

# Oral health behavior differences between dental students in graduate and doctoral programs

## Purpose

This study aimed to compare oral health behavior between dental students in graduate programs and those in doctoral programs (PhD students) and determine the effects of parental education and occupation on these behaviors.

## Materials and Methods

A questionnaire on oral health behaviors was distributed in a faculty of dentistry in Ankara, Turkey. A total of 629 questionnaires were distributed, and 528 dental graduate and 101 PhD students responded. Parental education and occupation were also recorded, and data were statistically analyzed.

## Results

Statistically significant differences were found between the two groups with respect to the frequency of replacing toothbrush ( $p=0.001$ ), use of electric toothbrush ( $p<0.001$ ), frequency of brushing ( $p<0.001$ ), amount of water used to rinse mouth ( $p<0.001$ ), toothpaste selection criteria ( $p<0.001$ ), use of dental floss ( $p<0.001$ ), amount of toothpaste used for brushing ( $p=0.018$ ), frequency of professional care ( $p<0.001$ ), and sugar consumption ( $p<0.001$ ). The PhD group showed more favorable outcomes for these behaviors except for toothpaste selection. Parental education and occupation were correlated with higher frequencies of flossing and mouth rinsing.

## Conclusion

The outcomes of this study show that the self-reported quality of overall oral health behavior is more pronounced in PhD students than in graduate students, with the exceptions of behaviors regarding the duration of brushing, toothpaste selection criteria, and use of mouth rinse. The current dental curriculum in the universities should be revisited with respect to oral health attitudes. This study also implies that educational and occupational status of parents had little effect on oral health behavior of the students, including the use of dental floss and mouth rinse.

**Keywords:** Oral health, toothbrushing, education, professional, parents

## Introduction

Dental students, the future leaders in oral health care, have an important role in educating and promoting public oral health (1-3). Dental students in general have been found to have a positive attitude towards oral health (4, 5). Oral health behavior of dental students must be improved if they are to serve as positive models for their patients, families and friends (6-9).

There are several studies about oral health attitudes and behavior of dental students (10-25). Most of these studies have been carried out using the Hiroshima University Dental Behavioral Inventory (HU-DBI) questionnaire developed by Kawamura (10-12, 14, 15, 17-21, 25). Some participants in the surveys were from all academic years (10, 12, 15, 17-20, 25)

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and others were from only final years of university (13, 14, 16). Yildiz and Dogan (25) and Peker *et al.* (19) compared the oral health attitudes and behavior of preclinical students to clinical students. Tseveenjav *et al.* (24) evaluated cross-sectional and longitudinal comparison among clinical dental students. Rong *et al.* (22) administered the HU-DBI questionnaire to medical and dental students when they were in years 1 and 5 of their university.

There has been a lack of information about oral health attitudes and behavior of dental students in doctoral (PhD) programs. Most research about oral health attitudes and behavior of dental students in Turkey has been done by administering the HU-DBI questionnaire (12, 18, 19, 25). HU-DBI questionnaire was developed to understand patients' perceptions of oral health (26), a structured questionnaire containing more specific questions related to oral health behaviors was developed for this study. The study aimed to compare the effects of educational level on oral health behaviors of dental and PhD students. Also, possible effects of educational level and occupational status of parents on these behaviors were investigated. Main null hypothesis tested in this study was that there is no difference in any of the study questionnaire items between dental and PhD students.

## Materials and methods

### Study sample and administration of the questionnaires

A 17-item questionnaire was prepared regarding oral health behaviors. Before conducting a full-scale survey in the Ankara University in the city of Ankara, Turkey, the questionnaire was pretested with 35 subjects who were representative of the study sample. After testing accuracy and comprehension of the questions, the self-administered questionnaire was delivered to a larger population. This study had exemption from institutional ethics review board of the university. Graduate level dental school education in

Turkey takes 5 years. PhD programs including Endodontics, Periodontology, Oral and Maxillofacial Surgery, Dento-Maxillofacial Radiology, Orthodontics, Pedodontics, Prosthodontics take about 4 years. The questionnaire was carried on 528 volunteer dental students in graduate level and 101 volunteer students in PhD programs. The survey was completed anonymously. Questionnaire items are shown in Table 1. Age, gender, academic year data, educational and occupational status of parents were also recorded. ISCED 2011 (International Standard Classification of Education) was used for the educational status and ISCO-08 (International Standard Classification of Occupations) for the classification of the occupational status of the parents. Oral health behaviors of dental students and students in PhD programs were compared. The correlation between the educational/occupational status of parents and the behaviors of both dental and PhD students were examined.

