

THE ATTITUDE OF DENTISTS' APPROACHES TOWARDS PREVENTIVE DENTISTRY AND TREATMENT OF DENTAL CARIES

Diş Hekimlerinin Koruyucu Diş Hekimliği ve Diş Çürüğünün Tedavisine Yaklaşımları

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ABSTRACT

Objective: It was aimed to determine the changes in dentists' approaches and their knowledge level towards preventive dentistry and treatment of dental caries.

Material and Methods: Two different questionnaires were conducted on different times face to face. While the main survey was carried out in 2010 with 200 dentists practicing in Istanbul, the supporting survey was also applied in 2024 with 414 dentists attending 2024 FDI World Dental Congress. The data were collected and analyzed statistically.

Results: The dentists who participated in 2010 were born between 1951-1960 (29%) and they were working mostly in dental offices (81%) for 20-30 years (30.5%). In the supporting questionnaire, mostly consist of young dentists who were born between 1991-2000 (61.1%) and were working for 0-10 years (72.5%). Most of them were specialists (55.2%) and doctorates (33.8%) working in dentistry faculties (33.8%) or private outpatient clinics (25.4%). In the time interval between the two questionnaires, the benefit, value and necessity of preventive dentistry for the public have decreased from 90% to 60%.

Conclusion: It was found that the scientific nature and effectiveness of preventive dentistry became questionable. Although traditional approaches to questions that determined the level of knowledge decreased, the answers to questions that examined the level of knowledge in detail were not known by the dentists who responded the questionnaire in 2024. It can be concluded that there is no significant change in dentists' knowledge levels and attitudes towards preventive dentistry over a period of approximately 15 years. This result may be correlated to the lack of education of dentists, the rapidly growing number of dental faculties and the further spread of specialization.

Keywords: Preventive dentistry, dentists, questionnaire survey

ÖZ

Amaç: Bu çalışmanın amacı, diş hekimlerinin koruyucu diş hekimliği ve diş çürüğü tedavisine yönelik yaklaşımlarındaki değişiklikleri ve bilgi seviyelerini belirlemektir.

Gereç ve Yöntemler: İki farklı zaman diliminde yüz yüze yapılan iki anketle veri toplanmıştır. Ana anket 2010 yılında İstanbul'da çalışan 200 diş hekimi ile yapılırken, destekleyici anket 2024 yılında 2024 FDI Dünya Diş Hekimliği Kongresine katılan 414 diş hekimiyle gerçekleştirilmiştir. Veriler toplanıp istatistiksel olarak analiz edilmiştir.

Bulgular: 2010 anketine katılan diş hekimlerinin çoğunluğu 1951-1960 yılları arasında doğmuş (%29), çoğunlukla diş hekimi muayenelerinde çalışmakta (%81) ve 20-30 yıllık deneyime sahip (%30,5) olanlardır. Destekleyici anket ise, katılımcılarının büyük çoğunluğu 1991-2000 yılları arasında doğmuş (%61,1) ve 0-10 yıl arasında deneyime sahip (%72,5) genç diş hekimlerinden oluşmaktadır. Katılımcıların çoğu uzman (%55,2) ve doktora (%33,8) olup, diş hekimliği fakültelerinde (%33,8) veya özel muayenelerinde (%25,4) çalışmaktadır. İki anket arasında geçen süre zarfında, toplum için koruyucu diş hekimliğinin faydası, değeri ve gerekliliği %90'dan %60'a düşmüştür.

Sonuç: Koruyucu diş hekimliğinin bilimsel doğası ve etkinliği sorgulanmaya başlanmıştır. Geleneksel bilgi seviyesini belirleyen sorulara verilen cevaplar azalırken, 2024 yılında yapılan ankette daha detaylı bilgi seviyesini sorgulayan sorulara verilen cevaplar çoğu diş hekimi tarafından bilinmemektedir. Yaklaşık 15 yıl içinde diş hekimlerinin bilgi seviyelerinde ve koruyucu diş hekimliğine yönelik tutumlarında önemli bir değişiklik olmadığı sonucuna varılmaktadır. Bu sonucun, diş hekimlerinin eğitim eksiklikleri, hızla artan diş hekimliği fakülte sayısı ve uzmanlaşmanın yaygınlaşması ile ilişkili olabileceği düşünülmektedir.

