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INVESTIGATION OF THE SELF-REPORTED ATTITUDE OF DENTISTS TOWARDS PREVENTIVE APPLICATIONS

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ABSTRACT: The purpose of this study was to determine the approaches of dentists to the use of fluoride applications as preventive treatment options. The study was a questionnaire based cross-sectional survey divided into two sections and the participating dental practitioners were asked to answer a questionnaire about: (i) demographic data and (ii) dentists' attitudes to prevention. Data entry and analyses were performed using SPSS statistical software. Data were analyzed using frequency counts, percentages, and Chi-square test. The sample (N=481), who volunteered to participate, consisted of 332 general dentists (69%) and 149 specialist dentists (31%). 380 (79%) dentists applied preventive applications. 452 dentists (94%) considered that fluoride was effective in preventing caries. 235 dentists (48.9%) thought that fluoride had side effects. Significantly more female dentists thought that fluoride had a caries preventive effect than male dentists (p=0.005) and they applied preventive treatments more frequently than male dentists (p=0.01). All age groups believed that fluoride was useful to prevent caries, and almost all the dentists in the 18–25 age range believed in a caries preventive effect of fluoride (98.6%) (p=0.0001). Dentists in 18–25 age range used preventive applications for their patients more than other age groups (p=0.019). Fewer dentists aged 26–35 than dentists in the other age groups (p=0.037) thought that the fluoride preparations had dental and/or medical side effects. Non-specialist dentists gave more priority to preventive applications than specialist dentists (p=0.0001). The approach of dentists to the use of preventive practices will change if they keep up-to-date with information about preventive practices through ongoing training.

Key words: Attitude; Dentist; Preventive applications; Survey

INTRODUCTION

Dental caries is one of the most common infectious diseases among children and can be precluded in the early phases. The studies have demonstrated that fluoride applications are effective in reducing caries in children and adolescents.[1,2] Despite the proven effectiveness of preventive treatments, the rate of children receiving these services is less than desired. One of the reasons why the use of preventive dental care is not common is the attitude of the dentists and their unwillingness to raise public awareness.[2,3] Fluoride applications, fissure sealants, fluoride containing toothpastes, dietary changes, behavior management, education, risk assessment and determination of caries are some of the caries preventive treatments.[4] Although many preventive treatments are utilizable today, fluoride application is an early treatment that has been

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proven to be effective.[5,6] People in high caries risk groups need to use fluoride applications more frequently, or in a more concentrated form, and may also benefit from other preventive applications.[5]

In children and adolescents, dental caries are most commonly seen on pits and fissures of occlusal surfaces of posterior permanent molars. In the high caries risk groups, fissure sealants, and fluoride varnishes are the most commonly used preventive options for the affected teeth.[7] To prevent tooth decay, especially in children, dentists should give more importance to early intervention. Topical application of fluoride varnish and fluoride gels for 3 to 6 months are the most applicable treatments.[8] The goal of fluoride treatments and other preventive applications is to prevent the onset of tooth decay in cases with a major future risk of decay. Despite the increasing interest in preventive practices in young children, high numbers still have tooth decay due to the absence of preventive treatment.[9] Previous studies have identified similar factors that have generally influenced caries prevention practices.[10] In making the decision of whether or not to use preventive treatment, it is reported that the effect of the dentist's workplace, cost of treatment, time, place, personnel related factors, and patient preferences are considered more than the available research evidence.[11] Although it is scientifically proven that fluoride applications are safe when applied properly, some people believe that fluoride applications are harmful and toxic. There are studies showing that high doses of fluoride taken systemically cause some health problems like dental fluorosis, skeletal fluorosis, and nonskeletal fluorosis, including a disturbance of thyroid hormone metabolism and developmental neurotoxicity such as a reduction in IQ. On the other hand, it is known that fluoride applied with the advice of a doctor has a caries-reducing effect.[12,13,14] Dentists can be considered as a primary source of dental information for the public. They may affect oral health information and potentially oral health outcomes including preventive treatment. To prevent tooth decay and to increase the knowledge of people's oral health, dentists' knowledge about preventive practices and their use is important.[15,16] The aim of this study is to determine the knowledge levels, application methods, and approach of dentists to caries preventive applications.

