Parents' Attitude towards the Use of Fluorides and Fissure Sealants and its Effect on their Children's Oral Health

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Objectives: *To characterize the attitudes of Israeli parents towards caries preventive measures.* ***Study design:*** *participating parents completed a 21-item questionnaire on their demographics, dental history, attitudes and satisfaction from fluorides and fissure sealants.* ***Results:*** *One hundred parents (average age 41.62±4.9 years, 85 females) participated. Most of the parents (88% of the mothers and 84% of the fathers) had an academic education. Most of the parents (54%) had a favorable attitude towards the use of fluoridated gels, while only 37% of them had a positive opinion regarding fluoridated water. The satisfaction levels were very high regarding fissure sealants, fluoridated mouth rinses and fluoridated gels (78.1%, 73.6% and 72.5% respectively). The satisfaction from fluoridated water was split almost equally (50.8% were 'pleased' and 49.2% 'not pleased'). The main source for parental oral health knowledge was the dentist (83%). Parents' attitude towards caries preventive measures was significantly correlated to their gender, dental experience, level of education and the number of children in the family.* ***Conclusions:*** *positive attitude towards caries preventive measures was found among parents with higher awareness for preventive oral health measures and among bigger families. Mothers were more positive about fissure sealants than fathers. Mothers with up to 12 years of education tended to have a positive opinion regarding water fluoridation.*

Key words: *Fluorides, sealants, parents attitudes*

INTRODUCTION

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[1]. In recent years, the emphasis 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[2]. 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[2].

The efficacy of communal water fluoridation in reducing dental caries is greatest for the primary dentition, with a range of 30-60 percent less caries in fluoridated communities. In the mixed dentition (ages 8 to 12 years), the efficacy is more variable, about 20-40 percent less caries. In adolescents (ages 14-17 years), it is about 15-35 percent less caries3.

Dental sealants have been developed to help prevent dental caries in the pit and fissures of tooth surfaces. Sealants act to prevent the growth of bacteria that can lead to dental decay [4]. There is evidence to suggest that fissure sealants are effective in preventing

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caries in children and adolescents when compared to children and adolescents who are sealant free. Their effectiveness may be related to the caries prevalence in the population[4].

Water fluoridation has been implemented in Israel for decades. As a result of a discussion that took place in the Israeli Ministry of Health, water fluoridation has ceased in 2014 [5]. The continuing debate about the pros and cones on water fluoridation has resulted in reversing the decision, and in 2015 The Israeli Ministry of Health reverted to the prior regulations, and water fluoridation was reintroduced.

Fisher-Owens *et al* [6], recognized multilevel influences on children's oral health at the individual, family and community levels. These family level influences are mediated mainly through parents and caregivers, with whom preschool children spend most of their time. During this period of primary socialization, routine dietary and health behaviors are being established and are directly and indirectly influenced by the oral health knowledge, attitudes, beliefs and practices of their parents and caregivers[7]. Nevertheless, researchers have demonstrated that parents' knowledge of preventing caries, is limited to tooth-brushing and dietary habits, whereas the use of fluoride does not seem important to them[8]. It was also found that parents' knowledge about the essential role of fluoride was poor[9].

The aim of this paper is to assess the knowledge and attitudes of Israeli parents towards the use of fluoride and fissure sealants, and to determine the factors that influence their opinions.

MATERIALS AND METHOD

The population sample was comprised of parents of children that attended the pediatric dentistry clinic in Tel Aviv University or the private clinics of 2 specialists in pediatric dentistry. The participation in the research was done on a voluntary basis. The study was approved by the ethical committee of Tel Aviv University. All respondents gave their informed consent to participate in the study.

The parents were asked to complete a 21-item questionnaire designed for this study to elicit information on the following:

a. Demographics and education (age, gender, number of years of education of both parents, number of children in the family).

b. Dental history (date of last dental visit, reason for this visit).

c. Personal use of fluoridated mouth rinses.

d. The source of information about oral health (media, internet, the dentist, friends).

e. Attitude towards water fluoridation, fluoridated toothpastes, fluoridated gels and mouth rinses (i.e. fluoridated products) and fissure sealants.

f. Satisfaction level from fluoridated water, fluoridated gels and mouth rinses and fissure sealants.