Anahtar Kelimeler: Koruyucu diş hekimliği, diş hekimleri, anket araştırması



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Received / Geliş Tarihi: 02.02.2025

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Accepted / Kabul Tarihi: 06.03.2025

INTRODUCTION

Oral health is the starting point of the general health and well-being of the body. It has been shown that there is a correlation between oral health, oral diseases and systemic complications. Oral health affects multiple organs and reflects systemic effects such as insulin resistance, cardiovascular systems and even neurodegenerative pathology.¹ In low- and middle-income countries, the prevalence of dental caries is increasing.² At the same time, in these countries, people have poor periodontal health and encounter more difficulties in accessing dental care services. Inequalities are mostly associated with ethnic background, economic condition and socioeconomic status.³ Limiting sugar intake, improving oral health education, incorporating national fluoride exposure programs, and accounting for sociodemographic limitations are essential for reducing the prevalence of dental caries in these countries.² On the other hand, dental caries can also be decreased if dental services focus primarily on oral health care and preventive dentistry.⁴ In high-income countries, preventive strategies have been successfully adapted to the dental services, which decrease the prevalence of dental caries. Finally, dental prevention is essential for the control of dental caries and systemic diseases.⁵

Dentists and dental health professionals are trained to encourage oral hygiene motivation within the community. Their responsibility includes implementing preventive measures and educating patients on adopting good oral health habits.^{6,7} They serve as role models for their patients and they are expected to possess the necessary knowledge to promote proper oral hygiene, dental care, and oral health behaviors.⁸ For better oral health in society, dental healthcare professionals need to provide extensive knowledge and a positive attitude, not just towards treatment but also towards preventive oral care.⁹

Several studies have evaluated the knowledge and attitudes of dental healthcare providers regarding oral health and preventive measures.¹⁰⁻¹³ Some of these studies have found that dental professionals may not always be fully informed about the latest effectiveness of preventive measures.^{14,15} Moreover, dentists' treatment attitudes may change over time and more preventive measures have been performed in recent years.¹⁶ To our best knowledge, there is no questionnaire survey with a high participation rate in Türkiye that evaluates dentists' attitudes and knowledge level towards preventive dental treatments. On the other hand, a big pandemic may have affected the dental education, and afterward, dentists' attitudes may have changed toward the preventive dentistry.^{17,18} It also seems to be important to compare these attitudes before and after the pandemic period. Therefore, the

aim of this study is to determine dentists' attitudes towards prevention and treatment of dental caries. Moreover, an additional questionnaire was also performed in 2024 after the pandemic period to compare the dentists' attitudes with the results obtained based on a PhD thesis.¹⁹

MATERIALS AND METHODS

Ethical registration

This study was approved by the Ethics Committee of Karadeniz Technical University, Faculty of Dentistry, Clinical Researches Ethical Committee (number 64529847/29 and protocol no 2024/25). The study was conducted according to the principles of the Declaration of Helsinki.

The questionnaires parts

This study was mainly created from the data of PhD thesis¹⁹ and an additional questionnaire was also performed in 2024, supporting and comparing the study performed in 2010 based on this PhD thesis. After evaluating some related studies,²⁰⁻²⁴ the main questionnaire conducted in 2010 was created by the researchers. The first seven questions were created to determine the sociodemographic characteristics of the participants. It consists of questions about gender (male, female), date of birth (in five options as 1940-1950, 1951-1960, 1961-1970, 1971-1980, 1981 and after), place of work (as open ended question), how many years they have been working as a dentist (in five categories as 0-10, 10-20, 20-30, 30-40 and more than 40 years), which university they graduated from (as open ended question), their postgraduate degree (in 4 categories as master's degree, doctorate, specialization and none) and where they are currently working (in six options as the dental office, in the private outpatient clinic, in the hospital, in charity, in the public outpatient clinic, in dentistry faculties). The other question in this section was about the last time when dentists attended seminars and courses on preventing tooth decay within the scope of postgraduate education. The options were in five categories as; "in the last year", "in the last 2-5 years", "before 5 years", "I have never attended" and "I do not remember". The second part was about the attitudes of dentists towards preventive dentistry. The items were scored based on a seven-point Likert scale (ranging from 1 = completely disagree to 7 = completely agree). In these questions, its being scientific, effective, easy, attractive, useful for dentists, reputable, beneficial for the public, valuable for the public and necessary for the public were evaluated by the dentists. The third part of the questionnaire was for evaluating dentists' knowledge level about preventive dentistry. In this part, 9 statements were given as "Q3.1. Fluoridation of drinking water in areas with low fluoride levels is an

