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RESEARCH ARTICLE

Correlation Between Oral and Dental Health Status of Primary School Children and Their Family Quality of Life in Torbat Heydariyeh County in Iran

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Abstract:

Background:

Due to little information on Iranian families, this study was conducted to investigate the correlation between the oral-dental health status of primary school children and their Family's Quality of Life (QoL).

Materials and Methods:

In this cross-sectional study, the oral-dental health status of 251 primary school children in Torbat Heydariyeh county, Iran, was examined according to decayed, missing, and filled teeth index for primary (dmft) and permanent (DMFT) teeth by a checklist. Their mothers (n=251) responded to the Family Impact Scale (FIS) for the assessment of family's QoL. Data were analyzed using SPSS version 20 by Poisson and Multiple Linear Regression analyses.

Results:

Primary dental caries of children at an intermediate level (dmft = 3.4 ± 3.1) and their permanent dental caries at a low level (DMFT = 2.6 ± 2.9) were evaluated. The mean score of families' QoL was estimated 13 ± 7.5 out of a maximum of 56. Pearson correlation test showed that there was no significant correlation between the FIS and dmft/DMFT index ($P > 0.05$). Regression models revealed that there was a correlation between mothers' dental visits over the past 8 months with the dmft ($p=0.006$), the DMFT index ($p=0.016$) and families' QoL ($p=0.045$).

Conclusion:

Although our study didn't show a correlation between the dental health status of children and family's QoL, the findings showed that there is still a gap between the goals of the WHO and the dental health status of children in Torbat Heydariyeh county.

Keywords: Family quality of life, Family Impact Scale, Primary school children, dmft/DMFT Index, Dental caries, Dental health status.

Article History

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1. INTRODUCTION

In the today's modern dentistry, not only the impact of children's oral and dental diseases in various aspects of life is given attention, but also the child's family and the Quality of Life (QoL) related to oral and dental health is reflected and evaluated [1, 2]. Oral and dental diseases are common in children [3] that can give children an ugly appearance and

affect their future performance and success [4]. In addition, these diseases also have a significant effect on family structure, including economic pressures, restrictions on the social life of family members, and reduced relationships with others [5].

The current epidemiology of dental caries in the world reflects a clear vision of basic risks regarding conditions, lifestyle and environmental factors. Statistics shows that about 60% to 90% of school children suffer from dental caries [6], and due to problems regarding oral and dental health, over 50 million hours is annually wasted at schools [7]. In addition, statistics shows that the prevalence and severity of dental caries

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in the past 20 years have significantly increased in developing countries [3]. Oral and dental health is currently known as one of the 11 slogans of the 21st century [8]. Reducing the dental caries index or the decay-missing-filled index for permanent teeth (DMFT) to less than one in 12-year-old youngsters had been among the goals of the World Health Organization (WHO) by the year 2010 [9]. The new goals of this organization in the year 2020 are focused on making use of experiences and evaluation of previous goals and emphasis on the importance of oral and dental health as an indispensable component of public health [10]. Since the year 1995 in Iran in line with the integration of healthcare activities in the healthcare network system of the country, the scheme of integration of oral and dental health and primary health care has been raised with the aim of promoting the oral and dental health of community members [11].

A review of previous studies conducted in the country shows that the decay-missing-filled index in Iranian children is much higher than the global average [3]. In a study carried out by Ajami and Ebrahimi in Mashhad in 2001, the mean of decay-missing-filled index for primary teeth (dmft) in children aged 6-7 years old was reported 4.72 ± 4.18 [12]. Also, in a study conducted by Mohebi *et al.* in 2007 on primary third-grade students in Gonabad, the mean of dmft and DMFT in male and female students were estimated 1.04 ± 0.22 and 3.86 ± 1.11 , respectively [2]. However, a review of studies conducted in other countries shows that the mean of these indexes is much lower in other countries. In studies carried out by Vizzotto *et al.* [8] in 12-year-old Brazilian students, and Nuca *et al.* [13] in Romanian children aged 6-12 years old, the rate of these indexes has been reported less than 1. On the other hand, a review of Oral Health-Related Quality of Life (OHRQoL) studies also indicates that there are different questionnaires in the world for studying OHRQoL from the perspective of different people, such as parents, caregivers, and children in different age groups [14]. However, due to the limited number of studies conducted in our country [15], no new information is available about the oral and dental health status of children in primary schools of Torbat Heydariyeh. Also, due to little information on children's OHRQoL in Iranian families, the authors decided to carry out a study aimed at determining the correlation between the oral and dental health status of primary school children and QoL of their families in Torbat Heydariyeh county.

