students.[27] In the present study, similar to many other studies, the overall HU-DBI scores of dental clinical students were higher than those of preclinical students.[12,15,24–26] Cultural disparities between Western and Eastern societies seem to significantly impact students' attitudes and perceptions regarding oral health behavior. As dental students enter the clinical setting and continue their periodontology education, there is a noticeable improvement in their oral health-related knowledge and attitudes, likely due to increased educational attainment and direct patient interactions.

Kawamura et al.[4] evaluated HU-DBI scores among dental hygiene students, finding that second-grade students had significantly higher scores than first-grade students. In contrast, the present study found no significant difference between the HU-DBI scores of first and second-year students in the oral and dental health program. This could be due to the curriculum, as students complete basic periodontology training by the end of their first year.

Table 2. Students responses to the Hiroshima University Dental Behavior Inventory (HU-DBI)

	Preclinical dental students[X]	Clinical dental students[X]	Preclinical oral and dental health program students[X]	Clinical oral and dental health program students[X]	P*
1. I don't worry much about visiting the dentist					
Agree	108 (71.5)	48 (63.2)	24 (70.6)	30 (88.2)	0.200
Disagree	43 (28.5)	28 (36.8)	10 (29.4)	4 (11.8)	
2. My gums tend to bleed when I brush my teeth					
Agree	27 (17.9)	7 (9.2)	5 (14.7)	7 (20.6)	0.108
Disagree	124 (82.1)	69 (90.8)	29 (85.3)	27 (79.4)	
3. I worry about the color of my teeth					
Agree	73 (48.3)a	18 (23.7)b	9 (26.5)ab	13 (38.2)ab	0.002
Disagree	78 (51.7)	58 (76.3)	25 (73.5)	21 (61.8)	
4. I have noticed some white sticky deposits on my teeth					
Agree	41 (27.2)	14 (18.4)	6 (17.6)	4 (11.8)	0.095
Disagree	110 (72.8)	62 (81.6)	28 (82.4)	30 (88.2)	
5. I use a child sized toothbrush					
Agree	15 (9.9)	11 (14.5)	5 (14.7)	4 (11.8)	0.582
Disagree	136 (90.1)	65 (85.5)	29 (85.3)	30 (88.2)	
6. I think that I cannot help having false teeth when I am old					
Agree	19 (12.6)	7 (9.2)	3 (8.8)	6 (17.6)	0.065
Disagree	132 (87.4)	69 (90.8)	31 (91.2)	28 (82.4)	
7. I am bothered by the color of my gums					
Agree	27 (17.9)	6 (7.9)	5 (14.7)	6 (17.6)	0.070
Disagree	124 (82.1)	70 (92.1)	29 (85.3)	28 (82.4)	
8. I think my teeth are getting worse despite my daily brushing					
Agree	38 (25.2)	10 (13.2)	3 (8.8)	7 (20.6)	0.085
Disagree	113 (74.8)	66 (86.8)	31 (91.2)	27 (79.4)	
9.I brush each of my teeth carefully					
Agree	106 (70.2)	61 (80.3)	29 (85.3)	29 (85.3)	0.143
Disagree	45 (29.8)	15 (19.7)	5 (14.7)	5 (14.7)	
10. I have never been taught professionally how to brush					
Agree	58 (38.4)a	15 (19.7)b	9 (26.5)ab	10 (29.4)ab	0.033
Disagree	93 (61.6)	61 (80.3)	25 (73.5)	24 (70.6)	
11. I think I can clean my teeth well without using toothpaste					
Agree	23 (15.2)ac	31 (40.8)b	4 (11.8)c	8 (23.5)abc	<0.001
Disagree	128 (84.8)	45 (59.2)	30 (88.2)	26 (76.5)	
12. I often check my teeth in a mirror after brushing					
Agree	140 (92.7)	69 (90.8)	33 (97.1)	33 (97.1)	0.569
Disagree	11 (7.3)	7 (9.2)	1 (2.9)	1 (2.9)	
13. I worry about having bad breath					
Agree	119 (78.8)	57 (75)	21 (61.8)	26 (76.5)	0.325
Disagree	32 (21.2)	19 (25)		8 (23.5)	
14. It is impossible to prevent gum disease with toothbrushing alone					
Agree	117 (77.5)a	39 (51.3)b	24 (70.6)ab	23 (67.6)ab	0.001
Disagree	34 (22.5)	37 (48.7)	10 (29.4)	11 (32.4)	
15. I put off going to the dentist until I have a toothache					
Agree	81 (53.6)ac	24 (31.6)b	23 (67.6)c	11 (32.4)ab	<0.001
Disagree	70 (46.4)	52 (68.4)	11 (32.4)	23 (67.6)	
16. I have used a dye to see how clean my teeth are					
Agree	3 (2)	2 (2.6)	2 (5.9)	1 (2.9)	0.807
Disagree	148 (98)	74 (97.4)	32 (94.1)	33 (97.1)	
17. I use a toothbrush which has hard bristles					
Agree	34 (22.5)	12 (15.8)	5 (14.7)	9 (26.5)	0.474
Disagree	117 (77.5)	64 (84.2)	29 (85.3)	25 (73.5)	
18. I don't feel I've brushed well unless I brush with strong strokes					
Agree	46 (30.5)	15 (19.7)	9 (26.5)	13 (38.2)	0.290
Disagree	105 (69.5)	61 (80.3)	25 (73.5)	21 (61.8)	
19. I feel I sometimes take too much time to brush my teeth					
Agree	27 (17.9)	20 (26.3)	6 (17.6)	10 (29.4)	0.425
Disagree	124 (82.1)	56 (73.7)	28 (82.4)	24 (70.6)	

