



Oral Health Attitudes and Oral Care Habits Among Preclinical and Clinical Dental Students: A Comparative Study

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Cite this article as: Fidan M, Tokan M. Oral health attitudes and oral care habits among preclinical and clinical dental students: A comparative study. *Essent Dent.* 2026; 5, 0054, doi:10.5152/EssentDent.2026.25054.

Abstract

Background: The aim of this study was to compare oral health attitudes and oral care habits of preclinical and clinical dental students.

Methods: This cross-sectional study included 375 dental students, with 186 preclinical and 189 clinical students. Data were collected using the oral health attitude scale (OHA-S) and a demographic information form, conducted via the paper-and-pencil method. The OHA-S scores and oral care habits were analyzed using the Mann-Whitney *U* test and chi-squared test. A significance level of $P < .05$ was applied.

Results: Clinical students scored significantly higher on total OHA-S (median: 175) compared to preclinical students (median: 167, $P < .001$). Similar findings were observed across all OHA-S subdimensions, except for sensitivity ($P < .05$). Clinic students were also more likely to floss regularly (52.5% vs. 47.5%, $P = .001$) and to visit the dentist every 6 months (67% vs. 33%, $P < .001$). No significant differences were found regarding tooth brushing frequency, duration, or mouthwash use.

Conclusion: Clinical education positively influences dental students' oral health attitudes and specific oral care habits such as regular dental visits and flossing. These findings underline the importance of clinical education in the development of both professional and personal oral health behaviors. Integrating experiential learning into the early stages of dental education may further close the gap in oral health attitudes between preclinical and clinical students.

Keywords: Dental education, dental students, oral care habits, oral health attitudes

What is already known on this topic?

- Clinical education in dentistry often improves students' oral health attitudes and practices due to hands-on patient interactions and experiential learning opportunities.
- Preclinical students tend to rely primarily on theoretical knowledge, which may not consistently translate into improved oral care behaviors.
- Existing studies have typically assessed attitudes or individual behaviors separately, and few provide a combined assessment of both attitudes and multiple oral care habits across the preclinical-clinical transition.

INTRODUCTION

Oral diseases are among the most prevalent health concerns worldwide, significantly affecting both individual well-being and economic productivity.¹ Oral health influences an individual's oral functioning, social interactions, and is closely linked to overall health.² Behavioral interventions for oral health are crucial, as oral diseases are multifactorial and are significantly influenced by behaviors such as oral hygiene practices, seeking oral health care, tobacco use, and stress management.³ Furthermore, oral health is influenced by the attitudes of individuals and communities, reflecting physical, social, and psychological factors, and is vital for overall quality of life.⁴ To maintain oral health and prevent dental diseases, oral care practices such as tooth brushing and interdental

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Received: April 23, 2025
Revision Requested: July 4, 2025
Last Revision Received: July 12, 2025
Accepted: August 11, 2025
Publication Date: March 26, 2026

What this study adds on this topic?

- *This study provides comprehensive evidence that clinical dental students score significantly higher in oral health attitudes and habits compared to their preclinical counterparts, as measured by the oral health attitude scale.*
- *It highlights specific behaviors, such as regular dental visits and dental floss use, that improve during the clinical period, underscoring the importance of experiential learning.*
- *The study recommends that practical patient simulation exercises should be implemented more in preclinical education to bridge the gap between oral health attitudes between preclinical and clinical students.*

cleaning help break down and remove microbial plaque, preventing its accumulation on the teeth and gums.⁵ In addition to clinician-related factors,⁶ cognitive, emotional, and behavioral characteristics of individuals are also influential in preventing oral diseases.⁷ Attitude, which encompasses the combination of these characteristics, is directly linked to positive or negative tendencies toward oral and dental health. In particular, attitude is a key determinant in explaining human behavior.⁸ Attitudes determine whether individuals like or dislike something, thereby influencing how they behave toward it.⁹ Therefore, maintaining oral hygiene through appropriate products, procedures, and behaviors is essential for preventing oral diseases and improving oral health.⁵