MATERIALS AND METHODS

The study was a questionnaire based cross-sectional survey. The study protocol was approved by the Ethics Committee of Istanbul University, Faculty of Dentistry, Istanbul, Turkey (No: 2016/64). Ethical approval was obtained and the personal information collected from the dental practitioners who participated in the present study was kept private. The criteria for dentists to be able to participate in the study were to have graduated and be actively involved in dental practice and agreeing to contribute to the research. The participating dental practitioners were asked to answer and complete a questionnaire. Surveys were delivered to dentists via the internet. A total of 481 dentists voluntarily answered all the questions. The questionnaire used in this study included twenty questions and these questions were divided into two sections. First section of the questionnaire was about dentists' demographic data. The questions in the second section included information about dentists' attitudes to preventive dentistry and use of fluoride applications.

Data Measurements

Questions were included about (1) gender, (2) age, (3) graduation year, (4) university graduated from, (5) speciality, (6) years in practice, and (7) working place.

To evaluate knowledge of and attitude to fluoride applications 13 questions were asked:

(8) Do you follow the news about fluoride on the written, visual or social media?

(9) Do you keep up-to-date information about preventive dentistry?

(10) Have you ever participated in a course or class on dental caries prevention?

(11) Do you assess your patients according to the caries risk factors?

(12) Do you use preventive applications for your patients?

(13) Do you recommend to your patients toothpaste with fluoride or mouthwash for individual use?

(14) Do you think that fluoride is useful to prevent caries?

(15) Do you think that fluoride preparations have a dental and /or medical side effect?

(16) Do you think that the age of the patient is important when choosing the fluoride preparations?

(17) Which preventive applications do you apply most often? In this question the dentists explained the preventive materials they applied, the age groups and the frequency of the application of fluoride and fissure sealants.

(18) Are professional fluoride applications absolutely necessary for children who were living in regions with non-fluoridated water?

(19) What do you think about the effect of adding fluoride to drinking water for caries prevention?

(20) What do you think about the effect of dietary fluorides on caries prevention?

Statistical Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS, IBM Corporation, Version 21.0; Armonk, NY, USA) software. Data were analyzed using frequency counts, percentages and Chi-square test. The level of significance was assessed at $p=0.05$.

RESULTS

Demographic Data of Dentists

Demographic data of the participants in the survey are shown in Figure 1. A total of 481 dentists participated in the survey; 355 female (73.8%) and 126 male (26.2%) male. The age prevalence ranged from 14.8% 18–25 years, 44.3% 26–35 years, 26.6% 36–50 years and 14.3% 51 years and over (Figure 1A).

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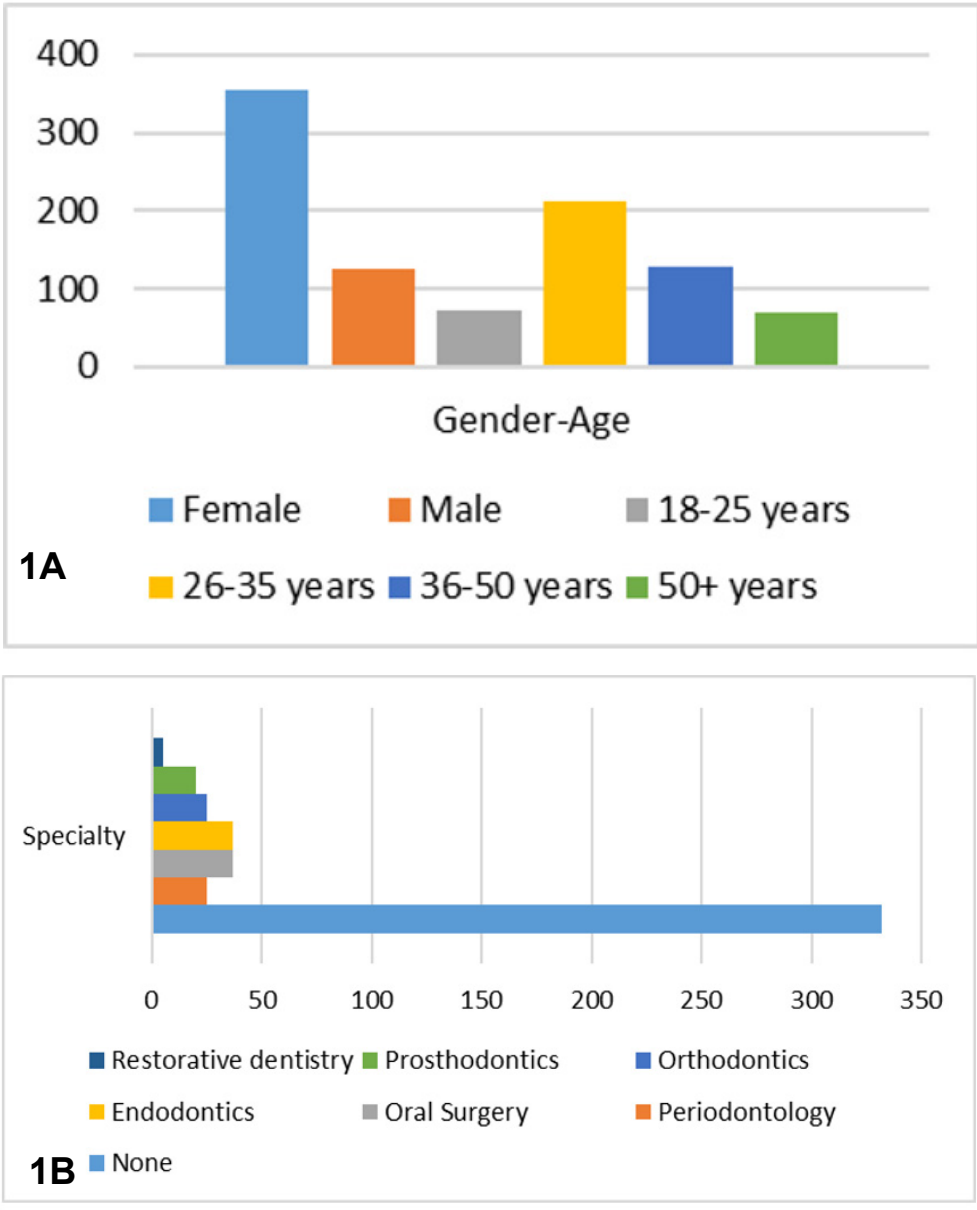
Dentists' specialities were 5.2% periodontology, 7.7% oral surgery, 7.7% endodontics, 5.2% orthodontics, 4.2% prosthodontics, and 1.03% restorative dentistry, while 69% of dentists did not have any speciality (Figure 1B).



