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Perspective of Families to Fluoride Applications in Pediatric Dentistry

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ABSTRACT

Purpose: This research seeks to comprehensively explore the perspectives of families regarding the application of protective fluoride varnish in schools, with a specific emphasis on understanding their attitudes, beliefs, and knowledge levels related to this preventive measure.

Methods: Parents of children between the ages of 6 and 11 studying at two different schools were asked to fill out a questionnaire we had prepared if they accepted. The questionnaire evaluated the demographic characteristics of children, their health and dental problems, the products used in oral and dental health, practices about oral dental health, fluoride knowledge level and opinions about fluoride.

Results: Of the 377 parents who participated in the survey, 50.4% had male and 49.6% had female children, and the mean age of children was 8.4 ± 1.2 years. 50.4% of the children had oral dental problems. The rate of use of fluoride toothpaste in children was 53.1%, the rate of fluoride mouthwash use was 10.3%, the rate of participation in the protective fluoride application was 36.1% and the rate of participation in the fluoride varnish application in school was 23.9%. The rate of parents who answered, "I think that fluoride applications contribute to dental health when applied correctly, " was 56.5%. The rate of parents who gave the answer "I have never heard of fluoride application" was 22%.

Conclusions: The lack of participation in the fluoride varnish application in schools and the fact that parents are still abstaining from this practice are affecting the program's success rate. In addition, the lack of information about parents' level of knowledge about fluoride is evaluated as a sign that parents are not sufficiently informed.

Key-words: *Fluoride, Fluoride varnifash, Family, Parent*

INTRODUCTION

In twenty-first-century societies, the approach of preventing diseases before they occur is adopted and preventive health programs are prepared in this direction [1,2]. Countries with large and young populations, such as ours, are planning school-based preventive programs to provide preventative dentistry services in an easy-to-access, high quality and most economical way and with the least need for professional health personnel [3]. These programs offer oral dental health education and protective applications containing fluoride support through schools [3-5].

Fluoride has been proven to be effective in preventing caries in children and adults in many studies

[5-7]. Fluoride, which used to be obtained only from natural sources, is now used individually with toothpaste and mouthwashes, especially with topical applications, and professionally with fluoride varnishes and gels [4].

Fluoride is considered a milestone in modern dentistry due to its anticariogenic effect [8]. It shows this effect by participating in the mineral structure, reducing enamel solubility and demineralization and activating remineralization [9]. In addition, fluoride has inhibitory properties on bacteria [9,10].

It is aimed to minimize caries formation both in childhood and in the future by providing necessary oral hygiene education and preventive applications [2,3]. For this reason, oral hygiene education, correct nutrition methods and fluoride applications should be provided to individuals in childhood. Reasons such as excessive fluoride intake pose a risk of fluorosis in children, and systemic toxic effects indicate that caution should be exercised in using fluoride [11].

A doubtful approach is observed throughout society regarding the preventive fluoride varnish applications in schools, which the Ministry of Health has put into practice within the scope of oral and dental health protection programs, and it is thought that families lack information on this issue. The primary objective of the study is to investigate the viewpoints held by families regarding the application of protective fluoride varnish in school settings. The focus is on gaining insights into how families perceive and approach the use of fluoride varnish as part of preventive oral health programs in schools. This research aims to investigate the nuanced perspectives of families concerning the application of protective fluoride varnish in schools, focusing on their attitudes, beliefs, and understanding of this specific preventive measure. We recognize that general awareness about the use of fluoride is widespread; however, our goal is to delve deeper into how families specifically perceive and approach the application of fluoride varnish in a school context.

MATERIAL AND METHODS

The study was planned in accordance with the Declaration of Helsinki and patient rights regulations and approved by the Ankara Keçiören Training and Research Hospital Clinical Research Ethics Committee (2016/1232).

Sample Size

This study was planned as a descriptive survey study to be monitored and supervised by the Department of Pediatric Dentistry at Gulhane Dentistry Faculty. The families of children between the ages of 6 and 11 who were studying in two different primary schools (one was chosen as a public school and the other as a private school in order to reflect the general population) were asked to fill out the questionnaire we had prepared if they accepted. The primary intent behind including children from both public and private schools was to capture a diverse cross-section of the population and assess whether perspectives on protective fluoride varnish applications varied across different educational settings. The sample size of our study, which will be applied to the families of children between the ages of 6-11, is targeted as a minimum of 400 questionnaires.

