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Knowledge, attitude, and practice of parents of 7–12-year-old children regarding fissure sealant therapy and professional fluoride therapy

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Abstract:

BACKGROUND: To increase the utilization of preventive dental care, it is essential to improve the knowledge and attitude of parents about such cares. The aim of this study was to evaluate the knowledge, attitude, and practice of school children's parents toward fissure sealant (FS) and professional fluoride therapy in Isfahan.

MATERIALS AND METHODS: In this cross-sectional study, school children's parents ($n = 637$) were selected based on proportional cluster sampling. A valid and reliable questionnaire was designed, including demographic section, questions about parents' experience and their knowledge and attitude about professional fluoride and FS therapy. Data were analyzed by ANOVA, regression, Chi-square, and correlation coefficient tests.

RESULTS: The means of total knowledge and knowledge about fluoride therapy and FS were 5.9 ± 4.1 out of 19, 3.3 ± 2.0 out of 9 and 2.6 ± 2.7 out of 10, respectively. The mean of attitude was 33.7 ± 5.8. The mean of knowledge toward FS therapy was significantly higher in academically educated parents ($P = 0.023$). The mean of total knowledge among those who received their knowledge by their dentist was also significantly higher than that of other resources such as mass media ($P = 0.003$). Total knowledge was positively correlated with attitude ($P < 0.001$, coefficient = 0.5). Of participants, 10.4% (54) and 23.2% (124) had the experience of FS and fluoride therapy, respectively.

CONCLUSION: Based on the low level of knowledge regarding professional preventive care in this study and the effectiveness of knowledge acquired through dentists and mass media consultations, it might be effective to require them to consider such training more seriously.

Keywords:

Attitude, knowledge, parents, pit and fissure sealant, practice, topical fluoride therapy

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Introduction

Dental caries is the most common disease among children[1] and is an infectious disease that can be prevented in its early stages.[2] Early childhood caries leads to pain, lack of growth, loss of confidence, and mental health problems.[3] Dental caries is common in Iranian children; approximately 75% of 6–9-year-old children have dental caries according to the report of Ministry of Health. This statistic shows an urgent need for major interventions to reduce the burden of dental caries through prevention.[4]

Most scientific evidence indicates that topical fluoride therapy applied by a dentist can effectively reduce the incidence of dental caries.[5] The widespread use of fluoride has been the main factor in reducing the prevalence and severity of dental caries in the United States and other developed countries.[6] Topical application of fluoride by a dentist four times a year has been

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reported to result in 86% reduction in the amount of dental caries.[7]

Since fluoride exposure is mostly on smooth surfaces,[8] 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. It is well-documented that sealants are more effective than topical fluoride in the prevention of occlusal caries.[9] 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.[10]

Despite the effectiveness of preventive interventions, the number of children receiving these services is still low.[11] One of the barriers to the utilization of preventive dental cares is lack of public awareness.[12] In a study conducted in Iran, 57.6% of parents had knowledge about the role of sealants in the prevention of dental caries.[6] Another study conducted in Tehran in 2012 found that the percentage of mothers' knowledge about the FS was much lower than fluoride therapy, and only 4.5% of the mothers' knowledge was acceptable.[13]

The first step to promote the utilization of preventive cares is to increase the awareness and attitudes of parents about the importance of such cares, as parents play an important role in developing healthy oral habits in children and have the responsibility of maintaining and improving the child's oral health.[14] The limitations of few studies available in Iran are lack of comprehensiveness in designing the questionnaire and failure to comply with available clinical guidelines on prevention methods. Therefore, this study was conducted to evaluate the knowledge, attitudes and practice of parents about FS and professional fluoride therapy.

Materials and Methods

This cross-sectional study was approved by the ethics committee of Isfahan University of Medical Sciences and was carried out in Isfahan, Iran in 2015. The parents of the first-to-sixth-grade students studying in Isfahan were included. The exclusion criterion was questionnaires that parents, for whatever reason, had not completed. Based on the sample size formula, including the maximum ratio for parents with lack of awareness (50%) and 5% accuracy (d), the sample size was calculated to 384 participants. Considering the design effect equal to 1.5 of cluster studies and loss to follow ups, 637 samples were expected. Sampling was performed by proportional cluster sampling method; according to five educational section, and population of first-to-sixth-grade students in each section based on the statistics of education released by the province municipal unit in 2014, the sample size was calculated for these five sections. The schools in each section along with their classes were chosen randomly.