effective and important way to protect caries", "Q.3.2. In the formation of dental caries, consumption frequency is more important than the total amount of sugar consumed", "Q.3.3. Application of fissure sealant on newly erupted molar teeth, is an effective preventive method against fissure and pit caries", "Q.3.4. A filled tooth is weaker than a tooth without filling", "Q.3.5. Rinsing the mouth with a little water after brushing the teeth increases the effectiveness of fluoride in toothpaste", "Q.3.6. Examining a newly erupted tooth by pressing strongly with a probe, will damage the enamel prisms and make the tooth prone to tooth decay", "Q.3.7. The use of fluoride toothpaste is more important than brushing technique to prevent tooth decay", "Q.3.8. Dental problems can cause general health problems" and "Q.3.9. Fluoride tablets should be given to newborns". The dentists were asked if they agreed or did not agree with these statements.

The questionnaire in 2024 after the pandemic period was almost the same as the main questionnaire with some modifications according to the results published in PhD thesis¹⁹ and conference paper.²⁵ The first part was created to determine the sociodemographic characteristics of the participants. It consists of 7 questions about gender (male, female), year of birth (in six options as 1951- 1960, 1961-1970, 1971-1980, 1981-1990, 1991-2000, 2001-2010) city of work (as open ended question), how many years they have been working as a dentist (in five categories as 0-10, 10-20, 20-30, 30-40 and more than 40 years), which university they graduated from (as open ended question), their postgraduate degree (in 3 categories as master's degree, doctorate and specialization) and where they are currently working (as in the dental office, in the private outpatient clinic, in the hospital, in the public outpatient clinic, in dentistry faculties). In this section, the other question was about whether they liked to attend courses and seminars on preventive dentistry as part of post-graduation continuing education. The options were yes and no. In the second part, dentists' attitudes towards preventive dentistry were aimed to be evaluated. The items were scored based on a seven-point Likert scale (ranging from 1=completely disagree to 7=completely agree). In these questions, the scientific nature and effectiveness of preventive dentistry, its benefit for the individuals, for the oral and dental health of the society and the general health of the individuals were evaluated. In the third part, Q3.1, Q3.2, Q3.3, Q3.4 and Q3.5 were prepared to measure dentists' knowledge level about fissure sealant, dental composite restorations, fluoride and initial tooth caries. In Q3.1, they were asked to indicate whether the use of fluoride toothpaste is effective in protecting against tooth decay. The options were grouped into two categories as effective and ineffective. In Q3.2, the

duration of the tooth with a composite filling remaining in the mouth was asked and the options were grouped as less than 1 year, 1-2 years, 3-4 years, 5-6 years, 7-8 years and more than 7-8 years. In Q3.3, it was asked whether they applied fissure sealant to newly erupted molar teeth. The options were grouped as yes and no. In Q3.4, they were asked whether they applied prophylactic intervention to non-cavitated lesions (white spot), and the options were grouped as yes, no and rarely. In Q3.5, it was asked whether rinsing the mouth with a little water after brushing the teeth increases the effectiveness of fluoride in toothpaste, and the options were grouped as "it increases", "it does not increase" and "I have no idea". In the fourth part, dentists were asked questions about preventive dentistry and prophylaxis. In Q.4.1, they were asked whether they found the number of courses on preventive dentistry during their undergraduate education sufficient, and in Q.4.2, they were asked if they think that the preventive dentistry courses in their undergraduate education provided them with competence. Both answers to these two questions were grouped as yes, no and insufficient. In Q.4.3, they were asked whether they provided routine prophylaxis to their patients in the clinic where they worked, and the answers were divided into yes and no. In Q.4.4, they were asked whether they received satisfactory fees from the patients to whom they administered prophylaxis. The answers were divided into yes, no, and rarely.