Statistical evaluation

Data analyses were performed using an SPSS (statistical package for the social sciences) 15.0 software (SPSS Inc., Chicago. IL., USA)

Bivariate analysis was completed using Chi square test and Fisher's exact test.

RESULTS

One hundred questionnaires were filled. Table 1 summarizes the main data on demographics and on parents' dental office visits. Eighty five percent of the respondents were mothers and 15% were fathers. The average age of the parents was 41.62±4.9 years. Most of the parents have had more than 12 years of education (84% of the fathers and 88% of the mothers).

Table 1. Summary of main demographic and parents' dental office visits

Responder's Gender	Females		85 (85%)
	Males		15 (15%)
Responder's Age (years±SD)	Total		41.62±4.9
	Mothers		42±4.8
	Fathers		39.2±5.2
Parent's education	Fathers	<12 years	16 (16%)
		>12 years	84 (84%)
	Mothers	<12 years	12 (12%)
		>12 years	88 (88%)
Number of children in family	1		17 (17%)
	2		34 (34%)
	3		39 (39%)
	4		9 (9%)
	5		1 (1%)
Time of responder's last dental visit (years)	<1		86 (86%)
	1-2		13 (13%)
	>2		1 (1%)
Reason for last visit	Check-up		56 (56%)
	Emergency		4 (4%)
	Routine treatment		40 (40%)

The majority of the families have had 2 or 3 children (73%), 17% of the families had a single child. Most of the parents (86%) received dental treatment in the past year. The main reason for the dental visit for most of them was a routine examination (56%) or a routine treatment (40%). Only 4% sought emergency treatment at their last dental visit.

As for the parents' own usage of fluoridated mouth rinses, 48% of the parents replied that they use fluoridated mouth rinses on a regular basis, while 52% do not use mouth rinses at all.

Figure 1 illustrates the source of parental oral health knowledge. Most of the parents, 83%, stated that their private dentist serves as the source for their parental oral health knowledge, 26% gather information on the internet, 12% from other media sources like television and newspapers and 11% rely on information from their friend.

Figure 2 illustrates the parents' personal attitude towards the use of fluoride for caries prevention in child dentistry.

Fifty four percent of the parents supported the use of topical fluoride products like mouth rinses and gels, only 6% were against it, 37% did not express any opinion in the matter and 3% were not familiar with these products.

With regard to fluoridated water, 37% of the parents were in favor of the matter, 19% were opposed, 7% were not familiar with the subject and 37% did not form any opinion in the matter.

Seventy six percent of the parents supported the use of fluoridated toothpastes for their children, 21% mentioned that they were unfamiliar with the subject, 2% were against and 1% expressed no opinion.

Sixty eight percent of the parents supported the use of fissure sealants, 28% did not hear about the procedure before, and only 4% were against it.

Figure 3 illustrates the parents' satisfaction levels from 4 means of caries prevention. The satisfaction level from fluoridated water was divided: 50.8% were 'pleased' and 48.2% were 'not pleased', 35 parents did not respond. Seventy parents graded their satisfaction from fluoridated gels. The majority of the parents, 72.5%, were 'pleased', while 27.5% were 'not pleased'. Similar outcome was obtained from the parents' satisfaction from fluoridated mouth rinses. Fifty three parents (73.6%) were 'pleased' and 19 parents (26.4%) were 'not pleased', 28 parents did not respond. Most of the parents, 78.1%, were 'pleased' from fissure sealants while 21.9%were 'not pleased', 27 parents did not reply.