20. I have had my dentist tell me that I brush very well					
Agree	47 (31.1)a	48 (63.2)b	15 (44.1)ab	19 (55.9)ab	<0.001
Disagree	104 (68.9)	28 (36.8)	19 (55.9)	15 (44.1)	
Other items evaluated the health behaviors and oral hygiene behaviors of students.					
I drink alcohol atleast once a week					
Agree	2 (1.3)	3 (3.9)	1 (2.9)	0 (0)	0.444
Disagree	149 (98.7)	73 (96.1)	33 (97.1)	34 (100)	
I smoke at least once a week					
Agree	14 (9.3)b	17 (22.4)a	6 (17.6)ab	9 (26.5)a	0.015
Disagree	137 (90.7)	59 (77.6)	28 (82.4)	25 (73.5)	
I visit the dentist at least once a year for a check-up					
Agree	82 (54.3)ac	59 (77.6)b	11 (32.4)c	20 (58.8)abc	<0.001
Disagree	69 (45.7)	17 (22.4)	23 (67.6)	14 (41.2)	
I floss regularly every day					
Agree	64 (42.4)	40 (52.6)	10 (29.4)	11 (32.4)	0.135
Disagree	87 (57.6)	36 (47.4)	24 (70.6)	23 (67.6)	
I brush my teeth twiceor more a day					
Agree	117 (77.5	57 (75)	25 (73.5)	30 (88.2)	0.130
Disagree	34 (22.5)	19 (25)	9 (26.5)	4 (11.8)	

*p<0.05, chi-square test. There is no difference between groups with the same letter.

In the dental curriculum, basic periodontology training continues into the clinical phase. However, in the curriculum of the oral and dental health program, this training is completed by the end of the first year. This difference may explain why preclinical dental students have significantly lower HU-DBI scores compared to other groups, while no significant difference is observed among the other groups.

The comparison of the HU-DBI knowledge, behavior, and attitude indexes between clinical and preclinical dental students showed a significant difference in the HU-DBI knowledge and attitude index, with clinical students exhibiting a higher score. However, no significant difference was found in the behavior index. A study was conducted on dental students in Germany, which revealed a notable difference only in the behavioral index, favoring clinical dental students.[20] Conversely, another investigation conducted on dental students in Estonia did not identify any significant distinction between clinical and preclinical dental students.[27]

In the present study, a comparison was made between the responses of clinical and preclinical dental students to HU-DBI questions. The findings revealed that a significantly higher proportion of preclinical dental students expressed concerns regarding the color of their teeth, reported not receiving prior instructions on proper tooth brushing techniques, relied on toothpaste for effective teeth cleaning, believed that gingival health could not be adequately maintained through brushing alone, visited the dentist only because of pain, and had not received prior affirmations from a dentist regarding their brushing proficiency. These differences in responses may be attributable to the completion of basic periodontology training and clinical training.

When the oral and dental health students were compared, it was seen that there was only a difference in item 15. More oral and dental health preclinical students than clinic students stated that they only go to the dentist when they have pain.