Figures 1A and 1B. Distribution of demographic data. 1A: gender and age; 1B: speciality.

The distribution of the graduation year of dentists: 2.2% graduated between 1970–1980 years, 11.6% graduated between 1981–1990 years, 17.6% graduated between 1991–2000 years, 68.3% graduated between 2001–2016 years (Figure 1C)

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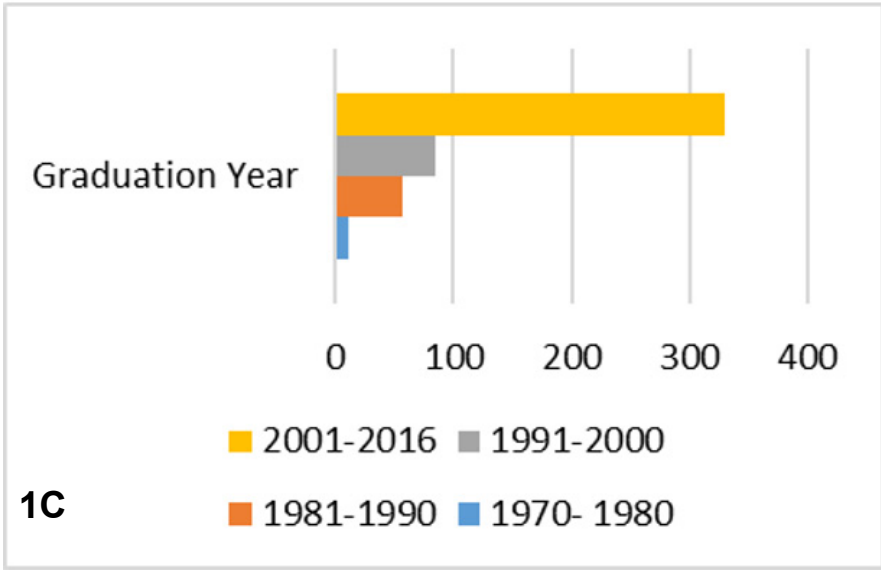
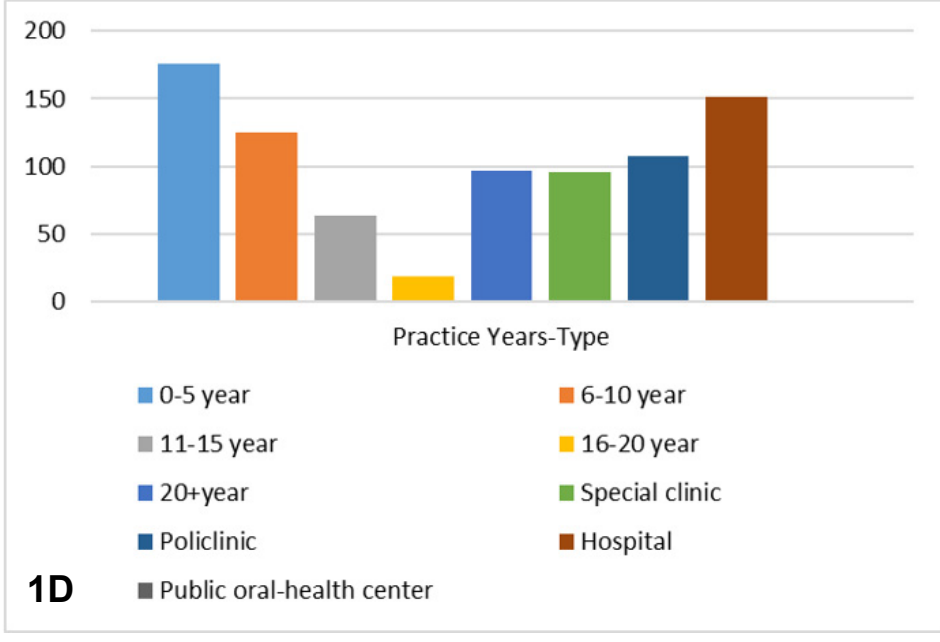
According to the information obtained; 36.6% of dentists have practiced in dentistry for 0–5 years, 26% for 6–10 years, 13.3% for 11–15 years, 4% for 16–20 years, 20.2% for 20 years and over. 20% of dentists worked in special clinics, 22.2% in policlinics, 31.4% in hospitals, and 26.4% in public oral health centers (Figure 1D).