One of the most effective methods of oral health education is the attitudes and behaviors of oral health professionals toward their own dental hygiene. These attitudes significantly impact the improvement of community oral health. Oral health attitudes reflect individuals' mental predispositions and are practically transformed into oral health behaviors. Therefore, oral health professionals can advise their patients and model good oral care practices to raise awareness about oral disease prevention.^{10,11} The cognitive processes and behaviors of dental professionals shape the quality of oral health services by influencing how they understand and apply oral hygiene practices. Increasing dental hygiene students' awareness of the importance of oral health enhances their ability to protect patients' oral health and prevent diseases. In this context, dental students must adopt proper oral health behaviors to effectively instruct their patients. This approach is crucial for achieving both individual and societal health goals.¹² Oral health is a crucial factor that significantly affects individuals' overall health. Dental students are expected to assume leadership roles in promoting oral health and educating patients throughout their professional careers. Therefore, the attitudes and behaviors they exhibit toward their own oral health are of particular importance, as these directly influence the quality of care they provide to their patients.¹³ Dental education consists of preclinical and clinical phases. The preclinical phase emphasizes theoretical knowledge and laboratory practices, while the clinical phase provides practical experience, allowing students to interact with real patients.¹⁴ The transition to the clinical period is a pivotal stage that shapes not only students' technical skills but also their professional identity and attitudes.¹⁵

Although numerous studies examine dental students' oral health attitudes and behaviors, most rely on instruments that assess a single dimension and often overlook the complex and multifaceted nature of these attitudes.^{16,17} Instruments such as the Hiroshima University Dental Behavioral Inventory have been widely used in international studies^{10,18} to assess oral health attitudes and behaviors; they often lack multidimensional depth. University students represent a population in a transitional phase, where the establishment and maintenance of healthy habits are especially crucial. However, studies suggest that university students often have limited awareness and insufficient knowledge regarding oral health and related attitudes.¹⁹ Although various instruments are available to measure attitudes toward oral health, the literature on valid and reliable scales based on comprehensive theoretical frameworks remains limited. The use of the OHA-S addresses this gap by incorporating 6 subdimensions, offering a more nuanced understanding of student attitudes. The Oral health attitude scale (OHA-S), developed and validated by Fidan et al,¹⁹ overcomes this limitation by combining 6 subdimensions, providing a more holistic view of oral health attitudes. This multidimensional approach allows educators and researchers to identify specific areas—such as awareness, social impact, and avoidance of harmful behaviors—that may require targeted curricular interventions. In addition to filling a methodological gap in the literature, this study, using the OHA-S, provides data that can inform curriculum development strategies aimed at improving students' personal and professional oral health behaviors. Investigating whether the transition from preclinical to clinical phases changes students' attitudes and habits toward oral health is essential for evaluating the effectiveness of educational processes and monitoring the development of

professional behavior.¹⁰ The value that dental students place on their own oral health may reflect the quality of care they are likely to provide to future patients. Therefore, evaluating students' oral health attitudes during both preclinical period (PP) and clinical period (CP) is of great importance. A review of the existing literature reveals that there are limited studies comparing the oral health attitudes of PP and CP students in a multidimensional way. This study aims to fill this gap by comparing the oral health attitudes and habits of preclinical and clinical students in dental education. While there are studies addressing the oral health knowledge, attitudes, and behaviors of dental students across different geographical regions, these studies often do not focus on the transition between student groups or use scales that assess only 1 dimension. The transition to the clinical period is a critical threshold where both technical competencies and personal health behaviors are shaped. Therefore, there is a need to fill the original scientific gap that identifies the differences in oral health attitudes and care habits between the PP and CPs. To address this gap, the attitudes and oral care habits of PP and CP students were compared for the first time using the OHA-S, validated and found reliable by Fidan et al.¹⁹ The aim of this study was to compare oral health attitudes and oral care habits of preclinical and clinical dental students.

Research Questions of this Study

1. Is there a significant difference in oral health attitude scores and their subdimensions between PP and CP students?
2. Is there a difference in the oral care habits of dental students between the PP and CPs?

MATERIAL AND METHODS

Ethical approval for the study was granted by the Uşak University Non-Interventional Clinical Research Ethics Committee on May 02, 2024, with decision number 372-372-06. All participants were fully informed about the study, and written informed consent was obtained. To ensure thorough and transparent reporting, this manuscript follows the STROBE guidelines for cross-sectional studies.²⁰ A completed STROBE checklist is included as Supplementary Table 1.

