

## **Original Research Article**

### **Evaluation of the Effect of Parents' Oral Health Behavior on the SiC, DMFT, and Plaque Indices in 7-year-old Male Students in Kerman, Iran**

**Molouk Torabi<sup>1</sup>, Hami reza Poreslami<sup>2</sup>, Jahangir Haghani<sup>3</sup>, Mohammad Ghasemirad<sup>4</sup>, Fatemeh Sadat Sajadi<sup>5\*</sup>**

<sup>1</sup>Ph.D. in Oral Pathology, Associate Professor, Dental and Oral Diseases Research Center, School of Dentistry, Kerman University of Medical Sciences, Kerman, Iran

<sup>2</sup>Full professor of Pediatric Dentistry, Dental and Oral Diseases Research Center, School of Dentistry, Kerman University of Medical Sciences, Kerman, Iran

<sup>3</sup>Ph.D. in Oral and Maxillofacial Radiology, Associate Professor, Dental and Oral Diseases Research Center, Department of Radiology, School of Dentistry, Kerman University of Medical Sciences, Kerman, Iran

<sup>4</sup>Dentist

<sup>5\*</sup>Assistant Professor of Pediatric Dentistry, Dental and Oral Diseases Research Center, School of Dentistry, Kerman University of Medical Sciences, Kerman, Iran

#### **\*Corresponding author**

Fatemeh Sadat Sajadi

Email: [fsajadi1234@gmail.com](mailto:fsajadi1234@gmail.com)

---

**Abstract:** Dental caries is one of the most common chronic diseases of childhood. Parents have an important role in the control of caries in their child. The aim of this study was to evaluation the effect of parents' oral health behavior on the SiC, dmft and plaque indices in 7-year-old male students in Kerman, Iran. The method in this cross-sectional descriptive-analytical study, were conducted on 200 male students in Kerman, Iran. The data were collected through questionnaire and clinical examination. Plaque, dmft and SiC indices were measured and recorded for each child. The score of oral health behavior of the parents was gathered through a questionnaire. T-test, regression analysis and Chi-square were used to analyze the data.  $P < 0.05$  was considered statistically significant. In results sixty six of the participants were mothers (122 persons). The average age of parents was  $34.5 \pm 9.71$ . Forty two percent of the fathers and 26% of the mothers had higher level education. The mean  $\pm$  SD of SiC and dmft indices were  $8.95 \pm 1.87$  and  $5.25 \pm 3.27$  respectively. The mean  $\pm$  SD of plaque index in the one third of the population with highest dmft was  $98.5 \pm 3.59$ . The mean  $\pm$  SD score of health performance in the one third of the participants with the highest dmft was  $5.87 \pm 2.13$ , and  $6.37 \pm 2.10$  in the remaining two third. There were statistically significant difference between these two groups ( $P = 0.012$ ). No statistically significant difference existed between the parents' job and age, and the number of children in family and the SiC index. In conclusion the result of this study showed that Oral health behavior of the parents has a direct association with the caries prevalence in their children. It was also found that the parents' oral health behavior and demographic characteristics, such as education, considerably affect the SiC and dmft indices in children.

**Keywords:** Dental Caries, dmft Index, SiC Index, Plaque Index, Parents Oral Health Behavior

---

#### **INTRODUCTION**

Dental caries is among the most common chronic diseases of all ages. In children, it is even more prevalent than the most frequent systemic diseases such as asthma [1]. Despite its apparent decline in different populations, a great number still suffer from dental caries [2]. The introduction of water fluoridation and highlighting the preventive role of fluoride significantly reduced dental caries in various populations; however, this was not the only effective strategy. The socioeconomic level is a key factor in determining the need for dental treatments and prevalence of dental caries. It was previously found that dental caries are more frequent in deciduous and permanent teeth of

children from families of lower socioeconomic level. This is true in both developed and developing societies [3].

In this regard, the effects of family environment and socioeconomic level on the incidence of dental caries in children at early ages have been raised in recent decades [2]. It was reported that the parents', particularly mothers' oral health beliefs significantly influence their children's oral health [4, 5, 6]. Studies also revealed that the parents' knowledge and attitude about oral and dental health, the related behaviors, and methods of caries prevention can

significantly affect the prevalence of caries in children [7, 8].

Ramos-Gomez assessed the oral and dental health education to infants' mothers and found that their children had less dental pain and caries at the age of 6-7. Moreover, the SiC index in the study group was significantly lower than the control group [9]. Likewise, Mitrakul *et al.* reported that the lack of adequate time, and proper knowledge about tooth-brushing, work stress, financial problems, and single-parenthood were respectively the most important factors that influenced the Thai parents' ability in their children's oral and dental health care [10].