Figures 1C and 1D. Distribution of demographic data. 1C: graduation year; 1D: practice years and type of practice.

Data of Dentists' Attitudes to Preventive Dentistry

Participants' knowledge of preventive dentistry applications is shown in Tables 1A and 1B.

Table 1A. Distribution of survey responses (n=481)

Question	Number	Percent
8. Do you follow the news about fluoride on the written, visual or social media?		
Yes	413	85.9
No	68	14.1
9. Do you keep up-to-date information about preventive dentistry?		
Yes	396	82.3
No	85	17.7
10. Have you ever participate a course or class on dental caries prevention?		
Yes	351	73
No	130	27
11. Do you assess your patients according to the caries risk factors?		
Yes	337	70.1
No	144	29.9
12. Do you use preventive applications for your patients?		
Yes	380	79
No	101	21
13. Do you recommend to your patients toothpaste with fluoride or mouthwash for individual use?		
yes for every patient	137	28.5
yes according to age group	106	22
yes according to the caries risk group	205	42.6
No	33	6.9
14. Do you think that fluoride is useful to prevent caries?		
Yes	452	94
No	29	6
15. Do you think that fluoride preparations have a dental and /or medical side effect?		
Yes	235	48.9
No	246	51.1
16. Do you think that the age of the patient is an important when choosing the fluoride preparations?		
Yes	443	92.1
No	38	7.9

Table 1B. Distribution of survey responses (n=481)

Question		Number	Percent
17. Which preventive applications do you apply most often?			
	Fluoride gel	351	73
	Fluoride varnish	212	44.1
	Fluoride tablet	24	5
	Fissure sealant	300	62.4
	do not apply	87	18.1
18. Are professional fluoride applications absolutely necessary for children who were living in regions with non-fluoridated water?			
	Yes	279	58
	No	202	42
19. What do you think about the effect of adding fluoride to drinking water for caries prevention?			
	very effective	277	57.6
	effective	24	5
	not effective	105	21.8
	don't know	75	15.6
20. What do you think about the effect of dietary fluorides on caries prevention?			
	very effective	239	49.7
	effective	16	3.3
	not effective	95	19.8
	don't know	131	27.2

85.9% of dentists follow the news about flouride and 82.3% keep up-to-date information about preventive dentistry. The rate of those who do not follow the news about fluoride is 14.1% and 17.7% do not have current information about preventive dentistry. 73% of the dentists who participated in this study have taken courses or classes on dental caries prevention, 70.1% of them assess their patients according to caries risk factors using the information from these courses or classes, and 79% of them applied preventive applications to their patients. 93.1% of the participants were recommending fluoride toothpaste and mouthwash to their patients for individual use, 22.6% of them were making recommendations according to the age group and 42.6% according to the caries risk group. 92% of them thought that the age of the patient was important when choosing fluoride preparations. Although 94% of the dentists thought fluoride is useful to prevent caries, almost half of them thought fluoride preparations had dental or medical side effects. The most commonly applied preventive applications were fluoride gel (73%), fissure sealant (62.4%) and fluoride varnish (44.1%). More than half of the dentists (58%) believed that professional fluoride applications were absolutely necessary for children who were living in

regions with non-fluoridated water. Most of the participants (57.6%, 49.7%) thought that adding fluoride to drinking water and dietary fluorides were very effective in caries prevention.

