

Dental Communication

A Questionnaire-Based Study to Assess the Knowledge of Parents about Caries Preventive Measures

Manal A. Almutairi

Department of Pediatric Dentistry and Orthodontics, Dental
College, King Saud University, Riyadh, Saudi Arabia

ABSTRACT

Preventive interventions, particularly among children, have become extremely important due to increased dental caries and lesions. Because parents have such a significant role in their children's lives, their understanding and attitude toward preventative measures will significantly influence their dental health. Therefore, this study aimed to evaluate parents' knowledge on preventive methods against dental caries. In this cross-sectional study, participating parents completed a comprehensive questionnaire on their demographics, dental history, questions about fissure sealant and topical fluoride therapy. Data were analyzed by Chi-Square tests, analysis of variance and independent t-tests. A total of 206 parents participated in this questionnaire study, with 124 (60.2%) were mothers, and 82 (39.8%) were fathers. The age group of parents included are as follows: 18.9 % in 20 - 29 years age group, 51.9 % in 30 - 39 years age range, and 29.1 % in 40 and older. The current knowledge of parents on the definition of fissure sealants was inadequate, with just 15% of parents having a better description of the term. There was no significant difference between parents' knowledge and gender, education level, and occupational status. The majority of parents in this research had limited knowledge about fissure sealants and fluoride treatment. Dentists play an important role in raising parental awareness. According to the results of this study, parents' knowledge of fissure sealant therapy and fluoride therapy is lacking. Knowledge gained primarily from dentists, followed by the internet, friends, and finally, the media. On the other hand, government services should spend more significant resources on caries prevention programs to provide parents with knowledge on preventive dentistry

KEY WORDS: CHILDREN, DENTAL CARIES, FISSURE SEALANT, FLUORIDE THERAPY, PARENT'S KNOWLEDGE.

INTRODUCTION

Oral health is an essential factor of good general health and plays a significant role in the child's life span (Lawrence and Leake 2001). Dental caries is a major oral health problem affecting 2.43 billion people (35.3% of the population) worldwide in the year 2010 (Vos, et al., 2012). Dental caries is common in Saudi children; approximately 85.77% in the six-year group, 64.98% in the 12 years group, and 71.35% in the 15 years group (Al-Rafee, et al., 2019). The pits and fissures are considered to be at significant risk for dental caries as the control of the accumulation and removal of dental plaque in these deep areas are challenging (Brown, et al., 1996, Liu, et al., 2012).

The increased prevalence of occlusal caries than smooth surface caries is due to the morphology of the teeth. Lower molars are more prone to caries than anterior teeth and most affected teeth in the entire dentition (Macek, et al., 2003, Hopcraft and Morgan 2006). Since preventing dental caries is a considerable challenge for the public, increasing parental knowledge and utilizing preventive methods, as practiced in developed countries, may lead to decreased dental caries and improved children's health (Downer 1995, Daly, et al., 2013). For example, fluoride therapy and fissure sealants are standard methods to prevent the formation of dental caries (Wright, et al., 2016, Lakshmanan and Gurunathan 2020, Mc Donald et al., 2021).

Pit and fissure sealant application on permanent teeth in the first molar has decreased dental caries from 86% in the first year to 78.6 % in the second and 58.6 % in the 4th year (Wright, et al., 2016). Most scientific evidence indicates that topical fluoride therapy applied by a dentist can effectively

Article Information:*Corresponding Author: malmutairi1@ksu.edu.sa

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reduce the incidence of dental caries (Merghache, et al., 2011). Topical application of fluoride by a dentist four times a year has been reported to result in an 86 % reduction in dental caries (Mc Donald et al., 2021). However, despite extensive evidence supporting preventive procedures, the percentage of children involved in these services is less (Bhuridej, et al., 2005). One of the barriers to the utilization of preventive dental cares is the lack of public awareness (Centers for Disease Control and Prevention 2020). Several studies have shown that parents know fluoride use as a preventive armory among their children. However, not many parents can convert this knowledge into practice. Surprisingly, some parents reported having refused the fluoride application due to the risk of toxicity or weak beliefs (Chi 2017, Djordjevic 2018, Al-Rafee, et al., 2019, Lakshmanan and Gurunathan 2020, Mc Donald et al., 2021).

