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Parental Comprehension About Use of Fissure Sealant and Fluoride for their Children

Manal A. Almutairi*
Department of Pediatric Dentistry and Orthodontics, Dental College, King Saud University, Riyadh Saudi Arabia

ABSTRACT

Children's oral health is the foundation on which preventive education and dental care must be built to increase the opportunity for life-time freedom from preventable oral diseases. The purpose of this study was to assess the comprehension of Saudi parents towards the use of fluoride and fissure sealants, and to determine the factors that influence their comprehension. This was a cross-sectional study of Saudi parents. A self-administered questionnaire was collected from 206 parents of outpatients attending the pediatric dentistry clinic of King Saud University in Riyadh, Saudi Arabia. In addition to the demographic questions, we investigated the knowledge and attitude of Saudi parents toward their children's use of fluoride and fissure sealants. In the present study, most of the parents a high-school education. Most of the parents (68.4%) had a favorable attitude toward the use of fluoridated gels for their children, while only 39.8% had a positive opinion regarding fluoridated water. The satisfaction levels were very high regarding fluoridated mouth rinses and fluoridated gels (69.4% and 68.4%, respectively). Satisfaction with fissure sealant was split almost equally (55.3% were "pleased" and 44.7% "not pleased"). The most important source of parental oral health knowledge was dentists (82%). The present study found that parents have a low opinion of fluoride and fissure sealants for their children. Therefore, greater effort should be made by professional organizations and government agencies to inform parents of the benefits of sealants and fluoridated products to prevent dental caries in children.

KEY WORDS: CARIES, FISSURE SEALANTS, FLUORIDES, PEDIATRIC DENTISTRY, PREVENTIVE DENTISTRY.

INTRODUCTION

Children's oral health is the foundation on which preventive education and dental care must be built to increase the opportunity for life-time freedom from preventable oral diseases (Nagarajappaet al., 2013). Preventive procedures must be started in early years of life (Thakareet al., 2012). The use of preventive treatment modalities in European and other developed countries is more than 50%, whereas there are few published reports on the use of preventive dental modalities in Saudi Arabia (Al-Shalan and Wyne 2002; Hamasha et al., 2019).

In Saudi Arabia, a significantly high prevalence of dental caries has been reported in children, adults, and older individuals. These groups have shown a higher prevalence and severity of caries over the past few decades (Al-Ansari, 2014). The use of caries preventive approaches, such as community water fluoridation, topical fluoride therapy, plaque control, and dietary sugar control has been generally seen to be the cause of the overall decline of caries prevalence, which in turn has had a greater effect on smooth-surface caries reduction (Kitchens, 2005). Exposure to fluorides plays a major role in preventing and reducing caries experience, with strong evidence for the effectiveness of both fluoridated water and toothpastes (Gussy et al., 2008).

In recent years, the importance placed on the systemic protective effect of fluoride against caries has significantly waned. Re-analysis of data from water fluoridation trials supports the presence of the post-eruptive effect of fluoride. It appears that teeth erupting during a period of water supplementation receive a measure of caries protection that would most likely be topical in nature (Adair, 2006). The primary caries preventive effects of fluoride result from its contact with enamel and through

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its antibacterial properties. Therefore, therapeutic use of fluoride for children should focus on regimens that maximize topical contact, preferably in low-dose, high-frequency approaches (Adair, 2006). Topical application of fluoride by a dentist four times a year has been reported to result in an 86% reduction in dental caries (Donald et al., 2000). The plaque-retentive nature of pits and fissures make them difficult to clean, causing them to be more susceptible to caries than smooth surfaces and possibly not to be protected by fluoride administration (Kitchens, 2005). The and, since fluoride exposure is mostly on smooth surfaces and more than 50% of dental caries in under-20-y-olds occurin the dental grooves, the use of fissure sealants (FSs) is recommended as another preventative (Ahovuo-Salorantaet al., 2016).

It is well documented that sealants are more effective than topical fluoride in preventing occlusal caries (Jafari et al., 2010). Pit-and-fissure caries accounts for about 90% of caries in permanent posterior teeth and 44% of caries in primary teeth (Beltran-Aguilar et al., 2005) Moreover, the application of resin-based FSs on permanent teeth (first molars) has been reported to reduce caries from 86% in the first year, to 78.6% in the second year, and 58.6% in the fourth year (Beauchamp et al.,2008). Sealant application is a preventive conservative approach involving the introduction of sealants into the pits and fissures of caries-prone teeth. This sealant then bonds to the tooth micromechanically, providing a physical barrier that keeps bacteria away from their source of nutrients (Simonsen, 1978). Despite the overall increase in sealant use and the efficacy and caries-preventive effect of pit and fissure sealants being well documented, they are still considered to be underused worldwide(Riley et al., 2010;Tellez et al., 2011).