The answers given to the questions about the age groups and the frequency of application of fluoride gel, fluoride varnish and fissure sealant are shown in Table 2. Application frequency of fluoride gel and fluoride varnish are similar to each other at once in a six month period (46.4%, 23.7%, respectively). Additionally, almost all participants were not recommending fluoride tablets to their patients (93.8%). They were applying fissure sealants mostly to the permanent first molars (40.5%) and they did not prefer fissure sealants for uncavitated caries lesions (54.7%).

Table 2A. Distribution of preventive applications (n=481)

Preventive application	Frequency	Percent
17a. Age groups applied fluoride gel		
don't apply	124	25.8
4-6 years	11	2.3
6-15 years	267	55.5
15-18 years	14	2.9
18+ years	49	10.2
all ages according to caries risk factors	16	3.3
17b. Application frequency of fluoride gel		
don't apply	124	25.8
once in a month	10	2.1
once in a three month	26	5.4
once in a six month	223	46.4
once in a year	69	14.3
several times a week	18	3.7
according to the patient	11	2.3
17c. Age groups applied fluoride varnish		
don't apply	266	55.3
2-4 years	43	8.9
4-6 years	63	13.1
6-12 years	72	14.9
12+ years	11	2.3
all ages according to caries risk factors	10	2.1
adults	16	3.3

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Table 2B. Distribution of preventive applications (n=481)

Preventive application	Frequency	Percent
17d. Application frequency of fluoride varnish		
don't apply	266	55.3
once in a month	37	7.7
once in a three month	14	2.9
once in a six month	114	23.7
once in a year	30	6.2
several times a week	12	2.5
according to the patient	8	1.7
17e. Age groups applied fluoride tablet		
don't apply	451	93.8
6-12 years	4	0.8
under 6 years	3	0.6
all ages according to caries risk factors	19	4
disabled patients	4	0.8
17f. Age groups applied fissure sealant		
don't apply	177	36.8
5 and 6 years	30	6.2
6-12 years	271	56.3
12 + years	3	0.6
17g. Teeth for applying fissure sealant		
don't apply	177	36.8
primary first and second molars	8	1.7
permanent first molars	195	40.5
permanent second molars	2	0.4
permanent first and second molars	57	11.9
primary and permanent molars	42	8.7
17h. Do you prefer fissure sealants for uncavitated caries lesions?		
Yes	216	44.9
No	263	54.7

Data on Dentists' Preventive Applications

The demographic data and survey questions were statistically compared in Tables 3A–3D.

When we examine the answers given to the questionnaire by gender, we observed that women replied 'yes' more than men (Table 3A). This means that female dentists are following the news about fluoride more (p=0.009) and taking more courses or

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classes on dental caries prevention than male dentists (p=0.008). These answers showed statistically significant results for female dentists: They were assessing their patients according to the caries risk factors (p=0.0001) and making fluoride applications according to their age groups (p=0.024). They were thinking that fluoride is useful to prevent caries (p=0.01) and they were doing more preventive applications (p=0.005).

Table 3A. Comparison of answers and demographic data

Question	Gender		Age			
	Female	Male	18-25	26-35	36-50	50+
Q.8	88.7%	77.8%	69%	82.6%	96.9%	93.9%
	*p=0.009**			*p=0.0001***		
Q.9.	83.7%	78.6%	73.2%	77.9%	90.6%	90.9%
	p=0.250			*p=0.001***		
Q.10.	76.3%	63.5%	84.5%	74.6%	77.3%	47%
	*p=0.008**			*p=0.0001***		
Q.11	75.2%	55.6%	66.2%	71.4%	76.6%	56.1%
	*p=0.0001***			*p=0.25*		
Q.12	82.3%	69.8%	85.9%	77.5%	83.6%	66.7%
	*p=0.005**			*p=0.019**		
Q.14	95.8%	88.9%	98.6%	97.7%	88.3%	87.9%
	*p=0.01**			*p=0.0001***		
Q.15	49.3%	47.6%	54.9%	42.3%	50%	60.6%
	p=0.826			*p=0.037**		
Q.16	94.1%	87.3%	87.3%	99.1%	87.5%	84.8%
	*p=0.024**			*p=0.0001***		
Q.18.	58.3%	57.1%	66.2%	61.5%	57%	37.9%
	p=0.902			*p=0.003**		