This study did not find any statistically significant difference in the HU-DBI scores between participants who consumed alcohol at least once a week and those who did not, consistent with the findings of Riad et al.[20] In the present study, 13.7% of all participants and 13.6% of dentistry students smoked at least once a week. This result is lower than the rate of smokers in previous studies conducted on dentistry students in Turkey.[15,28,29] However, a similar result was obtained from a study conducted in Estonia.[27] In the same previous study, the HU-DBI scores of smokers were significantly lower than those of nonsmokers. In contrast to the findings of the previous study, this study did not observe a significant effect of smoking on HU-DBI scores.

Previous studies have shown a positive correlation between parents' educational level and their children's oral hygiene practices.[30,31] Children with more educated parents tend to have better oral hygiene habits, indicating the significant influence of parental education and knowledge on developing these habits. However, in the present study, no statistically significant difference in HU-DBI scores was found based on the educational level of students' parents (p>0.05). Given that the study included dental and oral and dental health program students who were already educated about oral health, it can be inferred that their HU-DBI scores were not affected by their parents' educational background.

There is a commonly held belief that females have a greater propensity for attending to their physical well-being and maintaining their looks compared to males. A similar expectation is also anticipated about dental appointments and behaviors related to oral health. According to the study conducted by Ostberg et al.[32], it was observed that adolescent girls between the ages of thirteen and eighteen had superior performance on behavioral assessments and displayed a greater inclination toward oral health compared to boys within the same age group. Although it is an expected result that female students have higher HU-DBI scores, some studies do not find a relationship between HU-DBI scores and gender.[20,24,27] In contrast, a study in Romania revealed behavioral and attitude differences between genders among dental students.[25] In the present study, similar to this research, female students' overall HU-DBI scores and HU-DBI knowledge indexes were significantly higher than male students.

The present study aimed to assess dental students and oral and dental health program students in terms of oral health attitudes, knowledge, and behaviors. Additionally, the study attempted to identify the variables that may influence these factors. To our knowledge, no other study has evaluated the oral health knowledge, attitudes, and behaviors of oral and dental health program students before and after periodontology clinical training. Furthermore, there is a lack of investigation into the potential impact of variables such as urbanization and family education level on these outcomes.

The limitations of the study include the lack of a baseline evaluation before the initiation of basic periodontology training and the absence of a separate analysis of HU-DBI scores by class year among dental students. Additionally, the single-center design may restrict

Table 3. Comparison of oral health knowledge, attitudes, behaviors and overall HU-DBI score by the groups

		Preclinical dental students[X]	Clinical dental students[X]	Preclinical oral and dental health program students[X]	Clinical oral and dental health program students[X]	p*
Overall HU-DBI score	Mean ± SD Median(min-max)	6 ± 1.57 6 (2 - 9)a	7.25 ± 1.63 7 (3 - 10)b	6.38 ± 1.41 6.5 (2 - 11)ab	6.62 ± 2.09 7 (2 - 10)ab	<0.001
HU-DBI knowledge index	Mean ± SD Median (min-max)	2.83 ± 1.11 3 (0 - 5)a	3.53 ± 1.04 4 (1 - 5)b	3 ± 1.04 3 (0 - 5)ab	3.26 ± 1.33 4 (0 - 5)ab	<0.001
HU-DBI attitudes indexes	Mean ± SD Median(min-max)	1.25 ± 0.62 1 (0 - 3)b	1.8 ± 0.88 2 (0 - 3)a	1.32 ± 0.53 1 (0 - 2)ab	1.38 ± 0.89 1 (0 - 3)ab	<0.001
HU-DBI behaviour index	Mean ± SD Median(min-max)	1.92 ± 0.7 2 (0 - 4)	1.92 ± 0.61 2 (0 - 3)	2.06 ± 0.6 2 (1 - 4)	1.97 ± 0.52 2 (1 - 3)	0.963

* p<0.05, Kruskal-Wallis H test. There is no difference between groups with the same letter.

the generalizability of the findings to other institutions. The cross-sectional approach further limits the ability to establish causality or assess changes over time. Moreover, reliance on self-reported data introduces the potential for response bias, as participants may overreport positive behaviors.

Conclusion

This study found that clinical dental students had higher oral health scores than preclinical dental students, underscoring the importance of introducing elements of preventive dentistry into the Turkish dental curriculum at an earlier stage to enhance the foundational knowledge and awareness of future dental professionals. However, there was no significant difference between clinical and preclinical oral and dental health program students. Female students also exhibited higher scores. This research provides insights into factors influencing dental and oral health attitudes among students and suggests the need for further investigation into the effectiveness of oral health education programs.