### Statistical analysis

The collected data from both groups were imported to Statistical Package for Social Sciences (SPSS) for Windows software, version 10.0 (SPSS Inc.; Chicago, IL, USA). The standard descriptive methods such as the mean, standard deviation, median, frequency, minimum and maximum were applied to determine the characteristics of the sample. Pearson's chi-square test was used to compare the categorical demographic variables among the groups. Because the distribution of the data did not meet the requirements for normality and homogeneity of variances assumptions. The confidence interval was set to 95% and p values less than 0.05 was considered statistically significant.

## Results

Of the 528 participants, 417 were female and 212 were male. Frequency distribution of number of the students according to their academic year were as follows: 150 in the first year (28%), 109 in the second year (21%), 107 in the third year (20%), 83 in the fourth year (16%), 79 in the fifth year (15%).

The PhD students reported higher frequencies of flossing (60.40% PhD, 37.31% dental, Figure 1) and use of pea sized toothpaste during brushing (73.27% PhD, 61.36% dental) compared to the dental students. Seventytwo percent of the PhD students and 51.70% of the dental students reported that they replace their toothbrushes every 3 months (Figure 2). The PhD students visited professional dental care more frequently (every 6 months) than the dental students (39.60% PhD, 20.64% dental, Figure 3). Sugar consumption less than once per day was reported by 57.43% of the PhD and 38.45% of the dental students. The majority of participants (69%) brushed twice daily (87.13% PhD, 65.72% dental) (Figure 4). Most subjects (41.18%) reported rinsing with 2 handfuls of water after brushing. Two percent of all students brushed their teeth for less than 1 minute, 17.65% 1 minute, 30.84% 1-2 minutes, 24.32% 2 minutes, 23.53% more than 2 minutes and 1.59% more than 3 minutes.

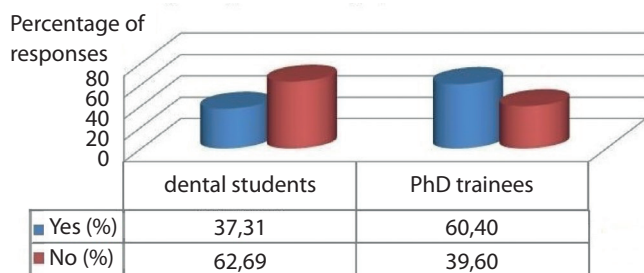


Figure 1. Frequencies of flossing in dental students and PhD trainees.

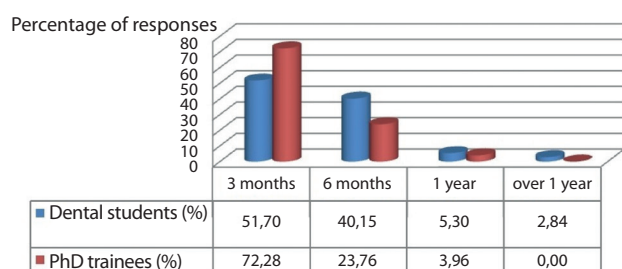
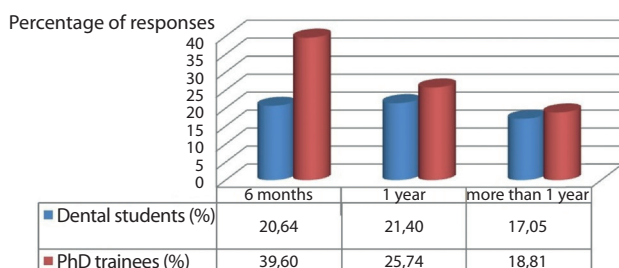


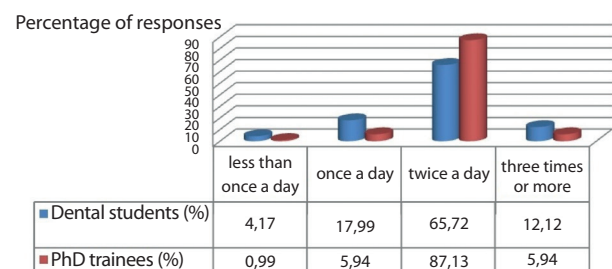
Figure 2. Frequencies of replacing toothbrush in study groups.