Conducting the Pilot Study

In order to determine the time taken to answer the questionnaire questions, whether the questions were understandable or not, and to make the necessary arrangements in the questions, a pilot study was carried out by applying a face-to-face questionnaire to 16 volunteer relatives of the patients randomly selected among the patients who applied to the Pediatric Dentistry Clinic of Gulhane Dentistry Faculty.After this pilot study, the necessary adjustments were made to the questions, and the main study was started.

Inclusion and Exclusion Criteria

The families of children between the ages of 6 and 11, who were studying in two different primary schools who voluntarily agreed to participate in the survey, were included in the study, and those who did not meet these criteria were not included in the study.

Statistical Analysis

Statistical evaluation was performed using the Statistical Package for Social Sciences (SPSS) for Windows 20 (IBM SPSS Inc., Chicago, IL). The normal distribution of the data was evaluated by Kolmogorov-Smirnov test. Numerical variables with normal

distribution were expressed as mean±standard deviation and those without normal distribution were expressed as median (min-max). Categorical variables were expressed as numbers and percentages. Chi-Square and Fisher's exact Chi-Square tests were used to compare categorical data.

A value of $p<0.05$ was accepted as meaningful in statistical analyses.

RESULTS

Demographics: Out of 377 participating parents, 50.4% had male children, 49.6% had female children, with an average child age of 8.4±1.2 years.

General Health: 2.4% of parents noted their child had a general health-affecting disease.

Oral and Dental Care Products: The majority of parents reported using toothbrushes (98.9%), toothpaste (96.3%), dental floss (8.5%), interdental brush (1.3%), and mouthwash (16.4%) for their child's oral care.

Tooth Brushing Frequency: 19.1% stated irregular brushing, 49.1% brushed once a day, 30.8% brushed twice a day, and 1.1% brushed three times a day.

Sources of Oral Health Information: 91% asked the dentist, 51.2% searched online, 7.7% watched TV programs, and 8.8% consulted relatives or friends.

Fluoride Usage: Among parents whose children used toothpaste, 53.1% mentioned fluoride content, 10.3% used fluoride mouthwash, and 8.5% used fluoride tablets in infancy.

Preventive Fluoride Applications: 27.6% reported preventive fluoride applications at clinics, and 63.9% indicated no such application.

Fluor Varnish Application in School: 66.8% reported no participation, 23.9% participated, and 9.3% stated the absence of such practice in their child's school.

Knowledge about Fluoride: Varied responses to statements, e.g., 30% believed packaged drinking water contains fluoride, 49.3% agreed that fluoride is stored in bones and teeth.

Opinions on Fluoridation in Schools: 17% agreed, 37.1% were undecided, and 45.9% disagreed with the usefulness of fluoridation in schools. 56.5% of parents believe preventive fluoride applications contribute to dental health when applied correctly. 22% reported never hearing about fluoride application, 13.5% expressed concerns about fluoride's toxicity, and 6.4% emphasized the need for increased societal awareness.

Relationship between General Health and Dental Problems: Parents who answered "no" to their child having a disease affecting general health had a higher proportion of children with dental problems (51.4% vs. 11.1%; $p=0.019$), mainly caries.

Oral and Dental Care Product Usage: Parents answering "no" to their child having a general health-affecting disease were more likely to use toothpaste (96.7% vs. 77.8%; $p=0.038$).

Tooth Brushing Frequency: Among those answering "no" to a general health-affecting disease, 49.2% reported their child brushing once a day. For those answering "yes," 55.6% reported their child brushing twice a day, and 44.4% reported brushing once a day. No significant correlation was found between general health and tooth brushing frequency ($p=0.271$).

Correlation with Dental Practices: No significant correlation was found between the presence of a general health-affecting disease and questions regarding fluoride in toothpaste, preventive fluoride applications, and school fluoride varnish participation ($p>0.05$).

Dental Problems and Tooth Brushing Frequency: No significant correlation found between tooth brushing frequency and reported dental problems ($p=0.879$). Children brushing three times a day had no reported caries.