2. MATERIALS AND METHODS

2.1. Study Design and Sampling

This is a cross-sectional study with descriptive design, carried out in 2015 on male and female children aged 11-12 years in primary schools of Torbat Heydariyeh along with their mothers. The sample size was calculated 247 mother and child pairs, using a pilot study on children ($n=30$), and sampling formula (confidence level of 1.96, statistical power of 0.80, the error of 0.05, and accuracy of 0.5). Regarding a 10% attrition, this sample size increased to 272 pairs. In this study, after the initial research design, preparation of questionnaires and the acquisition of necessary permissions, referring to the department of education of Torbat Heydariyeh, two urban and

governmental female schools and two urban and governmental male schools were selected through simple random sampling among all urban governmental schools. After obtaining permission from the schools, children and their parents, fifth-grade and sixth-grade elementary children, entered the study with their mothers through simple random sampling ($n=502$).

The DMFT/dmft indices recommended by the WHO were used to evaluate the number decayed, missing, and filled teeth [9]. The index has 4 tables, two of which are for the decay of permanent and primary teeth, the third is for gum problems, and the fourth table is for scoring. The decay rate is determined by the following;

- 0-1.1 very low
- 1.2-2.6 low
- 2.4-7.4 Moderate
- 4.6-5.5 high
- more than 6.6 very high

Given that; 1. Both WHO and the World Dental Federation (FDI) have stated that the age of 12 is a critical age for decay and for preventive measures, 2. Most 12-year-old, the exception of the third molars, have all permanent teeth, so the permanent dental system begins and child has both permanent and permanent teeth at this age, and 3. According to the WHO, the DMFT/dmft indices is less than 3 in the year 2000 and less than 1 in the year 2010 for children 12 years. It was important for researchers to choose the age of 12 years.

2.2. Measurements

In order to study QoL of families, data collection tools, filled out by mothers at home, consisted of a demographic-health questionnaire with 17 questions, the Persian version of the Family Impact Scale (FIS) with 14 questions, 5-point Likert Scale (ever, once or twice, sometimes, often, every day, or almost every day) with a score of 0-4 for each question. In the questions of this Scale, the frequency of the impact of oral and dental problems of children in the family was studied over the past 3 weeks. The score of the FIS (0-56) was calculated by adding up the scores of all questions. Higher scores indicate a greater impact of oral and dental problems of children on family and, as a result, lower QoL in the family. The psychometric properties of the FIS have been confirmed in numerous studies in Iran [15, 16]. In the present study, the reliability of the FIS was approved using the Cronbach's alpha coefficient (0.95) and the intra-class correlation coefficient or ICC (0.85). Oral and dental examination of school children was conducted by the first author, already trained by an expert dentist, with the dental and gingival decay index checklist using a flashlight and a disposable dental mirror as well as a tongue depressor.

2.3. Ethical Considerations

Before completing the questionnaire, the aim of the study was presented for the participants and the informed consent was obtained from them.

2.4. Data Analysis

Data were entered into SPSS version 20. Given the number of samples and based on the central limit theorem, the distribution of FIS scores was considered as normal. Descriptive statistics was used to describe the data. Furthermore, to investigate the relationships between variables, Pearson's correlation coefficient, Poisson Regression and Multiple Linear Regression were used. The level of significance was considered less than 0.05.

3. RESULTS

The mean of mother's age was 36.9 ± 4.9 with the range of 36-41 years. The mean of the age of children was 11.5 ± 0.5 years. The rest of the demographic and clinical information about mothers and children is shown in Tables 1 and 2. Table 3 shows the mean of dmft and DMFT according to gender in primary school children.