Chi-Square test *p <0.05 ** p <0.001

The dentists were evaluated according to age groups and answers were statistically significant (Table 3A). Dentists in 36–50 age range were following the news about fluoride in the written, visual or social media and keeping up-to-date with information about preventive dentistry more than the other groups (p=0.0001, p=0.001). Less than half of the 50+ age group had never taken a course or class on dental caries prevention (p=0.0001). Dentists in 18–25 age range were using

preventive applications for their patients more than other age groups (p=0.019). All age groups were believing that fluoride is useful to prevent caries, and almost all the dentists in 18–25 age range were believing about the caries preventive effect of fluoride (98.6%) (p=0.0001). Less than half of dentists in 26–35 age range were thinking that fluoride preparations have dental and /or medical side effects. More than half of all other groups were believing that there are side effects of fluoride mostly (p=0.037). Almost all dentists in 26–35 age range were thinking that the age of the patient is important when choosing fluoride preparations and the other groups were not as sensitive as this group (p=0.0001). 18–25 age group were thinking that professional fluoride applications are absolutely necessary for children who were living in regions with non-fluoridated water. 50+ age group were given less importance to this condition (p=0.003).

Although all specialists and general practitioners stated that fluoride is useful to prevent caries, there were significant differences between the specialists about the fluoride applications (Table 3B). Orthodontists were following insufficiently the news about fluoride in the written, visual or social media (p=0.0001) and keeping up-to-date with information about preventive dentistry (p=0.0001). Restorative dentistry practitioners were assessing their patients according to the caries risk factors commonly (100%), but prosthodontics were evaluating their patients occasionally according to the caries risk factors (40%) (p=0.025). The restorative dentistry practitioners were applying fluoride applications most frequently and believing about its necessity. However, oral surgeons were determined as those who were applying fluoride applications most rarely (p=0.0001). Restorative dentistry practitioners were thinking that professional fluoride applications are absolutely necessary for children who were living in regions with non-fluoridated water (100%). Endodontists were stating that this situation do not create a necessity for professional fluoride applications (32.4%) (p=0.004).

When we evaluated the dentists according to the groups of practice years, their answers to almost all questions were statistically significant (Table 3C). The dentists working for 0-5 year were following the news about fluoride in the written, visual or social media (p=0.0001) and keeping up-to-date information about preventive dentistry (p=0.0001) more than the other practice year groups. Half of the 20+ practice years group had never taken a course or class on dental caries prevention. The group between the practice year groups ages of 16 and 20 mostly said ‘yes’ (p=0.0001). 6–10 years group were assessing their patients according to the caries risk factors mostly, but 20+ years group were taking into consideration to risk factors less (p=0.0001). All groups according to practice years were believing that fluoride is useful to prevent caries, and almost all the dentists who practiced for 6–10 years were accepting the caries preventive effect of fluoride (p=0.0001). All groups according to practice years, except for the 11–15 years group, were thinking that fluoride preparations did not have dental and /or medical side effects, mostly (p=0.0001). All groups were thinking that the age of the patient is important when choosing fluoride preparations with the most sensitive group about this situation being the 11–15 years practice group (p=0.0001). 6–10 years practice group were thinking that professional fluoride applications are absolutely necessary for children who were living in regions

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with non-fluoridated water. Although the 16-20 practice years group gave answer 'no' to this question and this is statistically significant (p=0.001).

Table 3B. Comparison of answers and demographic data (Perio=periodontology; Surgery=oral surgery; Endo=endodontics; Ortho=orthodontics; Prostho=prosthodontics; Rest= restorative dentistry)

Question	Speciality						
	None	Perio	Surgery	Endo	Ortho	Prostho	Rest.
Q.8	90.1%	84%	62.2%	97.3% *p=0.0001***	52%	85%	75%
Q.9.	87.7%	68%	59.5%	83.8% *p=0.0001***	56%	80%	100%
Q.10.	73.5%	60%	78.4%	67.6% *p=0.508*	72%	80%	100%
Q.11	73.2%	64%	59.5%	67.6% *p=0.025**	72%	40%	100%
Q.12	87.7%	52%	45.9%	56.8% *p=0.0001***	84%	60%	100%
Q.14	91.6%	100%	100%	100% *p=0.076*	96%	100%	100%
Q.15	51.2%	44%	45.9%	51.4% *p=0.087*	32%	30%	100%
Q.16	90.4%	100%	94.6%	100% *p=0.266*	92%	95%	100%
Q.18.	59.9%	52%	51.4%	32.4% *p=0.004**	80%	55%	100%

