

## Effect of children's oral health on families' quality of life: A cross-sectional study in Rafsanjan, Iran

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### Original Article

#### Abstract

**BACKGROUND AND AIM:** Oral and dental health condition besides its impact on quality of life (QOL) is a significant aspect of public health appraisal. Recognition of this impact and various dimensions is required to design evidence-based programs. This study was conducted to determine the impact of children's oral health on families' QOL in Rafsanjan City, south of Iran, in 2017.

**METHODS:** This descriptive cross-sectional research was carried out on 631 parents of elementary students who were selected from schools using simple random sampling. Data collecting tool was a 3-section questionnaire including demographic characteristics, Family Impact Scale (FIS), and 6 items of health behaviors associated with oral health. Data were analyzed through SPSS software using statistical tests of Pearson correlation, one-way analysis of variance (ANOVA), independent t-test, and chi-square test at a significance level of 0.050.

**RESULTS:** The mean score of FIS was  $8.59 \pm 8.20$  out of 42. Major harms to family QOL occurred respectively in terms of concern about the child's future, upsetting family members, and needing more care compared to other family members. There was a significant relationship between FIS score and use of toothbrush, toothpaste, dental floss, junk foods, and regular check-up every 6 months ( $P < 0.010$ ). Regular check-up ( $B = -3.54$ ), regular brushing ( $B = 2.10$ ), and less use of junk foods ( $B = 1.40$ ) were three main factors in FIS ( $P < 0.001$ ).

**CONCLUSION:** Considering the association between oral health behaviors and FIS, evidence-based interventional programs for children and parents are recommended. Also, to remove financial barriers, available and affordable services are recommended.

**KEYWORDS:** Oral Health; Family; Quality of life; Child; Iran

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Oral health is essential to general health and quality of life (QOL). It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an

individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing.<sup>1</sup> Oral and dental health condition and its impact on QOL and daily living are significant aspects of public health appraisal.<sup>2</sup>

Health-related QOL (HRQOL) is a multi-dimensional concept which is one of the main

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criteria for assessing community health. Oral and dental health has been considered in promoting society health so that it has been recognized as one of the eleven significant slogans chanted in 21<sup>st</sup> century.<sup>3</sup> Despite the numerous advances in fighting against disease all around the world, dental disease particularly decay is still the most common disease in the world. Dental decays are observed in 60-90 percent of children and about 100% among adults.<sup>4</sup> Studies have reported adopting oral health behaviors as a support for fundamental actions such as awareness promotion, changing attitude and beliefs of families and children (risk factors), increasing skills, and facilitating treating and therapeutic services.<sup>5-9</sup> In case of absence of primary preventive services at right time, spreading oral diseases leads to physical, social, and mental-spiritual consequences for children and their families. Naturally, implications of children's oral diseases influence over working and activity time, rest time, economic status, and parents' mental conditions.<sup>10</sup> Therefore, oral diseases not only affect various dimensions of children's QOL but also influence family members, parents, siblings, and nurses.<sup>4</sup>

Family Impact Scale (FIS) evaluates family's QOL at different scales affected by child's inappropriate oral health during three past months.<sup>11</sup> The National Oral Health Program (NOHP) has been operating in Iran since 2014. Pregnant women, children under 6 years, and those aged 6 to 14 years were the target groups of the program. The ultimate goal of this program is to promote oral health through activities such as: education, regular examination and care, distribution of mouthwashes, fluoride therapy, and fissure sealant.<sup>12</sup> Since children are the most sensitive and vulnerable groups to dental decay and their health directly associates with society health, this study was conducted to determine children's oral health impact on families' QOL in Rafsanjan City, Iran.

## Methods

This descriptive cross-sectional study was conducted on 631 parents of elementary

students living in Rafsanjan, in 2017. Based on the formula  $Z^2S^2/D^2$  and the study of Al-Riyami et al.,<sup>13</sup> the minimum sample size estimated in this study was 552 ( $S = 3$ ,  $D = 0.25$ , and  $Z = 1.96$ ). The final sample size was estimated to be 614 with 10% missing. Because Rafsanjan is a no-zoning city, simple random sampling was used and selected schools comprised 6 male and female public schools out of 18 schools.

