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Awareness and Attitudes of Dental Students Regarding Contemporary Oral Hygiene Practices

Diş Hekimliği Öğrencilerinin Güncel Oral Hijyen Uygulamalarına İlişkin Farkındalık ve Tutumlarının Değerlendirilmesi

ABSTRACT

Objectives

This study aimed to explore the dental students' contemporary oral hygiene practices, their knowledge of oral care procedures, and determine the effect of dental education on eventual changes in the oral hygiene habits of the students of two different dental faculties.

Material and Methods

This study included 377 students in two dental faculties. Habits, knowledge, and attitudes regarding dental care were obtained from the questionnaire. Statistical analysis of the data was performed by applying the Chi-Square test.

Results

The students at Ankara Medipol University (52.3%) had a significantly higher knowledge of the working principle of power toothbrushes (oscillating-rotating) ($P < 0.05$) compared to the students at Cankiri Karatekin University (45.1%). 36.6% of the students at Ankara Medipol University preferred essential oil, whereas 29% at Cankiri Karatekin University preferred chlorhexidine. Those who used essential oils among those studying at Ankara Medipol University were 36.6%, significantly higher than those at Cankiri Karatekin University 26.1%. The dental students' answers regarding the questions about types of interdental aids used and tongue cleaning methods did not differ significantly ($P > 0.05$). Students at both universities stated that they did not know how plaque disclosing tablets work and did not use them before brushing their teeth.

Conclusion

Our study shows that oral hygiene knowledge is inadequate among dental students, but dentists, who form the basis of public oral and dental health, should set an example for public health. Therefore, students' knowledge of contemporary oral hygiene procedures needs to be improved in the preclinical education.

Key Words

Oral health, Oral hygiene, Dental education, Dental students

ÖZ

Amaç

Bu çalışmanın amacı, diş hekimliği öğrencilerinin güncel ağız hijyeni uygulamaları, ağız bakımı prosedürleri hakkındaki bilgilerini araştırmak ve diş hekimliği eğitiminin iki farklı diş hekimliği fakültesi öğrencilerinin ağız hijyeni alışkanlıkları üzerindeki etkisini belirlemektir.

Gereç ve Yöntemler

Bu çalışmaya iki diş hekimliği fakültesinden 377 öğrenci katıldı. Oral hijyen ile ilgili alışkanlıklar, bilgi ve tutumlar anket yoluyla elde edildi. Verilerin istatistiksel analizi Ki-Kare testi uygulanarak yapıldı.

Bulgular

Ankara Medipol Üniversitesi öğrencileri (%52.3) Çankırı Karatekin Üniversitesi öğrencilerine (%45.1) kıyasla elektrikli diş fırçalarının çalışma prensibi hakkında anlamlı derecede daha fazla bilgiye sahipti ($P < 0.05$). Ankara Medipol Üniversitesi'ndeki öğrencilerin %36.6'sı esansiyel yağ içeren gargaraları tercih ederken, Çankırı Karatekin Üniversitesi'ndeki öğrencilerin %29'unun klorheksidini tercih ettiği görüldü. Ankara Medipol Üniversitesi'nde okuyan öğrencilerden esansiyel yağ içeren gargara kullananlar %36.6 ile Çankırı Karatekin Üniversitesi'nde okuyan öğrencilerden %26.1 ile anlamlı derecede yüksekti. Diş hekimliği öğrencilerinin arayüz temizliği için kullandıkları araçlar ve dil temizleme yöntemleri ile ilgili sorulara verdikleri cevaplar arasında anlamlı bir fark bulunmadı ($P > 0.05$).

Sonuç

Çalışma sonucunda, toplum ağız ve diş sağlığının temelini oluşturan dişhekimliği öğrencilerinin ağız hijyeni bilgilerinin yetersiz olduğu görüldü. Bu nedenle, öğrencilerin güncel ağız hijyeni prosedürleri hakkındaki bilgilerinin klinik öncesi eğitimde geliştirilmesi gerektiği düşünülmektedir.

