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Impact of oral and dental health on quality of life in Iranian preschool children and their families

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Abstract

Introduction: Oral and dental health is one of the most important factors that affect the quality of life of preschool children. This study determined the effect of oral and dental health of preschoolers on their quality of life and that of their parents.

Methods: This descriptive-cross sectional study asked 304 mothers of children aged 2-5 years from Babol, Iran, to complete an Early Childhood Oral Health Impact Scale (ECOHIS) questionnaire. Higher raw scores for ECOHIS indicate more oral problems and lower quality of life as related to oral health. The demographic information and dmft indices of the children were documented. The data were analyzed using the independent sample t-test, one way ANOVA, and the Scheffe post hoc test.

Results: The mean ECOHIS score was 6.65 ± 3.57, and the mean score of "decay, missing and filling teeth" (dmft) was 4.39 ± 3.68. A high correlation (r = 0.725) was observed between the dmft score and the ECOHIS score ($p < 0.001$).

Conclusion: The oral and dental health of the children strongly influenced their quality of life and that of their parents. There was an inverse relationship between dmft and oral health-related quality of life.

Keywords: Oral health, Quality of life, ECOHIS index

1. Introduction

1.1. Background

Quality of life as it relates to health shows an individual's satisfaction with her/his physical and mental characteristics and the ability to perform daily activities (1). Oral health encompasses the health of the oral cavity and the teeth, gums, and mucosa. These features allow an individual to eat, drink, and speak (2). Oral health is one of the important issues in the field of general health of society because oral health problems are widespread and cause high health care costs in addition to affecting the daily lives of people (3).

1.2. Statement of the problem and study logic

Poor oral health causes dental pain and infections in children, so trouble sleeping and difficulty in eating may occur. Also, poor oral health makes disorders in pronouncing words and speaking, and it has negative effect on the facial appearance, so it can make the children be solitary and miss out on the activities at preschool and in school (4, 5). Therefore, determining the relationship between children's oral health and their quality of life is very important. This is because the children's oral health affects their growth, weight, pattern of sleeping, social life, self-confidence, and learning skills. One reliable scale for determining the relationship between oral health and preschool children's quality of life is the Early Childhood Oral Health Impact Scale (ECOHIS) (6-8). Unfortunately, there are significant

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oral and dental health problems in Iran's children, such as early childhood caries, dental pain, and there is a high level of dmft scores (9, 10). Even so, there has been insufficient investigation of the effect of these oral health problems on children's quality of life in Iran even though the Farsi version of the ECOHIS already has been validated for Iran's population (11). Because of the lack of information available in this field, we decided to determine the effect of oral health on the quality of life in preschool children as well as in their families. So, this study is one segment of a research chain that can be used by Iran's health policy makers who are concerned with children's oral and dental health.

1.3. Objectives

The general objective of this research was to determine the effect of oral and dental health on the quality of life of preschool children in Babol's kindergartens and of their families using the Farsi version of the ECOHIS. The specific objectives were to determine the effects of 1) the number of parents in the home, 2) the education levels of the parents, 3) the ages of the children, 4) the gender of the children, and 5) birth order on the oral health-related quality of life for the children and their families.

2. Material and Methods

2.1. Study setting

This descriptive, cross-sectional study selected 400 mothers of children aged 2-5 years from 16 preschools in 16 areas of the city of Babol, Iran. They were selected by multi-stage sampling. The map of the city of Babol was divided into 16 districts, and one preschool was selected from each district to ensure that our statistical sample was included all areas of the city.

2.2. Selection criteria

The criteria for participation of the children aged 2-5 years were the absence of systemic disease and no prolonged use of medications. Mothers and children who did not return the questionnaire or who left more than 5 questions unanswered were excluded. Children who had not developed teeth also were excluded from the study. In all, 304 questionnaires were examined for data analysis.

2.3. Instrument and data collection

The Farsi version of the ECOHIS questionnaire has been confirmed for validity and reliability (11). This questionnaire contains 13 questions classified into two general categories, i.e., effect on the child (9 questions) and effect on the family (4 questions). The effect on the child had 4 components, i.e., symptoms (1 question), child's function (4 questions), child's mental state (2 questions), and child's self-esteem and social interaction (2 questions). The effect on the family comprised parental concerns (2 questions) and family function (2 questions). These questions determined how often an event, such as a toothache, had occurred in the child's lifetime. The questions were scored based on Likert scale, i.e., 0 = never, 1 = hardly ever, 2 = occasionally, 3 = often, 4 = very often, 5 = don't know. The total raw score of the responses varied from 0 to 52. The higher the total score, the greater the degree of oral health problems and the lower the quality of life as related to oral health. A score for missing questions was input as an average score of the remaining items in each section (effect on child or effect on family). The demographic data collected were age, gender, and birth order of child, number of parents at home (one or two), and the parents' education levels. A dentistry student trained by a Master of Pediatric Dentistry measured the dmft index using oral examination tools (disposable dental mirror, dental explorer) in accordance with WHO's criteria for the diagnosis of caries. To preserve the confidentiality of the information, the questionnaires were collected without identifying the individuals by name. Only the names and addresses of the preschools were recorded.