In this study, the mean of the FIS score was estimated 13 ± 7.5 out of the maximum score (56). In a correlation matrix, the relationships between FIS and dmft index as well as DMFT was investigated using Person's correlation tests. Results showed that there was no significant relationship between the FIS variable and children's primary and permanent teeth decay index (dmft: $r=0.06$, $p=0.337$) (DMFT: $r=0.08$, $p=0.185$) (They have not been shown in the Table).

Poisson regression analyses were used to investigate the relationship between variables of dmft and DMFT indices as well as the FIS and demographic-clinical variables. At first by a series of univariate regression analyses significant demographic-clinical variables were found, and then significant variables were entered into the final models. The results of the Poisson regression analyses between children's dmft and DMFT indices and demographic-clinical variables are shown in Table 4. The prevalence ratio (PR) of the dmft index has been increased 1.29 times more in children with bleeding gums. However, in mothers who visited a dentist over the past 8 months, a protective effect was seen. This means that the PR of the dmft index was 19% less common in children of these mothers. In addition, Table 4 shows a protective effect between the DMFT index of children and a number of demographic-clinical variables. This means that children using dental floss (27%), mothers visiting dentists over the past eight months (19%), and finally, female children compared with the males (39%) showed a lower PR of the DMFT index.

Results of the multiple linear regression analysis between the FI and demographic-clinical variables are shown in Table 5. Significant demographic-clinical variables were entered into the final model, following a series of univariate regression analyses. There is a significant reverse relationship only between the FIS and mothers visiting dentists over the past 8 months ($\beta=-0.13$, $p=0.045$). This means that mothers who visited a dentist over the past 8 months reported a lower FIS.

4. DISCUSSION

This study was aimed at determining the correlation between the oral and dental health status of primary school children and families' QoL in Torbat Heydariyeh City.

Investigating families' QoL in the present study showed that the FIS mean was 13 ± 7.5 out of the total score of 57. In a study which was carried out by Goursand *et al.* [17] in 123 parents-caregivers of children between 11 and 14 years of age in Brazil, the mean of FIS was reported 6.97 ± 7.81 . In comparison, our study had a higher average and showed a greater impact of oral and dental problems of children on families and lower QoL of families in Torbat Heydariyeh. Unexpectedly, in this study, no relationship was found between the oral and dental health status of children and families' QoL. While, in the studies of Nemati *et al.*, in Babol, Iran and Alsumait *et al.*, in the Kuwait Capital Region, the life quality of the children and their parents was strongly influenced the oral and dental health status of children [18, 19]. This inconsistency can be related to methodological differences (*e.g.* the number of samples, the type of questionnaires, and the method of data gathering) in the present study.

With respect to the results of oral-dental health examinations in our study and observation of moderate intensity of children's primary teeth decay and low permanent teeth decay, it may be explained that the intensity of tooth decay in children has not affected their families. It seems that Iranian families are more responsiveness to acute and severe oral and dental problems of children. This result is consistent with the findings of Mazaheri *et al.* [16]. However, in a study by Nilchian *et al.* [15] in the city of Amol, Iran a significant relationship was found only between the dmft and the FIS. In addition, several studies have shown that oral and dental problems of children can negatively affect the lives of children and parents [20, 21]. Also, Bönecker *et al.* reported that dental caries could cause functional, physical and aesthetic impairment at early ages, and caries lesions can compromise children's QoL [22]. The results of study by Caglayan *et al.*, showed that oral health-related QoL is correlated with the patient's oral complaints. In addition to the patient's oral health status, factors such as gender, education, and harmful habits may also influence on oral health-related QoL [23]. In the study by James *et al.*, Mother's sense of coherence was negatively associated with the child's caries experience, which affected oral health related QoL of their children. In this context, improving a mother's Sense of coherence can be considered as the key to better oral health and QoL [24]. The results study of Qiu *et al.*, indicated that socioeconomic factors could influence on children's oral health practices, which may be directly related to their caries [25].

Regarding the dmft index, the results of regression models showed that in children with bleeding gums, the PR of primary teeth decay has been higher. However, the prevalence rate of primary teeth decay in children whose mothers visited a dentist over the past eight months was lower. In addition, regarding the DMFT index, the results also showed a protective effect such that the possibility of permanent tooth decay was lower in children using dental floss or in children whose mothers visited a dentist over the past 8 months, and also in female students compared to the males. In addition, with mothers' frequent visits to dentists over the past 8 months, the effect of oral and dental problems of children on families decreased and families' QoL subsequently improved.

