

KNOWLEDGE OF THE PARENTS OF CHILDREN LIVING IN UŞAK PROVINCE, TURKEY ABOUT ORAL HEALTH, PREVENTIVE APPLICATIONS, AND FLUORIDE

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ABSTRACT: The aim of this study was to evaluate the knowledge of the parents of children living in Uşak province about oral health, preventive applications and fluoride via a questionnaire. A cross sectional study was carried out to 263 parents who applied to health centers in center of Uşak, Turkey, in 2020. A 22-item questionnaire was delivered on a face to face interview basis. Data were analyzed using the Statistical Package for Social Sciences 21.0 version (IBM corporation, Chicago, USA) with Chi-square, Mann Whitney U, and Spearman's rho tests. The level of statistical significance used in this study was chosen at $p < 0.05$. There is a significant correlation between gender and knowledge about^a fluoride and fissure sealants ($p = 0.002$, $p = 0.001$) and positive correlation between the socioeconomic status and having knowledge about fluoride and fissure sealant ($p < 0.001$). As the socioeconomic status increases, getting information from the dentist decreases, while getting information from the internet and social media decreases. There was a positive correlation between education and tooth brushing frequency, tooth brushing education, having knowledge about fluoride and fissure sealant but there was no correlation between education and cariogenic diet and using fluoridated toothpaste. There was statistically positive correlation between frequency of going to the dentist and socioeconomic status ($p < 0.001$). There was also a significant relationship between the educational status and the use of fluoridated toothpaste and controlling the brushing of their child ($p = 0.001$, $p = 0.003$). Parental knowledge of preventive practices is not sufficient according to the results. Parents should be informed about brushing and preventive practices as children's oral and dental health is often aligned with that of their parents.

Keywords: Caries; Fluoride applications; Pit and fissure sealants.

INTRODUCTION

Dental caries constitute a widespread public health issue across the globe. It represents the most common oral disease among children¹ but can be prevented in early stages.² The American Academy of Pediatric Dentistry defines early childhood caries as "the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child under the age of six."³ Despite the improvements in oral health in children by means of the widespread use of fluoride (F) in the past 50 years, tooth decay remains a common problem around the world.⁴ Severe caries causes pain, growth and developmental delays, loss of confidence, and mental health problems.⁵

Carious teeth that cause chronic pain adversely affect a child's overall health and, consequently, that of the entire family.⁴ Parents must be informed about preventive treatments and oral hygiene practices to ensure dental health in their children.⁶ Caries are mostly preventable by good oral hygiene, the use of F, and a noncariogenic diet. According to the World Health Organization (WHO), brushing twice daily with toothpaste containing F is the most common, accepted, realistic, and effective form of F use globally; this use reduces the burden of tooth decay in broad populations.⁷

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In addition to the preventive effects of F on caries, the systemic effects of F must be considered. Systemic F toxicity—either acute or chronic (fluorosis)—is possible.⁸⁻¹⁰ Studies have reported that F may cross the blood-brain barrier to cause neurotoxicity and may affect children's cognitive abilities and mental development.¹¹⁻¹³ A recent meta-analysis found that high levels of F exposure significantly affected the development of intelligence in children.¹⁴ Another meta-analysis strongly indicated that F may adversely affect cognitive development.¹³

Despite these reported systemic risks, much scientific evidence supports the safety of topical F therapy applied by a dentist to efficiently reduce the incidence of dental caries.¹⁵ Other non-fluoride preventive treatments are required to protect teeth against pits and fissures because F is mostly effective on smooth surfaces. More than 50% of dental caries are seen in dental grooves, and pit and fissure sealants are effective preventive treatments for those grooves. In fact, sealants were more effective than topical F in the prevention of occlusal caries in one study.¹⁶

The family has the most important effect on the psychological, physical, and social aspects of health from the moment the child's birth.¹⁷ Acquiring good oral health habits in childhood usually occurs by means of parents, especially mothers.^{18,19} Oral health is affected by the parents' dental knowledge, attitudes about dental health, awareness about diet, oral hygiene habits, and routine preventive dental visits for oral health.²⁰

The aim of this study was to evaluate the knowledge of the parents of children living in the Uşak province (Turkey) about oral health, preventive applications, and F through a questionnaire.