Chi-Square test *p <0.05 ** p <0.001

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Table 3C. Comparison of answers and demographic data

Question	Practice years				
	0-5	6-10	11-15	16-20	20+
Q.8	75%	86.4%	98.4% *p=0.0001***	100%	93.8%
Q.9.	72.2%	84%	87.5% *p=0.0001***	100%	91.8%
Q.10.	71%	80.8%	89.1% *p=0.0001***	94.7%	51.5%
Q.11	63.1%	84.8%	75% *p=0.0001***	68.4%	60.8%
Q.12	80.7%	83.2%	71.9% *p=0.057*	94.7%	72.2%
Q.14	96.6%	99.2%	90.6% *p=0.0001***	73.7%	88.7%
Q.15	55.7%	38.4%	60.9% *p=0.0001***	5.3%	50.5%
Q.16	94.3%	97.6%	98.4% *p=0.0001***	73.7%	81.4%
Q.18.	61.9%	67.2%	48.4% *p=0.001***	21.1%	52.6%

Chi-Square test **p <0.05* *** p <0.001*

The answers given to the questionnaires showed significant differences compared to the places where the dentists are working (Table 3D). The dentists who are working in the policlinics and hospitals do not follow the news about fluoride in the written, visual or social media and were not keeping up-to-date with information about preventive dentistry. However the dentists who are working in the public oral-health centers (p=0.0027) and special clinics (p=0.007) are following the news more and in a similar ratio, Conversely, the dentists who are working in the special clinics have taken less courses or classes on dental caries prevention. (p=0.001). The dentists

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who are working in the hospitals were assessing their patients according to the caries risk factors, while the dentists who are working in the special clinics were considering these factors less. The dentists who are working in the policlinics and public oral-health centers answered this question similar to the dentists who were working in the special clinics (p=0.026). Almost all the dentists who are working in the hospitals were thinking that fluoride is useful to prevent caries (99.3%), others have given similar answers but in a lesser ratio. There is a statistically significant difference between the answers of this question (p=0.0001). All the groups were thinking that the age of the patient is important when choosing the fluoride preparations, but the dentists who are working in the special clinics were thinking it is important in a lesser ratio (p=0.012).

Table 3D. Comparison of answers and demographic data

Question	Practice type			
	Special	Policlinic	Hospital	Public center
Q.8	90.6%	81.3%	81.5% *p=0.027**	91.3%
Q.9.	87.5%	76.6%	76.8% *p=0.007**	89.8%
Q.10.	59.4%	80.4%	80.1% *p=0.001***	68.5%
Q.11	65.6%	65.4%	79.5% *p=0.026**	66.1%
Q.12	76%	82.2%	78.1% *p=0.736*	79.5%
Q.14	85.4%	94.4%	99.3% *p=0.0001***	93.7%
Q.15	52.1%	41.1%	56.3% *p=0.059*	44.1%
Q.16	84.4%	93.4%	95.4% *p=0.012**	93.7%
Q.18.	53.1%	60.7%	58.3% *p=0.722*	59.1%

Chi-Square test **p <0.05* *** p <0.001*

DISCUSSION

Dental practice is considered to be one of the dynamic professions which is continuously reshaped by new technologies and innovations in science, devices, techniques and materials, all of which have improved rapidly due to many trained dental practitioners in this field.[17] Studies involving dentists' knowledge and application methods about preventive dentistry materials are important, because dentists need to raise public awareness about preventive therapies and prevention of caries. Since dentists are professionals who convey information on oral health care and they also affect the oral health behavior of patients.[21,22] With the advancement of dental science, dentists need to keep their practice up-to-date according to the latest scientific evidence available. Treatment decisions of the dentists are influenced by their knowledge and attitudes related to care options, and their evaluations are useful.[23]

Preventive applications constitute a significant part of modern dentistry. Inability to prevent dental caries and periodontal diseases gives poor results.[24] Many previous studies show that preventive dentistry knowledge and practises are related to demographic characteristics.[16,22] Mahajan et al.[17] found that there was a statistically significant relationship between age, qualification, work experience and knowledge regarding the use of pit and fissure sealants to prevent caries and type of pit and fissure use. Also they found that a statistically significant relationship between gender and knowledge, with male dental practitioners having more knowledge than female dental practitioners regarding the ideal age for placing pit and fissure sealants and the recommended ideal age for preventing the progression of lesions. In this study, the dentists who have 6–12 years of working experience were applying more fissure sealants to their patients. Also with 16–20 years of working experience, female dentists and specialists in restorative dentistry had a positive attitude toward preventive applications.

