

The Relationship between Parental Socioeconomic Status and Knowledge, Attitudes and Tendency toward Fluoride Therapy for Their 7-9 Year Old School Children

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Abstract

Background: The present study was conducted to investigate the relationship between socioeconomic status of parents and their knowledge, attitude and tendency toward different forms of fluoride therapy for their 7-9 year-old primary school children in Shiraz.

Methods: A total of 444 subjects were selected through multi-stage random sampling. The subjects were parents of 7-9 year old boys and girls attending primary schools in 4 districts in Shiraz. They were asked to fill out a questionnaire containing a number of questions regarding their knowledge, attitudes and tendency toward fluoride therapy for their children.

Results: The mean scores for parental knowledge, tendency and attitude toward fluoride therapy for their children were 8.05 ± 2.46 , 3.38 ± 1.73 and 54.66 ± 5.89 , respectively. As to the parental knowledge, 25.23% and 72.52% of the subjects had either poor or average knowledge, respectively. Similarly, about 32% and 39.6% of the parents had a poor or average tendency toward fluoride therapy and 42.57% and 57.43% of them held a strong or mild positive attitude toward it, respectively.

Conclusion: The findings of the present study indicated that the majority of parents did not have sufficient knowledge about different types of fluoride therapy and their caries-preventive effect. They lacked a positive attitude and a strong tendency to practice fluoride therapy for their children. There was a significant association between socioeconomic status of parents and their knowledge, attitude and tendency toward fluoride therapy for their children.

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Introduction

Oral health, as an essential part of public health, greatly affects the individual's quality of life.¹ Usually, diseases of the mouth are more likely to occur as compared with those of other organs and tissues of the human body; therefore, our mouth requires more care than other parts of the body.²

Every year, about 5 to 10 percent of National Health Expenditure in developed countries is spent on treating oral health diseases, which imposes significant costs on governments.³ On the other hand, more than 50 million hours per year are lost due to problems caused by oral health diseases which affect people's performance and activities.⁴

Although all age and sex groups are at risk of dental caries,⁵ children are more vulnerable than other groups.^{6,7} As a multifactorial infectious disease, dental caries is severely affected by several factors such as the parents' knowledge and education, family income, family size, and oral hygiene.^{8,9}

Oral health has an important role in the quality of life, especially for children, since it can affect the children's growth, weight, confidence, social relationships and learning abilities as well as daily activities of children and their parents.^{1,10}

At present, dental health *indices* among Iranian children are lower than *global standards* and those of some other countries.¹¹ Studies conducted by the Oral Health Department of the Iranian Ministry of Health and Medical Education show that every 6-year-old Iranian child has an experience of 5 dental caries, of which about 4 have remained decayed when the child enters the primary school.¹¹ Also, every 12-year-old child has at least 3 permanent teeth with a previous *history of caries*.¹¹ Given these statistics, the National Oral Health Program for primary school students is the *Priority Oral Health Program* of the Health Department.

Health care provision for students is indeed investing for future generations. In most countries, health care provision for students is considered to be a major health concern.¹²

Making teeth more *resistant* to bacteria and decay by fluoridation along with mechanical methods such as brushing, flossing and plaque removal is a safe and cost-effective method of controlling dental caries.^{13,14} Fluoride is the most important mineral with caries preventive effects within our bones and teeth.¹⁵ Regular and sustainable fluoride therapy (especially in districts where the amount of fluoride in drinking water is less than the appropriate level of 1 ppm) significantly reduces the prevalence of dental caries in children and adolescents.¹⁶ In addition, *fluoride can affect the bacterial metabolism*. This contributes to the *anti-caries effect of fluoride*.¹⁷ Considering the obvious effect of oral health on physical and mental health of individuals and the fact that oral diseases can be controlled,¹⁸ dental caries prevention in children is very important since treatment of oral diseases is *extremely costly*.¹⁹ One of the programs of the World Health Organization for prevention of chronic diseases and health promotion is paying attention to oral health.²⁰ According to the Oral Health department of the Iranian Ministry of Health and Medical education quoted by the Iranian *Students News Agency* (ISNA), the preventive *school-based dental program* is currently being implemented in 60,000 schools for seven million and seven hundred thousand students.²¹ In addition, "*fluoride varnish treatment*" has been implemented twice a year since