Similarly, Castilho stated that the parents' oral and dental health habits affected their children oral health [11]. In a systematic review, Hooely *et al.* tried to analyze the articles on the effects of parents' beliefs and behavior on the prevalence of dental caries in children aged 0-6 years old. They found that the number of related studies was pretty limited, so more studies were required to be conducted [12]. In another study, Bozorgmehr *et al.* reported the parents' oral health behavior as a strong predictor of the rate of dental caries in their children, namely the brushing habit was significantly correlated between the parents and children [13]. In a study on the preschoolers' oral health care habits in Hong Kong, Chu detected the early childhood dental caries to be closely related with the socioeconomic status of the family, and the parents' level of education and dental knowledge [14].

Considering the above-mentioned studies, it seems that evaluation of the effect of parents' oral health behavior on the prevalence of dental caries in children can help improve dental caries preventive method and families' knowledge on the oral and dental health care. The current study was designed to assess the effect of parents' oral health behavior on the SiC, dmft and plaque indices in 7-year-old male students in Kerman, Iran.

## METHOD

In this cross-sectional descriptive-analytical study, 200 male students were selected by multi-stage cluster sampling. First, the city of Kerman was divided into 5 districts of north, south, east, west, and center. Then, all the schools were listed, two schools were chosen from each district, and a number of students were randomly selected out of each school. The data were collected through questionnaire and clinical examination.

The aims of the study were expressed to the parents, informed consent was obtained, and questionnaires were distributed. The questionnaire consisted of two sections, the first of which was concerned with the student's demographic characteristics, his oral and dental health behavior (using toothbrush, dental floss, fluoride mouthwash, the latest and reason of dental visit and the, the number of times and type of snacks used in school).

The second section required the parents' demographic data (age, sex, number of children, education and job), oral health behavior (using toothbrush, dental floss, fluoride mouthwash, the latest and reason of dental visit, the number of times and type of snacks used, using xylitol-containing chewing gum). Moreover, the parents' opinion was asked about their own oral and dental status. The students underwent oral and dental examination by using disposable mirror under normal light with no probe and radiography (according to the WHO standards). The dmft and SiC indices (the one third of the children with the highest dmft) were measured and recorded [15].

In order to measure the plaque index by using O'Leary index, the student was asked to chew the disclosing tablet, then the number of surfaces with dental plaque was counted and divided by the total number of teeth; the obtained number was multiplied by 4 and 100 [16]. Finally, all the participating students and parents received oral and dental health education and related posters were distributed in schools.

Data were analyzed by using SPSS software, version 18. T-test was employed to compare the mean plaque index, and regression analysis and Chi-square were used to evaluate the relation between the plaque and SiC indices and demographic data and parents' oral health behavior. The significance level was set at 5%.

## RESULTS

In this study which was performed on two hundred 7-year-old male students in Kerman, 44% of the participating parents were fathers and 66% were mothers. The mean  $\pm$  SD age of parents was  $34.5 \pm 9.71$ . Eighty four of the fathers (42%) and 52 (26%) of the mothers had university degrees. Among the mothers, 61.5% were housewives, while only 2% of the fathers were unemployed. Forty five percent of the families had 2 children. The mean  $\pm$  SD of SiC and dmft indices in children was respectively  $8.95 \pm 1.87$  and  $5.25 \pm 3.27$ . Out of all the enrolled students, 8.5% did not use toothbrush at all, 27.5% brushed twice daily, and only 19 of them used dental floss (9.5%). Sixty nine of the students (34.5%) had never visited a dentist (Table 1).

**Table 1: Frequency distribution of children’s oral and dental health behavior**

Variable	n	%	Total	
using toothbrush	Never	17	8.5	100
	Irregularly	23	11.5	
	Once daily	103	51.5	
	Twice daily	57	27.5	
using dental floss	Yes	19	9.5	100
	No	181	90.5	
using fluoride mouthwash	Yes	26	13.0	100
	No	174	87.0	
Last dental visit	6 months ago	74	37.0	100
	1 year ago	36	18.0	
	Over a year ago	21	10.5	
	No visit ever	69	34.5	
Reason for dental visit	Examination	22	11.0	100
	Tooth filling	72	36.0	
	Toothache	50	25.0	
	Tooth extraction	56	28.0	
using sweet snacks per day	Not at all	0	0	100
	Once	38	19.0	
	Twice	110	55.0	
	Three times	36	18.0	
	≥Four times	16	8	

According to the second section of the questionnaire, 12% of parents never brushed their teeth,

7.5% had never visited a dentist, and 50.5% had never used sugar-free chewing gums (Table 2).