**Table 1.** Sample of the questionnaire used in the present study

Age:	Gender:	Academic year:
Father educational level:		Mother educational level:
Father's occupation:		Mother's occupation:
1. From where or whom did you receive your initial oral hygiene education? No instruction ( ) From parents/family ( ) From dentist ( ) From advertisement, brochures ( ) From university/classes ( ) Other ( )		
2. What is the frequency of replacing your toothbrush? 3 months ( ) 6 months ( ) 1 year ( ) More than 1 year ( )		
3. Do you use regular or electric toothbrush? Regular ( ) Electric ( ) Both regular and electric ( )		
4. How many times do you brush your teeth daily? Less than once a day ( ) Once a day ( ) Twice a day ( ) Three times a day ( )		
5. How long do you brush your teeth? Half a minute or less ( ) 1 minute ( ) 1-2 minutes ( ) 2 minutes ( ) More than 2 minutes ( )		
6. Do you rinse your mouth with water after? Never ( ) Occasionally ( ) Often ( ) Always ( ) Never considered ( )		
7. How much water do you use for rinsing? A handful ( ) 2 handfuls ( ) Half a glass of water ( ) A full glass of water ( )		
8. What determines which toothpaste you use? Price ( ) Taste ( ) Advertisements ( ) Uses what's at home ( ) Do not know ( ) Other ( ) Toothpaste's ingredient ( )		
9. How much toothpaste do you put on your toothbrush? Size of a pea ( ) 1 cm ( ) 2 cm ( ) Never considered ( )		
10. What is the effect of fluoride in toothpaste? Makes teeth whiter ( ) Strengthens the teeth ( ) Clean teeth ( ) Makes your mouth fresh ( ) Do not know ( )		
11. Do you clean between your teeth? Yes ( ) No ( )		
12. Do you use interdental brush or dental floss on regular basis? Yes ( ) No ( )		
13. Do you use toothpick? Yes ( ) No ( )		
14. Do you use mouth rinse? Yes ( ) No ( )		
15. How often do you go to dentist for professional dental care? 6 months ( ) 1 year ( ) More than 1 year ( ) Do not know ( )		
16. Do you consume sugary products between meals? Less than once per day ( ) More ( )		
17. Do you smoke? Yes ( ) No ( )		

**Figure 3.** Frequencies of visiting dentist variable in study group stratified by interval.

The students whose fathers had the lowest educational status reported the lowest frequencies of flossing (28.28%) and using mouth rinse (5.05%). Likewise the students having

**Figure 4.** Frequencies of tooth brushing in study groups.

mothers with the lowest educational status reported the lowest rate of flossing (33.92%) and using mouth rinse (11.01%). Students with fathers having lowest occupation status also reported the lowest rate of flossing and using mouth rinse

(10%). Similar results were obtained for the students whose mother had the lowest occupational status with the lowest rate of flossing (34.49%) and using mouth rinse (12.41%). According to the results, parents of PhD students had significantly higher education level and higher skilled occupations than parents of dental students ( $p < 0.001$ ).

## Discussion

Professional dental education tends to have positive effects on dental students' oral health attitude and behavior as supported by several studies in different countries (19, 22-25, 27). To the best of our knowledge, this is the first study to examine oral health behaviors of PhD students in dentistry. This data might be useful to determine the effect of professional training on these behaviors.

According to the results of the present research, PhD students reported better behavioral responses for flossing, amount of toothpaste, sugar consumption, frequency of replacing toothbrush and visiting dentist variables. However, rates of other oral health behaviors were under 50% for both groups as indicated below. Most participants (41.18%) reported using 2 handfuls of water to rinse their mouth after brushing. Of the 17.17% who rinsed with 1 handful of water after brushing, 13.26% were dental and 37.62% were PhD students. Eighty three percent of all participants did not use mouth rinse (82.18% PhD, 83.14% dental). For the frequency of brushing, twice a day was the most common response (69%) and was reported by 87.13% of the PhD and 65.72% of the dental students. Only 12.12% of dental and 5.94% of PhD students reported brushing three times a day. The rate of choosing toothpaste according to the ingredient was higher in the dental student group (33.6% PhD, 41.29% dental). The ingredient was not a dominant factor in selection of toothpaste in both groups. Although the most frequent visit to the dentist (every 6 months) was higher in the PhD group, the rate of this response was only 39.60%. The duration of brushing was low for both groups. Most of the students brushed for 1-2 minutes (29.92% dental, 35.64% PhD). A further study should be performed to examine probable causes of these low results.

Theories of behavior may be used to search whether it is relevant to professional education or individual behavioral compliance. De Wandel *et al.* (28) used "attitude-social influence-self-efficacy model" to determine the predictors and determinants of noncompliance with hand hygiene prescriptions in intensive care unit nurses. They reported self-efficacy as a strong predictor whereas social influence and knowledge as noncontributing factors. According to Larson *et al.* (29), increase of one's knowledge should not be effective to improve one's attitude. Low correlation between knowledge/education and compliance to standard infection control precautions of healthcare practitioners was reported in the literature (30-32). Zadik *et al.* (33) found that oral self-care habits of dental practitioners were better but not perfect when compared to healthcare providers regarding toothbrushing, flossing and visiting the dentist. Maltby *et al.* (34) reported the relationship between how an individual perceives his/her brushing duration ranks relative to other people and the

duration for which they can clean their teeth. In the present study, individual comparisons within this social ranking system may have not promoted brushing duration. According to the results, 93% of all survey participants reported the use of regular toothbrush (95.64% dental, 79.21% PhD students). Not to use electric toothbrush may be due to financial factors which are not covered in this study.