Table 1. Demographic and clinical characteristics of mothers (n=251)

Variable		n (%)
Marital Status	Married	234(93.20)
	Divorced/Widowed	17(6.80)
Education	Illiterate	5(2.00)
	Primary school	20(8.00)
	Secondary school	14(5.60)
	High school	21(8.40)
	College	100(39.70)
	University	91(36.30)
Employment Status	Employed	80(31.90)
	Housewife	171(68.10)
Tooth/Gum problems	Yes	105(41.80)
	No	146(58.20)
Visiting the dentist during the past 8 months	Yes	94(37.40)
	No	157(62.60)
Regular tooth brushing	Yes	202(80.50)
	No	49(19.50)

Table 2. Demographic and clinical characteristics of primary school children (n=251)

Variable		n (%)
Gender	Male	125(49.80)
	Female	126(50.20)
Brushing after breakfast	Yes	42(16.70)
	No	209(83.30)
Brushing after dinner	Yes	200(79.70)
	No	51(20.30)
Flossing	Yes	70(27.90)
	No	181(72.10)
Visiting the dentist during the past 8 months	Yes	80(31.90)
	No	171(68.10)
Toothache during the last week	Yes	88(35.10)
	No	163(64.90)
Orthodontic	Yes	14(5.60)
	No	237(94.40)
Gums bleeding	Yes	47(18.70)
	No	204(81.30)

Table 3. Mean and standard deviation of dmft and DMFT teeth in primary school children.

Gender	Dmft, Mean±SD	DMFT, Mean±SD
Male	3.70±3.60	3.20±3.10
Female	3.00±2.60	1.90±2.50
Total	3.40±3.10	2.60±2.90

Table 4. Results of Poisson regression analyses for dmft and DMFT dental caries indices.

Independent variables	β coefficient	Standard error	PR [*] (95% CI)	p value
Child's bleeding gums	0.25	0.07	1.29(1.10-1.50)	0.001
Mother visited the dentist during the past 8 months	- 0.21	0.07	0.81(0.70-0.90)	0.006
Dependent variable: dmft; [*] PR (Prevalence Ratio)				
Independent variables	β coefficient	Standard error	PR [*] (95% CI)	p value
Child use flossing	- 0.31	0.09	0.73(0.60-0.90)	0.002
Mother visited the dentist during the past 8 months	-0.21	0.08	0.81(0.60-0.90)	0.016
Child gender	- 0.49	0.08	0.61(0.50-0.70)	0.000
Dependent variable: DMFT; [*] PR (Prevalence Ratio)				

^{*}Significant demographic-clinical variables based on the results of the univariate regression analyses were entered into the regression models.

Table 5. Results of multiple linear regression analysis for FIS score.

Independent variables	B coefficient Unstandardized	Standard error	β coefficient Standardized	t	p value
Mother visited the dentist during the past 8 months	- 1.97	0.98	0.13	- 2.01	0.045
Child's bleeding gums	-1.85	1.10	0.11	- 1.68	0.093

Dependent variable: FIS score

^{*}Only significant demographic-clinical variables based on the results of the univariate regression analyses were entered into the regression model.

5. LIMITATIONS

Application of the self-reported questionnaires proposes a possibility for recall bias. Also, mothers' conditions during responding to the questionnaires could be influential in their responses.

CONCLUSION

In conclusion, although this study did not show a significant relationship between primary and permanent teeth decay in children and families' quality of life, the findings showed that the health status of primary and permanent tooth of children in Torbat Heydariyeh is far away from the goals of the WHO. Therefore, there is still a long way to reach ideal goals. It is considerable for health policy makers, school nurses and the rest of the involved healthcare forces. They should mobilize resources and take measures, such as educational interventions in order to improve oral and dental health status of children at schools.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study is approved by Shahid Behesti University of Medical Sciences with ethics code IR.SBMU.PHNM.1394.183.

HUMAN AND ANIMAL RIGHTS

Not applicable.