Anahtar Sözcükler

Ağız sağlığı, Oral hijyen, Diş hekimliği eğitimi, Diş hekimliği öğrencileri

INTRODUCTION

It is well-established that dental plaque biofilms lead to caries, gingivitis, and periodontitis (1). The primary etiological factor for periodontal disease and proximal caries is the development of biofilm or dental plaque (2). Therefore, one of the dental professionals' key goals to preserve and enhance oral health is the control of dental plaque biofilm. There are several mechanical and chemical methods of plaque control, but despite various approaches, mechanical removal of plaque is still the most common method to practice good oral hygiene (3).

Dental students are essential in informing the public about oral health issues and promoting them. It has been further explained by Khami *et al.* (4) that dental students' oral hy-

giene and attitude should be given more consideration to increase their knowledge of oral health status and preventive dental care because they play a crucial role in health promotion and in raising awareness among their patients, families, and the general public.

Therefore, dental students must have a solid understanding of oral health and behave consistent with what the general public expects (5). The National Core Curriculum for Pregraduate Dentistry is the foundation for the dental faculties' curriculum. Examining the curriculum design reveals that periodontology training begins in the third year of dental school. Oral hygiene education is referred to as the subject matter of the course under the heading of mechanical and chemical plaque control. None of the students taking part in the study had previously received professional oral hygiene instruction because the survey was carried out at the start of the school year.

The purpose of the present cross-sectional study was to explore the dental students' contemporary practices of oral hygiene and determine their knowledge of oral care procedures, as well as find out the effect of undergraduate dentistry education on eventual changes in oral hygiene habits of the students in two different cities.

MATERIAL and METHODS

The study population comprised dental students from first to third year at the two dental schools in Türkiye. The two dental faculties follow the same curriculum. In both dental faculties, education is five years and clinical activities start in the fourth year.

The study proposal was accepted by the Ethical Committee of Cankiri Karatekin University (protocol number 6/2023). The initial data were obtained at the beginning of the 2022-2023 academic year. Volunteer students in the first, second, and third grades were included in the study. Of the 377 students who completed the questionnaire, 235 (67.5%) were female and 142 (32.5%) were male. Students that participated in the survey at the beginning of the academic year had not yet received any oral hygiene training during their studies. The participants gave their prior consent for study participation. The questionnaire was distributed in an anonymous format, and it was administered online through Google Forms platform.

Each student replied anonymously to a self-administered questionnaire composed of nineteen questions based on the literature on habits, knowledge of dental market tools, and attitude regarding dental care: teeth cleaning, tooth and tongue brushing, frequency of tooth brushing, and interdental cleaning (6-8).

The data obtained were introduced into a database and analyzed with an SPSS personal computer statistics package. Frequency distribution measures were used for the qualitative variables and measures of central tendency and dis-

persion for the quantitative variables. The chi-square test was used to evaluate differences in the survey variables' distribution. A p-value of 0.05 was used for the significance level in all cases.

RESULTS

A total of 377 students filled the questionnaire (male: 32.5% and female: 67.5%) (Table 1).

Table 1. Distribution of the students participating in the study according to gender

Gender		Ankara Medipol University		Cankiri Karatekin University		Total	
		n	%	n	%	n	%
		Female	131	67,5	104	57,1	235
Male	63	32,5	78	42,9	141	37,5	
Total	194	100,0	182	100,0	376	100,0	

In total, 131 were 1st year students, 45 2nd year, and 19 were 3rd year students at Ankara Medipol University. 75 were 1st year student, 64 2nd year, 43 were 3rd year students in Cankiri Karatekin University. The distribution and comparison of self-reported knowledge and practice of dental aids among different years of dental students are summarized in Table 2.

Of these students, 193 (99%) at Medipol University and 175 (96.2%) reported having been to the dentist at least once. The students in both Cankiri Karatekin University and Ankara Medipol University are the same regarding being to the dentist before (Q1, $P > 0.05$).

When asked to specify at what age they first saw a dental specialist (choosing one of four age brackets), 56.5% of the students at Ankara Medipol University visited the dentist for the first time between 5-9 years (Q2, $P < 0.05$), whereas the students at Cankiri Karatekin University showed significantly lower percentages (45.1%). Among those studying at Cankiri Karatekin University, the rate of being in the ten or older age group is higher.

