RESEARCH

Evaluation of Parents' Opinions on Dental Fluoride, Information Sources and Reflections on Their Children's Tooth Brushing Habits

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ABSTRACT

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Background: This study aimed to investigate the relationship between parents' attitudes towards dental fluoride, resources used to obtain information, and their children's oral hygiene habits.

Methods: The study included literate volunteer parents with children aged 1-15 years. 23-question survey prepared using online Google forms was applied to the participants. Questionnaires filled by non-parent persons or not completed successfully were excluded. The parents were asked about their demographic data, fluoride views, resources for information, and children's oral hygiene habits. Demographic data of the participants were categorized as gender, age, education level, employment status and number of children. Descriptive statistics and chi-square test were used for statistical analysis.

Results: The study included 481 participants (mean age:33±5.7; female:75.7%, male:24.3%). Participants stated that they got the most information about dental fluoride by the media. Participants; 36.4% stated that they did not know for what purpose fluoride was used in dentistry, 33.7% stated that the fluoride in toothpaste had an anti-caries effect, 14.6% stated that it was toxic / harmful. 81.4% of the participants who thought that the fluoride in toothpaste was toxic and harmful were university graduates or higher. 9.5% of the children of those who thought that the fluoride in toothpaste was toxic did not have a regular tooth brushing habit, and 37.2% did not have the habit of brushing their teeth every day or not at all.

Conclusion: It was determined that the parents received the most information about dental fluoride and dental health from the media and they had insufficient information about preventive fluoride applications.

KEYWORDS

Parent education, children, dental fluoride, media, toothpaste.

ÖZ

Ebeveynlerin Profilaktik Florür Uygulamaları Hakkındaki Görüşlerinin, Bilgi Kaynaklarının ve Çocuklarının Diş Fırçalama Alışkanlıklarına Yansımalarının Değerlendirilmesi

Amaç: Bu çalışmanın amacı ebeveynlerin profilaktik florür uygulamalarına karşı tutumları ve bilgi edinme yolları ile çocuklarının oral hijyen alışkanlıkları arasındaki ilişkiyi araştırmaktır.

Gereç ve Yöntemler: 1-15 yaş arası çocukları olan okur yazar gönüllü ebeveynleri çalışmaya dâhil edildi. Çevrimiçi Google formları kullanarak hazırlanan 23 soruluk anket uygulandı. Ebeveyn olmayan kişiler tarafından doldurulan veya başarıyla tamamlanmayan anketler çalışmadan çıkarıldı. Ebeveynlere; demografik verileri, florür hakkındaki görüşleri, bilgi edinme yolları ve çocuklarının oral hijyen alışkanlıkları hakkında sorular soruldu. Katılımcıların demografik verileri cinsiyet, yaş, eğitim düzeyi, istihdam durumu ve çocuk sayısı olarak kategorize edildi. İstatistiksel değerlendirme için tanımlayıcı istatistikler ve ki-kare testi kullanıldı.

Bulgular: Çalışmaya toplam 481 katılımcı (yaş ort: 33±5,7; kadın: % 75,7, erkek: % 24,3) katıldı. Katılımcılar profilaktik florür uygulamaları hakkında en fazla bilgiyi medyadan aldıklarını belirtti. Katılımcıların; % 36,4'ü florürün diş hekimliğinde hangi amaçla kullanıldığını bilmediğini, % 33,7'si diş macununda bulunan florürün çürük önleyici etkisi olduğunu, % 14,6'sı diş macununda bulunan florürün toksik / zararlı olduğunu belirtti. Diş macunundaki florürün toksik ve zararlı olduğunu düşünen katılımcıların %81,4'ü üniversite mezunu ve üzeri idi. Bu katılımcıların çocuklarının % 9.5'inin düzenli diş fırçalama alışkanlığı yoktu ve % 37,2'sinin ise ya her gün dişlerini fırçalama alışkanlığı yoktu ya da hiç fırçalamıyordu.

Sonuç: Ebeveynlerin profilaktik florür uygulamaları ve dental sağlık hakkındaki bilgileri en çok medyadan aldığı ve profilaktik florür uygulamaları konusunda yetersiz bilgiye sahip oldukları belirlendi.

ANAHTAR KELİMELER

Aile eğitimi, çocuklar, profilaktik florür uygulamaları, diş macunu, medya.