November 2015 among students all over the country (for systematic caries-prevention).²²

Several studies have shown the role of parents in preventing their children's oral and dental diseases. Children's behaviors regarding oral hygiene are influenced by their parents' knowledge, attitudes and beliefs about oral hygiene. Parental collaboration is a key factor in preventative dentistry.^{11,23} Poutanen et al. (2006) reported the parental influence on children's oral health-related behavior.²⁴ Meanwhile, mothers are directly responsible for their children's oral health and disease prevention.²⁵ In this regard, Weatherwax et al. (2015) found that the children whose mothers had higher educational levels and were concerned about *oral hygiene* were *less* likely to have dental caries.⁹

The relationship between socioeconomic status of families and their knowledge, attitude and tendency toward fluoride therapy for oral health of their primary school children has not been thoroughly investigated in Iran in general and in Shiraz, in particular. *Additionally*, the question of why impoverished *people* visit dentists *less* frequently for *preventive treatment* (including fluoride therapy) has not been addressed. Therefore, the present study aimed to investigate the relationship between socioeconomic status of parents with their knowledge, attitude and tendency toward different forms of fluoride therapy for their 7-9 year old children.

Materials and Methods

In this cross-sectional study, a total of 444 subjects were selected by multi-stage random sampling method. The subjects were parents or guardians of 7-9 year-old boys and girls attending primary schools in 4 districts in Shiraz in 2016.

Initially, the list of primary schools, affiliated with each geographical district of Shiraz city, was obtained from the Education Department of Fars Province. Thereafter, one girls school and one boys school were randomly selected from each district. From the four districts in Shiraz, a total of 8 randomly selected schools were investigated.

The data gathering tool was a researcher-made questionnaire containing two parts. The first part contained questions about the parents' demographic characteristics including gender, age, educational level, parent's job, number of sons aged 7-9 years, number of daughters aged 7-9 years, family size, housing situation, average income, and livelihood. The second part contained 40 questions including 18 questions on the participants' knowledge (7 questions about dental caries, 5 about mouthwash, 3 on fluoride varnish and 3 about toothpaste), 7 questions about the parents' tendency toward fluoride therapy for their children, and 15 questions on the parents' attitude

towards their children’s use of fluoride therapy. The questions on knowledge were multiple-choice tests. The items were always scored zero for an incorrect answer and one for a correct answer to determine the level of parents’ knowledge. The total score in each field was calculated by summing up all of the correct answers in that particular field. According to similar studies,²⁶ a score of 0-6, 6-12 and 12-18 showed poor, average and good level of knowledge on fluoride therapy, respectively. There were 7 questions about the parents’ tendency toward fluoride therapy with a minimum score of zero and maximum score of 7. Scores equal to 0-2.33, 2.33-4.66, and 4.66-7 were considered weak, moderate or strong tendency toward fluoride therapy, respectively. Consistent with some similar studies, these scores in a percentile scale correspond with 0-33% (weak), 33-66% (moderate) and 66 to 100% (strong).

The five-point Likert scale was used to design the questions on parental attitude. Responses were scored from 1 to 5 and the total score for attitude was calculated by summing up all the obtained points. Scores equal to 15-35, 35-55, and 55-70 showed weak, moderate and strong attitudes toward fluoride therapy, respectively.

After designing the questionnaire, its content validity was confirmed by experts in health and dental education (8 experts). The internal reliability of the

questionnaire was confirmed through Cronbach’s alpha (alpha coefficient=0.71). The external reliability of the questionnaire was confirmed by a pilot study on a sample of 100 people from the target group (correlation coefficient, r=0.8).

SPSS, version 24, was used to analyze the data (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp). Kolmogorov-Smirnov test was used for data normalization. T-test, Mann-Whitney U test, One-way analysis of variance, Kruskal-Wallis and Pearson and Spearman correlation coefficients were used for statistical analysis and analysis of correlation between the variables. A p-value less than 0.05 was considered as statistically significant.

Results

The mean age of the study participants was 37.34±7.51 years. Table 1 shows the demographic characteristics.

The mean scores for parental knowledge, tendency and attitude toward their children’s application of fluoride therapy were 8.05±2.46, 3.38±1.73 and 54.66±5.89, respectively.