Fluoride Knowledge and Usage: Among toothpaste users, 55.1% knew it contained fluoride, while 27.8% were unsure. Mouthwash usage correlated with fluoride mouthwash use for dental care (21%) compared to non-users (8.3%) ($p<0.001$).

Preventive Fluoride Applications: No significant correlation found between tooth brushing frequency and preventive fluoride applications in clinical settings ($p>0.05$). Children brushing three times a day were less likely to participate in school fluoride varnish application ($p=0.029$).

School Fluoride Varnish Participation and Parental Opinions: Parents participating in school fluoride varnish application were more likely to find school fluoridation useful (66.7%). Parents not participating were undecided (52.4%), and 40% believed in its usefulness.

Correlation with Fluoride Opinions: Parents believing their child participated in school fluoride varnish application were more likely to agree that pediatric

toothpaste contains more fluoride than adult toothpaste (30%).

Fluoride Varnish Application at School: Parents' opinions on fluoride storage in bones and teeth were consistent across groups, with no statistical difference (p=0.297). Majority of parents, regardless of school fluoride varnish participation, agreed that excessive fluoride intake is harmful and fluoride contributes to dental health.

Fluoride Tablets Usage and Opinions: No correlation found between using fluoride tablets in infancy and various fluoride opinions. Parents who disagreed that packaged drinking water contains fluoride were more likely to have not used fluoride tablets for their child in infancy (p=0.737). No significant correlation between using fluoride tablets in infancy and opinions about pediatric toothpaste containing more fluoride than adult toothpaste (p=0.812).

Fluoride Mouthwash Usage and Opinions: Parents using fluoride mouthwash for their child's oral care were more likely to agree that fluoride application in schools is useful. No statistical significance found between different fluoride mouthwash usage groups and opinions on packaged drinking water containing fluoride (p=0.493) or school fluoride varnish application (p=0.157).

Criteria for Oral Health Information: Parents wanting more information about fluoride applications relied primarily on dentists (95.8%) and internet searches (62.5%). Those unfamiliar with fluoride applications tended to seek information from dentists (86.7%).

Relationship Between Fluoride Opinions and Preventive Applications: Parents advocating for more information about fluoride applications had higher rates of disagreeing with protective fluoride applications in clinics (75%) and schools (16.7%). Parents believing in the contribution of fluoride to dental health had higher participation rates in clinic applications (36.6%) compared to other opinion groups.

Table 1. The relationship between participation in fluoride varnish application at school and fluoride application in the clinical setting

Using fluoride mouthwash to protect your child's or your own teeth from decay	Using mouthwash and mouthwash in your child's oral and dental care		p
	No n=315	Yes n=62	
No	253(80,3)	33(53,2)	<0,001*
Yes	26(8,3)	13(21,0)	
We use mouthwash, but we don't know if it contains fluoride.	36(11,4)	16(25,8)	

Categorical variables are shown as number (%).
*p<0.05 indicates statistical significance.

Table 2. Comparison of parents' thoughts about protective fluoride applications and their criteria for obtaining information about oral and dental health.

Obtaining information about oral and dental health	Thoughts about protective fluoride applications †‡				p
	0 n=24	1 n=83	2 n=213	3 n=51	
Ask the dentist	23(95,8)	72(86,7)	198(93,0)	44(86,3)	0,196
Search on the internet	15(62,5)	52(62,7)	99(46,5)	25(49,0)	0,059
Watch relevant programs on television	4(16,7)	9(11,0)	12(5,6)	4(8,0)	0,131
Ask family and friends	1(4,2)	11(13,4)	16(7,5)	5(10,0)	0,377

Categorical variables are shown as number (%).
***: p<0.05 indicates statistical significance.**
†: 0: I think the society should be more informed about fluoride applications.
1: I have never heard of fluoride application before.
2: I think it contributes to dental health when applied correctly.
3: Fluoride is poisonous, so I do not want to apply it to my child.
‡: Six parents were not included in the analysis because they had different opinions about preventive fluoride practices.

Table 3. The relationship between parents' thoughts about preventive fluoride practices and the fluoride content of the toothpaste their children use.