The majority of the participants, 140 (71.8% at Medipol University) and 139 (76.4% at Cankiri Karatekin University) declared that they were brushing their teeth at least twice a day. No statistically significant differences were found between the students of both universities in terms of frequency of brushing (twice) (Q3, $P > 0.05$).

A higher percent (94.5%) of the students at Cankiri Karatekin University reported that they used manual toothbrush (Q4, $P < 0.05$) than the students at Ankara Medipol University (86.2%).

The students at Ankara Medipol University (52.3%) had a significantly higher knowledge of the working principle of powered toothbrush (oscillating-rotating) (Q5, $P < 0.05$) compared to the students at Cankiri Karatekin University (45.1%).

No statistically significant differences were found between the students in terms of their answers to the duration of tooth brushing (Q6), using any other tools for oral hygiene (Q7-8), how often they use interdental tools (Q9), if they clean their tongues after brushing (Q10) ($P > 0.05$). Most students 113 (75.8%) at Ankara Medipol University, 97 (70.8%) at Cankiri Karatekin University, declared that they used dental floss.

The answers of the dental students in both universities regarding the questions about types of interdental aids used (Q8), and tongue cleaning methods (Q11) did not differ significantly ($P > 0.05$). 130 students (87.8%) at Ankara Medipol University and 130 students (93.5%) at Cankiri Karatekin University used toothbrushes for tongue cleaning.

Seven of the participants were found to have received orthodontic treatment, and among those who did, every single one of them utilized orthodontic brushes (Q13).

Dentifrices were utilized by 41.7% of Cankiri Karatekin University students to remove plaque mechanically. The rate is significantly higher than those at Ankara Medipol University (31.1%) (Q15, $P < 0.05$).

Most participants declared to use a mouthwash that contains fluoride, cetylpyridinium chloride, triclosan, essential oil, herbs, or chlorhexidine 153 (78.5% at Ankara Medipol University) 138 (75.8%) at Cankiri Karatekin University. There is no statistically significant difference between the students regarding using mouthwash and the frequency of using mouthwash (Q16-17, $P > 0.05$). However, 56 (36.6%) of the students at Ankara Medipol University preferred essential oil which is significantly higher than that of those studying at Cankiri Karatekin University (26.1%) whereas 40 (29%) of the students at Cankiri Karatekin University preferred chlorhexidine.

Students at both universities said they did not use plaque disclosing tablests before brushing their teeth (Q19).

DISCUSSION

Dental health practitioners play a significant role in raising the public's level of health education. Due to this, future dentists must develop the information and attitudes necessary for dental health and the prevention, management, and treatment of dental issues (9). Since dental students are the ones who will use these same behavior patterns with their patients in their clinics, it is crucial to understand how they apply this knowledge to their oral care while in dentistry school. In our study, we examined the contemporary oral hygiene knowledge among students of a private university and a public university in Türkiye. No significant differences exist in the dental curriculum between the two dental faculties.

The majority of the participants in this study were female. The admission of more female students to the Faculty of Dentistry may be the cause of this. Gender differences were not investigated in our study; instead, attitudes about oral

Table 2. Distribution and comparison of self-reported knowledge and habits of dental tools among different years of dental students at 2 dental schools (n = 377)