Determination of Sample Size and Study Population

In this study, a pilot study was initially conducted to determine the minimum required sample size, as no reference was available in the literature for a power analysis using the OHA-S. A total of 30 students²¹ from both the PP and CP were surveyed during the pilot study. Based on the pilot study results, where the clinical group had an average OHA-S score of 168.86 ± 17.58 and the preclinical group had an average of 163.66 ± 17.76 , a power analysis was performed using an independent samples *t*-test (G*Power 3.1, Heinrich-Heine-Universität Düsseldorf, Germany) with a 95% CI (1- α), 85% power (1- β), and an effect size of $d=0.29$. Although the

sample size was determined based on a *t*-test using pilot data, the normality assumptions were reassessed in the main dataset using the Kolmogorov-Smirnov test. This approach was chosen to identify the maximum sample size relative to the other parameters. Based on the assessment of these parameters, data that did not fit the normal distribution were subjected to non-parametric tests (e.g., Mann-Whitney *U*) to ensure statistical robustness. The analysis indicated that at least 167 students per group were required for this study. As a result, a total of 375 dental students from Uşak University Faculty of Dentistry who volunteered to participate and completed the survey in full were included. The study was conducted during the fall semester of 2024. Data were collected using the paper-and-pencil method, with participants completing survey forms distributed during face-to-face sessions. The preclinical group consisted of first- and second-year students, while the clinical group comprised fourth- and fifth-year students. Third-year students, who were in the transitional phase to clinical education, were excluded from the study. Third-year students were excluded to ensure analytic clarity, as they experience a heterogeneous mix of both preclinical theory and early clinical exposure. Including them could have introduced inconsistencies due to curricular variability and an undefined training phase, potentially confounding the comparison between preclinical and clinical groups. Among the participants, 241 (64.3%) were female, and 134 (35.7%) were male.

Data Collection Instruments

Personal Information Form

This form was used to collect demographic information and data on oral health-related behaviors, without recording any personal identifiers. For statistical comparison, behavioral variables were categorized as follows: gender (female and male), academic year (preclinical and clinical), parents' education levels (mother and father), frequency of dental visits (once every 6 months, once a year, and as long as the problem), frequency of tooth brushing (less than twice a day and 2 times a day or more), frequency of tooth floss (regular, rarely, never), and duration of toothbrush use (less than 1 minute, 1-3 minutes, more than 3 minutes), smoking (yes and no), use of mouthwash (yes and no), and residence (with family and not with family).

Oral Health Attitude Scale

The OHA-S was originally developed and validated in Turkish by Fidan et al¹⁹ specifically for use with university students in Türkiye. Since the current study was conducted within the same linguistic and cultural context, no translation or cultural adaptation was required. The scale's psychometric properties, including construct validity and internal consistency, have been thoroughly reported in the original publication. The validity and reliability of the OHA-S (see Appendix A for the Turkish version and Appendix B for the English version) were previously established by Fidan et al.¹⁹ The scale consists of 41

items distributed across 6 subdimensions: sensitivity (F1, 12 items), importance (F2, 6 items), avoidance of harmful elements (F3, 7 items), tendency toward products and activities (F4, 6 items), awareness (F5, 6 items), and social impact (F6, 4 items). The OHA-S is a 5-point Likert scale with response options ranging from "Strongly Disagree" to "Strongly Agree." There are no negatively worded items in the scale. The total score ranges from 41 to 205, and based on the score, attitude levels are classified as follows: 41-101 (very low), 102-144 (low), 145-160 (developable), 161-184 (high), and 185-205 (very high). The internal consistency coefficients for the 6 subdimensions were found to be 0.88 (sensitivity), 0.85 (importance), 0.85 (avoidance of harmful elements), 0.84 (tendency toward products and activities), 0.80 (awareness), and 0.78 (social impact). The overall internal consistency of the scale, as measured by the Spearman-Brown corrected split-half reliability, was 0.91.

Statistical Analysis

Data was analyzed using version 4.4.1 of the R programming language. The relationship between categorical variables was examined using Pearson's chi-squared test. Categorical data were represented as frequency and percentage. For numeric variables, normality was assessed using the Kolmogorov-Smirnov test. Variables that do not conform to a normal distribution were compared in pairwise groups using the Mann-Whitney U test. Numerical data were represented as median (minimum-maximum). The significance level was set at $P < .05$.

RESULTS

The comparison of the total scores and subdimensions of the OHA-S between preclinical and clinical dental students is shown in Table 1. For F2, CP median values (4.67) were higher than PP median values (4.5) ($P = .017$). For F3, the CP median value (3.71) was higher than the PP median value (3.57) ($P = .017$). For F4, the CP median value (3.83) was higher than the PP median value (3.67) ($P < .001$). For F5, the CP median value (4.33) was higher than the PP median value (4) ($P < .001$). For F6, the CP median value (3.75) was higher than the PP median value (3.5) ($P = .017$). For total OHA-S, the CP median value (175) was higher than the PP

median value (165) ($P < .001$). Table 2 shows significant differences in university students' oral health attitude levels based on their oral-care habits. Overall, the OHA-S scores were predominantly categorized as "improvable" or "relatively high," with no group achieving a "very high" level. Gender and period type are examined for statistical significance; a significant relationship is not found ($P = .140$). Smoking and period type were analyzed for statistical significance, and a significant relationship was found ($P = .012$). Non-smokers were observed at a higher rate in the preclinical group than in the clinical group. The frequency of dental visits and period type were analyzed for statistical significance, and a significant relationship was found ($P < .001$).

