



Determining the knowledge levels and opinions of high school students aged between 13-17 about fluoride in toothpastes

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Cite this article as: Akleyin E, Polat Y. Determining the knowledge levels and opinions of high school students aged between 13-17 about fluoride in toothpastes. *Dicle Dent J.* 2024;25(3):69-72.

Received: 20/07/2024

Accepted: 30/07/2024

Published: 19/09/2024

ABSTRACT

Aims: Fluorine, which has been proven to be effective in preventing dental caries, is applied systemically and topically as a public health method in children and adults. Toothpastes are the most common form of topical fluoridation. The aim of this study was to evaluate the level of knowledge of high school students aged 13-17 years about fluoridated toothpastes and the information sources from which they accessed this information.

Methods: A questionnaire prepared by us was administered to 750 volunteer high school students. In the questionnaire, demographic information, tooth brushing habits, knowledge and opinions about fluorine in toothpastes and the sources of this information were asked. In this study, percentage (%) and frequency (n) values were given as descriptive statistics.

Results: Of the 750 high school students who answered our questionnaire, 44% were female, 56% were male and the average age was 14.62 years. When the brushing habits of the students were analyzed; it was seen that 19% of them brush irregularly and 7% of them do not brush their teeth. About fluorine in toothpastes, 47% of the students had no information, 27% thought it prevented caries, 14% thought it was harmful, and 12% were undecided. When students were asked whether the toothpaste, they used to contain fluorine or not, 53% of them did not have any information, 37% of them had access to information from family and friends, 34% from dentists, 27% from social media, and 2% from school.

Conclusion: It was observed that high school students' tooth brushing habits were inadequate and their basic knowledge about fluoride applications was weak. Within the scope of community oral and dental health, it was thought that students should be informed about the caries preventive effect of fluoride at optimum intervals from accurate information sources such as dentists and schools.

Keywords: Fluorine, fluoridated toothpaste, high school students, toothpastes, tooth brushing habits

*This study was presented as an oral presentation at the 2nd International Congress on Health Research (ICOHER'22), held online from October 12-15, 2022.

INTRODUCTION

Oral and dental health is an important component of general health and plays a critical role in the protection of general health.¹ Dental caries, which affects 60-90% of children worldwide, is one of the most common chronic diseases in childhood.² In a study conducted on high school students in Türkiye, 44.86% of permanent first molars had caries and 7.92% were missing.³ Öztürk and Sönmez⁴ determined the rate of dental caries in the 15-year-old age group as 85.2%. Removal of microbial dental plaque is of great importance in the prevention of dental caries, especially in young individuals.⁵ Plaque-inhibiting chemicals have been developed to support mechanical plaque control.⁶

Fluoride ion is one of these chemical substances and shows caries preventive effect by acting on the demineralization and remineralization balance of dental hard tissues. Fluoride, which has been proven to be caries preventive in teeth, is applied systemically and topically as a public health method in children and adults. Toothpastes are the most common form of topical fluoride application. The use of fluoridated toothpaste has been shown to reduce the increase in caries by approximately 25% compared to a toothpaste without fluorine. Excessive fluorine content in drinking water or ingestion of fluorine from toothpaste in young children without a swallowing reflex may cause fluorosis.⁷⁻⁹ It has been

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reported that oral health of children is affected by individual, family and community levels.¹⁰ Therefore, considering that determining the basic knowledge of young individuals, whose level of awareness is gradually increasing, about dental fluoride applications is important for public health, this study aimed to examine the level of knowledge of high school students aged 13-17 years about fluoridated toothpastes and the sources of this information.

METHODS

The questionnaire questions prepared by us were applied individually face-to-face to 750 volunteer students studying at Diyarbakır Competition Authority Republic Science High School. The necessary the Dicle University Faculty of Dentistry Ethics Committee obtained for the study (Date: 28.09.2022, Decision No: 2022-38). All procedures were carried out in accordance with ethical rules and the principles of the Declaration of Helsinki. In this study, a cross-sectional survey consisting of questions whose reliability and validity have been proven in similar studies in the literature was administered.^{1,17} Our questionnaire consisted of demographic information questions and questions to determine the level of knowledge and opinions about fluorine in toothpastes. Individuals who participated in the questionnaire were asked questions about demographic information (age and gender), tooth brushing habits, knowledge and opinions about fluorine in toothpastes, and sources of access to this information.

Statistical Analysis

In this study, frequency (n) and percentage (%) values were given as descriptive statistics. SPSS 20 (IBM Corp., Armonk, NY, USA) package programme was used for statistical analyses.