The study population of the questionnaires

Both questionnaires were performed face-to-face. The questionnaire was carried out in 2010 as the main input of the PhD thesis.¹⁹ Before this questionnaire, a pilot study was performed with 18 voluntary dentists in 16th International Dentistry Congress of the Turkish Dentists Association in Istanbul in 2009. After making the necessary adjustments to the questions, the questionnaire was performed with a totally 200 dentists, working in 4 districts (Güngören, Fatih, Kadıköy, Şişli) of Istanbul (n=50). In the questionnaire in 2024, sample size was calculated based on the study Arheiam *et al.*,²⁶ alpha error = 0.05, beta error = 0.20, and the effect size= 0.45, resulted in a total of 158 participants. However, considering possible data loss, it was planned to include at least 175 participants in total in the study. The survey was performed at FDI World Dental Congress 2024 in Istanbul. Dentists who were born between 1951 and 2010, registered for FDI World Dental Congress, participated in the congress from all over Türkiye, could speak Turkish, worked in Türkiye and wanted to participate voluntarily were included in the study. Dentists who did not want to participate in the study voluntarily, could not read and write Turkish,

did not work in Türkiye, and did not register for the congress were excluded.

In both questionnaires, the participation was voluntary and without any incentive. The principal investigator (K.D) explained the objectives of the research to the participants and informed them that participation was voluntary and anonymous. Also, descriptions of the objective of the survey, contact number of the principal investigator, code of ethics, the assurance about the anonymity of responses and the voluntary participation of the responders were provided on the cover page of the questionnaires. It was also mentioned to answer the questions truthfully without consultation with other colleagues. Additionally, questionnaire forms with incomplete or incorrect answers were excluded. All responders signed an informed consent form before accessing the questionnaires. Data were stored anonymously.

Statistical analysis

For the analysis of the questionnaire in 2010, two hundred responses were coded in Microsoft Excel 2007 program. The analysis of the data obtained in the study was carried out using NCSS 2007 & PASS 2008 statistical software program (Utah, USA). Data from the questionnaire in 2024 were analyzed with IBM SPSS V23. In both questionnaires, the median (minimum-maximum) was used to display quantitative data. Frequency and percentage were used to display categorical data. The significance level was taken as $p < 0.05$.

RESULTS

Descriptive statistics of participants' characteristics

Two hundred participants from Istanbul responded to the questionnaire in 2010. 117 of them graduated from Istanbul University; 63 from Marmara University, 6 from Hacettepe University, 4 from Gazi University, 3 from Atatürk University, 3 from Ege University, 2 from Selçuk University, 1 from Dicle University and 1 from Crimea University. On the other hand, 414 participants responded to the questionnaire in 2024. As 148 of them were practicing in Istanbul (35.7%), 266 of them (64.3%) were practicing in other cities of Türkiye. They graduated from 55 different dentistry faculties. 52 of these faculties were in Türkiye. 38 were from dentistry faculties at state universities and 14 were from dentistry faculties of foundation universities in Türkiye. Moreover, 2 dentistry faculties were in North Cyprus and 1 faculty was in Azerbaijan. Characteristics of the participants of both questionnaires are shown in Table 1. Dentists' gender, date of birth, practice year duration, master's degree, place of employment and answers about attending courses and seminars were stated as the mean and median (%).

The attitudes of dentists towards preventive dentistry in 2010 and 2024 were stated in Table 2. It was shown that in the questionnaire in 2010, the rate of respondents who gave 7 points to the statements of preventive dentistry being scientific, effective, easy, attractive, useful for dentists, and reputable were 65%, 56.5%, 56%, 45.5%, 59.5%, and 66.5%, respectively.