In total, about 43.5% of dental students reported that they only visit the dentist when they have dental problems. In response to the question of regular dental visits every 6 months, 67% of the students in the clinical period reported regular dental visits. The majority of participants reported regular flossing (58.9%) and no mouthwash use (66.4%). Tooth brushing duration and period type are examined for statistical significance; a significant relationship is not found ($P = .244$). The majority of the participants brushed their teeth twice a day or more (82.9%) and for 1-3 minutes (77.6%). Frequency of tooth flossing and period type are examined for statistical significance; a significant relationship is found ($P = .001$). The use of mouthwash and period type are examined for statistical significance, but a significant relationship is not found ($P = .231$). Residence and period type are examined for statistical significance; a significant relationship is not found ($P = .897$). Frequency of tooth brushing and period type are examined for statistical significance; a significant relationship is not found ($P = .196$). The mother's educational level and period type are examined for statistical significance, but a significant relationship is not found ($P = .789$). The father's educational level and period type are examined for statistical significance; a significant relationship is not found ($P = .629$).

DISCUSSION

In this study, OHA-S scores, subdimensions, and oral care habits of dental students in PPs and CPs were compared.

Table 1. Comparison of OHA-S Total Scores and Subdimensions Between Preclinical and Clinical Dental Students

	PP	CP	Total	Test Statistic	P
F1	4.58 (1.25-5)	4.75 (2.67-5)	4.67 (1.25-5)	16251.000	.234*
F2	4.5 (1.5-5)	4.67 (3.33-5)	4.67 (1.5-5)	15023.000	.017*
F3	3.57 (1.57-4.86)	3.71 (1.71-5)	3.57 (1.57-5)	14983.500	.017*
F4	3.67 (1.17-5)	3.83 (2-5)	3.83 (1.17-5)	13935.000	<.001*
F5	4 (1.5-5)	4.33 (3-5)	4.17 (1.5-5)	11568.500	<.001*
F6	3.5 (1.5-5)	3.75 (1.5-5)	3.75 (1.5-5)	15005.500	.017*
Total OHA-S score	167 (82-199)	175 (117-205)	170 (82-205)	13466.500	<.001*
Fmean	4.07 (2-4.85)	4.27 (2.85-5)	4.15 (2-5)	13466.500	<.001*

CP, clinical period; F1, sensitivity; F2, importance; F3, avoidance of harmful elements; F4, tendency toward products and activities; F5, awareness; F6, social impact; PP, preclinical period. *Mann-Whitney U test.

Table 2. Comparison of Oral Care Habits of Dental Students in Preclinical and Clinical Periods

	PP	CP	Total	Test Statistic	P
Gender					
Male	65 (48.5)	69 (51.5)	134 (35.7)	2.174	.140 ^x
Female	136 (56.4)	105 (43.6)	241 (64.3)		
Smoking					
Yes	30 (40.5)	44 (59.5)	74 (19.7)	6.322	.012 ^x
No	171 (56.8)	130 (43.2)	301 (80.3)		
Frequency of visits to the dentist					
Once every 6 months	38 (33)	77 (67)	115 (30.7)	31.250	<.001 ^x
Once a year	54 (55.7)	43 (44.3)	97 (25.9)		
As long as the problem	109 (66.9)	54 (33.1)	163 (43.5)		
Tooth brushing duration					
Less than 1 minute	9 (56.3)	7 (43.8)	16 (4.3)		.244 ^y
1-3 minutes	162 (55.7)	129 (44.3)	291 (77.6)		
More than 3 minutes	30 (44.1)	38 (55.9)	68 (18.1)		
Frequency of tooth floss					
Regular	105 (47.5)	116 (52.5)	221 (58.9)		.001 ^y
Rarely	89 (65.9)	46 (34.1)	135 (36)		
Never	7 (36.8)	12 (63.2)	19 (5.1)		
Use of mouthwash					
Yes	73 (57.9)	53 (42.1)	126 (33.6)	1.435	.231 ^x
No	128 (51.4)	121 (48.6)	249 (66.4)		
Residence					
With family	31 (54.4)	26 (45.6)	57 (15.2)	0.017	.897 ^x
Not with family	170 (53.5)	148 (46.5)	318 (84.8)		
Frequency of tooth brushing					
Less than twice a day	39 (60.9)	25 (39.1)	64 (17.1)	1.671	.196 ^x
2 times a day or more	162 (52.1)	149 (47.9)	311 (82.9)		
Mother's educational level					
Primary education	84 (54.9)	69 (45.1)	153 (40.8)	0.474	.789 ^x
Secondary education	57 (50.9)	55 (49.1)	112 (29.9)		
University and higher	60 (54.6)	50 (45.5)	110 (29.3)		
Father's educational level					
Primary education	44 (50.6)	43 (49.4)	87 (23.2)	0.926	.629 ^x
Secondary education	64 (57.1)	48 (42.9)	112 (29.9)		
University and higher	93 (52.8)	83 (47.2)	176 (46.9)		