INTRODUCTION

Tooth decay is the most common bacterial, multifactorial, chronic and infectious disease in childhood.[1-4] As in other developing countries, there are important deficiencies in Turkey in terms of regular tooth brushing, periodontal health control and regular dentist visits.[3]

Studies conducted in Turkey have reported that the prevalence of caries in children aged 2 to 15 years varies between 17.3% and 84.9%.[2-5] Although tooth decay is a highly preventable disease, it is still an important public health issue especially in children. It is important to increase social and parental awareness about the regulation of diet and oral hygiene habits of children and the prevention of tooth decay spread.[1,2]

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Parents are the first educators who affect the cognitive, social and psychomotor development of children, whereby family education provides a basis for their future behaviors.[6] Therefore, parents constitute an important target group to inform children about preventive oral and dental health practices, determine their risk of caries in the early period and prevent possible oral and dental health issues.[2,6,7]

Today fluoride is considered one of the key factors in improving oral health and preventing dental caries, and its reliability and efficiency has been recognized by international health agencies.[8,9] Although some studies argue that excess intake of fluorine may cause dental fluorosis, skeletal fluorosis, neurological symptoms and low IQ level,[10,11] the adverse effects of fluorine on human health have not been fully proven yet, therefore studies on this subject are still ongoing. In particular, recent studies report a biased attitude towards fluoride toothpastes and topical fluoride applications.[12-14] As parental education level increases, their opinion about the toxicity/damage of fluoride-containing toothpastes increases, making them prefer fluoride-free toothpastes.[12,13] The number of parents who refuse topical fluoride applications gradually increases, thereby fluoridation opposition among parents becomes an important public health problem.[14]

Undoubtedly, the influence of media and communication tools on this issue is inevitable, especially among individuals with low socio-economic level.[15] A rapid spread of information has become quite easy due easy access to information and mass media influence on people. However, insufficient control of media broadcasts and wrong or incomplete information that people gain due to their trust on the media without a need for questioning may cause them to make wrong decisions on serious issues including health.[15-17] This study aimed to investigate the relationship between parents' attitudes towards dental fluoride, resources used to obtain information, and their children's oral hygiene habits.

MATERIALS AND METHODS

For conducting the study, an ethical approval was obtained from the Inonu University Non-Invasive Clinical Research Ethics Committee (No. 2020/895). Parents of children aged 1-15 years were planned to include in the study. The minimum sample size was determined to be 320 under 95% confidence level ($\alpha = 0.05$) and margin of error of 0.05. An informed consent and a consent for data use were received from all parents included in the study, whereby the study was conducted in accordance with the Declaration of Helsinki.

A new 23-question survey form was prepared by the researchers in order to obtain the participants' socio-demographic data, opinions about the effects of preventive fluoride applications on dental health, information sources, and oral hygiene habits of their children. The questions were prepared as short, clear and easy to read and answer by participants by evaluating the questionnaire questions obtained from similar studies[3,13,15,16-19] in the literature. The form was generated using online Google forms, and randomly selected potential participants were invited to participate in the survey by sending it via whatsapp, e-mail, websites and social media. To prevent participants from responding more than once, data collection software was set up to recognize and block responses from the same IP address.

Statistical Analysis

Data were analyzed using Microsoft Excel 2010 (Microsoft Corporation, Redmond, Washington, USA) and SPSS 21.0 (IBM, Chicago, USA) programs, and presented using descriptive statistics and Pearson's chi-squared test. P-values of < 0.05 were regarded as statistically significant.

RESULTS

Table 1 presents the demographic data of 481 participants who filled out the survey form.

Table 1.

Distribution of demographic data of the participants.

		Female(n=364)	Male(n=117)	Total(n=481)*
		n (%)	n (%)	n (%)
Age	≤30	68(18.7)	6(5.2)	74(15.4)
	31-40	218(59.9)	55(47.0)	273(56.7)
	41-50	68(18.7)	46(39.3)	114(23.7)
	≥51	10(2.7)	10(8.5)	20(4.15)
Education status	Primary	55(15.1)	14(12)	69(14.3)
	High	83(22.8)	21(17.9)	104(21.6)
	University	182(50)	65(55.6)	247(51.4)
	Postgraduate	44(12.1)	17(14.5)	61(12.7)
Employment status	Yes	193(53)	111(94.8)	304(63.2)
	No	171(47)	6(5.2)	177(36.8)
Number of children	1	105(28.8)	27(23.1)	132(27.4)
	2	188(51.6)	50(42.7)	238(49.4)
	3	55(15.2)	29(24.8)	84(17.6)
	≥4	16(4.4)	11(9.4)	27(5.6)

**: The total number of participants was determined according to the rows.*

Parents between the ages of 31-40 at most (female: 59.9%, male: 47%) participated in the survey. In addition, 68% of the participants lived in the Eastern Anatolia Region (Figure 1).