**Table 2: Frequency distribution of parents’ oral and dental health behavior**

Variables	n	%	Total	
using toothbrush	Never	24	12.0	100
	Irregularly	14	7.0	
	Once daily	89	44.5	
	Twice daily	73	36.5	
using dental floss	Yes	104	52.0	100
	No	96	48.0	
using fluoride mouthwash	Yes	50	25.0	100
	No	150	75.0	
last dental visit	6 months ago	22	11.0	100
	One year ago	65	32.5	
	More than a year ago	98	49.0	
	No visit ever	15	7.5	
reason for dental visit	Examination	51	25.5	100
	Tooth filling	78	39.0	
	Toothache	24	12.0	
	Tooth extraction	47	23.5	
using sweet snacks per day	Never	49	24.5	100
	Twice	110	55	
	Three times	20	10	
	≥Four times	17	8/5	
using sugar-free chewing gum	Never	101	50.5	100
	Sometimes	86	43.0	
	Most often	13	6.5	

The mothers' education, job, and the number of children in family were found to have statistically

significant relationship with the children's health performance (Table 3).

**Table 3: The relation between the parents' demographic variables and the children's oral and dental health behavior**

Variable	B	t	P.value
Father's education	-0.480	-1.146	0.255
Father's job	0.436	1.167	0.247
Mother's education	1.046	2.470	0.016*
Mother job	-0.661	-2.013	0.047*
Number of children in family	-0.460	-2.023	0.046*
Parents' sex	-0.536	-1.338	0.185
Parents' age	-0.037	-1.589	0.116

The mean ± SD of plaque index in the one third of the children with the highest dmft was 89.05±3.59 and 59.24±10.19 in the remaining two third. These two groups were significantly different in terms of plaque index (P=0.002).

was 5.87±2.13 and 6.37±2.10 in the remaining two third. Statistically significant difference was also found between these two groups (P=0.012). No statistically significant difference existed between the parents' job and age, and the number of children in family and the SiC index (Table 4).

The mean ± SD score of health performance in the one third of the participants with the highest dmft

**Table 4: The relationship between the parents' demographic variables and SiC index in children**

Variables	B	P value
Father's education	0.331	0.485
Father's job	0.355	0.347
Mother's education	1.155	0.027*
Mother's job	-0.375	0.233
Number of children in family	0.205	0.573
Parents' age	0.004	0.875

**DISCUSSION**

Dental caries is one of the most chronic diseases in children, the breakout of which highly depends on the oral health behaviors. Parents as the trainer and model can play a paramount role in training their children the principles of oral and dental health care.

The findings of this study revealed that a considerable percent of 7-year-old male students (34.5%) had never visited a dentist. Neither was a significant relationship noticed between the students' oral health behavior and the mothers' education level and the number of children. The mean score of health performance of those who had the highest SiC (one third of the students with the highest dmft) was significantly different compared with the rest of the students. Likewise, the mothers' education level of the students with high dmft was significantly different from the rest of mothers.

relationship between the parents' oral health performance and their children dental caries status; which was in line with the current study. Moreover, 51% of the participants they studied had no caries; while, the men dmft was relatively high in our study and only 7% of the students had no caries at all. This can be mainly due to the health and cultural differences between Iran and China [14].

In the present study, a significant difference existed between the parents' health performance score of the students with the highest SiC and dmft and the other students; i.e. the parents whose children got lower dmft, had higher oral health performance score than those whose children got higher dmft. Similar results were achieved by Ramos-Gomez *et al.*; they reported that those parents who received oral health care trainings and had better health performance, had children with lower dental caries and siC score [9].

In China, Chu *et al.* evaluated the relationship between the preschoolers' oral health status and the prevalence of dental caries. They found a significant

relationship between the parents' oral health behavior was a strong predictor of their children's oral health status. In that study, a significant relation existed between the

parents' history of dental problems and their children's dmft index. But, no difference was detected between the parents' education level and the dmft index; which was in contrast with the present study [13]. In our study, the parents' education level was significantly related with the children's SiC and dmft indices.

In agreement with the current study, Vanagas *et al.*[1]; reported a significant relationship between the parents' oral and dental skills and attitudes and their children's oral health status [17]. In Mexico, Vallejos-Sanchez showed that the social variables and mothers' oral and dental health performance was related with their children use of oral health services. In their study, almost 30% of the children used dental floss; whereas, in our study only 9.5% of the children used dental floss. These points out the importance of parents' oral health behavior and its effect on their children's oral health [18].