Does the toothpaste your child uses contain fluoride?	Thoughts about protective fluoride applications †‡				P
	0 n=24	1 n=83	2 n=213	3 n=51	
Yes	2(10,5)	12(14,8)	28(13,5)	19(38,8)	<0,001*
No	13(68,4)	29(35,8)	134(64,4)	20(40,8)	
I do not know	4(21,1)	40(49,4)	46(22,1)	10(20,4)	

. Categorical variables are shown as number (%).
***: p<0.05 indicates statistical significance.**
†: 0: I think the society should be more informed about fluoride applications
1: I have never heard of fluoride application before.
2: I think it contributes to dental health when applied correctly.
3: Fluoride is poisonous, so I do not want to apply it to my child.
‡: Six parents were not included in the analysis because they had different opinions about preventive fluoride practices.

Table 4. The relationship between parents' thoughts about protective fluoride applications and fluoride applications

Fluoride applications	Thoughts about protective fluoride applications †‡				p
	0 n=24	1 n=83	2 n=213	3 n=51	
Has your child received any preventive fluoride treatments in the clinic environment?					
No	18(75,0)	79(95,2)	97(45,5)	41(80,4)	<0,001*
Yes once before	5(20,8)	4(4,8)	87(40,8)	8(15,7)	
Yes, it is applied regularly	1(4,2)	0(,0)	29(13,6)	2(3,9)	
Has your child participated in the application of fluoride varnish at her/his school?					
No	18(75,0)	66(79,5)	117(54,9)	45(88,2)	<0,001*
Yes	4(16,7)	4(4,8)	78(36,6)	4(7,8)	
There is no such application at my child's school.	2(8,3)	13(15,7)	18(8,5)	2(3,9)	

Categorical variables are shown as number (%).
***: p<0.05 indicates statistical significance.**
†: 0: I think the society should be more informed about fluoride applications.
1: I have never heard of fluoride application before.
2: I think it contributes to dental health when applied correctly.
3: Fluoride is poisonous, so I do not want to apply it to my child.
‡: Six parents were not included in the analysis because they had different opinions about preventive fluoride practices.

Table 5. Comparison of parents' thoughts about protective fluoride practices and their knowledge levels about fluoride

Knowledge levels about fluoride	Thoughts about protective fluoride applications †‡				P
	0 n=24	1 n=83	2 n=213	3 n=51	
Packaged drinking water contains fluoride.					
Agree	8(33,3)	17(20,5)	74(34,7)	12(23,5)	0,148
I'm undecided	13(54,2)	56(67,5)	116(54,5)	29(56,9)	
Disagree	3(12,5)	10(12,0)	23(10,8)	10(19,6)	
Children's toothpaste contains more fluoride than adult toothpaste.					
Agree	3(12,5)	9(10,8)	52(24,4)	7(13,7)	0,005*
I'm undecided	15(62,5)	58(69,9)	101(47,4)	23(45,1)	
Disagree	6(25,0)	16(19,3)	60(28,2)	21(41,2)	
Fluoride is stored in bones and teeth in the body.					
Agree	9(37,5)	25(30,1)	127(59,6)	20(39,2)	<0,001*
I'm undecided	14(58,3)	52(62,7)	68(31,9)	26(51,0)	
Disagree	1(4,2)	6(7,2)	18(8,5)	5(9,8)	
Too much fluoride is harmful to human health.					
Agree	13(54,2)	32(38,6)	145(68,1)	41(80,4)	<0,001*
I'm undecided	11(45,8)	46(55,4)	58(27,2)	9(17,6)	
Disagree	-	5(6,0)	10(4,7)	1(2,0)	
Fluoride contributes to dental health.					
Agree	10(41,7)	39(47,0)	167(78,4)	10(19,6)	<0,001*
I'm undecided	13(54,2)	35(42,2)	39(18,3)	29(56,9)	
Disagree	1(4,2)	9(10,8)	7(3,3)	12(23,5)	
It is not appropriate for children who swallow toothpaste to brush their teeth with toothpaste.					
Agree	12(50,0)	30(36,1)	88(41,3)	31(60,8)	0,041*
I'm undecided	9(37,5)	35(42,2)	65(30,5)	12(23,5)	
Disagree	3(12,5)	18(21,7)	60(28,2)	8(15,7)	
Using fluoride tablets as a baby protects teeth for life.					
Agree	2(8,3)	2(2,4)	16(7,5)	1(2,0)	<0,001*
I'm undecided	17(70,8)	62(74,7)	115(54,0)	22(43,1)	
Disagree	5(20,8)	19(22,9)	82(38,5)	28(54,9)	
High amounts of fluoride damage tooth structure.					
Agree	10(41,7)	24(28,9)	108(50,7)	28(54,9)	0,004*
I'm undecided	12(50,0)	56(67,5)	88(41,3)	20(39,2)	
Disagree	2(8,3)	3(3,6)	17(8,0)	3(5,9)	