Acknowledgements

This study was presented as an oral presentation at the Necmettin Erbakan University 3rd International Dentistry Congress (May 24-26, 2024). We would like to thank Dr. Naci Murat, the founder of https://eistatistik.com, for the statistical analyses of our data.

Financial Support

None.

Author Contributions

Conceived the concept and the protocol : Z.T.E.
Carried out the collection of data : T.Y.
Responsible for the supervision, data interpretation and critical editing : Z.T.E
Wrote the draft : Z.T.E
Contributed to the critical revision : All Authors

Conflict of Interest

The authors declare that they have no competing interests.

Authors' ORCID(s)

Z.T.E. 0000-0002-0003-2120
T.Y. 0009-0008-4973-0772

References

1. Dogan B. Differences in oral health behavior and attitudes between dental and nursing students. Clin Exp Health Sci. 2013;3(1):34. doi:10.5455/musbed.20130102082831.
2. Kawamura M. Dental behavioral science. The relationship between perceptions of oral health and oral status in adults. Hiroshima Daigaku Shigaku Zasshi. 1988;20(2):273–286.
3. 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;38(5):381–388. doi:10.1111/j.1834-7819.1993.tb05520.x.
4. Kawamura M, Honkala E, Widstrom E, Komabayashi T. Cross-cultural differences of self-reported oral health behaviour in Japanese and Finnish dental students. Int Dent J. 2000;50(1):46–50. doi:10.1111/j.1875-595x.2000.tb00546.x.
5. Kawamura M, Iwamoto Y, Wright FA. A comparison of self-reported dental health attitudes and behavior between selected Japanese and Australian students. J Dent Educ. 1997;61(4):354–360.
6. 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(3):156–162. doi:10.1111/j.1875-595x.2002.tb00621.x.
7. 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(3):159–163. doi:10.1002/j.1875-595x.2001.tb00833.x.
8. Kim KJ, Komabayashi T, Moon SE, Goo KM, Okada M, Kawamura M. Oral health attitudes/behavior and gingival self-care level of Korean dental hygiene students. J Oral Sci. 2001;43(1):49–53. doi:10.2334/josnusd.43.49.
9. Barrieshi-Nusair K, Alomari Q, Said K. Dental health attitudes and behaviour among dental students in Jordan. Community Dent Health. 2006;23(3):147–151.
10. Polychronopoulou A, Kawamura M. Oral self-care behaviours: comparing Greek and Japanese dental students. Eur J Dent Educ. 2005;9(4):164–170. doi:10.1111/j.1600-0579.2005.00387.x.
11. Polychronopoulou A, Kawamura M, Athanasouli T. Oral self-care behavior among dental school students in Greece. J Oral Sci. 2002;44(2):73–78. doi:10.2334/josnusd.44.73.
12. SEN DO, Betul I, YARKAC FU, Elif O. Diş Hekimliği Fakültesi Öğrencilerinin Periodontal Farkındalığı, Ağız Sağlığına Yönelik Tutum ve Davranışlarının Değerlendirilmesi. NEU Dent J. 2020;2(1):14–24.
13. Yener O, TORUMTAY G, DOGAN B. Diş hekimliğinde yardimci personel eğitimi: Dental implantlar ve biyomateryaller üzerine bir pilot çalişma. BAUN Sağ Bil Derg. 2012;1(2):59–64.