CONSENT FOR PUBLICATION

Informed consent was obtained from all the participants.

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AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this research are available from the corresponding author upon request with permission from the Ethics Committee of School of Nursing and Midwifery in Shahid Beheshti University of Medical Science.

CONFLICT OF INTEREST

The authors declare no conflicts of interest, financial or otherwise.

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REFERENCES

- [1] Jabarifar SE, Birjandi N, Khadem P, Farsam T, Falinezhad F, Moshref- Javadi F. Relationship between quality of life and oral health in 18-45 year-old subjects' referring to Khorasgan School of Dentistry in 2010-2011. *J of Isfahan Den Sch* 2012; 8(1): 68-74.[<https://www.researchgate.net/publication/279679689>]
- [2] Mohebi S, Ramezani A, Matlabi 1 M, Mohammadpour L, Noor N, Sh A, Hosseini ES. The survey of oral-dental health of grade 3 students of Gonabad primary schools in 2007. *Ofogh-e-Danesh. GMUHS Journal* 2009; 14(4): 69-77.[<http://en.journals.sid.ir/ViewPaper.aspx?ID=140664>]
- [3] Shariate E, Mohammad Nejad E, Abotalebi GH. Oral health status of students. *Health and Care J.* 2010; p. 3.[<http://www.magiran.com/temp/mag-pdf/2152017/5752-68581424-PME.pdf>]
- [4] Kolk AM, Schipper JL, Hanewald GJ, Casari EF, Fantino AG. The Impact-on-Family Scale: A test of invariance across culture. *J Pediatr Psychol* 2000; 25(5): 323-9.[<https://academic.oup.com/jpepsy/article/25/5/323/1014483/The-Impact-on-Family-Scale-A-Test>]