The parents' own dental experience has had significant effect on their attitude towards the usage of fluoride: Parents who visited their dentist in the past year, were more prone to fluoride usage than parents who did not visit their dentist in the past year (57.6% vs. 23.1%), (Fisher's Exact Test p=0.034). Parents that visited dental clinic for routine examinations demonstrated a higher level of satisfaction regarding the use of fluoridated gel (82.9%), than those who stated that the reason for their last dental visit was a regular or an emergency treatment (57.1%), (p=0.028, Fisher's Exact Test). There was a tendency for higher satisfaction level from fluoridated water among parents who visited their dentist for a routine examination, but that was not statistically significant.

The attitude towards fissure sealants was related to the parent's gender and to the mother's level of education:

Only 40% of the fathers supported the use of fissure sealants for their children, whereas 72.9% of the mothers supported these preventive measures. This difference was statistically significant (p=0.017, Fisher's exact test). Significantly more mothers were satisfied from fissure sealants than fathers (82.3% vs. 54.5%), (p=0.055, Fisher's exact test). All of the mothers who had less than 12 years of education supported fissure sealants for their children, while only 62.3% of the mothers with higher education supported this procedure (p=0.016, Fisher's exact test).

The maternal educational level was significantly related to their attitude towards water fluoridation. Significantly more mothers with high school education supported water fluoridation, than mothers with an academic education (62.5% vs. 32.1%), (p=0.027, Pearson Chi-square).

Figure 1: Source of parents' oral health knowledge

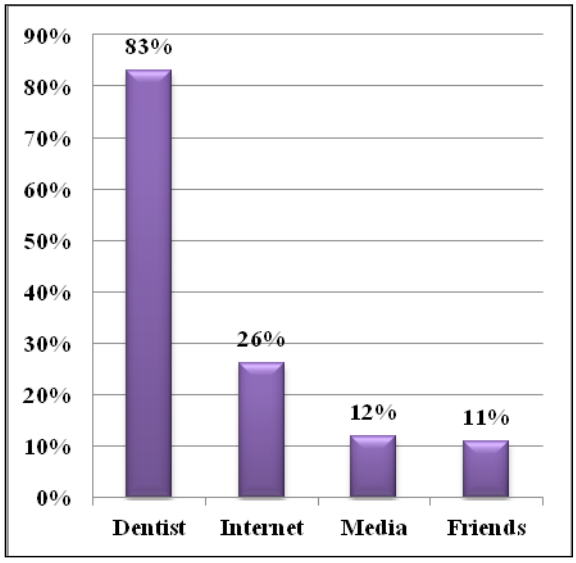


Figure 2: parents' personal attitude towards the use of fluoride for caries prevention in child dentistry