Table 2 shows the participants’ scores for knowledge, tendency and attitude toward their children’s use of fluoride therapy.

Table 1: Frequency distribution of the participants by demographic variables

Row	Variable		Number	Percentage
1	Relationship with student	Father	135	30.4
		Mother	295	66.4
		Other	14	3.2
2	Educational level	Elementary School	17	3.83
		Junior High School	42	9.46
		High School	32	7.20
		Diploma	132	29.73
		Associate Degree	55	12.39
		Bachelor’s Degree and Higher	166	37.39
3	Urban district	District 1	111	25
		District 2	111	25
		District 3	111	25
		District 4	111	25
4	Father’s job	Government Employee	160	36.03
		Worker	65	14.64
		Self-employed	157	35.36
		Retired	19	4.28
		Other Jobs	28	6.31
		Unemployed	15	3.38
5	Mother’s job	Government Employee	90	20.27
		Housewife	321	72.30
		Other	33	7.43
6	Housing status	Personal (owned)	241	54.28
		Rented	195	43.92
		Government-Leased	8	1.80
7	Economic status	Low	94	21.17
		Middle	251	56.53
		High	99	22.30

Table 2: Frequency distribution of the participants by categorized variables

Row	Variable		Number	Percentage
1	Knowledge on dental caries prevention	Poor	112	25.23
		Average	322	72.52
		Good	10	2.25
2	Attitude toward fluoride therapy for children	Poor	0	0
		Average	255	57.43
		Good	189	42.57
3	Tendency to fluoride therapy for children	Poor	142	31.98
		Average	176	39.63
		Good	126	28.39

As shown in Table 3, statistically significant associations were found between parental knowledge and education ($P < 0.05$). That is, knowledge of parents with elementary education was significantly lower than those with higher levels of education, but there were no significant differences among other groups.

Statistically significant associations were also found between the parental knowledge and father's job ($P < 0.05$). Thus, fathers who were official employees or self-employed had more knowledge than workers and those with other jobs while there were no significant differences in pair comparison among other jobs (Table 3). Additionally, the results

of Spearman's correlation coefficient showed that there was a significant negative correlation between the parental knowledge and family size in a way that the larger the family size, the lower the parental knowledge ($r = -0.108$ and $P = 0.023$). However, there were no significant differences in the participants' knowledge among other demographic variables.

According to our results, there were statistically significant differences between the mean scores for attitude in different groups and the relationship with the student, educational level and father's job (Table 4). There was no statistically significant difference in the mean score for attitude between other

Table 3: Comparison of the participants' knowledge mean scores by demographic variables

Row	Variable		Mean±SD	P value
1	Educational level	Elementary School	6.35±2.42	0.028
		Junior High School	8.12±2.13	
		High School	7.69±2.54	
		Diploma	8.23±2.10	
		Associate Degree	7.74±2.28	
		Bachelor's Degree and Higher	8.19±2.77	
2	Father's job	Government Employee	8.25±2.39	0.024
		Worker	7.55±2.47	
		Self Employed	8.26±2.32	
		Retired	7.37±2.63	
		Other	6.96±2.92	
		Unemployed	8.47±3.11	

Table 4: Comparison of the participants' scores regarding attitudes toward fluoride therapy by demographic variables

Row	Variable		Mean±SD	P value
1	Relationship with the student	Father	54.64±6.18	0.002
		Mother	54.85±5.75	
		Other	49.86±3.53	
2	Educational level	Elementary School	50.76±6.56	0.001
		Junior High School	53.09±5.96	
		High School	51.62±4.86	
		Diploma	55.33±6.10	
		Associate Degree	53.96±6.07	
		Bachelor's Degree and Higher	55.76±5.31	
3	Father's job	Government Employee	55.27±5.95	0.022
		Self-Employed	55.22±5.89	
		Other	54.07±5.52	
		Worker	53.23±5.08	
		Retired	52.16±6.39	
		Unemployed	53.20±6.01	

groups of demographic variables.

In the present study, there was a significant difference in the participants' tendency toward their children's use of fluoride therapy between different groups by urban area, gender, relationship with the student, level of education, father's job, mother's job, housing situation, and economic status (Table 5). Additionally, there was a significant positive correlation between *income* and *tendency* toward their children's use of fluoride therapy ($r=0.303$, $P<0.0001$).