Compared to fluorides, the level of knowledge related to dental sealants is lower, as reported in previous studies. Less knowledge has resulted in a lower number of children receiving dental sealants. Differences between mothers and fathers have also been observed in a few studies, where mothers' attitudes were comparatively positive (Lenčová and Duskova 2013). The first step to promote the utilization of preventive cares is to increase the awareness and knowledge of parents about the importance of such cares, as parents play an essential role in developing healthy oral habits in children and have the responsibility of maintaining and improving the child's oral health (Gill, et al., 2001). Therefore, this study was conducted to evaluate the knowledge of parents about preventive measures on their children in Riyadh city, Saudi Arabia.

MATERIAL AND METHODS

Ethical clearance was obtained from the Institutional Review Board and Ethics Committee of the College of Dentistry Research Center (CDRC) and approval IRB. No. E-21-5902. This cross-sectional study was conducted among the parents of children who attended the Pediatric Dental Clinics in Dental University Hospital, Riyadh, Saudi Arabia. The sample size for the study was estimated through power 0.89 and $\alpha = 0.05$ (maximum difference, 0.9). Therefore, the sample size was determined to be a minimum of 200. Participation in the study was voluntary. Before data was collected, the purpose of the study was explained to parents, and the parents of the children obtained formal informed consent. Inclusion criteria were Saudi parents who could answer the questionnaire and whose children were patients at pediatric dentistry clinics. The exclusion criterion was parents not agreeing to participate in the study. A structured and validated questionnaire was modified from questionnaires used previously in studies done by Baradaran Nakhjavani, et al., (2013) and Blumer, et al., (2018).

The first section of the questionnaire consisted of demographic information of the parents such as age, gender, occupational status, the highest level of education and number of their children. The second part consists of dental information such as the last dental visit of their children, the reason for visit, personal use of fluoridated

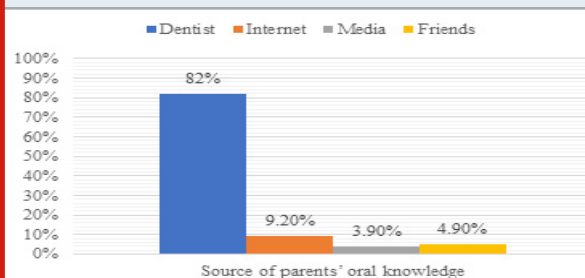
mouth rinses and source of information about oral health. Finally, the third part assessed parents' knowledge regarding fissure sealants and fluoride therapy. The questionnaire was constructed in English before being translated into the local language (Arabic) and then back to English to ensure accuracy. Before distributing the questionnaire, a pilot study was conducted on ten parents to check the validity and reliability of the questionnaire; changes were made accordingly. Later, parents were asked to give feedback on the overall questionnaire clarity regarding length and language.

The pilot study responses were not considered in the main study. The questionnaire was an assessed level of knowledge scores varied from 1 to 8. Parents who scored equal to or below four were considered to have less than average knowledge. Others, on the other hand, were found to have more than the average level of knowledge. Descriptive statistics (mean, standard deviation, frequencies, and percentages) were used to describe the quantitative and categorical variables. Chi-Square Tests, analysis, independent t-test and analysis of variance (ANOVA) were used for statistical analysis of the results. A p-value of less than 0.05 was statistically significant. All analyses were performed in SPSS software version 22.0 (IBM Inc., Chicago, Ill, USA).

Table 1. Summary of main demographics.

Variables		n (%)
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)
Occupation status of parents	Working	131(63.6)
	Not working	75(36.4)
Number of children in family	1	15(7.3)
	2	36(17.5)
	More than 3	155(75.2)

Figure 1: Representing source of parents' oral knowledge.



RESULTS AND DISCUSSION

Two hundred and six questionnaires were filled. Table 1 summarized the main data on demographics. The study sample consisted of 206 parents, of which 82(39.8%) were fathers, and 124 (60.2%) were mothers. Approximately half 52% of the parents were from 30 to 39 age groups. Nearly 73.3% of the parents had university-level education, 36.4 % of the parents were homemakers/unemployed, while

63.6% employees. Mostly 75.2% of families had three or more children. 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%, then checkups 24.3%. Only 16% sought emergency treatment at their last dental visit. Figure 1 shows various sources of parental oral health knowledge. Dentists were the primary source for most parents 82%, followed by the internet 9.2%, friends 4.9%, and media 3.9%.