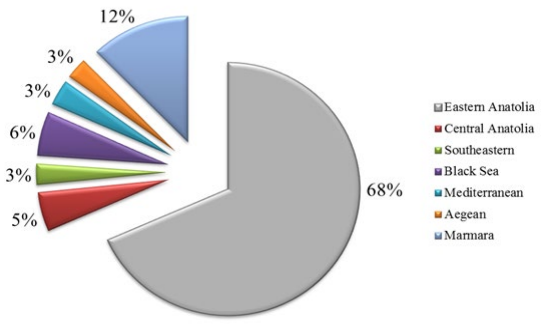

Figure 1

Regional distribution of participants.

While 53% of the women were employed, 94.8% of the men were employed. The participants were asked how much time they spent daily using communication tools (0-30 minutes, 30-60 minutes, 1-2 hours, 2-4 hours 4-6 hours,> 6 hours), and 69.2% of them were found to spend at least one hour a day. While 57.2% of the participants reported to get up-to-date health information via the internet and social media, the rate of those who received information from experts in their field or the relevant health institution was only 26.2%.

The participants were also asked about the product features they paid attention to in toothpaste selection and the answers are shown in Table 2. Chemical content (n=460) were the most preferred property, followed by the amount of fluoride (n=99).

Table 2.

The distribution of the answers to the question '"What do you pay attention to when choosing the right paste for your child?' by age, gender and education level.

		Chemical content	Taste	Smell	Fluoride amount	I don't use	Child's age	Other
		n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)
Gender	Female	363(79.3)	21(55.3)	15(62.5)	75(75.8)	6(100)	19(82.6)	6(60)
	Male	95(20.7)	17(44.7)	9(37.5)	24(24.2)	-	4(17.4)	4(40)
Age	≤30	73(15.9)	4(10.6)	3(12.5)	12(12.1)	2(33.3)	4(17.4)	2(20)
	31-40	257(55.9)	23(60.5)	8(33.3)	60(60.6)	3(50)	14(60.9)	4(40)
	41-50	114(24.7)	11(28.9)	11(45.8)	22(22.2)	1(16.7)	5(21.7)	4(40)
	≥50	16(3.5)	-	2(8.4)	5 (5)	-	-	-
Education status	Primary	61(13.3)	7(18.4)	8(33.3)	10(10.1)	-	6(26.1)	2(20)
	High	102(22.2)	4(10.5)	4(16.7)	26(26.3)	1(16.7)	2(8.7)	5(50)
	University	236(51.3)	20(52.6)	9(37.5)	51(51.5)	4(66.6)	9(39.1)	3(30)
	Postgraduate	61(13.2)	7(18.5)	3(12.5)	12(12.1)	1(16.7)	6(26.1)	-

More than one option can be selected.

36.4% of the participants stated that they do not know what purpose of fluoride use in dentistry. 43.9% of the participants stated that they obtained information about fluoride through TV and internet-social media. Only 33.7% of the participants in this study thought that the fluoride in toothpaste had an anti-caries effect. Moreover, 14.6% (n=70) of the participants considered the fluoride in toothpastes to be toxic/harmful (Table 3).

Table 3.

Distribution of participants' answers to questions about fluoride.

		n (%)
Do you know for what purpose fluoride application is used in the field of dentistry?	**Yes**	**306 (63.6)**
	No	**175 (36.4)**
Where can you get information on fluoride?	Newspaper/ Brochure / Flyer	19 (4)
	TV	11 (2.3)
	Internet/ social media	200 (41.6)
	Profesyonel	210 (43.6)
	Other (school etc ..)	41 (8.5)
Do you think that fluoride application applied in schools and by dentists is beneficial?	Yes	285 (59.3)
	No	186 (38.7)
	No idea	10 (2.1)
Do you have any idea under which conditions fluorine can have a negative effect?	Yes	188 (39.1)
	No	293 (60.9)
If you briefly describe the effect of fluoride in toothpastes, which of the following statements would you choose?	No idea	65 (13.5)
	Insufficient information	184 (38.3)
	Prevents caries	162 (33.7)
	Toxic / harmful	70 (14.6)

Of this group, 81.4% had a university and above (p<0.001), 82.9% were women (p<0.05), 57.1% were between the ages of 31-40 (p<0.001) and 64.3% had two children (p<0.01) (Table 4).

Table 4.

The distribution of the answers to the question 'If you briefly describe the effect of fluoride in toothpastes, which of the following statements would you choose?' by demographic data.