Table 1: The characteristics of participants of the questionnaires

Characteristics of the participants		n	%
Gender			
2010	Male	99	49.5
	Female	101	50.5
2024	Male	93	22.5
	Female	321	77.5
Date of Birth			
2010	1940-1950	26	13.0
	1951-1960	58	29.0
	1961-1970	49	24.5
	1971-1980	45	22.5
	1981 and after	22	11.0
2024	1951-1960	2	0.50
	1961-1970	21	5.10
	1971-1980	40	9.70
	1981-1990	61	14.7
	1991-2000	253	61.1
	2001-2010	37	8.90
How many years have you been working as a dentist?			
2010	0-10 years	51	25.5
	10-20 years	51	25.5
	20-30 years	61	30.5
	30-40 years	29	14.5
	40 years and more	8	4
2024	0-10 years	300	72.5
	10-20 years	52	12.6
	20-30 years	37	8.9
	30-40 years	24	5.80
	40 years and more	1	0.2
Master's degree			
2010	Master	5	29
	PhD	12	71
	Specialization	0	0
2024	Master	23	11
	PhD	71	33.8
	Specialization	116	55.2
Current place of employment			
2010	Dental office	162	81
	Private outpatient clinic	26	13
	Hospital	4	2
	Dentistry faculty	5	2.5
	Dental Office+Dentistry faculty	1	0.5
2024	Dental office+Public outpatient clinic	2	1
	Dental office	92	22.2
	Private outpatient clinic	105	25.4
	Hospital	45	10.9
	Public outpatient clinic	32	7.7
	Dentistry faculty	140	33.8
When the last time did the dentists attend seminars and courses on preventing tooth decay within the scope of postgraduate education?			
2010	In the last year	54	27
	In the last 2-5 years	45	22.5
	Before 5 years	16	8
	I have never attended	71	35.5
	I do not remember	14	7
Would you like to attend courses and seminars on preventive dentistry as part of post-graduation continuing education?			
2024	Yes	328	79.2
	No	86	20.8

The options "beneficial for the public", "valuable for the public" and "necessary for the public" were higher than the others. They were about 96%, 91%, and 97.5%, respectively. On the other hand, in the questionnaire in 2024, the rate of respondents who gave 7 points to "beneficial for the individuals",

"beneficial for public oral and dental health" and "beneficial for the general health of the individuals" were about 63%, 65% and 62.1%, respectively. The rate of the respondents who gave 7 points to "The scientific nature and effectiveness of preventive dentistry may be questioned" was about 34%.

Table 2: The attitudes of dentists toward preventive dentistry

The attitudes of dentists	Likert Scale						
	1	2	3	4	5	6	7
2010							
Scientific	1%	1%	3%	4.5%	13%	12.5%	65%
Effective	1.5%	3.5%	5.5%	6.5%	6.5%	20%	56.5%
Easy	3.5%	3.5%	4.5%	7%	9%	16.5%	56%
Attractive	4.5%	5%	5%	13.5%	8.5%	18%	45.5%
Useful for dentists	5.5%	4%	2%	7.5%	7%	14.5%	59.5%
Reputable	3%	2%	3.5%	3.5%	7%	14.4%	66.5%
Beneficial for the public	0.5%	0.5%	0%	1%	1%	1%	96%
Valuable for the public	1.5%	1.5%	0%	1%	2%	3%	91%
Necessary for the public	0.5%	0%	0%	0.5%	1%	0.5%	97.5%
2024							
The scientific nature and effectiveness of preventive dentistry may be questioned	13.3%	5.1%	11.1%	13.3%	10.4%	12.8%	34.1%
Beneficial for the individuals	1.9%	1.2%	1.9%	4.8%	9.4%	17.6%	63%
Beneficial for public oral and dental health	1.9%	1.2%	1.7%	2.9%	8%	19.3%	65%
Beneficial for the general health of the individuals	2.2%	2.7%	1.9%	5.3%	9.7%	16.2%	62.1%

The percentage of the answers given to the questions which evaluate the knowledge level of dentists in both questionnaires are shown in Table 3. The statements most accepted by dentists in 2010 were that "dental problems can cause general health problems" (98.5%) and "in the formation of dental caries, consumption frequency is more important than the total amount of sugar consumed" (89.5%). These rates were followed by the answer to the statement "Application of fissure sealant on newly erupted molar teeth, is an effective preventive method against fissure and pit caries." with a rate of 88%. In 2024, 96.1%, is the highest response rate for the statement "The use of fluoride toothpaste in protecting against tooth decay is effective."

Table 4 shows the percentages of the answers to the questions about preventive education and prophylactic interventions in the questionnaire in 2024. The rate of dentists who think that the number of courses on preventive dentistry is sufficient and provides them with competence is 41.3% and 54.1%, respectively. In addition, the rate of dentists who provide routine prophylaxis to their patients is 52.7%. 79.2% of the dentists are not able to receive a satisfactory fee from the patients for the prophylaxis interventions.