Data collecting tool was a 3-section questionnaire including demographic characteristics with 10 items (child and parents age, class grade, birth order, economic status, education level, job, family size, gender of child, and public health status), family QOL appraisal affected by children's oral health and evaluated by FIS (14 items), and children's oral health-related behaviors including 6 items. FIS evaluates the impact of oral problems on family during the past three months. Responding scale was 4-point Likert scale from never to always including score domain of 0-42. Higher scores indicated more family QOL in terms of various dimensions of children's inappropriate oral health. Parents' responding method was based on self-report. This standard instrument was developed by Jokovic et al.<sup>11</sup> and Nilchian et al.<sup>14</sup> Cronbach's alpha coefficient was reported 0.83 in the study of Nilchian et al.<sup>14</sup>

In third section, some behaviors such as regular appointment with dentist every 6 months and using toothbrush and dental floss regularly were considered. All parts of questionnaire were filled out by parents. According to class differentiation, parents were invited and asked to complete the questionnaires after expressing research goals. Inclusion criterion was parents' consent to participate in research. Data were analyzed after inserting to SPSS software (version 16, SPSS Inc., Chicago, IL, USA) and testing their normality. Tests of Pearson correlation, one-way analysis of variance (ANOVA), independent t-test, and chi-square test at significance level of 0.050 were used.

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## Results

The average age of parents was  $38.01 \pm 5.91$  years (range: 17-58 years); there were 4 members averagely in each family with highest household size equal to 4 members (about 46%). Majority of students (51.8%) were the first child of family and most parents had diploma degree. Other demographic characteristics are reported in table 1. Student's average age was  $9.6 \pm 1.8$  years (range: 7-13 years).

The Tukey's test showed a significant difference in the mean score of FIS between families with poor economic status and those with moderate or good economic status ( $P < 0.050$ ). In terms of parental education, there was only a significant difference in the mean score of FIS between the elementary and academic level ( $P = 0.003$ ). Tukey's test also showed a significant difference in the mean

score of FIS between worker and retired people ( $P = 0.010$ ). There was no significant difference between the mean scores of other groups' FIS in the variables of family economic status, educational level, and job ( $P > 0.050$ ).

Majority of parents, 73% and 46%, described optimal public health situation and oral health of children, respectively. Chi-square test indicated a significant relationship between description of children's public health and oral health status ( $P < 0.001$ ).

The mean score of FIS was  $8.59 \pm 8.21$  out of 42. Parents' responses to questions have been described in table 2 that according to its results, the most serious harms to family QOL due to children's inappropriate oral health respectively included: being concerned for children situation, being sad, needing more care compared to other family members, and economic problems.

In this research, 214 members (34.1%) used toothbrush regularly, 31 members (4.9%) used toothpaste regularly, 57 members (9.0%) used dental floss regularly, 151 members (25.3%) often used junk foods, 503 members (81.0%) referred to the dentist due to pain and dental problems, and 288 members (45.9%) visited dentist regularly every 6 months (Table 3).

