

Research Article

Parental Comprehension about Use of Fissure Sealants and Fluorides in Their Children and Effects on Oral Health of the Children

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Abstract

Aim: To assess the knowledge and attitudes of Saudi parents towards the use of fluoride and fissure sealants, and to determine the factors that influence their opinions.

Methods: The study was a cross-sectional study of Saudi parents. A self-administered questionnaire was collected from 206 parents of outpatient attend pediatric dentistry clinic King Saud University in Riyadh, Saudi Arabia. In addition to the demographic questions, parent was investigating the knowledge and attitude of Saudi parents towards the use of fluoride and fissure sealants. Data obtained from the questionnaire were coded and analyzed using the Statistical Package for the Social Sciences (SPSS Version 20). Descriptive and inferential statistics were used. Data were displayed as number and percentage, and the Chi-square test was used to measure association. Ethical approval was obtained from the ethical approval committee of the King Saud University.

Results: A total of 206 parents participated in this questionnaire study, of which, 124 (60.2%) were mothers and 82 (39.8%) were fathers. In the present study, most of the parents (84% of the mothers and 67% of the fathers) had an academic education. Most of the parents (68.4%) had a favorable attitude towards the use of fluoridated gels, while only 39.8% of them 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). The satisfaction from fissure sealant was split almost equally (55.3% were 'pleased' and 44.7% 'not pleased'). The most important source of information parental oral health knowledge was dentist (81.6%).

Conclusions: The present study was found attitude of parents towards fluoride and fissure sealants was low. However, Greater effort should be made by the professional organization and governmental agencies to inform parents of the benefits of sealants and fluoride products in prevention of dental caries in children.

Introduction

Child's oral health is the foundation on which preventive education and dental care must be built to increase the opportunity for lifetime freedom from preventable oral diseases [1]. Dental preventive procedures must be started in early years of life [2]. The utilization of preventive treatment modalities in European and other developed countries is more 50%, whereas there is very few published report on the utilization of preventive dental modalities in Saudi Arabia [3-6]. In Saudi Arabia, significantly high prevalence of dental caries has been reported in children, adults and older individuals [7]. Children, adults, and elderly populations show a higher prevalence and greater severity of caries rates over the past few decades in Saudi Arabia [7]. 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

carious lesion reduction [8]. Exposure to fluorides plays consider one of a major role in preventing and reducing caries experience, with strong evidence for the effectiveness of both fluoridated water and toothpastes [9]. In recent years, the importance placed on the systemic caries protection effect of fluoride has significantly waned. Re-analysis of data from water fluoridation trials supports the presence of 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 [10]. The primary caries preventive effects of fluoride result from its topical contact with enamel and through 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 [10]. Topical application of fluoride by a dentist four times a year has been reported to result in 86% reduction in the amount of dental caries [11]. The plaque retentive nature of pits and fissures make them difficult to clean, thereby causing them to be more susceptible to caries than smooth surfaces and possibly not to be protected by fluoride administration. And since fluoride exposure is mostly on smooth surfaces, and more than 50% of dental caries occur in under-20-year-old children in the dental grooves, thereby requiring the use of Fissure Sealants (FSs) as another way of prevention [12]. It is well-documented that sealants are more effective than topical fluoride in the prevention of occlusal caries [13]. Pit and fissure caries accounts for about 90% of the caries of permanent posterior teeth and 44% of caries in the primary teeth in children and adolescents [14]. And application of resin-based FSs on permanent teeth (first molar) has been reported to reduce dental caries from 86% in the 1st year to 78.6% in the second and 58.6% in the 4th year [15]. Sealant application is a preventive conservative approach involving the introduction of