CP, clinical period; n, (%); PP, preclinical period. PP and CP percentages were calculated within the rows. The total column represents the overall sample percentages.
^xPearson's Chi-squared test.
^yMonte Carlo simulation Fisher's exact test.

Analyses revealed that clinical period students outperformed PP students in both oral health attitude scores and subdimensions. Similarly, clinical period students exhibited more favorable oral care habits. These results indicate that clinical education positively influences clinical period students' attitudes and habits toward oral health. The significantly higher total OHA-S scores in clinical period students compared to PP students suggest that clinical experience and patient follow-up enhance oral health awareness. Additionally, the elevated subdimension scores in the OHA-S imply that clinical experience strengthens students' perceived importance of oral health and contributes to greater awareness. It can be emphasized that the transition to clinical practice has a direct impact on individuals' own oral health, extending

beyond theoretical knowledge. This finding has been similarly emphasized in previous studies;^{10,22} it has been reported that students gaining clinical experience positively affects not only their professional competence but also their personal health behaviors. While the observed differences between preclinical and clinical students align with expectations—due to the increased knowledge, responsibility, and patient interaction in the clinical phase—the value of this study lies in quantitatively demonstrating these effects using a validated, multidimensional scale. This provides clearer benchmarking and offers objective data to inform curricular planning.

Regular dental visits are essential for preventing oral diseases, educating patients, and promoting the maintenance of good

oral hygiene.²³ This study observed that clinical semester students tended to visit the dentist regularly. This finding suggests that the habit of visiting the dentist may be closely linked to students' oral health attitudes. In addition to the importance of regular visits for disease prevention and early intervention, it has been reported that such visits positively influence students' perceptions of their health.²⁴ The study results reveal that dental students' educational experiences shape not only their professional knowledge and skills but also their personal health attitudes. As they transition from preclinical to clinical years, their health attitudes and behaviors improve.¹⁸ The impact of experiential learning processes, such as clinical practice and patient follow-up, on both students' personal health and their future professional practices underscores the need to review and improve educational programs. In this context, it is suggested that dental faculties develop applied education models that reinforce students' positive attitudes toward oral health.^{25,26} It is crucial to emphasize the importance of oral health in university curricula to improve attitudes toward oral health. A previous study found a significant association between irregular dental care and smoking among adults.²⁷ Another study highlights that the dental curriculum should emphasize the effectiveness of anti-smoking initiatives in both theoretical and practical courses. The study suggests that knowledge of the harmful effects of smoking alone may not be enough to improve dental students' attitudes.²⁸ Smoking is linked to poor oral hygiene and periodontal disease. Awareness campaigns highlighting the negative impact of smoking on oral health could be effective in encouraging healthier behaviors among students.

Oral diseases are influenced by multiple factors, with socio-behavioral and environmental elements playing a crucial role in oral health.²⁹ In the present study, it was observed that both preclinical and clinical undergraduate students generally maintained good oral hygiene. Students were aware of the importance of regular tooth brushing and oral hygiene practices. The use of dental floss was notably more common among clinical semester students. Previous studies have also indicated that individuals who regularly brush and floss tend to have higher levels of oral health knowledge.²³ The study found that the oral health habits and attitude scores of clinical period dentistry students were higher compared to PP students. This difference is likely attributable to the active participation of students in clinical experiences and practices gained during their education.²² During the clinical period, students' direct involvement in patient care and practical training processes not only enhances their awareness of maintaining their own oral health but also ensures the regular continuation of these habits.¹⁰ Since preclinical students are primarily exposed to theoretical knowledge at the early stages of their education, they may not yet have sufficient experience in translating this knowledge into behavior. The findings suggest that oral health habits should be encouraged early

in dental education programs, with theoretical knowledge being reinforced through hands-on practice. This approach can help reduce the awareness gap between preclinical and clinical students and foster a consistent level of oral hygiene behavior across all students.