- of-Invariance] [<http://dx.doi.org/10.1093/jpepsy/25.5.323>] [PMID: 10880062]
- [5] World Health Organization. Oral health country/area profile project Available from <http://www.mah.se/capp>
- [6] Mohammadi Zeidi I, Yekaninejad MS, Akaberi A, Pakpour A. The effectiveness of Motivational interviewing (MI) of oral self-care behaviors among high school students in Qazvin. *Journal of North Khorasan University of Medical Sciences* 2013; 5(1): 138. <http://en.journals.sid.ir/ViewPaper.aspx?ID=352085>
- [7] Rahimi F, Shojaezade D, Zeraati H, Akbarian M. Oral health care based on educational health belief model in child. *Health and Hygiene Ardabi J* 2012; 2(1): 74-81. [http://healthjournal.arums.ac.ir/browse.php?a_id=128&sid=1&slc_lang=en].
- [8] Vizzotto D, Paiano HM, Rudey AC, Lovera AK, Hagemann P, Gazolla T. DMFT index of 12 year-old students of public schools participating in the project of education for working for health. *RSBO Revista Sul-Brasileira de Odontologia* 2013; 10(3): 245-51. [<https://www.redalyc.org/articulo.oa?id=153028468009>].
- [9] Sadeghi M, Bagherian A. DMFT Index bilateral dental caries occurrence among - 12 - Year old students in Rafsanjan. *J of Uni of Med Sci Rafsanjan* 2007; 7(4): 267-74. [http://journal.rums.ac.ir/browse.php?a_id=520&sid=1&slc_lang=en].
- [10] Kaykhaei R, Rakhshani F, Izadi SH, Hashemi Z. Survey of oral health behaviors and its associated factors in female students of primary schools in Zabol based on health belief model. *Zabol University of Medical Sciences J*. 2012; pp. 34-41.
- [11] Mazloomi Mahmoodabad SS, Roohani Tanekaboni N. Survey of some related factors to oral health in high school female students in Yazd, on the basis of health behavior model (HBM). *J of Birjand Uni of Med Sci* 2006; 15(3): 40-8.
- [12] Ajami B, Ebrahimi M. Oral health status of children 7-6 years old kindergarten in Mashhad. *J Dent* 2006; 29: 235-42.
- [13] Nuca C, Amariei C, Borutta A, Petcu L. Prevalence and severity of dental caries in 6 and 12 year old children in constanta district (Urban Area), Romania. *OHDMBSC* 2009; 8(3): 19-24.
- [14] Golkari A, Moeini A, Jabbarifar SE. Relationship of socioeconomic status with quality of life related to oral and dental health of 2-5-year-olds in Shiraz. *J of Isfahan Dent Sch* 2014; 9(6): 534-4.
- [15] Nilchian F, Jabbarifar SE, Larijani M, Navaei H. Evaluation of the impact of children's oral health on their family quality of life in Amol, Iran. *J of Isfahan Dent Sch* 2013; 8(7): 662-8.
- [16] Mazaheri R, Ahmadi Roobahani A, Jabbarifar SE, Birjandi N, Bayat HR. Evaluation of oral health status in 8-11 year-old primary school students of Isfahan and its effect on their family. *J of Isfahan Dent Sch* 2012; 8(2): 151-61.
- [17] Goursand D, Paiva SM, Zarzar PM, PorDdeusi A, Allison P.J. Family Impact Scale (FIS): Psychometric properties of the Brazilian Portuguese language version. *Eur J Paediatr Dent* 2009; 20(2): 169-74. [PMID:19761289].
- [18] Nemati S, Ghasempour M, Khafri S. Impact of oral and dental health on quality of life in Iranian preschool children and their families. *Electron Physician* 2016; 8(11): 3296-301. [doi: 10.1186/s12955-015-0283-8]. [PMID: 26149439]. [<http://dx.doi.org/10.19082/3296>] [PMID: 28070264]
- [19] Alsumait A, ElSalhy M, Raine K, *et al.* Impact of dental health on children's oral health-related quality of life: A cross-sectional study. *Health Qual Life Outcomes* 2015; 13(1): 98. [doi: 10.1186/s12955-015-0283-8]. [PMID: 26149439]. [<http://dx.doi.org/10.1186/s12955-015-0283-8>] [PMID: 26149439]
- [20] Locker D, Jokovic A, Stephens M, Kenny D, Tompson B, Guyatt G. Family impact of child oral and oro-facial conditions. *Community Dent Oral Epidemiol* 2002; 30(6): 438-48. [PMID:12453115]. [DOI: 10.1034/j.1600-0528.2002.00015.x] [<http://dx.doi.org/10.1034/j.1600-0528.2002.00015.x>] [PMID: 12453115]
- [21] Abanto J, Paiva SM, Raggio DP, Celiberti P, Aldrigui JM, Bönecker M. The impact of dental caries and trauma in children on family quality of life. *Community Dent Oral Epidemiol* 2012; 40(4): 323-31. [doi: 10.1111/j.1600-0528.2012.00672.x]. [<http://dx.doi.org/10.1111/j.1600-0528.2012.00672.x>] [PMID: 22292606]
- [22] Bönecker M, Abanto J, Tello G, Oliveira LB. Impact of dental caries on preschool children's quality of life: an update. *Brazilian oral research* 2012; 26(SPE1): 103-7. [<http://dx.doi.org/10.1590/S1806-83242012000700015>]
- [23] Caglayan F, Altun O, Miloglu O, Kaya MD, Yilmaz AB. Correlation between oral health-related quality of life (OHQoL) and oral disorders in a Turkish patient population. *Med Oral Patol Oral Cir Bucal* 2009; 14(11): e573-8. [<http://dx.doi.org/10.4317/medoral.14.e573>] [PMID: 19680207]
- [24] James JM, Puranik MP, Sowmya KR. Mothers' Sense of Coherence as a Predictor of Oral Health Related Quality of Life Among Preschool Children: A Cross-Sectional Study. *Journal of Indian Association of Public Health Dentistry* 2017; 1;15(1): 11. <http://www.jiaphd.org/text.asp?2017/15/1/11/201939>
- [25] Qiu RM, Lo EC, Zhi QH, Zhou Y, Tao Y, Lin HC. Factors related to children's caries: a structural equation modeling approach. *BMC Public Health* 2014; 14(1): 1071. [doi: 10.1186/s12903-016-0270-4]. [PMID: 27585709]. [<http://dx.doi.org/10.1186/1471-2458-14-1071>] [PMID: 25316607]