Questionnaire design

To evaluate the knowledge, attitudes, and practices of parents, a questionnaire was designed included demographic questions, experience of receiving preventive dental care, parents' awareness toward fluoride and FS therapy, and parents' attitudes toward these cares.

Knowledge questions were prepared based on other studies[9,15] and clinical guidelines published by American Dental Association, European Academy of Pediatric Dentistry (APD), and American APD in the field of fluoride and FS therapy.[16-21] To ensure the face and content validity, four dental public health and two dental pediatric experts were asked to evaluate the questions according to their relevancy to the goals (questions with high relevance = 1, moderate = 2, and low or uncertain = 3). The questions scored 2 or 3 were deleted or were modified accordingly. Furthermore, experts' opinion about the face validity of the questionnaire was evaluated. Knowledge questions were all multiple choice and in the form of "yes," "no," and "do not know." Score of 1 and 0 was considered for the correct and wrong answers, respectively.

To obtain the opinion of parents about preventive cares and effectiveness of these cares, some statements were designed based on the open interviews with a group of ten parents admitted to the pediatric department in Isfahan dental school. Statements were mostly focused on the effectiveness of FS and fluoride therapy, the reasons for receiving and/or not undergoing these therapies and the perceived barriers. To confirm the validity, statements were evaluated by the same experts. Attitude questions were designed based on 3-point Likert scale (1 = agree, 2 = have no idea, and 3 = disagree).

The reliability of the knowledge questions was assured by a pilot study on 50 parents, and Guttman coefficient (split half) was calculated to be 0.82.

In the pilot study (on 50 parents), Guttman split-half coefficient and alpha-Cronbach's coefficient were 0.82 and 0.78, respectively, for the reliability of questions included in knowledge and attitude sections, respectively.

The practice section questions were about experiences of parents on these two preventive treatments. The validity of questions was assessed the same as the prior sections. Ultimately, the validated questionnaire consisted of 5 questions on demographic characteristics, 19 questions on knowledge, 15 questions on attitude, and 10 questions

on the practice (history of receiving fissure and fluoride therapy, costs, and place of care provision).

In coordination with the Department of Education of the province, schools and classes were randomly selected and questionnaires were distributed among students in schools, and they were asked to return the completed questionnaires within 2 days. Informed consents were obtained from parents. In addition, the information provided by them remained confidential.

Statistical analysis

Both descriptive and analytical statistical measurements were used to describe the main variables by SPSS 18 (IBM Corporation, Armonk, New York, USA) software. Chi-square, ANOVA, and Pearson's correlation coefficient were used to compare the qualitative and quantitative variables. The statistical significance of the coefficients in the statistical analyses was tested at 0.05 ($\alpha = 0.05$) level. Considering the sampling method, cluster analysis was used to control the confounding effects on the results; according to the population of each region, weights were calculated and used in the analysis (0.09 for region 1, 0.014 for region 2, 0.23 for region 3, and 0.27 for regions 4 and 5).

Results

In this study, 567 questionnaires were returned (89% response rate). Of students, 307 were boy (54%) and 260 were girl (46%). In terms of parent's education, they mostly had diploma (50.6%), and some had academic education (37%). Furthermore, 67% of children had dental visit during the recent year. The main reason for dental visits was filling then checkups.

Practice

Regarding FS therapy, it was reported that 10.4% of the children ($N = 54$) received FS s, which were applied mostly in private offices (31.6%) and clinics (28/9). The average cost of treatment was 1270 ± 1430 thousand Rials (equal to 40US $). Further, 124 children (23.2%) were reported to have had a history of receiving gel or varnish fluoride. Moreover, 47.2% of parents ($n = 257$) mentioned the mass media and 35% ($n = 191$) the dentist as the main sources of receiving oral and dental health information.

Knowledge

the total mean of knowledge was 5.8 out of 18 (confidence interval [CI] 95% = 4.5–6.2). The mean scores for knowledge of fluoride and FS therapy were 3.3 out of 9 (CI 95% = 3.1–3.5) and 2.6 out of 10 (CI 95% = 2.2–2.8), respectively. Considering the cutoff points 0–2 (weak), 3–5 (moderate), and 6–9 (good), the results of fluoride knowledge are categorized and shown in Figure 1.