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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 [16]. Despite the overall increases in sealant use, they are still considered to be underused worldwide although the efficacy and caries-preventive effect of pit and fissure sealants has been well documented in the literature. Since preventing dental caries is a huge challenge for the public, increasing parental knowledge and utilizing preventive methods, as practiced in developed countries, may lead to decreased dental caries and improved health of children [17,18]. 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 the cost of living, most of the parents are working with very less time left for performing day-to-day oral health care practices in their child's early years [19,20]. Especially in preschool children, parental role is the most important aspect of maintaining good oral health [21,22]. In view of the high caries prevalence in Saudi children, it is important to carry out such studies among the parents in Saudi Arabia. However, there has been no such published report in Saudi Arabia. The objective of the present study was to assess the knowledge and attitudes of parents towards the use of fluoride, fissure sealants and other preventive measures for their children in Saudi Arabia.

Material and Methods

This cross-sectional study was conducted among the parents of children that 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 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 minimum 200. The participation in the research was on a voluntary basis. Informed consent was obtained from each participant before the commencement of the study (appendix 1). No potential risk to the participants was anticipated due to this study. Inclusion criteria were; Saudi parents, whose children were attending the pediatric dentistry clinics and were able to answer the questionnaire. Exclusion criterion was parents not agreeing to participate in the study. The questionnaire was constructed in English before being translated into 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:

1. Demographics information (age, gender, number of years of education of both parents, number of children in the family).
2. Dental history (date of last dental visit, reason for the visit) for their children.
3. Personal use of fluoridated mouth rinses.
4. The source of information about oral health (media, internet, dentist, friends).
5. Attitude towards water fluoridation, fluoridated toothpastes, fluoridated gels and mouth rinses (i.e. fluoridated products) and fissure sealants.
6. Satisfaction level from 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 in the questionnaire where required. The pilot study responses were not considered in the main study.

Statistical Analysis

The data were analyzed using SPSS pc+ version 22.0 statistical software (IBM Inc., Chicago USA). Descriptive statistics (mean, standard deviation, frequencies and percentages) were used to describe the quantitative and categorical variables. Chi-square test was utilized to find out the significant difference between the responses. Confidence was kept at 95% and $p\text{-value} \leq 0.05$ was considered to be statistically significant.

Results

A total of 206 parents consented and then completed the study questionnaire. Table 1 summarizes the demographic information and on parents' dental office visits. Mothers mostly (60.2%) completed the questionnaires. The average age of majority (52%) of the parents was from 30 to 39 years. About three-fourth (73.3 %) of the parents had University level education. Three in every four (75.2%) families had three or more children. Almost half of the children (50.5 %) have visited a dentist during last one year. The main reason for the dental visits was routine dental treatment (59.7%). Figure 1 shows various sources of parental oral health knowledge. Dentists were the source for most of the parents (81.6 %) followed by internet (25.2 %), Media (14.6 %) and friends (12.1 %). Overall knowledge of parents was poor about definition of fissure sealants. However, mothers had better knowledge in comparison to the fathers (Table 2). A great majority (73%) of the parents supported the use of fluoridated toothpastes in their children (Figure 2) Almost half of the parents did not know about fluoridated water and fissure sealants. Nevertheless, a majority (60%) supported use of topical fluoride products. Figure 3 show the parents' satisfaction levels about the four methods of caries prevention. With the exception of fluoridated water where a majority (60%) of parents was "not pleased", for the other three methods a majority showed "pleased" results; i.e. 55% for fissure sealants, 68% for fluoridated gels and 70% for fluoridated mouth rinses. The parents' own dental experience has had no significant effect on their attitude towards the usage of fluoride and fissure sealant Table 3. Parents who visited their dental office in recent year a tendency for higher satisfaction level to fissure sealants, fluoride gels and mouth rinse. Similar to Parents that visited dental clinic for routine examinations demonstrated a higher level of satisfaction level to fluoride gels and mouth rinse than those who stated that reason for their last dental visit was a checkup or