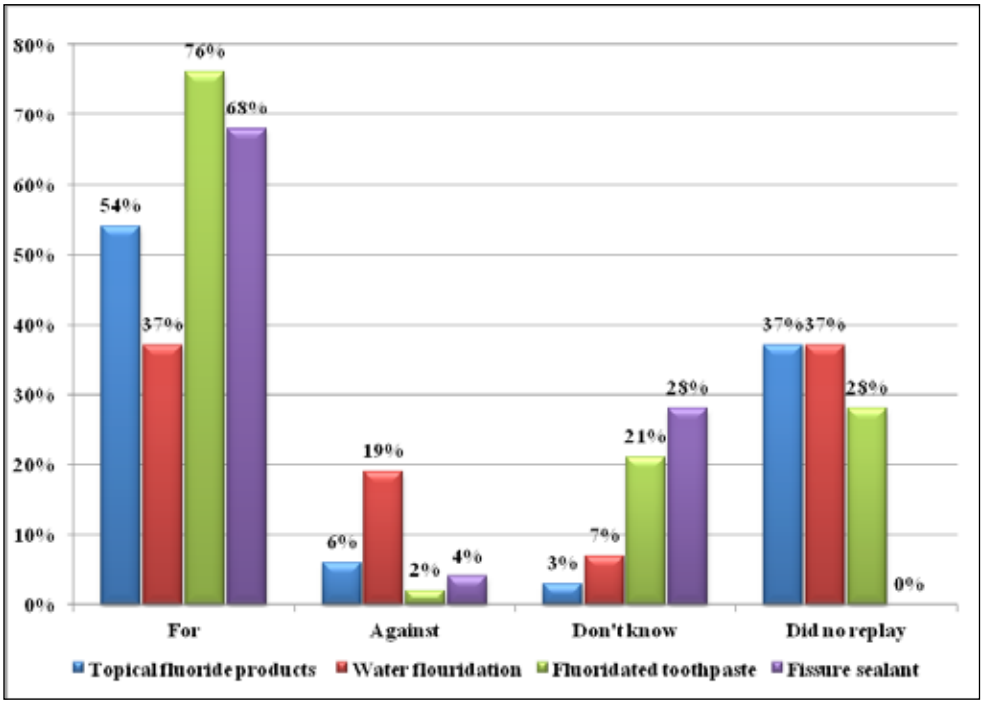
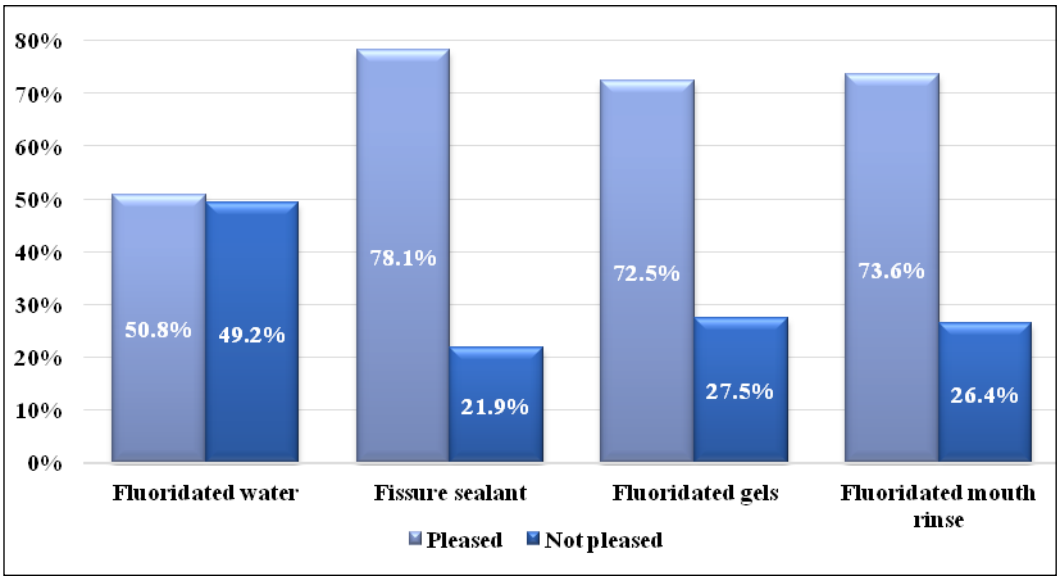


Figure 3: Parents' satisfaction levels from 4 means of caries prevention



No correlation was found between the parents' age to their attitude towards fissure sealants, fluoridated gels, fluoridated toothpastes and fluoridated water.

Families with 3 children or more, demonstrated higher satisfaction from fluoride gels than families with 1-2 children (85.7% vs. 58.8%), (p=0.016, Fisher's exact test).

The number of children in the family was also correlated to their parents' satisfaction from mouth rinses. The majority of parents with 3 children or more (86.5%) were satisfied from fluoridated mouth rinses, whereas only 60% of the small families (composed of 1-2 children) were satisfied (p=0.016, Fisher's exact test).

The satisfaction from mouth rinses was significantly higher among parents that use fluoridated mouth rinses themselves, 82.9% vs. 57.1% of the parents that do not use them (p=0.033, Fisher's exact test). Parents that use fluoridated mouth rinses themselves were significantly more in favor of using fluoride products for their children, than those who do not use fluoridated mouth rinses (72.9% vs. 36.5%), (p=0.000,Fisher's exact test). As for the use of fluoridated toothpastes for children, the results were similar, with a greater preference of the matter among parents that use fluoridated mouth rinses themselves (87.5% vs. 65.4%), (p=0.011, Fisher's exact test). No statistical significance was found regarding the parents' own usage of fluoridated mouth rinses and their opinion on water fluoridation, although there was a tendency among the mouth rinses users to support water fluoridation (48.8% vs. 38.8%).