Categorical variables are shown as number (%).
***: p<0.05 indicates statistical significance.**
†: 0: I think the society should be more informed about fluoride applications.
1: I have never heard of fluoride application before.
2: I think it contributes to dental health when applied correctly.
3: Fluoride is poisonous, so I do not want to apply it to my child.
‡: Six parents were not included in the analysis because they had different opinions about preventive fluoride practices.

DISCUSSION

In many developed countries, caries severity and frequency in children have decreased compared to the past and this is mainly attributed to the widespread use of preventive practices. In addition, high living standards, public education on dental health and increased awareness have been reported as other effective factors [12-16]. Parents, who are role models for children, need to learn basic issues such as nutrition, preventive measures and the necessary information for oral hygiene at a certain level in order to apply the right approaches to their children's dental health [17].

Preventive health services are organized so that they are easy, affordable, high quality, and minimize the need for professional health personnel. In dentistry, these programs include oral dental health education through schools and preventive practices, including fluoride supplementation, thereby planning for long-term dental health.

The aim of our study, which was based on the questions and concerns of the parents who applied to our clinic about the protective fluoride varnish applications in schools, which the Ministry of Health implemented, is to determine the perspective of the families on fluoride and fluoride applications in schools. Our study is important in terms of being one of the few studies evaluating the perspectives of the families about protective fluoride varnish applications in schools within the framework of the literature we have reviewed. The primary intent behind including children from both public and private schools was to capture a diverse cross-section of the population and assess whether perspectives on protective fluoride varnish applications varied across different educational settings.

Professional topical fluoride applications are indicated for children and adults with one or more flat surface caries or at high caries risk. The frequency of application varies depending on the patient's caries risk and usually requires at least every six months. The efficacy of fluorinated gels and varnishes in preventing caries has been proven in preventive studies on deciduous teeth. Although both applications are effective, fluorinated varnishes have been preferred more for reasons such as ease of application, patient acceptance and less risk of swallowing [18].

It should not be assumed that fluoride varnish will completely prevent tooth decay. Fluoride varnishes are the most effective prevention method against dental caries in the case of brushing children's teeth with the right amount of fluoridated toothpaste, regular flossing, regular dental check-ups and a healthy diet [12, 16, 19, 20].

Calcium fluoride is formed on the tooth surface due to long-term contact of varnishes with the demineralized tooth surface. Thus, a fluoride reservoir is formed in the mouth and saliva and plaque are

enriched in fluoride. In this way, fluoride varnishes are reported to prevent demineralization of the tooth surface and support remineralization. Studies have shown that varnishes reduce the prevalence of caries in deciduous and permanent teeth [21-23]. In vitro and in vivo studies demonstrating the inhibition effect of fluoride-containing varnishes on artificial caries, it has been shown that the use of fluoride as a fluoride source in school-age children with high caries risk provides a 17-88% reduction in caries incidence [23-25].

In our study, the proportion of parents who stated that their child received preventive fluoride application in the clinical setting was 36.1%, while the proportion of parents who stated that their child participated in fluoride varnish application at school was 23.9%. In addition, 64.4% of this group stated that their child received preventive fluoride applications in the clinical setting. Although 66.7% of the parents who stated that they participated in fluoride varnish application in their child's school reported that fluoride application in schools is a useful service, we still think it does not have a sufficient rate in terms of preventive dentistry program. Hendaus et al. [26], in their study conducted in Qatar, stated that approximately 70% of the families had not heard of fluoride varnish application before, but if there were such an application, they would allow a health worker to apply fluoride to their children.