DISCUSSION

It is important and useful to evaluate dentists' attitudes and knowledge levels towards prevention. In addition, comparing the questionnaires in different time periods (such as before and after pandemic period) will help to evaluate the changes in dentists' characteristics, attitudes and their knowledge levels towards prevention. The dentists in the questionnaire in 2010

were mostly born between 1951-1960 (29%) and they had been working mostly in dental offices (81%) for 20-30 years (30.5%) (Table 1). It is seen in the questionnaire in 2024 that dentists' characteristics have changed in this time interval. In 2024, they mostly consisted of young dentists who were born between 1991-2000 (61.1%), and had been working for 0-10 years (72.5%). Most of them were specialists (55.2%) and doctorates (33.8%) and worked in dentistry faculties (33.8%) or private outpatient clinics (25.4%) (Table 1). This situation shows that dentistry faculties in both state and foundation universities have been increasing and dentists who work at dentistry faculties and private outpatient clinics are more than those who work in dental offices. Since the specialization law was not passed in 2010, specialization and PhD degrees were not common among dentists in the questionnaire in 2010. However, it is seen that specialization and PhD have increased among dentists in 2024.

It is well known that dentists perform high quality treatments for patients by attending continuing dental courses.²⁷ It is also known that dentists' theoretical and technical knowledge increase, and new technological adaptations and positive treatment results are gained with the help of continuing education courses.²⁸ A previous study found that participation in professional development courses in Western Australia between 2001 and 2006 was low.²⁹ This result was compatible with the questionnaire conducted in 2010. In the questionnaire in 2010, the rate of dentists who said they had never attended courses and seminars on tooth decay prevention within the scope of post-graduation education was 35.5% while the rate of dentists who did

not remember attending was 7%. However, the rate of dentists who wanted to attend these courses increased to nearly 80% in the questionnaire in 2024 (Table 1). This situation may be an indicator of the largely negative answers given to the questions of "Do you

find preventive dentistry education sufficient during undergraduate dentistry education? (58.7%) and "Do you think that the preventive dentistry courses in your undergraduate education provided you with competence?"(45.9%) (Table 4).

Table 3: The percentage of the answers to the questions which evaluate the knowledge level of dentists

The statements and answers	Mean Median	
	n	%
2010		
Q.3.1. Fluoridation of drinking water in areas with low fluoride levels is an effective and important way to protect caries.		
I agree	147	73.5
I do not agree	53	26.5
Q.3.2. In the formation of dental caries, consumption frequency is more important than the total amount of sugar consumed.		
I agree	179	89.5
I do not agree	21	10.5
Q.3.3. Application of fissure sealant on newly erupted molar teeth, is an effective preventive method against fissure and pit caries.		
I agree	176	88
I do not agree	24	12
Q.3.4. A filled tooth is weaker than a tooth without filling.		
I agree	95	47.5
I do not agree	105	52.5
Q.3.5. Rinsing the mouth with a little water after brushing the teeth increases the effectiveness of fluoride in toothpaste.		
I agree	69	34.5
I do not agree	131	65.5
Q.3.6. Examining a newly erupted tooth by pressing strongly with a probe, will damage the enamel prisms and make the tooth prone to tooth decay.		
I agree	71	35.5
I do not agree	129	64.5
Q.3.7. The use of fluoride toothpaste is more important than brushing technique to prevent tooth decay.		
I agree	31	15.5
I do not agree	169	84.5
Q.3.8. Dental problems can cause general health problems		
I agree	197	98.5
I do not agree	3	1.5
Q.3.9. Fluoride tablets should be given to newborns.		
I agree	126	63
I do not agree	74	37
2024		
Q.3.1. The use of fluoride toothpaste in protecting against tooth decay is		
Effective	398	96.1
Ineffective	16	3.9
Q.3.2. How long do you think a tooth with a composite filling will stay in the mouth?		
Less than one year	2	0.5
1-2 years	5	1.2
3-4 years	34	8.2
5-6 years	99	23.9
7-8 years	86	20.8
More than 7-8 years	188	45.4
Q.3.3. Do you apply fissure sealant to newly erupted teeth?		
Yes	241	58.2
No	173	41.8
Q.3.4. Do you apply prophylactic intervention to non-cavitated (white spot) lesions?		
Yes	139	33.6
No	159	38.4
Rarely	116	28
Q.3.5. Does rinsing the mouth with a little water after brushing the teeth increase the effectiveness of fluoride in toothpaste?		
Increases	134	32.4
Does not increase	139	33.6
I have no idea	141	34.1