Since preventing dental caries is a huge challenge for the public, increasing parental knowledge and using preventive methods, as practiced in developed countries, may lead to decreased dental caries and improved health of children (Daly et al.,2002).Parents are responsible for their child's oral health care. Preschool children are not capable of brushing themselves and lack the manual dexterity and the psychological maturity to understand the importance of maintaining oral health. With changing lifestyles, a trend of having a single child, and increased cost of living, most parents are working with very little time left for performing day to day oral health care practices in their child's early years (Maniet al., 2011). Especially in preschool children, the parental role is the most important aspect of maintaining good oral health (Castilho et al., 2013; Hamasha et al., 2019).

In view of the high caries prevalence in Saudi children, it is important to carry out such studies evaluating the comprehension of Saudi parents about various caries preventive modalities available (Al-Ansari, 2014). However, such studies are rare in Saudi Arabia. The objective of the present study was to assess the comprehension of Saudi parents about the use of fluoride, fissure sealants and other preventive modalities for their children in Saudi Arabia.

MATERIAL AND METHODS

This cross-sectional study was conducted among the parents of children who attended the Pediatric Dentistry Clinics of King Saud University College of Dentistry in Riyadh, Saudi Arabia. The research proposal was submitted to the Institutional Review Board and Ethics Committee of the College of Dentistry Research Center (CDRC) and approvals (19/0315/IRB) were obtained. The sample size for the study was estimated through power 0.89 and $\alpha = 0.05$ (maximum difference, 0.9). The sample size was determined to be a minimum of 200. Participation in the research was on a voluntary basis. Informed consent was obtained from each participant before commencement of the study, and no risks to the participants were anticipated. Inclusion criteria were Saudi parents who were able to answer the questionnaire, and whose children were patients at pediatric dentistry clinics. The exclusion criterion was parents not agreeing to participate in the study.

The questionnaire was constructed in English before being translated into the local language (Arabic) and then back to English to ensure accuracy. The parents were asked to complete a 23-item questionnaire to elicit information in the following areas:a. Demographics (age, gender, number of years of education of both parents, number of children).b. Dental history (last dental visit of their children and reason for visit). c. Personal use of fluoridated mouth rinses.d. Source of information about oral health (media, Internet, dentist, friends).e. Attitude toward fissure sealants and fluoridated water, toothpastes, gels, mouth rinses, and other fluoridated products.f. Satisfaction with fluoridated water, fluoridated gels and mouth rinses, and fissure sealants.

A pilot study was conducted on 10 parents not participating in the main study to check the validity and reliability of the questionnaire; changes were made accordingly. The pilot study responses were not considered in the main study.The data were analyzed using SPSS pc+ version 22.0 statistical software (IBM Inc., Chicago, Ill, USA). Descriptive statistics (mean, standard deviation, frequencies, and percentages) were used to describe the quantitative and categorical variables. The chi-square test was used to determine the significant difference between the responses.Confidence was kept at 95% and a P-value ≤ 0.05 was considered to be statistically significant.

RESULTS AND DISCUSSION

A total of 206 parents consented and then completed the study questionnaire. Table 1 summarizes the demographic information and their children dental office visits. Mothers mostly (60.2%) completed the questionnaires. The average age of most (52%) of the parents was 30 to 39 years. About three-fourths (73.3%) of the parents had university-level education. Three in every four (75.2%) families had three or more children.

Table 1. Summary of main demographic and their children dental office visits		
Parents Gender	Females	124 (60.2%)
	Males	82 (39.8%)
Parents Age	20-29	39 (18.9%)
	30-39	107 (51.9%)
	40 and older	60 (29.1%)
Education level of parents	Below high school	22(10.7%)
	High school	33(16%)
	University degree	151(73.3%)
Number of children in family	1	15(7.3%)
	2	36(17.5%)
	More than 3	155(75.2%)
Time of last dental visit for child	Less than year	104 (50.5%)
	Between one and two years	44(21.4%)
	More than two years	58(28.2%)
Reason for last visit	Check-up	50(24.3 %)
	Emergency	33(16%)
	Routine Treatment	123(59.7%)
Source of parents' oral knowledge	Dentist	169(82%)
	Internet	19(9.2%)
	Media	8(3.9%)
	Friends	10(4.9%)

Table 2. Knowledge of parents for definition of fissure sealants

Which one is the definition of fissure sealants	Father n (%)	Mother n (%)	Total n (%)
Covering carious fissures of tooth crown by mercury	1(0.5%)	2(1%)	3(1.5%)
Covering deep carious fissures by tooth color material	10(4.9%)	14(6.8%)	24(11.7%)
Covering deep normal fissures of tooth crown by tooth color material as a foundation	7(3.4%)	24(11.7%)	31(15%)
Covering all of the tooth crown by metal sheets to prevent dental caries	7(3.4%)	13(6.3%)	20(9.7%)
I do not know	57(27.7%)	71(34.5%)	128(62.1%)
Total n (%)	82(39.8%)	124(60.2%)	206(100%)

Almost half the children (50.5%) had visited a dentist during the past year. The main reason for the dental visits was routine dental treatment (59.7%).Also shows various sources of parental oral heath knowledge.