Table 2. Responses of parents to different questions regarding fissure sealants and fluoride therapy.

Questions	n (%)
Which one is the definition of fissure sealants?	
a) Covering carious fissures of tooth crown by mercury	3(1.5)
b) Covering deep carious fissures by tooth color material	24(11.7)
c) Covering deep normal fissures of tooth crown by tooth color material as a foundation*	31(15)
d) Covering all of the tooth crown by metal sheets to prevent dental caries	20(9.7)
e) I do not know	128(62.1)
Which teeth are indicated for sealants?	
a) Deciduous teeth	7 (3.4)
b) Permanent teeth	47(22.8)
c) Both*	60(29.1)
d) I do not know	92(44.7)
What age can you use sealants?	
a) 4-6 years old	35(17)
b) 6-9 years old*	27(13.1)
c) 10 years old and more	29(14.1)
d) I do not know	115(55.8)
How long do pit and fissure sealants last?	
a) 2 years	19(9.2)
b) 5 years*	15(7.3)
c) 10 years and more	12(5.8)
d) I do not know	160(77.7)
What age can you use fluoride therapy?	
a) From tooth emergence up to 6 years of age	42(20.4)
b) 6-12 years old	47(22.8)
c) After 12 years of age	6(2.9)
d) All ages*	62(30.1)
e) I do not know	49(23.8)
How often should you visit a dentist for fluoride therapy?	
a) Every 4-6 months*	105(51)
b) Every 12 months	35(17)
c) Every 2 years	7(3.4)
d) I do not know	59(28.6)

The result regarding the frequency of responses to questions related to preventive dental procedures in children, for example, fissure sealants and topical fluoride therapy among parents, were summarized in Table 2. Overall knowledge of parents about the definition of fissure sealants was poor. However, only 15 % of parents marked correct answers in define fissure sealants, 62.1 % of parents selected "I do not know" choice, and others gave wrong answers. On the other hand, almost on third, 29.1% of the parents responded

correctly to questions on the application of fissure sealant in both permanent and deciduous teeth. Nevertheless, 55.8% of parents responded "I do not know" to questions on what age can use sealants, and 77.7% of parents responded "I do not know" to questions on how long do pit and fissure sealants last in the tooth. Moreover, 13.3% of mothers expected fissure sealants to last for five years, 5.8% thought they remain for ten years or more. About 30.1% of the parents knew the age of fluoride therapy to prevent decay

(all ages to prevent caries). However, 23.8% selected “I do not know”. On the other hand, half 51% of the parents had appropriate information about the frequency of fluoride therapy (periods of 4-6 months), but 28.6% of the parents had no idea (Table 2).

There was no significant difference between parents' gender and their knowledge about fissure sealant and fluoride therapy. However, almost all fathers and mothers their knowledge less than average. Furthermore, there was no

significant difference in correlation between parents' level of education and their knowledge about fissure sealant and fluoride therapy. While parent with a higher level of education was more knowledgeable, less educated parents' knowledge was less than average but then inadequate. Also, there was no significant difference between parents' occupational status and their information about fissure sealant and fluoride therapy ($p > 0.05$ statistically non-significant, Table 3).

Table 3. Relationships between the parents' knowledge about fissure sealants and fluoride therapy and gender, their level of education and occupational status.

knowledge	Parents Gender		Education level of parents		Occupation status of parents		
	Females	Males	Below high school	High school	University	Working	Not working
Less than average	58.7	38.8	10.7	15.5	71.4	61.7	35.9
More than average	1.5	1	0	0.5	1.9	1.9	0.5
p-value	0.993	0.924	0.229				

* $p < 0.05$ statistically significant; $p > 0.05$ statistically non-significant NS

Oral health is a critical component of general health and is considered a determinant of the good quality of a child's life (Petersen 2009). Parental knowledge and practices play an essential role in preventing oral diseases and improving dental health in children. In addition, oral health maintenance is initially a parental responsibility, which later involves both parents and children (American Academy of Pediatric Dentistry 2020). Because parents' knowledge is vital in maintaining proper health care for their children at a young age, it's essential to examine their knowledge for preventative measures to avoid dental caries in their children. Therefore, this study aimed to evaluate parental knowledge about preventive measures such as fissure sealants and fluoride therapy. A total of 206 parents participated in this questionnaire study, of which 82 (39.8%) were fathers, and 124 (60.2%) were mothers. In the present study, most parents (82 %) had received information for preventive dental treatments through dentists, which could be attributed to the effectiveness of face-to-face education of dentists and most reliable sources of information, which is similar to the results of other studies (Baradaran Nakhjavani, et al., 2013, Tahani, et al., 2017, Lakshmanan and Gurunathan 2020, Mc Donald et al., 2021).