MATERIALS AND METHODS

A cross-sectional study was carried out with 263 parents who applied to health centers in the center of Uşak, Turkey. This study was approved by the ethics committee of the Uşak University of Medical Sciences. In this study, parental participation was voluntary, and the participants were fully informed about the study. A self-administered, 22-item questionnaire was delivered during a face-to-face interview. This questionnaire was tested in a pilot study that included 30 parents/guardians. The participants in the pilot study were not included in the main study, and no questions from the pilot needed to be removed for this study.

Questions were divided into three parts. The first part asked about demographic data, including name, gender, and age. The ages of the parents were categorized as follows: group 1, 20–30 years old; group 2, 30–40 years old; group 3, 40–50 years old; and group 4, more than 50 years old. The second part asked about socioeconomic status, education status and relation to the children. The socioeconomic status of the families was analyzed as bad, moderate, or good; the education status was analyzed as bad, moderate, or high. The last part consisted of questions about knowledge of preventive treatments and about the source of that information.

Data were analyzed using the Statistical Package for Social Sciences, version 21.0 (IBM Corporation, Chicago, IL, USA) with chi-square, Mann-Whitney U, and Spearman's rho tests. The level of statistical significance used in this study was set at $p < 0.05$.

RESULTS

People who applied to health institutions for care were randomly selected for participation in this study. The selected parents were invited to answer the questionnaire. Overall, 35.7% of participating parents were men, and 64.3% were women (Table 1).

Table 1. Percent and frequency of gender

	Male	Female	Total
Percent	35.7	64.3	100
Frequency	94	169	263

Although there was no correlation between gender and knowledge about fissure sealants, a significant correlation between gender and knowledge about F was found ($p=0.002$). Female parents were more knowledgeable than male parents about F. Both parents obtained this information most often from the dentist. Women used the internet and social media more than men did (Table 2, Table 3). Although 4.9% of participating parents had a bad socioeconomic status, 64.6% had a moderate status, and 30.4% had a good status (Table 4).

There was a positive correlation between improving socioeconomic status and increasing knowledge about F ($p<0.001$). As the socioeconomic status increased, the number of parents who obtained information from the dentist increased, whereas use of the internet and social media as information sources decreased. Strikingly, none of the parents who had knowledge about F obtained this information from the newspaper (Table 5).

Table 2. Parent's knowledge about fluoride and fissure sealants according to their gender

	I know about fluoride		I know about fissure sealants	
	Yes	No	Yes	No
Female	80	89	35	133
Male	25	69	10	84
Total	105	158	45	217

Table 3. Where the parent's get information

	Information from					Total
	Dentist	School	Internet	Social media	None	
Female	38	32	21	13	65	169
Male	12	4	11	11	56	94
Total	50	36	32	24	121	263

Table 4. Percent and frequency of socioeconomic status

Socioeconomic status	Bad	Moderate	Good	Total
Percent	4.9	64.6	30.4	100
Frequency	13	170	80	263

Table 5. Where the parents get the information according to their socioeconomic status

Socioeconomic status	Information from					Total
	Dentist	School	Internet	Social media	None	
Low	0	0	0	1	12	13
Moderate	26	17	19	16	92	170
Good	24	19	13	7	17	80
Total	50	36	32	24	121	263

Although no statistically positive correlation was observed between socioeconomic status and tooth brushing frequency, knowledge about the F content in toothpaste was significantly associated with better socioeconomic status ($p < 0.001$). No correlation was found between having a decayed tooth and using toothpaste with F. As the family's socioeconomic status increased, the number of caries in children decreased, and awareness about caries increased. However, none of these findings were statistically significant ($p = 0.468$).

Parental education status was also recorded. There was a positive correlation between better education and tooth brushing frequency ($p = 0.006$) and knowledge about tooth brushing ($p < 0.001$). Conversely, no correlation was observed between education level and a cariogenic diet or the use of fluoridated toothpaste. There was a positive correlation between education level and knowledge about F and about fissure sealants ($p < 0.001$ for both). As the level of education increased, the sources of information varied, and the replies to each choice increased. The group with the lowest educational status acquired information from school most often, but the groups with moderate and high educational statuses acquired information from dentists (Table 6).