This study found no significant relationship between parental education level and the attitudes of PP and CP students. Although this result contradicts the literature that reports a positive relationship between parental education and oral health behaviors in adolescents and young adults, it suggests that parental influence may diminish as individuals gain autonomy and begin making independent health decisions. However, parental education level and health attitudes continue to play a role in the formation of dental health habits during childhood.³⁰ The unique social and academic environment in which university students live may explain why parental education level did not have a statistically significant effect on oral health attitudes. During this period, individuals tend to develop their health behaviors and attitudes largely independently of their parents, limiting the influence of parental education level. Additionally, the study found no significant difference between gender and oral health attitudes. This finding aligns with previous studies that reported no significant difference in oral hygiene attitudes between male and female students.^{31,32} This is also consistent with findings from other studies suggesting that gender may not always be a determining factor in oral health attitudes, particularly in young, educated populations where awareness levels are generally high.^{33,34} These findings can also be interpreted through the lens of the Health Belief Model, which explains health behaviors based on individuals' perceptions of susceptibility, benefits, barriers, self-efficacy, and cues to action. In the context of dental education, clinical exposure may serve as a critical cue to action, reinforcing the perceived benefits of oral hygiene and enhancing students' self-efficacy through hands-on practice and patient care experiences. This framework may help explain why demographic factors such as gender, parental education, and living arrangements were not significantly associated with oral health attitudes, as clinical experience likely plays a more immediate and influential role in shaping these behaviors during dental training.³⁵ This may be due to differences in study populations or methodologies. Since the sample in this study consisted of young individuals with similar lifestyles within the same faculty, significant gender differences may not have emerged. Additionally, the university environment, where social awareness tends to be high for both genders, may have contributed to this result.

This is a cross-sectional study based on participants' self-reports. While the study offers valuable insights, it has several limitations. One limitation is that the sample size was confined to a single university, which limits the generalizability of the findings. Additionally, data were collected

through self-reported measures, which may introduce biases. Although these factors restrict the generalizability, the results provide important insights that can be connected to practical experience in dental education. Additionally, as with all self-reported data, there is the potential for response biases, such as social desirability bias—where participants may present themselves in a more favorable light—and recall bias, which may affect the accuracy of behavior-related responses. These limitations should be considered when interpreting the findings. While the OHA-S scale was developed and validated within the same cultural and educational context as this study, its applicability to other populations or countries may still be limited. Future cross-cultural studies could explore the scale's validity in different contexts. Future research would benefit from confirming and expanding these findings by conducting similar studies at different universities and with larger sample sizes.

This study has several limitations that should be acknowledged. First, the research was conducted at a single dental school, which may limit the generalizability of the findings to other institutions or geographic regions. Second, the cross-sectional nature of the study prevents any inference of causality. While associations between clinical training and improved attitudes have been observed, longitudinal designs are necessary to confirm these directional effects. Third, the data were collected using self-reported questionnaires, which are susceptible to recall and social desirability biases, potentially affecting the accuracy of the reported behaviors. Additionally, the sample size was restricted to a single university, further limiting the generalizability of the findings to broader populations. To address these limitations, future studies should consider multi-center sampling to enhance generalizability, longitudinal designs to capture changes over time, and intervention-based approaches to evaluate the effectiveness of specific educational strategies on oral health attitudes and behaviors.

CONCLUSION

Clinical dental students have higher oral health attitudes compared to preclinical dental students. Students in the clinical period in dentistry have a better attitude toward oral and dental health-related factors than nonclinical students. A review of the curriculum and consideration of appropriate reforms are needed to support dental students in acquiring expected oral health behaviors and to pave the way for a successful preclinical-clinical transition. The findings underscore the importance of experiential learning in dental education and suggest that integrating similar practices into preclinical curricula may reduce the observed gaps. Future research should explore innovative pedagogical approaches and broader sociocultural influences on oral health behaviors.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: The research had the approval of the Uşak University Non-Interventional Clinical Research Ethics Committee (Approval no: 372-372-06, Date: May 2, 2024), which complies with the Helsinki Declaration.