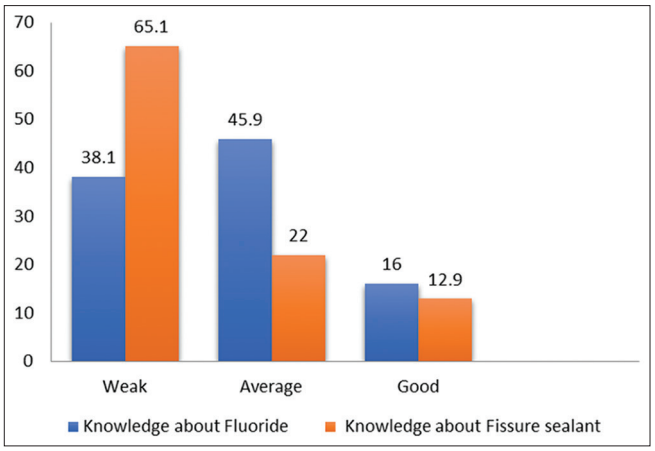

Figure 1: Percentage of parents' level of knowledge regarding fluoride and fissure sealant therapy

Accordingly, 16% had good awareness and 38% had weak level of knowledge. Considering the cutoff points of 0-3 (weak), 4–6 (moderate), and 7–10 (good), the results of knowledge about FS therapy are categorized and shown in Figure 1, in which 12% had good awareness and 65.5% had weak awareness.

Based on the frequency of responses to each of the questions [Figure 2], it was found that knowledge about the role of fluoride therapy as a reinforcement material for teeth (78.1%) and as a material to reduce cariogenic bacteria (67%) was good, but it was low for other questions (for example, awareness about the allowed time to eat after gel therapy or the right age for fluoride therapy). As for the knowledge of parents about FS, the results showed they had a relatively good knowledge about potential effects of FSs in preventing caries. Regarding other questions (mostly FS technique), awareness was low. One important result of the analysis of responses was that parents had chosen "I do not know" option from among most of the questions, which reflects lack of familiarity with the proposed options.

Attitude

Parental attitudes about fluoride therapy and FS are shown in Figures 3 and 4. Accordingly, about 40% were opposed to this statement that FSs damages the teeth of children. Furthermore, 21% agreed that the cost of this treatment was high compared to its benefits. Further, 70% believed children should brush their teeth even with application of FSs, but about 10% thought sealed teeth would never be decayed.

The mean score of knowledge about FS and fluoride therapy based on the gender of parents and their experience are shown in Table 1. There was no significant difference between parents based on their gender; however, those with a history of preventive