The most frequent response for the origin of oral hygiene education was reported as "family" (42.57% of PhD, 39.58% of dental students). Oral health behaviors in contradiction to expected results may be related to the parental influence. A correlation was found between use of mouth rinse and both occupational and educational status of parents. There was no correlation between criteria for toothpaste selection and occupational/educational status of parents. The present results indicate that education and occupation of parents effect use of floss and mouth rinse of the participants. 51.67% of all participants' fathers graduated with a bachelor degree, 36.09% of mothers had primary education and 47.38% of fathers had occupations requiring professional skill, 64.07% of mothers had elementary occupations.

This study has been conducted with only one questionnaire, which is a serious limitation. To research the effect of education, cross-sectional and longitudinal comparisons would be more useful as personal differences between students may predominate over education. Clinical examinations besides the questionnaire would probably affirm the results. Another limitation of the study was that the sample population was limited to students of one university and had a small population of PhD students, which may have biased the results.

## Conclusion

The outcomes of this study show that the self-reported quality of overall oral health behavior is more pronounced in PhD students than those in graduate programs, with the exceptions of behaviors regarding duration of brushing, criteria of choosing toothpaste and use of oral rinse. Present dental curriculum in the universities should be revisited with respect to oral health attitudes. This study also implied that educational and occupational status of parents had little effect on oral health behavior of the students including the use of dental floss and mouth rinse.

**Ethics Committee Approval:** This study had exemption from institutional ethics review board of the university.

**Informed Consent:** This study had exemption from institutional ethics review board of the university.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** NOC designed the study, generated, gathered and analyzed the data, wrote the majority of the original draft. SKN and SÜ generated, gathered the data. All authors approved the final version of paper.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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**Türkçe öz:** Önlisans ve Doktora Programında Okuyan Diş Hekimliği Öğrencilerinin Kişisel Ağız Bakımları Arasındaki Farklılıklar. Amaç: Bu çalışmanın amacı, doktora (PhD) ve önlisans programlarında okuyan diş hekimliği öğrencilerinin ağız sağlığı davranışlarını karşılaştırmak, ebeveynlerin eğitim ve mesleklerinin bu davranışlar üzerindeki etkilerini belirlemektir. Gereç ve Yöntem: Ankara'daki (Türkiye) bir diş hekimliği fakültesinde ağız sağlığı davranışları ile ilgili bir anket yapılmıştır. Toplam 629 anket dağıtılmış, 528 diş hekimliği ve 101 doktora öğrencisinden cevap gelmiştir. Ayrıca ebeveynlerin eğitim ve meslekleri de kaydedilmiştir. Veriler istatistiksel olarak analiz edilmiştir. Bulgular: Diş fırçasını değiştirme sıklığı ( $p=0,001$ ), elektrikli diş fırçası kullanımı ( $p<0,001$ ), diş fırçalama sıklığı ( $p<0,001$ ), ağız çalkalamak için kullanılan su miktarı ( $p<0,001$ ), diş macunu seçme kriteri ( $p<0,001$ ), diş ipi kullanımı ( $p<0,001$ ), diş fırçalamada kullanılan macun miktarı ( $p<0,001$ ), profesyonel yardım alma sıklığı ( $p<0,0001$ ) ve şeker tüketimi ( $p<0,001$ ) açısından iki grup arasında istatistiksel olarak anlamlı farklar bulunmuştur. Sonuç: Bu çalışmanın sonuçları; diş fırçalama süresi, diş macunu seçme kriteri ve gargara kullanımı dışında belirtilen tüm ağız sağlığı davranışlarının üstünlüğünün PhD öğrencilerinde önlisans programındakilere göre daha belirgin olduğunu göstermektedir. Üniversitelerdeki mevcut diş hekimliği müfredatı ağız sağlığı davranışları açısından yeniden değerlendirilmelidir. Bu çalışma ayrıca, ebeveynlerin eğitim ve mesleki durumlarının diş ipi ve gargara kullanımını içermek üzere öğrencilerin ağız sağlığı davranışları üzerinde çok az etkisi olduğunu göstermiştir. Anahtar kelimeler: Ağız sağlığı, diş fırçalama, eğitim, profesyonel, ebeveynler

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