**Table 1.** Participants' demographic characteristics and their relationship with Family Impact Scale (FIS)

Variables							P	F or t
Class grade	First	Second	Third	Fourth	Fifth	Sixth	0.280*	F = 1.25
n (%)	93 (14.8)	98 (15.6)	70 (11.1)	133 (21.0)	97 (15.4)	139 (22.0)		
Mean $\pm$ SD	8.93 $\pm$ 8.30	7.18 $\pm$ 7.10	8.65 $\pm$ 8.20	9.86 $\pm$ 8.40	8.15 $\pm$ 8.10	8.47 $\pm$ 8.10		
Economic situation	Poor		Moderate		Good		0.005*	F = 5.43
n (%)	69 (11.6)		464 (74.0)		62 (10.4)			
Mean $\pm$ SD	11.36 $\pm$ 8.00		8.55 $\pm$ 8.20		6.60 $\pm$ 7.40			
Parents' education	Elementary		Middle school	Diploma	Academic		0.004*	F = 4.49
n (%)	55 (8.9)		94 (15.3)	258 (41.9)	209 (33.9)			
Mean $\pm$ SD	11.50 $\pm$ 8.50		8.95 $\pm$ 7.80	8.90 $\pm$ 8.20	7.18 $\pm$ 7.70			
Parents' job	Worker		Employee	Self-employed	Retired		0.017*	F = 3.43
n (%)	150 (24.8)		132 (22.7)	152 (25.2)	165 (27.3)			
Mean $\pm$ SD	8.36 $\pm$ 8.30		6.80 $\pm$ 7.90	9.86 $\pm$ 7.70	8.93 $\pm$ 8.20			
Gender of child	Girl				Boy		0.680**	t = -0.41
n (%)	278 (49.38)				285 (50.62)			
Mean $\pm$ SD	8.66 $\pm$ 8.46				8.37 $\pm$ 7.57			

SD: Standard deviation; ANOVA: Analysis of variance

\*One-way ANOVA, \*\*Independent t-test

**Table 2.** Frequency distribution of responses provided on the Family Impact Scale (FIS)

Questions (events experienced during the past 3 months due to dental problems of children)	Response scale				Mean ± SD	Priority
	Never	Once or twice	Sometimes	Often or always		
Concerned about the child's future	234 (37.7)	133 (21.4)	163 (26.2)	91 (14.7)	1.18 ± 1.09	1
Upsetting family members	264 (41.9)	169 (26.8)	145 (23.0)	52 (8.3)	0.98 ± 0.99	2
Needing more care compared to other family members	308 (48.9)	161 (25.6)	135 (21.4)	26 (4.1)	0.81 ± 0.91	3
Economic problems	378 (60.7)	102 (16.4)	88 (14.1)	55 (8.8)	0.71 ± 1.01	4
Feelings of humiliation, shame, and guilt	393 (63.0)	82 (13.1)	104 (16.7)	45 (7.2)	0.68 ± 0.99	5
Less attention to other family members	389 (62.1)	116 (18.5)	103 (16.5)	18 (2.9)	0.60 ± 0.86	6
Discomfort in public	408 (65.4)	95 (15.2)	95 (15.2)	25 (4.0)	0.58 ± 0.88	7
Creating controversy and debate in family	415 (66.8)	97 (15.6)	85 (13.7)	24 (3.9)	0.55 ± 0.86	8
Taking leave from work	104 (64.6)	123 (19.6)	91 (14.5)	9 (1.4)	0.53 ± 0.79	9
Sleep disturbance	409 (64.8)	116 (18.4)	100 (15.8)	6 (1.0)	0.52 ± 0.79	10
Creating frustration and family disputes	461 (74.4)	74 (11.9)	65 (10.5)	20 (3.2)	0.43 ± 0.80	11
Blaming each other	455 (72.8)	88 (14.1)	63 (10.1)	19 (3.0)	0.41 ± 0.79	12
Family function impairment	457 (71.9)	99 (15.7)	71 (11.4)	6 (1.0)	0.41 ± 0.72	13
Creating jealousy and mistreatment	502 (80.7)	58 (9.3)	50 (8.0)	12 (1.9)	0.31 ± 0.70	14

SD: Standard deviation

Independent t-test indicated a significant relationship between FIS score and regular appointment with dentist every 6 months ( $P < 0.001$ ,  $t = 6.03$ ). Families that set regular appointment with dentist for their children experienced less children's oral and dental

pain impact on their QOL. One-way ANOVA test showed a significant relationship between FIS and use of toothbrush ( $P < 0.001$ ,  $F = 13.06$ ), use of toothpaste ( $P = 0.001$ ,  $F = 7.67$ ), use of dental floss ( $P = 0.010$ ,  $F = 4.63$ ), and use of junk foods ( $P < 0.001$ ,  $F = 36.66$ ) (Table 3).