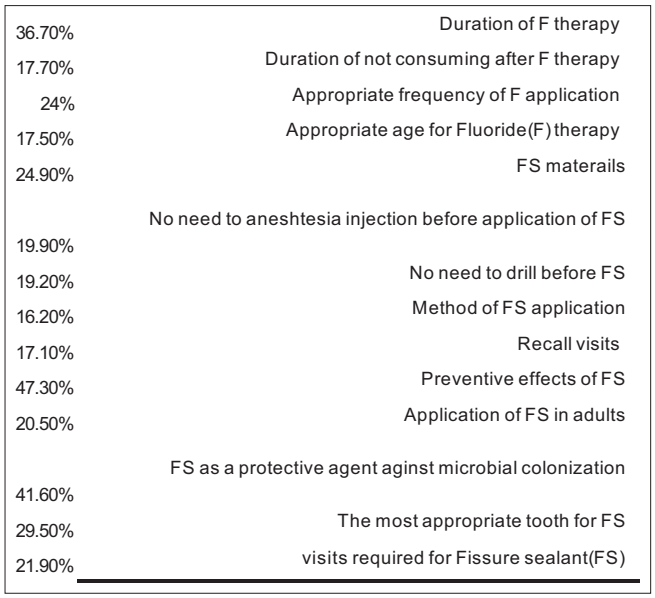

Figure 2: Percentage of parents who answered the questions correctly

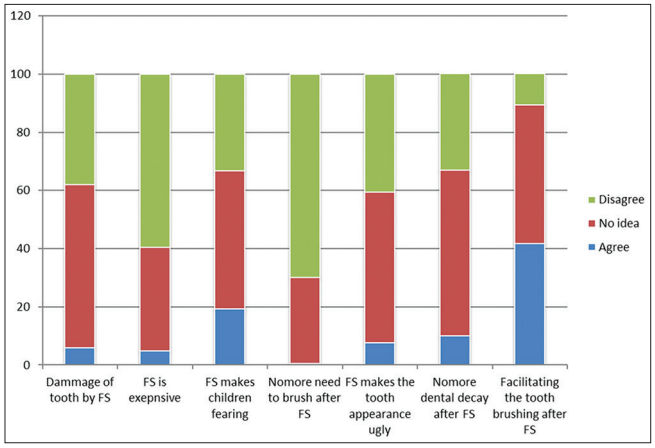

Figure 3: Attitude of parents toward fissure sealant therapy in dental setting

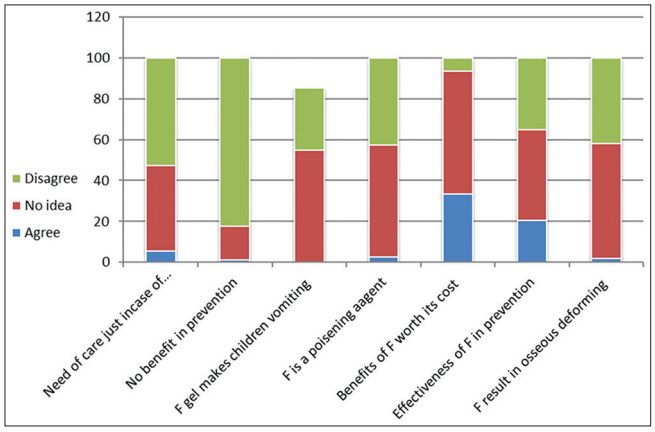

Figure 4: Attitude of parents toward tooth decay prevention and fluoride therapy (F) in dental settings

treatments for their children had significantly higher knowledge. One-way ANOVA analysis did not show a significant correlation between the mean total knowledge and child's birth order and school districts. Comparison of knowledge based on parents' education (ANOVA) showed the means of total knowledge (P = 0.008) and FS knowledge (P = 0.017) were significantly higher among parents with academic education. Furthermore, ANOVA analysis showed a significant difference for total knowledge (P = 0.002) and fluoride knowledge ($P < 0.001$) based on the parents' information source; if the dentist was the source of information, the total knowledge of the parents was higher than other sources such as mass media (P = 0.003). Regarding the awareness of fluoride therapy, the same pattern was observed.

The mean of attitude questions was 33.7 ± 5.8 from 45 (higher scores indicate positive attitudes toward professional preventive treatments). Considering the cutoff point equivalent to 75% of the range, a mean of 33 was determined; people with a score of 33 or higher were considered as having positive attitude. Accordingly, 42.3% had a negative attitude and 57.7% had a positive attitude.

Pearson's correlation of scores of parents' total knowledge and attitude showed a significant correlation between these two variables ($P < 0.001$, correlation coefficient of 0.5). Gender and age did not affect parents' attitudes. On the other hand, positive attitude toward prevention services was significantly higher in those with academic education and was lower in people with education below diploma ($\chi^2 = 26$, $P < 0.001$).

Furthermore, it was shown that parents who had a history of treatment for their children had significantly more positive attitude toward FS (89.6% vs. 10.4%, $P < 0.001$ and $\chi^2 = 21$) and fluoride therapy (P = 0.001 and χ^2 = 1071.2% vs. 28.8%).

Using logistic regression model (Enter) and considering the attitude level (positive/negative attitude) as a dependent factor [Table 2], it was found that only education level and total knowledge of parents were significantly correlated with their attitude (R^2 = 0.4, $P < 0.001$). Other factors such as the age group of parents, fluoride therapy, and FS history had no significant correlation.

Discussion

The aim of this study was to evaluate the knowledge and attitudes of parents toward professionally applied preventive treatments. In general, the results showed that most of the parents had a low level of knowledge toward FS (12.9%) and fluoride therapy (16%). In similar studies,[9,22] this figure has been reported to be more than 50%.

Table 1: Mean of total knowledge and knowledge about fissure sealant and fluoride therapy according to cluster analysis

Demographic and practice Factors	Mean of total knowledge (95%CI)	*P*	Mean of knowledge about fissure sealant therapy (95%CI)	*P*	Mean of knowledge about fluoride therapy (95%CI)	*P*
Gender of parents						
Female	6 (5.6-7.3)	0.56	2.6 (2.2-4.9)	0.13	3.3 (3.1-3.5)	0.38
Male	5.3 (3.2-4.6)		2.1 (1.2-4.7)		3.2 (2.3-6.8)	
Experience of fissure sealant therapy						
Yes	10 (6.3-8.1)	0.001>	5.5 (4.6-5.6)	0.001>	4.4 (3.5-6.1)	0.001>
No	5.4 (1.8-5.5)		2.2 (1.2-8.6)		3.1 (3-3.3)	
Experience of fluoride therapy						
Yes	7.9 (6.9-8.1)	0.001>	3.4 (2.4-6.2)	0.001>	5.4 (4.5-10)	0.001>
No	5.4 (1.8-5.5)		2.3 (1.6-2.2)		3.1 (2.3-8.1)	