Naidu et al. [27], in a prospective study, the rate of parents who thought that teeth should be protected with fluoride varnish every six months was 3.7% (n:2). In contrast, the rate of undecided parents was 81.5% (n:14). After dentists informed the parents, the rate of parents who were positive about fluoride varnish protection was 50% (n:10). At the same time, the rate of parents who were undecided was 45% (n:9). Although the rate of parents who approached positively to fluoride varnish protection after education showed a significant increase in the study, we think that it is not appropriate to present it as sufficient evidence due to the limited sample size.

Protective behaviors against dental caries should start in infancy; therefore, parents' knowledge and experience about oral health is important in the treatment of children from the age of one. Increasing the level of knowledge of parents about fluoride-containing products and fluoride varnish in oral and dental care is effective in managing and preventing dental caries in young children [28, 29]. In a study conducted by Akgün et al. [30], the child's exposure to fluoride was taken into consideration in the evaluation of caries risks and children who did not use fluoridated toothpaste, did not drink fluoridated water or milk, and did not use fluoride preparations were shown to be in the high-risk group and the rate of this group corresponded to 63.8% of the entire population. In the same study, children from families in the high and medium-risk groups received preventive fluoride treatment and oral hygiene education. In addition to fluoride treatment administered by specialist dentists, it is also essential to perform healthy oral and dental care at home, and parents should be informed about this issue. The importance of paying attention to the principles of maximum topical contact of fluoride material with teeth, low dose application, and frequent application should be explained, and the child should be advised to brush their teeth twice a day with fluoridated toothpaste [31].

Proper counseling and education can help implement better oral health and perhaps increase awareness of fluoride varnish. In our study, 91% of the parents answered that they would ask their dentist for information about oral and dental health. However, in this multiple-choice question, half of the population stated that they could also choose to search on the internet. It is important to take into consideration that information obtained from the internet instead of direct information from dentists may leave a question mark in many parents about fluoride applications and may perhaps form an opinion against fluoride applications; therefore, family physicians and dentists must continuously inform parents in order to increase awareness about this issue.

There are many studies evaluating fluoride applications and parental opinions in the literature. Evans et al. [32] conducted a study with the "Happy Teeth Fluoride Varnish Program," in which fluoride varnish was applied to 1822 children aged 3-6 years, and parents/caregivers and school staff highly appreciated the application. Berg et al. [33] conducted a study comparing the preferences of parents and children regarding fluoride varnish. Children aged 4-18 years were included in this study, and parents expressed positive opinions about the effectiveness of fluoride varnish. Adams et al. [34], in their study involving 211 children/parents, parents' preferences and views on preventive methods for early childhood caries were examined. The methods evaluated included fluoride varnish, tooth brushing with fluoridated toothpaste, xylitol in foods for children, xylitol chewing gum and chlorhexidine mouthwash. Although parents reported that all five treatments were acceptable, it was found that fluoride varnish and tooth brushing with

fluoridated toothpaste were generally preferred over the other options.

Wong et al. [35] examined Chinese parents' attitudes towards the oral health of their children with caries and found that the main barriers to the establishment of regular oral hygiene habits included parents' lack of dental education, lack of social support in dental treatment, fear of sedation for dental procedures, and cultural beliefs that do not support the preservation of the primary dentition.

In a single study by Liu et al. [36], the level of knowledge of children, parents and teachers about fluoride was examined, and the questions asked about fluoride were scored as low, medium, and high levels of knowledge. While 64% of parents stated that excess fluoride content was harmful to health, this rate was 68% among teachers. In our study, 62.9% of the parents answered "agree" to the statement "Excessive fluoride intake is harmful to human health." and 46.2% of the parents answered "agree" to the statement "High fluoride content deteriorates tooth structure." The same study found that the level of knowledge of children, parents and teachers about fluoride was at an intermediate level. Similar results were obtained in the study mentioned above and our study.