DISCUSSION

This study provides important data on the perceived attitudes of parents regarding preventive measures of childhood caries. It presents the results of a parental questionnaire designed to assess the attitudes of parents living in Israel towards that issue. Health behaviors that are established in childhood have an extensive implication not only on the child's current oral health, but also on his oral health as he grows up into an adult[10]. Considering the parents' central role in ensuring the well-being of young children, it is important to explore their attitude towards preventive caries measures for their children.

Water fluoridation led to a dramatic decline in the incidence of dental caries in the fluoridated areas. The primary mode of action of fluoride in reducing dental caries is post-eruptive (topical), in that it promotes remineralization and inhibits demineralization of dental enamel during the caries process. Other effects of fluoride include the inhibition of glycolysis and a reduction in the production of extra cellular polysaccharides. Fluoride may also have an effect on the cariogenic potential of *Streptococcus mutans* and is bactericidal in high concentrations[11].

Community water fluoridation is currently experiencing social resistance in many countries, including Israel[12]. Water fluoridation has strong advocates and even more opponents. It seems that there is a major focus of groups across Europe against water fluoridation, although the objection is reduced in countries where people have experienced fluoridation without adverse effects [13]. Studies in the USA and South Africa have shown that many people did not know water fluoridation was intended to prevent tooth decay. Anti-fluoridation websites propose various claims about diseases caused from fluoride exposure, concern regarding civil rights violation, and alteration in the taste of water[13].

Fissure sealants serve as a dominant caries preventive measure for children. It is recommended by the American dental association (ADA) and the American academy of pediatric dentistry (AAPD). According to their recommendations, dental sealants should be placed on primary or permanent teeth, when it is determined that the tooth or the patient is at risk of experiencing caries[14].

It was shown that only 57% of the parents are aware to fissure sealants, with only 46 percent of parents, knowing that sealants can prevent caries[15].

The majority of the responders in this study were highly educated mothers. The level of education of the mother plays a major role in their child's oral health and their caries risk assessment. Higher dmft scores were recorded for children whose mothers had finished primary and secondary school[16].

In this study, the less educated mothers had a favorable attitude towards water fluoridation and fissure sealants. This result can be

related to a tendency of the less educated mothers to rely on public fluoridation and to participate less in the public debate of the matter. This includes their acceptance of dentist's recommendations regarding pit and fissure sealants.

Another indicator of parent's satisfaction from caries preventive products was the number of children in the family. Eighty five percent of the parents with 3 children or more were satisfied with fluoridated gels, and 86% of the parents of this group were satisfied with fluoridated mouth rinses. Higher number of siblings is known to be one of the risk factors for dmft>0[17].

The satisfaction rate from topical fluoride products that was evident in this study among parents with large families is encouraging and may symbolize the change in their state of mind and a better understanding of the advantages in preventive measures.

Parents who are aware of their own oral health preventive measures and visit their dentist on a regular basis exhibited grater satisfaction from usage of topical fluorides for their children. It was shown that the most significant factors in sealant awareness are dentists as the main source of dental information and frequency of dental visits by the child[15].

Parents who attend their dentists frequently are exposed to preventive information which may affect their children's oral health. Therefore it is essential to increase dentist's awareness towards educating parents about the ways of preventing caries.

More research is needed to determine parents' knowledge and attitudes towards other issues regarding their children oral health and dental habits.

CONCLUSIONS

1. Mothers with up to 12 years of education tended to have a positive opinion regarding water fluoridation.
2. Families with 3 children or more were more satisfied with preventive measures like fluoridated gel and mouth rinses than families with 1-2 children.
3. Parents with higher awareness for preventive oral health measures were more satisfied with preventive measures for their children.
4. Mothers were more positive about fissure sealants application for their children than fathers.

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