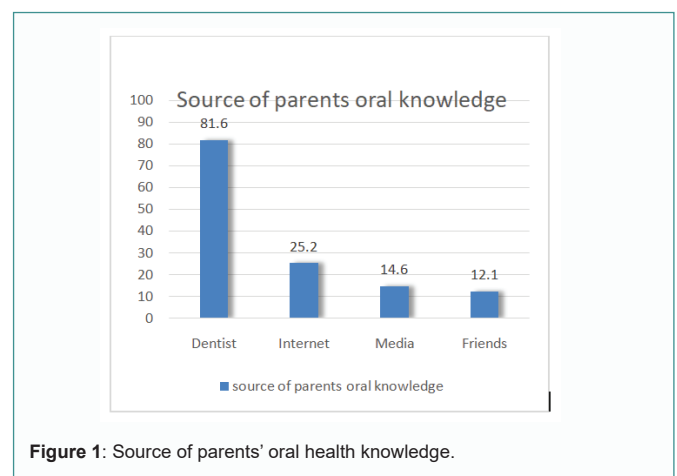


Figure 1: Source of parents' oral health knowledge.

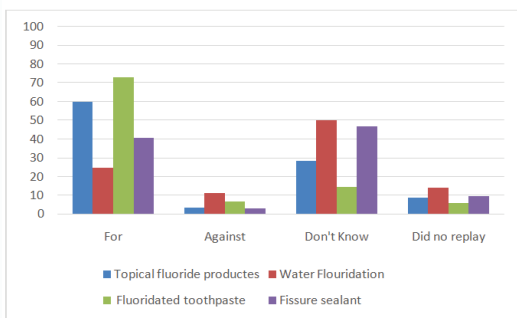


Figure 2: Parents' personal attitude towards the use of fluoride for caries prevention in children.

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%)

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%)

emergency treatment. There was a tendency for higher satisfaction level from fissure sealant among parents who visited their dental clinic for a routine examination had significant effect, (Pearson Chi-Square, $p=0.05$) Table 4. The attitude towards preventive measures was related to the parents' gender, age and to the parents' level of education. More mothers (61%) supported the use fissure sealants in their children as compared to the fathers (39%). The difference was statistically significant ($p=0.019$, Pearson Chi-Square). While only 41% of the parents who had University degree and 45.5% of the parents who had degree below high school support to use fissure sealant. Families with 3 children and more demonstrated higher support to topical fluoride product use than small families (69.1% vs. 30.9%). The difference was not statistically significant ($p=0.269$, Pearson Chi-Square). The larger family was also correlated to their parents' satisfaction from Fluoride gels. The majority of parents' with 3 and more children were satisfied

from Fluoride gels than families with less number of children (72.3% vs. 27.6%). The difference was not statistically significant ($p=0.324$, Pearson Chi-Square). Further, majority of parents' with large families compared to parents with the small families were satisfied from mouth rinse (73.4% vs. 26.6%). The difference was not statistically significant ($p=0.568$, Pearson Chi-Square).