Dentists were the source for most of the parents (82%), followed by the Internet (9.2%), friends (4.9%), and media (3.9%). Overall knowledge of parents about the definition of fissure sealants was poor. However, mothers had better knowledge than did the fathers (Table 2). Most (72.8%) of the parents supported the use of fluoridated toothpastes for their children (Table 3). Almost half the parents did not know about fluoridated water or fissure sealants. Nevertheless, a majority (59.7%) supported the use of topical fluoride products.

Table4 shows the parents' satisfaction levels about the four methods of caries prevention. With the exception of fluoridated water wherein most (60%) parents were "not pleased" by the other three methods, most showed "pleased" results, that is, 55.3% for fissure sealants, 68.4% for fluoridated gels, and 69.4% for fluoridated mouth rinses. The parents' own dental experience had no significant effect on their attitude towardthe use of fluoride and fissure sealants for their children (Table 5). Parents who visited their dentist recently tended to have a higher satisfaction for fissure sealants, fluoride gels, and mouth rinses. Parents who visited the dental clinic for routine examinations demonstrated a higher level of satisfaction for fluoride gels and mouth rinses than those whose reason for their last dental visit was a checkup or

emergency treatment. There was a tendency for higher satisfaction with fissure sealants among parents who visited their dental clinic for a routine examination (Pearson chi-square, P = 0.05, Table 5).

Table 3. Parents' personal attitude towards the use of fluoride for caries prevention in children

Variables	Responses			
	For n (%)	Against n (%)	Do not Know n (%)	Did not replay n (%)
The parent's Personal attitude to Topical Fluoride products	123(59.7%)	7(3.4%)	58(28.2%)	18(8.7%)
The parent's Personal attitude to Water Fluoridation	51(24.8%)	23(11.2%)	103(50%)	29(14.1%)
The parent's Personal attitude to Fluoridated toothpaste	150(72.8%)	14(6.8%)	30(14.6%)	12(5.8%)
The parent's Personal attitude to Fissure Sealant	84(40.8%)	6(2.9%)	96(46.6%)	20(9.7%)

Table 4. Parents' satisfaction level from (four) means of caries prevention.

Variables	Responses	
	Pleased n (%)	Not Pleased n (%)
The parent's satisfaction level from Water Fluoridation	82(39.8%)	124(60.2%)
The parent's satisfaction level from Fissure Sealant	114(55.3%)	92(44.7%)
The parent's satisfaction level from Fluoridated gels	141(68.4%)	65(31.6%)
The parent's satisfaction level from Fluoridated mouth rinse	143(69.4%)	63(30.6%)

The attitude toward preventive measures was related to parents' gender, age, and level of education. More mothers (61%) supported the use fissure sealants for their children than did the fathers (39%), and the difference was statistically significant (P = 0.019, Pearson chi-square). Only 41% of the parents who had university degrees and 45.5% who had less than a high school diploma supported the use of fissure sealants. Families with three or more children demonstrated higher support for topical fluoride products than small families (69.1% vs. 30.9%), but the difference was not statistically significant (P = 0.269, Pearson chi-square). Larger families were also correlated with their parents' satisfaction with fluoride gels. Most parents with three or more children were satisfied with fluoride gels than were families with a smaller number of children (72.3% vs. 27.6%), but the difference was not statistically significant (P = 0.324, Pearson chi-square). Further, most parents with large families were satisfied with mouth rinses (73.4% vs. 26.6%), but the difference was not statistically significant (P= 0.568, Pearson chi-square).

Studies about parents' comprehension of their children's oral health are scarce in Saudi Arabia. Increasing parental comprehension about their children's oral health in developed countries has led to a decrease in dental caries and improved health of their children (Khan et al., 2009). The aim of this study was to evaluate Saudi parents' comprehension of preventive dental measures. Health behaviors established in childhood have implications not only for their current oral health, but also as they grow up into adulthood (Saldunaite et al., 2014). Considering parents' central role in ensuring the well-being of young children, it is important to explore their attitude toward preventive oral health measures.

The results of the present study have provided important information in this area.Fissure sealants serve as important caries-preventive measures for children. It is recommended by the American Dental Association (ADA) and the American Academy of Pediatric Dentistry (AAPD) that dental fissure sealants be placed on a primary or permanent tooth when it is determined that the tooth is at risk for developing dental caries in these sites (Crall and Donly, 2015). The present study showed that most of the parents had limited knowledge aboutfissuresealants as a preventive measure. Results of a similar study were the same (Tahaniet al.,2017).