Discussion

The present study aimed to investigate the association between socioeconomic status of parents and their knowledge, attitude and tendency toward different forms of fluoride therapies in 7-9 year-old primary school children in Shiraz. To the best of our knowledge, this is the first study to investigate the association between city districts and knowledge, attitude and tendency toward fluoride therapy in one of the biggest cities of Iran.

The results of the study showed that one quarter of the participants in the study had poor knowledge about fluoride therapy for their children, and only 2.5%

had a good level of knowledge. The level of parental knowledge in surveys conducted by Nazari et al. (2013) in Shirvan,²⁶ Soltani et al. (2002) in Isfahan,²⁷ and Begzati et al. (2014) in Kosovo,²⁸ was quantitatively similar to that of the present study. Naido et al. (2012) also suggested that for children's oral health care, parents need information and education about the factors affecting oral health.²⁹

However, the level of parental knowledge reported in Naderfar et al. (2006) in Zahedan,³⁰ Khayrinamin (2002) in Tehran,³¹ Ansari Moghaddam (2003)³² and Martínez et al. (2011) in Columbia³³ was higher than that of the present study.

Although the exact reasons for these discrepancies are not known, factors such as the structure of the studied population, age, level of education, sample size, sampling strategy, type of statistical analyses (univariate or bivariate), control or lack of control for potential confounders may explain, at least in part, these inconsistencies.

The results of the present study about parental knowledge on dental caries preventive methods for their children were quantitatively and qualitatively consistent with those of many national and

Table 5: Comparison of the participants' scores regarding tendency toward fluoride therapy by demographic variables

Row	Variable		Mean±SD	P value
1	Urban district	District 1	3.63±1.84	0.001
		District 2	3.56±1.70	
		District 3	2.68±1.58	
		District 4	3.66±1.64	
2	Gender	Boy	3.66±1.73	0.001
		Girl	3.12±1.69	
3	Relationship with the student	Father	3.36±1.69	0.012
		Mother	3.44±1.75	
		Other	2.00±1.52	
4	Level of Education	Elementary school	2.88±1.80	0.001
		Junior high school	2.67±1.44	
		High school	2.41±1.41	
		Diploma	3.20±1.68	
		Associate degree	3.25±1.84	
5	Father's job	Bachelor's degree and higher	3.98±1.64	0.001
		Government Employee	3.71±1.74	
		Worker	2.72±1.54	
		Self employed	3.47±1.71	
		Retired	3.00±1.63	
		Other	3.64±1.66	
6	Mother's job	Unemployed	2.27±1.87	0.001
		Government Employee	4.11±1.64	
		Housewife	3.16±1.72	
7	Housing status	other	3.54±1.62	0.001
		Personal	3.68±1.63	
		Rented	3.04±1.82	
8	Economic status	Government-leased	3.37±1.92	0.001
		Low	2.76±1.66	
		Middle	3.42±1.72	
		High	3.96±1.55	

international studies. It seems that lack of adequate parental knowledge is a global problem.

According to our study, there was a significant association between the level of parental knowledge, educational level and fathers' job, but a statistically significant association was not observed between the level of parental knowledge and other factors affecting socio-economic status, such as housing area, housing situation and economic status. There was no statistically significant difference in the mean score of parental knowledge in different districts.

The distribution of schools in the four educational districts of Shiraz is overlapping and the students are not grouped into distinct social *categorizations*. Moreover, a large number of students study in educational districts unrelated to their housing areas. Therefore, one cannot expect that parents' scores for knowledge are affected by the geographical district in which their children study.

In a study by Nazari and Taherpour (2013), also no association was found between the residential area and parental knowledge.²⁶ The results of our study showed that there was no significant relationship between knowledge and age. This finding is consistent with the results of Nazari and Qasemi et al.^{26,34} but not consistent with Naderyfar et al.'s.³⁰

It is possible that in Naderyfar et al.'s study older individuals were more educated.