Discussion

The studies about comprehension of parents on oral health of their children are scarce in Saudi Arabia. Increasing parental comprehension about oral health of their children in developed countries has led to decrease dental caries and improved health of in the children [23]. The aim of this study was to evaluate the comprehension of parents living in Riyadh towards preventive dental measures. Health behaviors that are established in childhood have implications not only on the children's current oral health, but also as they grow up into adulthood [24]. Considering the parents' central role in ensuring the well-being of young children, it is important to explore their attitude towards preventive oral health measures for their children. The results of the present study have provided important information on the in this area. Fissure sealants serve as important caries preventive measure in children. It is recommended by the American Dental Association (ADA) and the American Academy of Pediatric Dentistry (AAPD) that dental fissure sealants should be placed on primary or permanent teeth when it is determined that the tooth is at risk of developing dental caries in dental fissures and deep grooves [25]. The present study showed that most of the parents had low knowledge about fissure sealants as a preventive measure. The results of a similar recent study [26] were same. It has been reported that the most significant factors in sealant awareness are dentists as the main source of dental information for parents and frequency of dental visits of the children [27]. The majority of the parents in this study were highly educated, and had better knowledge about their children's oral health. Other studies have also reported a significant correlation between the parents' education level and their knowledge about preventive dental measures [28]. This observation might be explained by the fact that people with higher education have more chance to receive and understand information about preventive dental programs [29]. In the present study, the majority of parents (81.6%) received preventive dental information the dentists; and those receiving the information from the dentists had better preventive knowledge. This is in agreement with the results of other similar studies. This could be attributed to the effectiveness of face-to-face education by the dentists [30]. Considering the proven effectiveness of media in oral health education as reported by several studies, utilization of this source of information should also be encouraged [31,32]. About half of the children visited the dentist during the past one year, encouraging dentists to provide oral health education about preventive measures. A great majority the parents with 3 children or more were satisfied with fluoridated products, including topical fluorides and fluoridated mouth rinses. Higher number of siblings is known to be one of the risk factors for high caries experience in the children [33]. 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 usage of topical fluorides in their children. Parents who visit their dentists frequently are exposed to preventive information which may affect their children's oral health. Therefore, it is essential to increase dentists' awareness towards educating parents

Table 3: Relationship between the parents' dental experience for their children and opinion about the four methods of caries prevention.

Variables	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					
	For	Against	Don't know	Did no replay	p-value	For	Against	Don't know	Did no replay	p-value	For	Against	Don't know	Did no replay	p-value	For	Against	Don't know	Did no replay	p-value	
Last dental visit																					
less than one year	63	2	30	9		31	11	50	12		71	8	17	8		50	3	41	10		
between 1-2 year	24	3	10	7	0.274	9	6	22	7	0.717	34	3	4	3	0.611	13	2	25	4	0.4	
more than two years	36	2	18	2		11	6	31	10		45	3	9	1		21	1	30	6		
Reason for last visit																					
Check-up	32	1	12	5				26	8		37	2	8	3		24	1	23	2	0.46	
Emergency	21	0	11	1	0.584	13	3	14	3	0.51	28	3	1	2		15	2	13	3		
Routine treatment	70	6	35	12		12	4	63	18		85	9	21	8		45	3	60	15		

*Statistical significant difference at P

Table 4: Relationship between the parents' dental experience for their children and satisfaction to four methods of caries prevention.

Variables	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		
	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	45	59		63	41		74	30		67	37	
between 1-2 year	14	30	0.429	25	19	0.151	29	15	0.7	32	12	0.275
more than two years	23	35		26	32		38	20		44	14	
Reason for last visit												
Check-up												
Emergency	18	32		31	19		35	15		33	17	
Routine treatment	13	20	0.8	12	21	0.05	21	12	0.805	19	14	0.16
	51	72		71	52		85	38		91	32	

*Statistical significant difference at P

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 oral health.

Conclusion

Due to the low knowledge of parents about the four methods of

caries prevention, it is necessary to improve the parent's awareness to improve the oral health of children. Most parents support using resin fissure sealants placed an overall acceptable procedure in their children, with parent's acceptance improving with increased treatment experience. On the other hand, main source of information by the dentists, it appears that increasing the knowledge of dentists in this

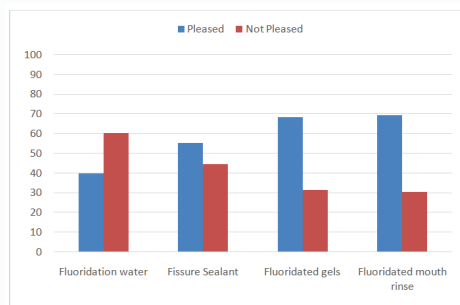


Figure 3: Parents' satisfaction level from 4 means of caries prevention.

area and asking them to offer prevention education to their parents while providing treatment to their children. Greater effort should be made by the health care providers and government organizations to impart primary dental care knowledge to parents, as they have greater influence on their children.

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