		No idea		Insufficient information		Prevents caries		Toxic/ harmful		p
		n	%	n	%	n	%	n	%	
Gender	**Female**	**38**	**(58.5)**	**146**	**(79.3)**	**122**	**(75.3)**	**58**	**(82.9)**	**.030 ***
	Male	**27**	**(41.5)**	**38**	**(20.7)**	**40**	**(24.7)**	**12**	**(17.1)**	
Age	**≤30**	22	(33.8)	33	(17.9)	15	(9.3)	4	(5.7)	**.000 *** **
	31-40	33	(50.8)	105	(57.1)	95	(58.6)	40	(57.1)	
	41-50	8	(12.3)	41	(22.3)	41	(25.3)	24	(34.3)	
	≥50	2	(3.1)	5	(2.7)	11	(6.8)	2	(2.9)	
Education status	Primary	26	40	23	(12.5)	18	(11.1)	2	(2.9)	.000 *** **
	High	6	(9.2)	48	(26.1)	39	(24.1)	11	(15.7)	
	University	27	(41.6)	89	(43.4)	81	50	50	(71.4)	
	Postgraduate	6	(9.2)	24	13	24	(14.8)	7	10	
Employment status	**Yes**	**38**	**(58.5)**	**106**	**(57.6)**	**109**	**(67.3)**	**51**	**(72.9)**	**.014 ***
	No	**27**	**(41.5)**	**78**	**(42.4)**	**53**	**(32.7)**	**19**	**(27.1)**	
Number of children	1	28	(43.1)	43	(23.4)	47	29	14	20	.003 **
	2	19	(29.2)	100	(54.3)	74	(45.7)	45	(64.3)	
	3	12	(18.7)	35	19	28	(17.3)	9	(12.8)	
	≥4	6	(9.2)	6	(3.3)	13	8	2	(2.9)	

**:p<0.05, **:p<0.01, ***p<0.001.*

The rate of children with regular brushing habits was 64.9%, while those who brush their teeth twice a day or more constituted 34.3% of all children. 9.5% (n=16) of the children of those who thought that the fluoride in toothpaste was toxic, did not have a regular tooth brushing habit (p<0.05). In the evaluation of the frequency of brushing of these children, 37.2% either did not brush their teeth every day or not at all (Table 5).

Table 5.

The distribution of the answers to the question 'If you briefly describe the effect of fluoride in toothpastes, which of the following statements would you choose?' by oral habits.

		No idea		Insufficient information		Prevents caries		Toxic/ harmful		p
		n	(%)	n	(%)	n	(%)	n	(%)	
Does your child have a regular tooth brushing habit?	**Yes**	**33**	**(10.6)**	**123**	**(39.4)**	**102**	**(32.7)**	**54**	**(17.3)**	**.012 ***
	No	**32**	**(18.9)**	**61**	**(36.1)**	**60**	**(35.5)**	**16**	**(9.5)**	
How often does your child brush teeth?	3 per day	4	(18.2)	11	(50)	5	(22.7)	2	(9.1)	.164
	2 per day	16	(11.2)	46	(32.2)	55	(38.5)	26	(18.2)	
	1 per day	22	(11.4)	86	(44.6)	55	(28.5)	30	(15.5)	
	2-3 per week	15	(17.9)	30	(35.7)	33	(39.3)	6	(7.1)	
	Once a week	5	(23.8)	6	(28.6)	6	(28.6)	4	(19)	
	No	3	(16.7)	5	(27.8)	8	(44.4)	2	(11.1)	
Does your child have their own toothbrush?	**Yes**	**62**	**(13.2)**	**180**	**(38.4)**	**157**	**(33.5)**	**70**	**(14.9)**	**.347**
	No	**3**	**(25)**	**4**	**(33.3)**	**5**	**(41.7)**	**-**	**-**	
Does your child have their own toothpaste?	Yes	53	(12.7)	167	(40)	138	(33)	60	(14.4)	.207
	No	12	(19)	17	(27)	24	(38.1)	10	(15.9)	

**:p<0.05*

While 13% (n=63) of the total participants stated that their children did not have their own toothpaste, this rate was 16.5% among those with children aged 3 years and under. Again, 97.5% of the participants reported that their children had their own toothbrushes, whereas 2.8% of them who had children aged 1-5 years stated that their children had no toothbrush.

DISCUSSION

Prophylactic approaches and oral hygiene are of great importance in preventing tooth decay. Fluorine is considered the most effective and reliable method to prevent tooth decay as long as it is applied with the correct form and frequency.[8,9] Recent studies have reported an opposing attitude toward fluoride applications in many parents.[12,14] This study aimed to investigate the relationship between parents' attitudes towards dental fluoride, resources used to obtain information, and their children's oral hygiene habits.