Given the high percentage of the parent, 50.5% visiting their children visiting the dentist during the last year, encouraging dentists to provide oral health education about preventive treatments is essential. Moreover, according to the proven effectiveness of media in oral health education in other studies, the potential use of this source of information should be considered (Martensson, et al., 2006, Gholami, et al., 2014). In this study, the majority 50.5% of parents reported that the primary reason for their children's visits to the dental clinic in the past year was for routine dental treatment. In a different study conducted in Riyadh, fewer than a third of the participants (28%) went to the dentist

for their children even if they were not in pain (Almulhim and Alamro 2016). Increasing parents' awareness of preventative programs may result in the early detection and prevention of dental problems (Kay and Locker 1996). In general, the results showed that most of the parents had a level of knowledge less than average toward fissure sealant and fluoride therapy which was in agreement with the previous studies performed in Saudi Arabia and other countries (Al-Shalan, et al., 2002, Baradaran Nakhjavani, et al., 2013, Almulhim and Alamro 2016, Tahani, et al., 2017, Lakshmanan and Gurunathan 2020, Mc Donald et al., 2021).

In the present study, only 15% of parents knew that fissure sealant was covering deep normal fissures of tooth crown by tooth color material, whereas it was found to be 34% in the study of Baradaran Nakhjavani et al., (2013). This difference may be explained by the fact that information is taken more seriously by school and local media in Tehran. One of the critical preventive measures to be taken against dental caries in children is fissure sealants. As a recommendation by The American Academy of Pediatric Dentistry (AAPD) and the American Dental Association (ADA), it should cover primary and permanent teeth with dental sealants if the patient or the tooth is categorized as high risk for suffering from dental caries in the future. However, it was concluded that fissure sealant was known to only 29.1 % of the parents reported application could be for both dentition and only a smaller percent of 13.1 % of the parents knowing that sealants are used in age between 6-9 years, which indicated the low information of parents toward preventive dental treatment and could partly be explained by lack of parents' awareness, as shown in other studies and in this study (Baradaran Nakhjavani, et al., 2013, Tahani, et al., 2017, Djordjevic 2018, Lakshmanan and Gurunathan 2020, Mc Donald et al., 2021).

Similar to a previous study, the highest parental knowledge mean score was reported in questions associated with fluoride application. In this study, only 30.1 % of parents answered the age correctly, using fluoride therapy. However, 51% of parents were aware that the dental visit should be made within 4-6 months for fluoride therapy (Baradaran Nakhjavani, et al., 2013). This suggests the importance of increasing parental awareness regarding fluoride application. Details on the levels of knowledge score and the associations with the gender, their level of education and occupational status of parents were determined. Knowledge level of parents about preventive dentistry had no significant correlation with gender, education, and occupational status. For instance, a study in Saudi Arabia reported that while knowledge was not affected by age, gender, and parents' education, it was significantly related to socioeconomic status (AL-Shalan 2003). However, other studies have reported opposite finding (Baradaran Nakhjavani, et al., 2013, Blumer, et al., 2018, Lakshmanan and Gurunathan 2020, Mc Donald et al., 2021). Accordingly, Baradaran Nakhjavani et al., said that knowledge of response about preventive measures had statistically significant difference with university degree or occupation (Baradaran Nakhjavani, et al., 2013). Sampling location and the applied tool to assess knowledge could have caused this difference

CONCLUSION

According to the results of this study, parents' knowledge of fissure sealant therapy and fluoride therapy is lacking. Knowledge gained primarily from dentists, followed by the internet, friends, and finally, the media. On the other hand, government services should spend more significant resources on caries prevention programs to provide parents with knowledge on preventive dentistry. The level of knowledge of parents visiting the Pediatric Dental Clinic at the Dental University Hospital was investigated in this study. It might be used as a guide for future government services and caries prevention programs, informing parents about the benefits of sealants and fluoridated products in preventing dental caries in children.

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