Table 4: The percentages of the answers to the questions about preventive education and prophylactic interventions in the questionnaire in 2024

The questions and answers	n	%
Do you think the number of courses on preventive dentistry during your undergraduate education is sufficient?		
Yes	171	41.3
No	149	36.0
Insufficient	94	22.7
Do you think that the preventive dentistry courses in your undergraduate education provided you with competence?		
Yes	224	54.1
No	86	20.8
Insufficient	104	25.1
Do you provide routine prophylaxis to your patients in the clinic where you work?		
Yes	218	52.7
No	196	47.3
Do you receive a satisfactory fee from the patients to whom you provide prophylaxis for the prophylaxis interventions you provide?		
Yes	22	5.3
No	328	79.2
Rarely	64	15.5

This is also concluded that younger dentists may be more conscious about continuing dental education courses and seminars.

It can be said that dentists are role models to prevent and control dental caries.⁸ Their positive attitude and knowledge towards preventive dentistry may affect the oral health of people in society. Nepalese dentists' attitudes towards preventive dentistry were assessed and it was shown that the majority of participating dentists had general competency in preventive dentistry.³⁰ When dentists' attitudes towards preventive dentistry in both 2010 and 2024 were compared, positive responses about its being scientific, effective, easy, attractive, useful for dentists, reputable, beneficial, valuable and necessary for the public were higher in 2010 than the responses in 2024 (Table 2). In 2010, beneficial for the public, valuable for the public and necessary for the public options were stated largely as 7. However, dentists' attitudes towards the benefits of preventive dentistry for individuals, public oral and dental health and general health of the individuals decreased in 2024. The scientific nature and effectiveness of preventive dentistry have become controversial in 2024. This means that trust in preventive dentistry has diminished within time interval of 2010-2024. This situation may be explained by many factors. Firstly, dentists are not able to perform preventive treatments sufficiently because of lacking preventive dentistry in the dental education curriculum. Also, lacking dentists' competence and patients' demands may avoid prevention. Preventive treatments are not covered by the insurance system in the practice environment and dentists have difficulties in charging fees to patients. These factors may actively

prevent dentists from performing preventive practices. Secondly, since the questionnaire in 2024 was conducted among dentists who attended the 2024 FDI World Congress, dentists were conscious and aware of this negative situation of preventive dentistry during undergraduate education. In addition, as they stated they did not find the curriculum sufficient (Table 4). However, as specialization was integrated into the curriculum, prophylaxis and preventive dentistry were ignored by specialists and even dentists who wanted to improve themselves academically.

To effectively prevent dental caries, it is necessary to reduce sugar in the diet, ensure oral hygiene and use fluoride to increase the resistance of the tooth against acids.³¹ According to the answers given to the questionnaire in 2010, dentists responded positively to the fluoridation of water and giving fluoride tablets to newborns. They also agreed that the frequency of sugar consumed was more important than the amount of sugar consumed for the occurrence of tooth decay and the relationship between dental health and general health (Table 3). However, the fact that 84.5% of dentists did not agree with the statement "the use of fluoride toothpaste is more important than brushing technique to prevent tooth decay" was similar to previous studies.^{20,32} In the questionnaire in 2024, although more positive responses have been given to the effectiveness of fluoride toothpaste in protecting against tooth decay (96.1%), the ratios of negative answers given in both questionnaires in 2010 and 2024 to the question of "Does rinsing the mouth with a little water after brushing with fluoride toothpaste increase the effectiveness of fluoride" were 65.5% and 67.7%, respectively (Table 3). This situation may also be related to insufficient course numbers and content about preventive dentistry in undergraduate education, as seen in Table 4. In addition, in the questionnaire in 2010, while 64.5% of dentists did not accept the statement that "examining a newly erupted tooth by pressing strongly with a probe, will damage the enamel prisms and make the tooth prone to tooth decay", 35.5% of them accepted it. The general lack of awareness about fluoride in toothpaste and lack of knowledge about examination may stem from traditions, cultural variations, or the content of educational curricula in schools and universities.³² Because the effectiveness of the pit and fissure sealants has been proved, they should be implemented in dental caries prevention programs.³³ However, the reasons for the limited use of fissure sealants were attributed to the lack of insurance coverage, poor long-term retention rate, concern about undetected caries, maintenance required, concern about cost-effectiveness and difficulty of placement.³⁴ Insufficient knowledge and lack of practice guidelines were also stated as the