**Table 3.** Distribution of behaviors related to children's oral health and mean and standard deviation (SD) of Family Impact Scale (FIS)

Oral health behaviours		Response scale for oral health behaviours			Statistical test, P, F or t
		Yes, regularly	Yes, sometimes	No	
Use of toothbrush	n (%)	214 (34.1)	381 (60.6)	33 (5.3)	One-way ANOVA, $P < 0.001$ , $F = 13.06$
	Mean ± SD	6.44 ± 7.40	9.58 ± 8.36	12.03 ± 8.37	
Use of toothpaste	n (%)	31 (4.9)	235 (37.4)	363 (57.7)	One-way ANOVA, $P = 0.001$ , $F = 7.67$
	Mean ± SD	4.23 ± 6.14	7.72 ± 7.98	9.47 ± 8.29	
Use of dental floss	n (%)	57 (9.0)	519 (82.4)	54 (8.6)	One-way ANOVA, $P = 0.010$ , $F = 4.63$
	Mean ± SD	6.56 ± 8.64	8.50 ± 8.12	11.33 ± 7.89	
Use of junk foods		Rarely	Sometimes	Often or always	One-way ANOVA, $P < 0.001$ , $F = 36.66$
	n (%)	192 (32.2)	254 (42.5)	151 (25.3)	
Referring to the dentist due to pain and dental problems	Mean ± SD	5.00 ± 5.56	10.28 ± 7.95	11.08 ± 9.61	Independent t-test, $P < 0.001$ , $t = 4.79$
	n (%)	503 (81.0)	118 (19.0)		
Regular check-up every 6 months	Mean ± SD	5.29 ± 6.67	9.35 ± 8.31		Independent t-test, $P < 0.001$ , $t = 6.03$
	n (%)	288 (45.9)	340 (54.1)		
	Mean ± SD	6.79 ± 7.52	10.75 ± 8.47		

ANOVA: Analysis of variance; SD: Standard deviation

**Table 4.** Determining the impact of independent variables on Family Impact Scale (FIS) (multiple linear regression)

Model	Unstandardized coefficients		Standardized coefficients	t	P
	B	SE	Beta		
Constant	23.345	5.005	-	4.664	0.0001
Birth rank	1.332	0.524	0.150	2.540	0.0110
Economic situation	-1.609	0.750	-0.093	-2.144	0.0330
Parents' education	-1.101	0.437	-0.124	-2.519	0.0120
Parents' job	0.225	0.325	0.031	0.691	0.4900
Parents' age	-0.145	0.071	-0.104	-2.046	0.0410
Family size	-0.659	0.411	-0.083	-1.604	0.1090
Referring to the dentist due to dental problems	-2.387	0.990	-0.111	-2.411	0.0160
Regular check-up	-3.543	0.746	-0.217	-4.750	0.0001
Use of junk foods	1.470	0.257	0.236	5.717	0.0001
Toothbrush	2.119	0.662	0.146	3.202	0.0001
Toothpaste	0.766	0.641	0.054	1.195	0.2330
Dental floss	-1.182	0.843	-0.059	-1.403	0.1610

SE: Standard error

Dependent variable: FIS

One-way ANOVA test showed a significant relationship between FIS and parents' academic education ( $P = 0.004$ ), employed parent ( $P = 0.017$ ), and good economic situation of the family ( $P = 0.005$ ) (Table 1). There was no significant relationship between FIS mean score with child and parent age, class grade, birth rank, gender of child, and family size ( $P > 0.050$ ).

There was a significant difference between the FIS mean score of students who rarely consumed junk food and the students who sometimes, often, or always consumed it ( $P < 0.001$ ). This test showed a significant difference between the FIS mean scores of students who regularly or sometimes brushed and students who did not brush ( $P < 0.001$ ). There was also a significant difference in the three groups of students who regularly or sometimes used dental floss and students who did not use it at all ( $P < 0.050$ ).

Multiple linear regression showed that three variables of regular visitation every six months for check-up ( $B = -3.54$ ), regular brushing ( $B = 2.10$ ), and less use of junk food ( $B = 1.40$ ) were the most powerful factors in enhancing family QOL associated with children oral health ( $P < 0.001$ ) (Table 4). In exchange for regular check-up, the FIS score was reduced by 3.54 and the family QOL improved. In general, the variables and

health behaviors listed in this table predicted 46% mean score of FIS.