Toothpastes are among the most effective cosmetic and therapeutic agents in providing oral hygiene, and among all dental products, they are among the most widely used by consumers.[20] Liu et al. stated that in study, more attention was paid to the taste, brand and commercial advertisements of the toothpaste than the fluoride content in the toothpaste selection of the participants.[19] On the other hand, Jahandideh and Tuloglu found that the participants mostly paid attention to the dentist's suggestions followed by the amount of fluoride in it when choosing toothpaste for their children.[18] In this study, the most important feature of the participants in choosing toothpaste for their children was the chemical content, followed by the amount of fluoride in it. Looking at the demographic data, it was determined that women, university graduates and parents between the ages of 31-40 paid more attention to the chemical content and fluoride amount in toothpaste. This may indicate that parents, especially mothers, are becoming more aware and researched about the care of their children due to the increasing education level. However, it is also important to investigate where or from whom the information is obtained, the degree of accuracy and the benefit-harm relationship.

Today, mass media have an important place in addressing public service issues and social problems.[21] Parents may be confused due to information provided by non-health experts. In this study, it was found that parents obtained information on fluoride mostly from the media and through experts on the subject, and this information was consistent with previous studies.[18,19] In studies in different countries, [19, 22-25] where the knowledge and attitudes of parents about fluoride toothpaste are evaluated, there are opinions that more than 70% fluoride is effective in preventing tooth decay. However, only 33.7% of the participants in this study thought that the fluoride in toothpaste had an preventive programs. anti-caries effect. According to the results of previous studies,[13,18] conducted in Turkey were in line with this study, it was determined that the parents did not have enough information about the effect of fluoride on preventing tooth decay, fluorine containing products, results of fluorine intake and possible negative effects. It was that have doubts as to whether this is due to negative manipulation of the media, the most common source of information on fluoride by parents, or a lack of knowledge of parents about preventive programs.

In this study, 81.4% of respondents who believe that toxic fluoride in toothpaste were university graduates and above. It was similar to the studies conducted by Topaloğlu et al.[13] and Chi[26] in terms of increasing the opinion that fluoride is harmful with the increase in education level. However, although all families have the right to think freely about topical fluoride, children of families with low or high education levels will be affected differently in the case of refusing to use fluoride. Since children of families with low socioeconomic and educational backgrounds are often included in the high caries risk group, it should be considered that their children are more likely to suffer from this condition.

Fluoride toothpaste is now the most widely used method for maintaining a constant low level of fluoride in the oral environment.[27] Based on meta-analysis of 70 trials, the review by Marinho et al. reported a reduction of 24% in caries increment in permanent teeth with the use of fluoride toothpaste and concluded that there was "…clear evidence that fluoride toothpastes are efficacious in preventing caries." This review also found that the effect of fluoride toothpaste increased with increasing frequency of brushing (twice a day more effective than brushing once a day) and with increasing fluoride concentration. [9] But in this study, 9.5% of the children of the participants who thought that the fluoride in toothpaste was toxic did not have regular tooth brushing habits, 37.2% either did not brush their teeth every day or not at all and 15.9% did not have their own toothpaste. More detailed studies are needed to determine whether this is due to the fact that the participants think that fluoride may cause toxic effects for children or because of insufficient information.

While determining the interval and frequency of fluoride application, dentists should take a detailed anamnesis of children from their parents and determine their oral hygiene and nutritional habits, the risk group of caries and the amount of fluoride they are exposed to systemically and topically, thereafter should recommend fluoride application according to their needs. [26] In addition, parents should be informed that their children do not receive fluoride only from toothpaste or fluoride application in schools and dental clinics, because they are also systemically exposed to fluoride through food and beverages (water, tea, chicken meat, fish, cola, cheese).[28] Parents should also be informed about the topical/systemic fluoride protocols to be applied according to their children's risk group of caries, and the amount of fluoridation to reach a toxic dose of fluoride. Again, parents should be informed about why fluoride is important and necessary, and their attitudes toward fluoride applications should be evaluated.[26] The reasons for parents' oppositional attitudes toward fluoride applications should be learned, and they should be guided about dietary practices rich in protein, calcium, vitamins C and D, or alternative

products such as sugar alcohols (xylitol, etc.) with anti-caries properties. For creating the most accurate treatment plan for children, dentists and parents should cooperate by taking into account the pros and cons of fluoride.

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