Table 6. Where the parents get the information according to their education status

Education status	Information from					Total
	Dentist	School	Internet	Social media	None	
Low	3	7	3	3	32	48
Moderate	11	4	7	5	47	74
High	36	25	22	16	42	141
Total	50	36	32	24	121	263

Although 45.6% of the 263 participating parents reported never going to the dentist, 54.4% reported regularly dental visits. There was a statistically positive correlation between the frequency of dental visits and increasing socioeconomic status ($p < 0.001$). There were also significant relationships between increasing educational status and the use of fluoridated toothpaste ($p = 0.001$) and parental control of tooth brushing for the child ($p = 0.003$). The relationship between educational status and using the internet and social media was also significant: as the level of education increased, the use of social media increased. The group with the highest educational status had more awareness about the number of caries in their children and about caries in general ($p < 0.001$).

A significant difference was found between the first and second age groups and between the first and third age groups with regard to social media use ($p < 0.001$). Although no significant relationship was observed between age groups with regard to information about F ($p = 0.40$) and about fissure sealants ($p = 0.74$), a statistically significant relationship was found between age groups and social media use ($p < 0.001$) and control of the child's brushing ($p = 0.006$). The frequency of regular visits to the dentist decreased as the age of the parents increased (i.e., young parents visited the dentist more regularly), but this trend was not statistically significant ($p = 0.255$).

Statistical analysis showed that 39.9% of parents reported knowing about F applications' benefits. The level of parents surveyed who knew about the benefits of sealants was 17%, and a significant relationship was observed between these two findings ($p < 0.001$). Parents who had knowledge about F had high rates of experience with F application; the information was obtained most often from a dentist (19%) and then from the internet (12.2%) and social media (9.1%).

DISCUSSION

The aim of this study was to evaluate the knowledge reported by parents about oral health and about professionally applied preventive treatments for their children. Parents' knowledge about oral health predicts their children's oral health. Highly educated parents were significantly more likely to have higher knowledge scores in this study. This increasing knowledge can be related to their increased potential to search for and learn about general health for their children. Many studies have explored this topic and reported different findings. Although most studies (Laaksonen et al.,²¹ Wigen and Wang,²² Hooley et al.,²³ Ashkanani and Al-Sane,²⁴ Tahani et al.²⁵) have shown positive correlations between increasing education and more knowledge, others (Ersin et al.,²⁶ Cogulu et al.,²⁷ Elfrink et al.,²⁸ Hooley et al.²³) found no relation. One study reported a negative association.²⁹

Dental caries represent one of the main oral diseases that cause complications and costly and time-consuming treatments.³⁰ In different countries, studies have shown that preventive dental treatments and improved social environments can reduce the prevalence of dental caries.³¹⁻³⁶ This study has shown that the children of parents who have better educational and socioeconomic statuses have a reduced incidence of caries. This finding may relate to improved tooth brushing and deliberate use of fluoridated toothpaste. Similar to our findings, Hallet and Rourke³⁷ and Gläser-Ammann et al.³⁸ found an association between these parameters. Some studies have reported a correlation between only socioeconomic status and caries.³⁹⁻⁴¹ Awareness of caries may have influenced those results. A recent study showed that parents whose children visit the dentist less frequently are less likely to be aware of carious teeth or caries.⁴² Our results showed that awareness about caries increases as socioeconomic status increases.

Many studies in different countries have shown that preventive measures or programs are being introduced to reduce the prevalence of dental caries.^{31-33,35,43} These measures are effective and easily accessible by families.^{44,45} Parental education status affects their knowledge about preventive dental treatments. In our study, parents with higher education had good knowledge about preventive dental

care; this finding was similar to results of studies done in Iran, Michigan, and India.⁴⁶⁻⁴⁸ Also, we found that female parents were more knowledgeable about preventive applications than male parents. In our country, mothers are more interested in taking care of their children than fathers. Therefore, especially health-related trainings should be organised mostly for women. For this purpose, we are planning online courses for mothers at our clinic on weekends.