Matsuo et al.[16] have determined that female dentists follow the news about fluoride more and take more courses or classes on dental caries prevention than male dentists. These results are similar to our outcomes. They also compared the knowledge of general dentists and pediatric dentists about preventive dentistry and found that pediatric dentists were generally more knowledgeable about fluoride than general dentists and their knowledge about dental sealants was generally higher than their knowledge of fluoride. In this study pediatric dentists were excluded from the study, but it shows that the restorative dentistry practitioners were applying fluoride applications more frequently than other specialists and general dentists.

This study showed that the place where the dentists are working had an impact on their level of knowledge about preventive treatments. It was observed that dentists working in private clinics were less likely to consider patient age in fluoride applications. San Martin et al. stated that the places where dentists work have a specific effect on their preventive treatment knowledge, but there is no significant differences about opinion, values and applications.[25] Al Jafari et al. also reported that the workplace did not make a significant difference about fluor and fissure sealant applications.[26] The results of our study about application of preventive treatments are similar to other studies; however different results were obtained about opinion and

education about preventive applications, and this difference was especially seen in dentists working in private clinics.

Narendran et al.[22] asked questions to dentists who work in Houston, Texas, USA, about factors affecting fluoride supplementation prescription to a child. As a result they found that, although most of the respondents identified the age of patients and fluoride percentage in drinking water as important factors, a lesser ratio of the dentists considered children's caries activity. Also Turkish dentists who have responded to this survey were thinking that the age of the patient and the caries risk factors are important when choosing fluoride preparations. The survey conducted by Shah et al.[23] included questions about dental caries prevention. They found almost all dentists are thinking that fluoride was effective for remineralization of carious lesions and most of them agreed that pit and fissure sealants are preventive agents for fissure caries. Half of the participants accepted performing a caries risk assessment for all patients. 70% of responders to our study were assessing their patients according to the caries risk factors and they were applying fluoride varnish and fissure sealants mostly. These findings show similarity with Shah et al.'s study. Pakdaman et al.[24] obtained the results as follows: The respondents accepted that topical fluoride application in the gel, foam or varnish form was effective for prevention of caries. In addition, they believed that the positive inhibitory effect of fluoride toothpastes and the addition of fluoride to drinking water are necessary. Dobaradaran et al. examined the F concentration of groundwater in Iran, they argued that high fluoride in water could cause various adverse health effects and recommended the use of bottled drinking water with low F content; however, they reported that the number of caries in permanent teeth and primary teeth did not show a significant relationship with F content in water.[27] Rahmani et al. also obtained similar results in their study with drinking water.[28] Also, 66% said that they are supporting the use of fluoride tablets and drops. Although similar findings have been obtained in gel, foam and varnish form and adding fluoride to drinking water, Turkish dentists do not prefer to recommend the tablet form of fluoride. Both study showed that younger dentists are using preventive applications more for their patients. Also the proportion of dentists concerned about the toxic effects of fluoride is similar with this study.

This study is one of the rare studies with dentists on the use of preventive practices in Turkey. The major limitation is that some dentists who are reached by E-mail have not completed the questionnaire, therefore the number of participants is less than expected. The high number of dentists in large cities and the problem of reaching other provinces via E-mail have caused this limitation.

CONCLUSIONS

It was found that preventive practices are of secondary importance only for specialist dentists because they have given priority to their speciality. Keeping ongoing training and information about preventive practices up-to-date will change the dentists' approach to the preventive practices.

CONFLICT OF INTEREST DECLARATION

The authors declare that there are no competing interests.

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AUTHOR CONTRIBUTIONS

Designing the study by Figen Seymen and Mine Koruyucu; generating the data by Hazal Özcan, Sinem Birant, and Ceren İlisulu; analysing the data by Nural Bekiroglu and Mine Koruyucu; writing the paper by Mine Koruyucu and Hazal Özcan; approving the final version of this paper by Mine Koruyucu, Hazal Özcan, Sinem Birant, Ceren İlisulu, Nural Bekiroglu, and Figen Seymen.

PREVIOUS PRESENTATION AS A POSTER

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