It has been reported that the most significant factors in sealant awareness are dentists—the main source of dental information for parents and frequency of visits for children (Mafeni and Messer ,1994). Most of the parents in this study were highly educated, and they had better knowledge about their children's oral health. Other studies have reported a significant correlation between parents' educational level and their knowledge about preventive dental measures(Jafari et al., 2010; Tahaniet al.,2017). This observation might be explained by the fact that people with a higher education have more of a chance to receive and understand information about preventive dental programs (Kazemi, 2012).

In the present study, the majority of parents (82%) received preventive dental information from dentists; those receiving the information from dentists had better preventive knowledge. This is in agreement with the results of other studies (Mafeniand Messer,1994; Jafari et al., 2010). This could be attributed to the effectiveness of face-to-face education by the dentists (Kay and Locker ,1998). Considering the proven effectiveness of media in oral health education as reported by several studies, use of thissource of information should also be encouraged was poor (Mårtensson et al., 2006; Gholami et al., 2014; Hamasha et al., 2019).

Table 5. Relationship between the parents' dental experience for their children and opinion about the four methods of caries prevention.

Variables	Parents opinion about the four methods of caries prevention.																				Satisfaction to four methods of caries prevention.											
	The parent's Personal attitude to Topical Fluoride products					The parent's Personal attitude to Water Fluoridation					The parent's Personal attitude to Fluoridated tooth paste					The parent's Personal attitude to Fissure Sealant					Parent's satisfaction level from Fluoridation Water			Parent's satisfaction level from Fissure Sealant			Parent's satisfaction level from Fluoridated gels			Parent's satisfaction level from Fluoridated mouth rinse		
	against		Don't know	Did no replay	p-value	Against		Don't know	Did no replay	p-value	Against		Don't know	Did no replay	p-value	Against		Don't know	Did no replay	p-value	Pleased	Not Pleased	p-value	Pleased	Not Pleased	p-value	Pleased	Not Pleased	p-value	Pleased	Not Pleased	p-value
Last dental visit																																
less than one year	63	2	30	9	0.274	31	11	50	12	0.717	71	8	17	8	0.611	50	3	41	10	0.400	45	59	0.429	63	41	0.151	74	30	0.700	67	37	0.275
between 1-2 year	24	3	10	7		9	6	22	7		34	3	4	3		13	2	25	4		14	30		25	19		29	15		32	12	
More than 2 years	36	2	18	2		11	6	31	10		45	3	9	1		21	1	30	6		23	35		26	32		38	20		44	14	
Reason for last visit																																
Check-up	32	1	12	5	0.584	13	3	26	8	0.510	37	2	8	3	0.430	24	1	23	2	0.460	18	32	0.800	31	19	0.050	35	15	0.805	33	17	0.160
Emergency	21	0	11	1		12	4	14	3		28	3	1	2		15	2	13	3		13	20		12	21		21	12		19	14	
Routine treatment	70	6	35	12		26	16	63	18		85	9	21	8		45	3	60	15		51	72		71	52		85	38		91	32	

*Statistical significant difference at P<0.05

About half the children visited the dentist during the past year, encouraging dentists to provide oral health education about preventive measures.A great majority of parents with three or more children were satisfied with fluoridated products, including topical fluorides and fluoridated mouth rinses. A higher number of siblings is known to be one of the risk factors for high caries experience in children (Sujlana and Pannu, 2015). The satisfaction rate among parents with large families is encouraging and symbolizes the change in their state of mind and a better understanding of the advantages of preventive measures.

Parents who are aware of their own oral health and visit their dentist on a regular basis exhibited greater satisfaction from the use of topical fluorides for their children. Parents who visit their dentists frequently are exposed to preventive information that may affect their children's oral health. Therefore, it is essential to increase dentists' awareness toward educating parents about the ways of preventing dental diseases in their children. More research is needed to determine parental comprehension of the issues related to their children's oral health.

Due to the low knowledge of parents about the four methods of caries prevention, it is necessary for professional organizations and government agencies to inform them of the benefits of sealants and fluoridated products to improve the oral health of their children.

Most parents support using resin fissure sealants as an overall acceptable procedure, with their acceptance improving with increased treatment experience. On the other hand, since the main source of preventive information comes from the dentists, it appears that increasing dentists' knowledge and asking them to offer prevention education to parents would be a sensible approach. Greater effort should be made by health care providers and government organizations to impart primary dental care knowledge to parents, as they have greater influence on their children.

CONCLUSION

The parental comprehension about fluoride and fissure sealants was low. Greater effort should be made by the professional organization and governmental agencies to inform parents of the benefits of fissure sealants and fluoridate products in prevention of dental caries in children was inadequate.

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