Socioeconomic status also affects knowledge. This study reported a positive correlation between the two variables, which is similar to results of other studies.^{39,41} It was learned that parents with low socioeconomic status obtained information about preventive applications from the internet and social media, not from the dentist. We plan to develop a free mobile application for patients to obtain more accurate information by taking this internet usage into consideration. In addition, hand brochures were prepared in order to increase the information about these applications in our clinic and videos about preventive treatments were uploaded to our website. Our survey also showed that access to information about preventive treatments increased as the educational status increased. Other studies have also reported that correlation.^{49,50} Enthusiasm about searching for and learning about their children's health can be one reason for this finding.

According to guidelines from the American Academy of Pediatric Dentistry, a check-up every 6 months is recommended to prevent dental problems.⁵¹ One study found that only 13% of parents favored taking their child to the dentist twice every year.⁵² In our study, we found that a much higher level 54.4% of the 263 parents regularly visited the dentist for their children.

In this study, 33.8% of parents knew that their children should brush their teeth twice a day (per American Dental Association recommendations to brush teeth twice a day for 2 minutes with fluoridated toothpaste).⁵³ The rate of twice daily tooth brushing has been reported as 70.9%⁵² and 51.8%⁵⁴ in previous studies. Recommendations also state that parents should supervise their children during tooth brushing.³ In our study, 60.5% of parents stated that they controlled their children's brushing. Nguyen et al.⁵⁵ reported that a third of parents never or rarely assist their children with tooth brushing.

Professional topical F application four times a year has been reported to ensure a reduction in the amount of dental caries at a rate of 86%.⁵⁶ But it has been shown that sealants are more effective than topical F applications to prevent occlusal caries.¹⁶ Application of resin-based fissure sealants on permanent teeth (first molars) in the first year of eruption reduces dental caries by 86%; reductions are 78.6% in the second year, and 58.6% in the fourth year.⁵⁷ This study showed that most of the parents do not have a high level of knowledge about pit and fissure sealants (12.9% aware) or about F therapy (16% aware). Although they had high levels of knowledge about oral health, they did not know much about preventive treatments, regardless of educational/socioeconomical status. In this study, 17% of parents knew that fissure sealants were an effective preventive treatment, whereas Jafari et al.¹⁶ and Mafeni and Messer⁴⁷ reported that 57.6% and 53% knew about the efficacy of the sealants. One survey declared that parents do not have sufficient knowledge about the benefits of sealants in keeping children's molars healthy.³⁹ In our study, knowledge about F applications (39.9%) was higher than knowledge about fissure sealants (17%), as in

the study by Tahani et al. in 2017.²⁵ The parents that know more about F therapy are better able to relate news about F. Speculations about the toxicity of F have increased familiarity with F and increased news about its usefulness. Another reason why F applications are more known may be that F is applied at younger ages and fissure sealants can be used around 6 years of age and on teeth with specific indications. Parents are role models in promoting sustainable, healthy oral care behaviors. They should be educated about the importance of oral health and about preventive oral health practices.⁵⁸

In our study, the participants were informed about the preventive treatments after the questionnaire and we think that increased the awareness about fissure sealant which is less known among others. The results of this study showed our failure as dentists. Maintaining good oral health is our responsibility to all people, so that we must improve the educational status of the people about dental care and preventive applications. A 4-week online programme about 'Professional Fluoride Applications for Mothers' and a mobile application were planned to make up this deficiency.

STUDY LIMITATIONS

A limitation of this study includes its small sample size. In the future, findings should be expanded with larger samples for better results.

CONCLUSION

According to our results, parental knowledge about preventive practices for oral health is not sufficient. Children's oral and dental health is often aligned with that of their parents. Therefore, parents should be informed about oral health-related habits and preventive treatments. Educational programs about oral health and preventive treatments directed toward both children and parents are needed, especially in developing countries.

CONFLICT OF INTEREST DECLARATION

The authors do not have any conflict interest, financial or personal, in any of the materials described in this study.

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