The SiC and dmft are two important dental indices which determine the amount of dental caries in children. They are reported to be low in most of developed countries; while, it is relatively high in our country due to the parents' lack of knowledge. Apparently, investment in parents' oral health training and considering the effect of parents' oral health beliefs and behaviors can help decreasing dental caries. The cultural, social, and economic differences are among the most important causes of difference in the parents' level of oral health knowledge in different societies. Hence, to control the breakout of dental caries, the oral and dental health training programs must be more focused on the poor social class. It is also advised that free oral health education be performed publicly via mass media to benefit those who do not have access to dentist and professional expert.

## CONCLUSION

The result of this study showed that a major percent of 7-year-old school boys have dental caries. It was also found that the parents' oral health behavior and demographic characteristics, such as education, considerably affect the SiC and dmft indices in children.

## REFERENCES

1. Vargas CM, Crall JJ, Schneider DA; Sociodemographic distribution of pediatric dental caries: NHANES III, 1988-1994. *Journal of the American Dental Association* 1998;129(9):1229-38.
2. Harris R, Nicoll AD, Adair PM, Pine CM; Risk factors for dental caries in young children: a systematic review of the literature. *Community dental health* 2004;21(1):71-85.
3. Gillcrist JA, Brumley DE, Blackford JU; Community socioeconomic status and

- children's dental health. *Journal of the American Dental Association* 2001;132(2):216-22.
4. Dummer P, Addy M, Hicks R, Kingdon A, Shaw W; The effect of social class on the prevalence of caries, plaque, gingivitis and pocketing in 11-12-year-old children in South Wales. *Journal of Dentistry* 1987;15(5):185-90.
5. Frandsen A; Changing patterns of attitudes and oral health behaviour. *International dental journal* 1985;35(4):284-90.
6. Kay E, Locker D; A systematic review of the effectiveness of health promotion aimed at improving oral health. *Community dental health* 1998;15(3):132-44.
7. Peres MA, Peres KG, Antunes JLF, Junqueira SR, Frazão P, Narvai PC; The association between socioeconomic development at the town level and the distribution of dental caries in Brazilian children. *Revista Panamericana de Salud Pública* 2003;14(3):149-57.
8. Weinstein P, Harrison R, Benton T; Motivating parents to prevent caries in their young children: one-year findings. *Journal of the American Dental Association* 2004;135(6):731-38.
9. Ramos-Gomez F; Early maternal exposure to children's oral health may be correlated with lower early childhood caries prevalence in their children. *Journal of Evidence Based Dental Practice* 2012;12(2):113-15.
10. Mitrakul K, Laovoravit V, Vanichanuwat V, Charatchaiwanna A, Charatchaiwanna A, Bunpradit W, *et al.*; Factors associated with parent capability on child's oral health care. *Southeast Asian Journal of Tropical Medicine and Public Health* 2012;43(1):249.
11. Castilho ARFd, Mialhe FL, Barbosa TdS, Puppim-Rontani RM; Influence of family environment on children's oral health: a systematic review. *Journal de Pediatria (Versao em Portugues)* 2013;89(2):116-23.
12. Hooley M, Skouteris H, Boganin C, Satur J, Kilpatrick N; Parental influence and the development of dental caries in children aged 0-6 years: a systematic review of the literature. *Journal of Dentistry* 2012;40(11):873-85.
13. Bozorgmehr E, Hajizamani A, Malek Mohammadi T; Oral health behavior of parents as a predictor of oral health status of their children. *ISRN dentistry* 2013; 5(4):768-79.
14. Chu C-H, Ho P-L, Lo EC; Oral health status and behaviours of preschool children in Hong Kong. *BMC public health* 2012;12(1):767.
15. Bratthall D; Introducing the Significant Caries Index together with a proposal for a new

- global oral health goal for 12-year-olds. International dental journal 2000;50(6):378-84.
16. Løe H, Silness J; Periodontal disease in pregnancy I. Prevalence and severity. Acta Odontologica 1963;21(6):533-51.
  17. Vanagas G, Milauskiene Z, Grabauskas V, Mickeviciene A; Associations between parental skills and their attitudes toward importance to develop good oral hygiene skills in their children. Medicina (Kaunas) 2009;45(9):718-23.
  18. Vallejos-Sánchez A, Medina-Solís C, Minaya-Sanchez M, Villalobos-Rodelo J, Marquez-Corona M, Islas-Granillo H, *et al.*; Maternal characteristics and treatment needs as predictors of dental health services utilisation among Mexican school children. European journal of paediatric dentistry: official journal of European Academy of Paediatric Dentistry 2012;13(4):307-10.