There was no significant difference in the mean score for knowledge between the fathers and mothers. Consistent with the results of our study, Torabi et al. (2003) did not find any significant difference in the mean scores for knowledge between fathers and mothers.³⁵

There was a significant association between the education level and knowledge level so that the knowledge level of parents with primary education was significantly less than that of parents with other educational levels; however, there was no significant difference between other educational levels. Several studies in Iran and around the world also have found these associations.^{9,25,26,30,32,27}

Contrary to the results of Nazari,³⁰ Khayri Namin,³¹ and Nakhjavani et al. (2012),²⁵ there was no significant association between the mother's job and knowledge level in this study. The reason probably is that there was no difference in educational level between housewives and employees. Their spouse may have helped them when they were filling in the questionnaire at home.

The level of parental knowledge is expected to be lower in larger families with lower socioeconomic status and lower parental educational level. In line with this view, we observed a reverse association

between parental knowledge and family size. In contrast, Nazari and Taherpour (2013) found a statistically significant association between parental knowledge and the number of children in the family.²⁶ Additional studies are required to address reason(s) for this discrepancy.

No statistically significant difference was observed in the mean score of knowledge level between families with different economic statuses. Some studies in Iran also showed no association between DMF and economic status, parents' education, and job.³⁶ However, Nazari and Taherpour (2013) showed a statistically significant positive correlation between parental knowledge and economic status.²⁶

In the present study, a strong positive attitude toward fluoride therapy was found in the participants who had no parental relationship with the students. There was no significant difference between the fathers and mothers' attitudes. On the other hand, the participants with higher educational levels showed more positive attitude toward fluoride therapy and those who were worker, retired or unemployed had a more negative attitude toward fluoride therapy. In this regard, Movahed et al. (2013) in Mashhad showed that people with higher education level and higher socioeconomic status showed more positive attitudes toward oral health preventive care.³⁷ Kent and Croucher (1998) also found that lower socioeconomic level was often associated with a negative attitude toward oral health.³⁸

There was a significant difference in tendency toward fluoride therapy between participants from different districts of Shiraz. Tendency toward fluoride therapy was more positive in *districts* 3 and 4 which are more underprivileged than *districts* 1 and 2. It is likely that inhabitants of districts with higher socioeconomic *status* have more tendency to refer to private offices for oral health care.

Parents of male students showed more tendency toward fluoride therapy. Further investigation is required to find the reason. The tendency toward fluoride therapy was lower in participants with no parental relationship with the students. However, no significant difference was observed between parents in this regard. The results of comparing other socioeconomic variables such as education, occupation, housing status, and family's economic status also revealed that higher socioeconomic status was associated with a greater tendency toward fluoride therapy.

Kent and Croucher (1998) also found that low socioeconomic levels were often associated with less positive attitude toward oral health and dental care.³⁸

Statesman et al. (2012)³⁹ in Sweden and Al-Shammari et al. (2007)⁴⁰ in Kuwait reported that

educational level had a direct association with dental visits. Also, Movahed et al. (2013) in Mashhad showed that educational level had a significant direct association with the number of dental visits. In a systematic review, de Castilho et al. (2013) argued that children whose fathers had better jobs and their mothers were housewives had less tooth decay (DMFT).⁴¹

Limitations of the Study

Cause and effect relationship could not be established from cross-sectional studies such as this investigation. Additionally, the sample size of the study was relatively small and only focused on a small geographical area of the country (only Shiraz). These limitations all call for additional studies with larger sample sizes to be undertaken in different cities to further substantiate these preliminary findings.

The results of this study may contribute to parental knowledge promotion, attitude correction, and dental caries prevention.

Conclusion

Taken together, the findings of the present study showed that the majority of parents did not have sufficient knowledge about oral and dental health in general and different types of fluoride therapy and their caries-preventive effect, in particular. Additionally, they lacked a positive attitude and a strong tendency to practice fluoride therapy for their children.

Education is known to play an important role in the students' oral and dental health improvement as well as in reducing the prevalence of dental caries as a major health problem. Therefore, it is suggested that knowledge enhancement *courses* should be held for parents by school health care providers, and the *parent-teacher association* should be reinforced. In their curriculum, students should be provided with proper methods of fluoride therapy and other methods of dental caries prevention with emphasis on their economic and health benefits. Regular and special programs should be broadcasted to contribute to the success of National Fluoride Therapy Program. Appropriate pamphlets and brochures should be provided in private dental centers to attract the clients' attention to Fluoride Therapy.

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