Informed Consent: Written informed consent was obtained from students who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – M.F.; Design – M.F., M.T.; Supervision – M.F.; Materials – M.F., M.T.; Data Collection and/or Processing – M.F., M.T.; Analysis and/or Interpretation – M.F.; Literature Review – M.F., M.T.; Writing– M.F., M.T.; Critical Review – M.F., M.T.

Declaration of Interests: The authors have no conflicts of interest to declare.

Funding: This study was supported by the TUBITAK 2209-A project.

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APPENDIX A. AĞIZ SAĞLIĞI TUTUM ÖLÇEĞİ (AST-Ö) (TURKISH VERSION) (ORIGINAL VERSION)

	Kesinlikle katılmıyorum	Kesinlikle Katılıyorum
1-Dişlerimin beyaz olmasını arzu ederim.		
2Dişlerimi aşındıran yiyecek veya içeceklerden uzak dururum.		
3Dişlerimi vücudumdaki diğer organlarım kadar önemserim.		
4-Diş ipi kullanmak ağız ve diş sağlığını korumaya yardımcı olur.		
5-Dişlerimden birini bile kaybetmek beni endişelendirir.		
6-Ağız ve diş sağlığı ile ilgili yeni çıkan ürünler dikkatimi çeker.		
7-İyi bir gülümseme için ağız ve diş sağlığı önemlidir.		
8-Başkalarının dişlerim hakkında ne düşündüğünü önemserim.		
9-Dişlerimi fırçalamak beni rahatlatır.		
10-Şaka da olsa, dişlerimle dalga geçilmesi beni üzer.		
11-Dişlerimde renklenmeye neden olan yiyecek veya içecekleri aşırı tüketmekten kaçınırım.		
12-Gülümsediğimde dişlerimi başkalarına göstermek hoşuma gider.		
13Dişlerimin/dişetlerimin sağlıklı olması beni mutlu hissettirir.		
14-Dişeti sağlığı için belirli zamanlarda diş taşı temizliği yaptırmak gereklidir.		
15-Diş fırçamın seçiminde fırça kıllarının sertlik, yumuşaklık ve şekil gibi özelliklerine dikkat ederim.		
16-Estetik açıdan dişlerimin düzgün dizilimde olmasını arzu ederim.		
17-Ağız ve diş sağlığı problemlerim beni endişelendirir.		
18-Şekerli gıdalardan uzak dururum, çünkü dişlerime zarar vereceğini düşünürüm.		
19-Ağız ve diş sağlığı ile ilgili ürünlerin tanıtım veya reklamları ilgimi çeker.		
20-Ağız ve diş sorunları yaşamamak için ağız ve diş bakımına dikkat ederim.		
21-Diş fırçamı yılda en az bir kez değiştirmeye özen gösteririm.		
22Dişlerimi fırçalamanın yanında diş ipini de düzenli kullanmada istekliyim.		
23-Aşırı sıcak/soğuk yiyecek veya içeceklerden uzak dururum, çünkü dişlerime zarar vereceğini düşünürüm.		
24-Medyada ağız ve diş sağlığı ile ilgili program, haber, etkinlik vs. ilgimi çeker.		
25-Başkaları gülümsediğinde onların dişlerinin estetik görünümünü dikkatimi çeker.		
26-Başkalarının dişlerinin benim dişlerimden daha güzel olmasını kıskanırım.		
27-Diş çürümesine neden olan yiyecek veya içeceklerden uzak durmaya çalışırım.		
28-Diş macunumun içeriğini kontrol ederek seçerim.		
29-Ağız kokusu olmaması için ağız ve diş sağlığıma özen gösteririm.		
30-Ağız ve diş sağlığı kontrolü için düzenli periyotlarda diş hekimine gitmede istekliyim.		
31-Ağız ve diş bakımı genel vücut sağlığım için önemlidir.		
32-Ağız ve diş sağlığına yönelik eğitim ve seminerlere katılmada istekliyim.		
33Dişlerimde renklenme olması beni endişelendirir.		
34-Dişlerimi güçlendiren besinleri tüketmeye dikkat ederim.		
35-Dişlerimin doğal ve estetik görünümü benim için önemlidir.		
36-Sert kabuklu yiyecekleri dişlerimle kırmaktan kaçınırım.		

37- Dişlerimi günde en az iki kez fırçalamaya dikkat ederim.

38- Ağız ve diş sağlığımı korumak için gerekli bilgileri öğrenmede istekliyim.

39- Ağız ve diş sağlığımı korumak için sigara içmemeye özen gösteririm.

40- Ağız ve diş tedavim tamamlandığında mutlu hissederim.