	Questions	Answer	Cankiri Karatekin University			Ankara Medipol University			P value	Chi-Square
			1st year	2nd year	3rd year	1st year	2nd year	3rd year		
Q1	Have you ever visited a dentist?	Yes, I have No, I have not	69 6	63 1	43 0	129 2	45 0	19 0	*0,073	
Q2	If so when was the first time you did it?	Between 0-4	6	7	2	30	6	5	*0,001	
		Between 5-9	28	26	25	73	25	11		
		Between 10-12	25	16	9	18	9	1		
		Over 13	10	14	7	8	5	2		
Q3	How many times a day do you brush your teeth?	Never	0	0	0	0	0	0	0,236	
		Once	15	8	8	22	7	1		
		Twice	55	52	32	86	37	17		
		Three times	4	4	3	20	1	1		
		More than three times	1	0	0	3	0	0		
Q4	What type of toothbrush do you use?	Manual	72	61	39	113	40	15	*0,008	
		Power toothbrush (oscillating-rotating)	3	2	4	18	5	4		
		Power toothbrush (sonic techn.)	0	1	0	0	0	0		
Q5	Do you know how the powered toothbrush or sonic toothbrush work?	No, I don't	19	16	12	42	10	3	*0,036	
		Yes, I know how the powered toothbrush works	24	35	23	67	24	11		
		Yes, I know how the sonic toothbrush works	4	0	1	0	0	0		
		Yes, I know both	28	13	7	22	11	5		
Q6	Duration of toothbrushing	0-1 minutes	5	0	2	4	0	0	0,472	2,516
		1-2 minutes	38	36	13	71	24	11		
		2-3 minutes	29	22	19	44	19	7		
		Over 3 minutes	3	6	9	12	2	1		
Q7	Do you use any other tools for your oral hygiene?	Yes, I do	50	52	35	99	35	15	0,797	0,066
		No, I don't	25	12	8	32	10	4		
Q8	If so, which ones?	Dental floss	31	40	26	74	25	14	0,646	1,659
		Interdental brushes	8	3	4	7	4	1		
		Dental woodsticks	4	5	2	7	1	0		
		Oral irrigators?	7	4	3	11	5	0		
Q9	How often do you use interdental hygiene tools?	Never	0	0	0	0	0	0	0,687	1,478
		Once a week	18	10	8	27	9	2		
		More than once a week	18	19	13	29	11	10		
		Once a day	7	18	9	32	11	3		
		Other	7	5	5	11	4	0		
Q10	Do you also clean your tongue?	Yes, I do	63	46	30	97	34	17	0,914	0,012
		No, I don't	12	18	43	34	11	2		
Q11	If yes, with what aids?	Toothbrush	60	42	28	83	30	17	0,148	2,094
		Tongue cleaner	3	4	2	14	4	0		
Q12	Do you wear braces or do you have implants or restorations?	Yes	1	2	0	2	2	0	0,772	
		No	74	62	43	129	43	19		
Q13	If so, do you use special toothbrushes	No	0	0	0	0	0	0		
		Implant brush	0	0	0	0	0	0		
	designed to clean them?	Orthodontic brush	1	2	0	2	2	0		
Q14	Do you use dentrifices?	Yes, I do	75	64	41	130	44	19	0,945	
		No, I don't	0	0	2	1	1	0		
Q15	If so, for what additional effect of dentrifices do you use?	Mechanical effect on plaque removal	32	24	19	35	16	9	0,004	15,462
		To prevent the development of caries	17	18	9	28	15	3		
		Bad breath	18	12	10	30	8	2		
		Sensitive teeth	2	1	0	16	2	2		
		Whitening	6	9	3	21	3	3		
Q16	Do you use mouthwash?	Yes, I do	45	55	38	102	35	16	0,542	0,372
		No, I don't	30	9	5	29	10	3		
Q17	How often do you use mouthwashes?	Once a day	3	11	5	18	5	3	0,785	1,729
		Twice a day	4	1	2	6	1	1		
		Once a week	7	10	8	13	7	0		
		Twice a week	4	4	9	12	7	1		
		Other	27	29	14	53	15	11		
Q18	Which antimicrobial agents are used in mouth rinses do you prefer?	Chlorhexidine	5	21	14	13	7	5	0,013	14,494
		Essential oil	13	12	11	36	13	7		
		Triclosan containing mouth rinse	5	3	5	9	2	2		
		Cetylpyridinium chloride	1	3	0	12	3	0		
		Fluorides	16	12	7	23	6	1		
		Herbs	5	4	1	9	4	1		
Q19	Do you know what disclosing tablets are and how they work?	Yes, I do	0	0	0	0	0	0		
		No, I don't	75	64	43	131	45	19		

*<0.05

hygiene were assessed based on academic year. The fact that there were more female participants and that they were more interested in and concerned about looking well may have affected the study's findings. In our study, the students showed similar knowledge depending on the academic year. This might be explained by the students taking part in the survey at the start of the academic year and had yet to take the course that includes instruction on oral hygiene. According to some studies, the academic year of student's increases, there is a positive correlation observed between the students' increased education level and the periodontology training they receive, as well as a positive change in their oral hygiene practices, knowledge of periodontal disease, and attitudes and behaviors related to this topic (10,11).