RESULTS

Of the 750 high school students who participated in our survey, 44% were female and 56% were male. The ages of the participants ranged between 13 and 17, with a mean age of 14.62 years. When the tooth brushing habits of the students were analysed, it was found that 47% of them brushed their teeth twice a day (morning and evening), 27% brushed their teeth once a day regularly, 19% brushed irregularly and 7% never brushed their teeth (Table 1). It was determined that 47% of the students had no information about fluorine in toothpastes, 27% thought that fluorine prevented caries, 14% thought that fluorine was harmful and 12% were undecided (Table 2). When asked whether toothpastes contain fluorine or not, 53% of the students stated that they had no information on this subject, 35% stated that they used fluoridated toothpaste and 12% stated that they used fluoride-free toothpaste (Table 3). When the sources of information about the content and effects of toothpaste were evaluated, 37% obtained information from family and friends, 34% from dentists, 27% from social media and 2% from school (Table 4).

Brushing frequency	Number	Percentage (%)
Twice a day (morning/evening)	353	47
Regular once a day	203	27
Irregular	143	19
No brushing	53	7

Thought about fluor	Number	Percentage (%)
No information	353	47
He thinks it is harmful	105	14
I think it prevents caries	203	27
Undecided	90	12

Toothpaste content	Number	Percentage (%)
No information	393	53
Fluoride	263	35
Fluoride free	90	12

Source of information	Number	Percentage (%)
Family and friend circle	278	37
Dentist	255	34
Social media	203	27
School	15	2

DISCUSSION

Today, toothpastes are the most accessible and widely used plaque preventive agents.¹¹ Fluoride is one of the most commonly added therapeutic agents to toothpastes, and the main effect of fluoride toothpastes is to prevent caries.¹²

In a study conducted with Iranian students aged 13-16 years, 79.7% of the participants reported brushing their teeth at least once a day, while 14.8% reported brushing their teeth twice a day.¹³ Kocaoğlu et al.¹⁴ conducted a study with 151 students aged 7-15 years and reported that 66.9% of the students did not have tooth brushing habits and 35.8% did not own a toothbrush. In a study conducted in a private school in Diyarbakır province, the caries rate of children in high school was found to be 37.8%. Brushing habits were found to be 54.3% twice a day and 34.4% once a day.¹⁵ In our study, when the tooth brushing habits of the students were analysed, it was found that 47% brushed their teeth regularly twice a day (morning and evening), 27% brushed their teeth once a day, 19% brushed their teeth irregularly and 7% did not brush their teeth at all. In our study, tooth brushing habits, which are affected by socioeconomic status and many environmental factors, were thought to be inadequate similar to other studies.

Mechanical removal of dental plaque by tooth brushing with fluoridated toothpastes and other supportive methods is the

most widely recommended method worldwide for plaque control and prevention of dental caries.¹⁶ When Iranian students aged 13-16 years were asked what is the importance of fluoride in toothpaste, 59.03% answered that it strengthens teeth.¹³ In a study of 718 Romanian students with an average age of 14.54 years, 20.47% stated that fluoride in toothpaste can remineralize hard tooth tissue.¹⁷ In a survey conducted on adults in Konya province, it was reported that 40% chose toothpaste unconsciously, 16% thought that fluoride-containing toothpastes were effective in preventing caries, and the opinion that fluoride-containing toothpastes were toxic/harmful increased with the increase in the educational status of the individual.⁷ According to the results of the survey we applied to young individuals, it was determined that 53% chose toothpaste unconsciously, 27% thought that fluoride had a caries-preventive effect, and 14% thought that it was harmful. According to the results of the study, it was observed that the level of awareness about fluoride was insufficient in young individuals, similar to adults.

In a study conducted in Bangladesh, it was reported that 35% of the participants obtained information about fluoride from family and friends, 25% from dentists, 20% from school, 15% from social media and the internet, and 5% from textbooks and educational materials.¹ Ak et al.⁷ and Ota et al.¹⁸ reported that parents accessed information about fluoride more through social media and the internet. In our study, it was determined that young individuals obtained information about dental fluoride from family and environment, and the importance of educating parents on this issue was understood. Since our study was cross-sectional, participation was based on the availability and willingness of volunteers. Access to only one high school in the city limited our ability to reach a wider participant population.

CONCLUSION

This study revealed that students' knowledge and performance regarding the use of fluoride-containing toothpaste was inadequate and that they did not act consciously in their choice of toothpaste. Within the scope of oral and dental health of the society, it is thought that students should be told about the caries preventive effect of fluoride at optimum levels from reliable information sources such as dentists and schools.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of the Dicle University Faculty of Dentistry Ethics Committee obtained for the study (Date: 28.09.2022, Decision No: 2022-38).

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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