## Discussion

Theory of oral health impact on person and family QOL is associated with oral health or disease impact of person and family QOL and performance. One significant advantage of oral HRQOL (OHRQOL) indicators' application can be observed in demanding programs and purposeful interventions promoting oral health;<sup>4</sup> hence, this study was carried out to examine the effect of Iranian children's oral health on their family QOL.

The mean score of FIS was 8.59 out of 42. Concerning about children situation, needing more care compared to other family members, economic problems, and being sad were the most serious harms to family QOL. Approximately, 34.0% used toothbrush, 9.0% used dental floss, and 45.9% visited dentist every 6 months, regularly.

Aldrigui et al.<sup>15</sup> and Jamieson et al.<sup>16</sup> reported more harms to family QOL due to children's inappropriate oral health in terms of concerning for children situation, being sad, sense of guilt and shame, sense of discomfort in presence of others and various situations, and lack of sufficient relationship with family members; these results were in line with results of present study.

Considering the serious oral health impact on various dimensions of family QOL, it is recommended to families to learn required teachings in relation with oral health and QOL. In this regard, health beneficiaries should provide specific facilities for promoting children's oral health.

There was a significant relationship between FIS mean score and regular appointment with dentist (every 6 months) indicating that families who have set regular appointment with dentist for their children experienced lower children's oral health impact. Birungi et al.,<sup>17</sup> Chaffee et al.,<sup>18</sup> and Bahmanpour et al.<sup>19</sup> reported a significant relationship between FIS and variables including parents' job and education, economic status, using dental floss and toothbrush, and junk food consumption; this result is matched with the result obtained by present paper. Hence, it was concluded that some behaviors such as correct and regular tooth brushing, regular use of dental floss, and regular dentist visits could promote children's oral health and family QOL. Families with lower education level and economic status experienced higher children's oral health impact indicating positive impact of family education and economic status on oral health and person QOL. The mentioned findings have been reported by Hooley et al.<sup>20</sup> Accordingly, it is recommended to take into account interventional programs in order to provide inexpensive oral health services for poor population living in city margin. According to the obtained results, employed families obtained lower FIS mean score while retired families obtained higher mean score; these results were in line with findings obtained by Abanto et al.<sup>21</sup> Families who reported regular use of dental floss and toothbrush as well as lower junk food consumption obtained lower FIS mean score; this finding was matched with study of Keikhaee et al.,<sup>22</sup> Pakpour et al.,<sup>23</sup> and Shirzai and Ghanbariha.<sup>24</sup> According to the overall results, it is recommended to promote level of awareness, attitude, and beliefs among

persons and their families toward the studied case.<sup>25-27</sup> This study showed a significant relationship between children's public health and their oral health; there was also a significant relationship between oral health and family QOL. The mentioned results were also reported by Karki et al.,<sup>28</sup> Ortiz-Barrios et al.,<sup>29</sup> and Khodadadi et al.<sup>30</sup> Hence, children's oral health should be essentially considered due to the relation between public health and oral health as well as its impact on family QOL. One of the most important limitations of the research was the lack of parents' participation in completing the questionnaires. Another limitation was the recall bias in answering FIS questionnaire.

### Conclusion

In this research, optimal mean score was obtained for OHRQOL and serious harms to families included: concerning about children situation and future, upsetting family members, and needing more care compared to other family members. There was a significant relationship between FIS score and use of toothbrush, toothpaste, dental floss, junk foods, regular check-up every 6 months, parent academic education, employed parents, and good economic situation of the family.

Hence, it is essential to facilitate referral, costs, and accessibility processes, distribute resources fairly, provide dentistry facilities and services especially in deprived areas, expand information and teach through mass media, and give toothbrush, toothpaste, and dental floss among poor people in order to achieve oral health optimal level. Moreover, it is recommended to design, implement, and evaluate interventional programs for families to expand information, attitude, and behaviors related to oral health.

### Conflict of Interests

Authors have no conflict of interest.

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