Liu et al. [36], the rate of parents who stated that they had not heard of fluoridated toothpaste was 8%. In addition, in this study, the rate of parents who answered "fluoridated toothpaste can prevent dental caries" was 72% and the rate of parents who answered "tooth brushing with fluoridated toothpaste can strengthen the resistance of tooth surfaces" was 74%. In our study, 56.5% of the parents answered, "I think it contributes to dental health when applied correctly", and 22% answered, "I have never heard of fluoride application before".

Studies show that information and motivation are important for behavior change. Weinstein et al. [37] conducted motivational interviews with mothers of children at high risk for dental caries and found that caries occurrence was lower in these children. Chhabra and Chhabra [38] examined parental knowledge, attitudes, and cultural beliefs about oral health and dental care of preschool children in a study conducted in an Indian population. The authors found that parents' lack of knowledge, cultural beliefs, and dental fear were the most significant barriers to disseminating preventive practices. Al-Omiri et al. [28] found that parents' level of knowledge, dental hygiene habits and dental treatment concerns directly affected their children's oral and dental health.

The results of other information analyzing the knowledge levels of parents about fluoride are as follows: 30% of the parents "agree" with the statement "Packaged drinking water contains fluoride.", 19.1% of the parents "agree" with the statement "Children's toothpaste contains more fluoride than adult toothpaste.", 49.3% of the parents "agree" with the statement "Fluoride is stored in bones and teeth in the body.", 43.8% of the parents "agree" with the statement, "It is not appropriate for children who swallow toothpaste to brush their teeth with paste."43.8% of the parents agree with the statement, "Using fluoride tablets as a baby protects teeth for life." 37.1% of the parents "disagree" with the statement, "Interestingly, in our study, it was found that these rates did not change significantly in parents who stated that they participated in fluoride varnish application at their child's school. Another different point is that among parents who use a fluoride mouthwash to protect their child's or their teeth from caries, the rate of parents who are undecided about the idea that fluoride application in schools is a useful service is 30.8%, while the rate of parents who state that it is not a useful service is 15.4%. Although 91% of the parents stated that they would consult a dentist for information about oral and dental health, these results show that society is still not sufficiently aware of the use of protective fluoride in dental health.

In our study, there are findings that support that society is not sufficiently conscious about the use of fluoride in our country, where the prevalence of dental caries is high. 13.5% of the parents answered, "Fluoride is poisonous, so I do not want my child to apply it". The rate of parents who answered "I think the society should be informed more about fluoride applications" is 6.4%. Among the parents who answered, "I think it contributes to dental health when applied correctly", 64.4% stated that the toothpaste they use in their children contains fluoride, 54.4% stated that they participated in the preventive fluoride application of children in the clinical environment, and 45.1% stated that they participated in fluoride varnish application at school. In fact, the level of knowledge about fluoride in the parents who answered "I think it contributes to dental health when applied correctly" in our study also shows inconsistency. Even this finding shows the fact that parents who have a positive approach to fluoride application hesitate in its application.

In the literature, in a study conducted on preschool children, the fluoride varnish opinions of the families were examined. It was found that the parents' knowledge and attitudes and their concerns about dental treatment affected their children's dental care [26]. In this study conducted in Qatar, the main point is again the conclusion that families do not have sufficient knowledge about fluoride varnish applications and approach with hesitation.

CONCLUSIONS

The lack of sufficient participation in fluoride varnish application in schools and the fact that parents are still hesitant in this application affect the program's success rate. In addition, parents' lack of knowledge about fluoride indicates that parents are not sufficiently informed. Therefore, primary care physicians, especially pediatricians, should contribute significantly to oral health education. The limitation of our study is that it was a pilot study; therefore, we think that it should be evaluated with a larger sample for better generalization. However, it's important to emphasize that our research aimed not only to contribute new insights but also to reaffirm existing knowledge through empirical evidence. The study's primary goal was to provide a comprehensive understanding of parental perspectives on fluoride applications in schools and their correlation with oral health beliefs.

In this study, some conclusions may align with common knowledge, the strength of our study lies in the systematic collection and analysis of specific data points, shedding light on the nuanced relationships between parental opinions, oral health practices, and attitudes toward fluoride applications. We believe the detailed examination of these aspects adds depth to the existing body of knowledge and can guide future research and public health initiatives.

CONFLICT OF INTERESTS

The Author(s) declare(s) that there is no conflict of interest.

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