14. von Elm E, Altman DG, Egger M, Pocock SJ, Gotzsche PC, Vandenbroucke JP, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Lancet. 2007;370(9596):1453–1457. doi:10.1016/S0140-6736(07)61602-X.
15. Yildiz S, Dogan B. Self reported dental health attitudes and behaviour of dental students in Turkey. Eur J Dent. 2011;5(3):253–259. doi:10.1055/s-0039-1698889.
16. Al-Wesabi AA, Abdelgawad F, Sasahara H, El Motayam K. Oral health knowledge, attitude and behaviour of dental students in a private university. BDJ Open. 2019;5:16. doi:10.1038/s41405-019-0024-x.
17. Kawamura M, Ikeda-Nakaoka Y, Sasahara H. An assessment of oral self-care level among Japanese dental hygiene students and general nursing students using the Hiroshima University–Dental Behavioural Inventory (HU-DBI): surveys in 1990/1999. Eur J Dent Educ. 2000;4(2):82–88. doi:10.1034/j.1600-0579.2000.040206.x.
18. Freire Mdo C, Jordao LM, de Paula Ferreira N, de Fatima Nunes M, Queiroz MG, Leles CR. Motivation towards career choice of Brazilian freshman students in a fifteen-year period. J Dent Educ. 2011;75(1):115–21. doi:10.1002/j.0022-0337.2011.75.1.tb05030.x.
19. Knevel RJ, Gussy MG, Farmer J, Karimi L. Nepalese dental hygiene and dental students' career choice motivation and plans after graduation: a descriptive cross-sectional comparison. BMC Med Educ. 2015;15:219. doi:10.1186/s12909-015-0500-5.
20. Riad A, Buchbender M, Howaldt HP, Klugar M, Krsek M, Attia S. Oral Health Knowledge, Attitudes, and Behaviors (KAB) of German Dental Students: Descriptive Cross-Sectional Study. Front Med (Lausanne). 2022;9:852660. doi:10.3389/fmed.2022.852660.
21. Tanalp J, Ilguy D, Dikbas I, Oktay I. Demographic profile and future expectations of students enrolled in a Turkish private dental school. J Dent Educ. 2012;76(6):800–809. doi:10.1002/j.0022-0337.2012.76.6.tb05316.x.
22. Knevel R, Gussy MG, Farmer J, Karimi L. Perception of Nepalese dental hygiene and dentistry students towards the dental hygienists profession. Int J Dent Hyg. 2017;15(3):219–228. doi:10.1111/idh.12192.
23. Marino RJ, Morgan MV, Winning T, Thomson WM, Marshall RI, Gotjamanos T, et al. Sociodemographic backgrounds and career decisions of Australian and New Zealand dental students. J Dent Educ. 2006;70(2):169–178. doi:10.1002/j.0022-0337.2006.70.2.tb04073.x.
24. Badovinac A, Bozic D, Vucinac I, Vesligaj J, Vrazic D, Plancak D. Oral health attitudes and behavior of dental students at the University of Zagreb, Croatia. J Dent Educ. 2013;77(9):1171–1178. doi:10.1002/j.0022-0337.2013.77.9.tb05589.x.
25. Dumitrescu AL, Kawamura M, Sasahara H. An assessment of oral self-care among Romanian dental students using the Hiroshima University–Dental Behavioural Inventory. Oral Health Prev Dent. 2007;5(2):95–100.
26. Pacauskiene IM, Smailiene D, Siudikienė J, Savanevskyte J, Nedzelskiene I. Self-reported oral health behavior and attitudes of dental and technology students in Lithuania. Stomatologija. 2014;16(2):65–71.
27. Riad A, Pold A, Olak J, Howaldt HP, Klugar M, Krsek M, et al. Estonian Dental Students' Oral Health-Related Knowledge, Attitudes and Behaviours (KAB): National Survey-Based Study. Int J Environ Res Public Health. 2022;19(3):1908. doi:10.3390/ijerph19031908.
28. Gurlek O, Baser U, Beklen A, Guncu GN, Hakki SS, Haytac MC, et al. The rate of tobacco smoking among dental school students in Turkey. Ege univ dis hekim fak derg. 2019;40(3):185–191. doi:10.5505/eudfd.2019.49379.
29. Peker I, Alkurt MT. Oral Health Attitudes and Behavior among a Group of Turkish Dental Students. Eur J Dent. 2009;3(1):24–31. doi:10.1055/s-0039-1697402.
30. Al Mejmaj DI, Nimbeni SB, Alrashidi RM. Association between Demographic Factors Parental Oral Health Knowledge and their Influences on the Dietary and Oral Hygiene Practices followed by Parents in Children of 2-6 Years in Buraidah City Saudi Arabia: A Pilot Study. Int J Clin Pediatr Dent. 2022;15(4):407–411. doi:10.5005/jp-journals-10005-2409.
31. Chen L, Hong J, Xiong D, Zhang L, Li Y, Huang S, et al. Are parents' education levels associated with either their oral health knowledge or their children's oral health behaviors? A survey of 8446 families in Wuhan. BMC Oral Health. 2020;20(1):203. doi:10.1186/s12903-020-01186-4.
32. Ostberg AL, Halling A, Lindblad U. Gender differences in knowledge, attitude, behavior and perceived oral health among adolescents. Acta Odontol Scand. 1999;57(4):231–236. doi:10.1080/000163599428832.