According to a study on the frequency of use, ownership duration, and social background characteristics of electric toothbrushes, 129 patients who had purchased one within the previous 36 months used it every day 62% of the time. It was discovered that the degree of compliance was high and unconnected to social factors (12). In research assessing doctors' opinions regarding the electric toothbrush, it was found that most doctors had sufficient knowledge about the device and that the percentage of doctors using it was extremely low. Doctors working in upscale hospitals in the affluent area were found to have higher levels of use and expertise. While dentists performed better on average, they also knew more about electric toothbrushes than doctors who weren't dentists, and their use rate was also quite low (13). In our study, the usage of manual toothbrushes differs between the universities. Similarly, a survey in Bucharest and Croatia found that most dental students use manual toothbrushes (14,15). The distinction of using manual toothbrushes between private and public school students may be related to their varying socioeconomic backgrounds. A small percentage of our students used electric toothbrushes. This result is consistent with earlier research findings indicating a low frequency of use among students (14,15). Systematic reviews showed that oscillating-rotating powered toothbrushes have superior efficacy over manual toothbrushes in reducing plaque and gingivitis (16,17). The use of a powered toothbrush may be taken into consideration as an alternative to manual tooth brushing for patients undergoing periodontal care, as per the Clinical Practice Guideline created by the European Federation of Periodontology. Clinically significant changes in effect magnitude between powered and manual toothbrushes were not observed (18,19).

Regarding our study students in both universities use toothbrushes for tongue cleaning, however the tongue scraper was found to work better in cleaning the tongue (20). The results of this study, however, indicated that dental students only sometimes clean their tongues with tongue scrapers.

Just 17% of participants in research by Zhu *et al.* (21) used mouthwashes. When asked what kind of mouthwash they used, 36% of respondents said they used Listerine, 14% said they used Chlorhexidine. Students at dentistry and medical schools were asked if they used mouthwash, and the results showed that 29% of them did. In response to a question about

their preferred mouthwash, 36% of respondents said they used Listerine, and 14% said they used Chlorhexidine (22). Similarly, 56 (36.6%) of the students at Ankara Medipol University preferred essential oil whereas 40 (29%) of the students at Cankiri Karatekin University preferred chlorhexidine. The rate of those who answered "*Mouthwashes containing essential oils (Listerine)*" among those studying at Ankara Medipol University is 36.6%, which is significantly higher than that of those studying at Cankiri Karatekin University (26.1%).

A well-known technique for helping patients in visualizing their dental plaque and enhancing their compliance and self-performed hygiene in both professional and home settings is the use of tablets and liquids for plaque disclosure (23-25). Students at both universities stated that they did not know how plaque-disclosing tablets work and didn't use them before brushing their teeth (Q19).

Regarding how often they brushed their teeth, used dental floss, and used mouthwash, it was observed that the majority of the students' behaviors were similar. The present study has shown that there might be significant differences between a private dental school and a public dental school regarding oral hygiene attitude.

The research was performed based on self-reported data. Thus, participants may need to correct their interpretation of questions. One of the limitations of our study is that there were no clinical students at both universities. Following enrollment in the periodontology course, a thorough investigation, including clinical students, is necessary. Social desirability bias may be present in this study due to the small number of students who participated.

CONCLUSION

The study's findings demonstrated that dentistry students' knowledge of contemporary oral hygiene procedures needs to be improved. Oral health education is necessary for the oral and dental health of the population to improve to the desired level. It is the dentist's primary responsibility to encourage and educate their patients. Students should learn about current dental methods from the outset, considering their societal effects.

Author Contribution Statement:

Conceptualization: B.K., H.E.; Investigation: B.K., H.E.; Methodology: B.K., H.E.; Data curation: H.A.K.; Formal analysis: H.A.K.; Writing - Original Draft: B.K., H.E.; Writing - Review and Editing: B.K., H.E.; Visualization: H.A.K.; Supervision: H.A.K.

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Conflict of Interest:

There is no conflict of interest between the authors.

Ethics Committee Approval:

The necessary ethical approval for this study was received from Çankırı Karatekin University Non-Pharmaceutical and Medical Device Ethics Committee (2023/6).

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