CI=Confidence interval

Table 2: Results of logistic regression on the factors affecting positive attitude according to cluster analysis

Independent factors	*P*	OR	CI95%	
Education level of parents	0.02			
Illiterate		0.332	0.15	0.72
High school		0.308	0.07	1.32
Diploma		0.556	0.42	0.74
Academic				
History of receiving fissure sealant	0.26	0.469	0.094	2.353
History of receiving fluoride	0.81	1.03	0.72	1.5
Age group	0.46			
25-30		0.14	0.02	0.88
31-36		0.11	0.02	0.47
37-42		0.14	0.02	0.93
43-48		0.12	0.03	0.58
49-54				
Mean of total knowledge	0.005	1.39	1.18	1.63

OR=Odds ratio, CI=Confidence interval

In the present study, <20% of parents knew the right age for fluoride therapy, whereas it was found to be 50.4% in the study of Baradaran Nakhjavan[15] Perhaps, this difference could be attributed to the information given more seriously in schools or local media in Tehran (as the capital city). In the present study, nearly 50% of parents knew that FS was effective in prevention of dental caries, similar to the results of Jafari *et al*.[9] and Mafeni and Messer[22] reporting 57.6% and 53% for the efficacy of FSs, respectively. About 10% of children in our study and 9% in a study conducted in Saudi Arabia[23] had a history of FS, which indicated the low tendency of parents toward preventive dental treatment and could partly be explained by lack of parents' awareness,[12,24] as shown in other studies and in our study.

In the present study and other similar studies,[9,15] a significant correlation was observed between the parents' education level and their knowledge; people with higher and academic education had more knowledge about preventive treatment. This observation might be explained by this fact that people with higher education might have more chance to receive and understand information about preventive programs.[25]

In the present study, although the majority of parents (47.2%) had received information for preventive dental treatments through mass media, those receiving their information by dentists had better knowledge, which is similar to the results of other studies.[9,22] This could be attributed to the effectiveness of face-to-face education of dentists.[26] Given the high percentage (67%) of children visiting the dentist during the past year, encouraging dentists to provide oral health education about preventive treatments is essential. Furthermore, according to the proven effectiveness of media in oral health education in other studies,[27,28] the potential use of this source of information should be considered.

Most of the reported dental visits in our study were for filling, extraction, and pain relieving. Increasing the parents' knowledge about prevention programs might result in prevention of dental diseases in early stages[29] and reducing the pain and discomfort.[3]

Regarding attitude, nearly 60% of parents had a positive attitude toward professional prevention programs, and the higher was their knowledge, the more positive attitude they had. Other factors affecting positive attitude were education and history of doing the FS. In a similar study in Australia,[22] 63% of children and 83% of parents were satisfied with provided FS. In the study of Jafari *et al*. in Tehran,[9] 5.44% of parents valued FS as important and effective. In their study, parental age and years of training were significantly correlated with their attitudes. In a study conducted in Saudi Arabia,[30] only parental education had an impact on their attitudes toward FS.

Regarding the barriers, about 20% of parents reported the high cost of treatment. Currently, the tariff of FS is slightly lower than the restoration of a CL I amalgam,

and if a strategic plan is adopted by insurance companies to cover the cost of this effective treatment, it can greatly encourage the parents.[23] On the one hand, this service is currently being provided in the health centers with a lower tariff by dentists.[31] Mass media should also be required to inform parents of this opportunity.

Through primary socialization, parents transfer healthy norms and serve as role models in promoting sustainable healthy oral health behaviors. Parents should be educated about the importance of oral health, and preventive oral health practices.[32] As part of programs in "Oral Health Promoting Schools," gathering data regarding oral health beliefs, values, knowledge, attitudes, and behaviors of parents, school children, and staffs are essential for planners and could help them to understand both positive and negative influences on oral health of children.[33] Findings of this study could be used as such basic data. Furthermore, the findings have been used as a guide to design education materials such as pamphlets or leaflets distributed in primary schools. Besides, prevention syllabus including the guidelines of FS therapy is going to be considered in continuing education courses of dentists.

Conclusion

Due to the low knowledge of parents about professional preventive dental care, it is necessary to improve the collective consciousness to improve the oral health of children. On the other hand, owing to the positive impact of the trainings provided by the dentists and mass media, it appears that increasing the knowledge of dentists in this area and asking them to offer prevention education to their patients while providing services as well as involving the mass media in providing public education can be effective strategies to raise the knowledge of society in making use of oral health preventive measures.

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Conflicts of interest

There are no conflicts of interest.

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