41- Ağız ve diş sağlığım için belirli zamanlarda ağız gargarası kullanırım.

Duyarlılık: 1,5,9,13,15,17,21,25,29,33,37,40; Önem: 3,7,16,20,31,35; Zararlı unsurlardan kaçınma: 2,11,18,23,27,34,39; Ürün ve faaliyetlere eğilim:

6,19,24,28,32,41; Farkındalık: 4,14,22,30,36,38; Sosyal etki: 8,10,12,26

APPENDIX B. ORAL HEALTH ATTITUDE SCALE (OHA-S) (ENGLISH VERSION)

Strongly disagree	Disagree	Somewhat agree	Agree	Strongly agree
1-I want my teeth to be white.				
2-I avoid damaging foods or beverages causing tooth erosion.				
3-I care about my teeth as much as my other organs in my body.				
4-Dental floss use helps me maintain my oral and dental health.				
5-I am worried about losing even one of my teeth.				
6-New products related to oral and dental health attract my attention.				
7-Oral and dental health is important for a good smile.				
8-I care about what other people think of my teeth.				
9- When I brush my teeth, I feel relaxed.				
10-Even if it's a joke, it makes me very sad when my teeth made fun of my teeth.				
11-I avoid excessive consumption of foods or beverages that cause discoloration on my teeth.				
12-I am pleased to show my teeth to other people when I smile.				
13-I feel good when my teeth or gums are healthy.				
14-Teeth scaling is periodically necessary for gingival health.				
15-When choosing my toothbrush, I take care of several features such as hardness, softness, and shape of its bristles.				
16-I want to have straight teeth in terms of esthetic.				
17-My oral and dental health problems worry me.				
18-I avoid sugary foods due to their damage to my teeth.				
19-I am interested in the promotion or advertisement of products on oral and dental health.				
20-I pay attention to my oral and dental care in order not to experience oral and dental problems.				
21-I take care of my toothbrush and change it at least once a year.				
22-Besides brushing my teeth, I am willing to use dental floss regularly				
23-I avoid extremely hot/cold foods or beverages due to their damage for my teeth.				
24-Programs, news, and events related to oral and dental health in the media attract my attention.				
25-When others smile, I notice whether their teeth have an esthetic appearance or not.				
26-I feel jealous when someone's teeth are prettier than my teeth.				
27-I try to avoid foods or beverages that cause dental caries.				
28-I purchase my toothpaste by checking its ingredients.				
29-I take care of my oral and dental health so that there is no bad breath.				
30-I am willing to go to the dentist regularly for oral and dental health check-up.				
31-Oral and dental care is important for general body health.				
32-I am willing to participate in seminars and trainings on oral and dental health.				
33-I am worried about discoloration of my teeth.				
34- I take care to consume foods that strengthen my teeth.				

35-The natural and esthetic appearance of my teeth is important to me.
 36-I avoid breaking hard-shelled foods with my teeth.
 37-I take care to brush my teeth at least twice a day.
 38-I am willing to learn the necessary information to protect my oral and dental health.
 39-I take care not to smoke to protect my oral and dental health.
 40-When my dental and oral treatment is completed, I feel happy.
 41-I periodically use mouthwash for my oral and dental health.

Sensitivity: 1,5,9,13,15,17,21,25,29,33,37,40; **Importance:** 3,7,16,20,31,35; **Avoidance of harmful elements:** 2,11,18,23,27,34,39; **Tendency toward products and activities:** 6,19,24,28,32,41; **Awareness:** 4,14,22,30,36,38; **Social impact:** 8,10,12,26

Supplementary Table 1. STROBE Statement—Checklist of items that should be included in reports of cross-sectional studies

	Item No	Recommendation	Page No.
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	1-2
Objectives	3	State specific objectives, including any prespecified hypotheses	2
Methods			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	3
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	3
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	3
Bias	9	Describe any efforts to address potential sources of bias	3
Study size	10	Explain how the study size was arrived at	3
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	3
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	3
		(b) Describe any methods used to examine subgroups and interactions	
		(c) Explain how missing data were addressed	
		(d) If applicable, describe analytical methods taking account of sampling strategy	
		(e) Describe any sensitivity analyses	
Results			
Participants	13	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	4
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15	Report numbers of outcome events or summary measures	4
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	4
		(b) Report category boundaries when continuous variables were categorized	
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	

Discussion			
Key results	18	Summarise key results with reference to study objectives	4
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	4-5-6
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	4-5-6
Generalisability	21	Discuss the generalisability (external validity) of the study results	6
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	7