reason for low rate fissure sealants in Greece.¹⁴ It is seen in the present study that dentists agreed that the application of fissure sealant on newly erupted molar teeth is an effective preventive method against fissure and pit caries in the questionnaire in 2010 (88%). However 41.8% of dentists stated that they do not apply fissure sealants to newly erupted teeth in the questionnaire in 2024. The high rate of 88% in questionnaires in 2010 may be explained by the nature of the self-reported questionnaires in which people may give more acceptable answers.³⁵ It is also seen that the dentists who participated in the questionnaire in 2024 did not provide routine prophylaxis to their patients (47.3%) (Table 4) and did not apply the prophylactic intervention to non-cavitated (white spot) lesions (38.4%) (Table 3). This situation is parallel to the rate of 57.5% of dentists performing restorative treatment for enamel tooth decay in 2010, even in patients with low risk of dental caries.²⁵ The reason may be a lack of education and not receiving satisfactory fees from the patients for preventive treatments (Table 4).

Nowadays there is an increasing focus on minimally invasive dentistry, which prioritizes the preservation of tooth structure. Modern resin composites, along with advanced adhesive techniques, facilitate this approach by enabling restorations that closely replicate the natural look and function of teeth, in terms of conservative dental care principles.³⁶ In addition, the aesthetic outcome of resin composites and patients' preference for more "natural-looking" restorations have contributed to their widespread use.³⁷ Innovations such as bulk-fill composites, improved bonding agents, and advanced light-curing units have further improved the efficiency and durability of composite restorations.³⁸ However, when we compare the answers given to both questionnaires from a restorative perspective, it is important to state that there is not much difference in proportion between those who agree that a filled tooth is weaker than a tooth without filling (47.5%) and those who say that a restoration will remain in the mouth for 7-8 years and less (54.6%) in this time interval (Table 3). Despite the advancements in the materials, the durability and success of composite restorations also largely depend on the practitioner's expertise, experience, and skill level.³⁹ It was shown that the proper application of restorative techniques and the operator's knowledge were crucial for achieving successful outcomes, no matter which material was used.⁴⁰ Almost half of the dentists in the questionnaire in 2024 state that dental composites can stay in the mouth for 7-8 years and less. This may be due to the fact that dentists who specialize in different departments do not know the exact duration of a dental composite restoration in the mouth.

According to the results obtained from the questionnaire in 2010, the rate of dentists who never attended and did not remember attending post-graduate courses and seminars was 42.5%. Dentists had more positive responses to the necessity of preventive dentistry for the public in 2010. Dentists' answers to the questions about the etiology of dental caries and toward preventive dentistry showed that they did not gain sufficient qualifications with the education they received in dentistry faculties. Yet, there has been no significant change in dentists' knowledge levels and perspectives on preventive dentistry approximately in 15 years. This may be due to lacking dental education, the rapidly increasing number of dental faculties and the further spread of specialization. Even though specialization increases, keeping preventive dentistry at the forefront should always be the first duty of the dentistry education curriculum. In light of the information obtained from the study, it can be concluded that researches/studies aimed at increasing preventive dentistry practices may contribute to the national economy in the relevant field.

Conflict of Interest: There is no conflict of interest between the authors.

Researchers' Contribution Rate Statement: Concept/Design: KD, TY; Analysis/Interpretation: KD, TY, Data Collection: KD, TY; Writer: KD, TY; Critical Review: KD, TY; Approver: KD, TY

Support and Acknowledgment: No financial support was received from any institution or person.

Ethics Committe Aproval: This study was approved by the Ethics Committee of Karadeniz Technical University, Faculty of Dentistry, Clinical Researches Ethical Committee (number 64529847/29 and protocol no 2024/25). The study was conducted according to the principles of the Declaration of Helsinki.

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