2.4. Statistical analysis

The data were analyzed statistically by the Scheffe post hoc test, one-way ANOVA, and the independent sample t-test.

2.5. Research ethics

The study was approved by the Ethics Committee at Babol University of Medical Sciences (P/Z/304834), and written consent was obtained from the children's mothers.

3. Results

The results showed that the average plus standard deviation of the dmft index was 4.39 ± 3.68. The average plus standard deviation of the ECOHIS scores was 6.65 ± 6.57. For the children's section, it was 4.29 ± 4.21, and for the

parental section, it was 2.35 ± 2.78 (Tables 1 and 2). There was a direct, significant relationship between the dmft and ECOHIS scores. The ECOHIS scores increased as the dmft indices increased, and the level of the oral health-related quality of life (OHRQoL) decreased ($p < 0.001$). A strong correlation ($r = 0.725$) was observed between dmft scores and ECOHIS scores. This correlation was stronger in the parental section ($r = 0.700$) than it was in the children's section ($r = 0.625$). The education level of the parents showed that 50.3% of the mothers and 81.9% of the fathers were high school or university graduates. A direct significant relationship was observed between the level of OHRQoL and both the mother's education level ($p < 0.001$) and the father's education level ($p < 0.05$). This relationship was stronger as it related to the mother's education level. This indicated that an increase in the level of education of the parents increased the level of OHRQoL. The demographic data showed that 42.1% of the children were first-born, 49.0% were second-born, and 8.9% were third-born or fourth-born. The findings showed an inverse relationship between birth order and OHRQoL ($p < 0.001$). An increase in birth order decreased the OHRQoL level. About 15.5% of the children lived in single-parent homes. There was a direct, significant relationship between ECOHIS scores and single-parent households ($p < 0.05$). It means that the children who live only with their mothers at home have lower OHRQoL levels. Of the participants, 53.9% of children were male and 46.1% were female. No significant relationship was observed between a child's gender and OHRQoL ($p = 0.31$). The average age of the children was 4.40 ± 0.77. No significant relationship was observed between the child's age and OHRQoL ($p = 0.14$).

Table 1. Distribution of mothers' ECOHIS responses in the field of oral health impact on child's quality of life

Child impacts	Never, n (%)	Hardly ever, n (%)	Occasionally, n (%)	Often, n (%)	Very often, n (%)	Don't know, n (%)
Oral/dental pain	148 (48.7)	93 (30.6)	49 (16.1)	10 (3.3)	2 (0.7)	2 (0.7)
Difficulty drinking	186 (61.2)	88 (28.9)	24 (7.9)	3 (1.0)	0 (0)	3 (1.0)
Difficulty eating	166 (54.6)	90 (29.6)	40 (13.2)	6 (2.0)	2 (0.7)	0 (0)
Difficulty pronouncing words	233 (76.6)	60 (19.7)	8 (2.6)	2 (0.7)	0 (0)	1 (0.3)
Missed preschool or school	222 (73.0)	52 (17.1)	26 (8.6)	4 (1.3)	0 (0)	0 (0)
Trouble sleeping	198 (65.1)	83 (27.3)	19 (6.3)	2 (0.7)	1 (0.3)	1 (0.3)
Irritable or frustrated	177 (58.2)	91 (21.9)	28 (9.2)	7 (2.3)	1 (0.3)	0 (0)
Avoided smiling or laughing	233 (73.4)	68 (22.4)	10 (3.3)	3 (1.0)	0 (0)	0 (0)
Avoided talking	233 (73.4)	63 (20.7)	14 (4.6)	3 (1.0)	1 (0.03)	0 (0)

Table 2. Distribution of mothers' ECOHIS responses in field of oral health impact on family's quality of life

Family impacts	Never, n (%)	Hardly ever, n (%)	Occasionally, n (%)	Often, n (%)	Very often, n (%)	Don't know, n (%)
Been upset	176 (57.9)	88 (28.9)	25 (8.2)	13 (4.3)	2 (0.7)	0 (0)
Felt guilty	187 (61.5)	85 (28.0)	15 (4.9)	12 (3.9)	3 (1.0)	2 (0.7)
Time off from work and home	209 (68.8)	57 (18.8)	23 (7.6)	0 (0)	0 (0)	0 (0)
Financial impact	195 (64.1)	40 (13.2)	38 (12.5)	29 (9.5)	2 (0.7)	0 (0)

4. Discussion

The results clearly showed that as the child's dmft index increased, the quality of life level as related to oral health of both the child and parent(s) decreased, although this correlation was stronger for the parental section than the children's section. This indicates the effect of children's oral health on parental quality of life was greater than on the

quality of life of the child. The reason for this finding relates to the importance of the health of their child for the parents. It is natural for parents to be very sensitive to and upset about deficiencies in their child's health. A young child would lack perspective and not be as affected by this issue; thus, the quality of life of the parents would be more greatly affected than that of their child. The present study suggests that economic pressure of seeking dental treatment and concerns related to a child's toothache are the most important factors decreasing the oral health related quality of life of the parents.

The average ECOHIS score of present study was 6.6 ± 6.5, while this was 3.1 ± 5.1 in the study by Li et al. in China (12). The oral and dental problems in the population of our study were more than that in the population of the study conducted by Li. The average ECOHIS score in the study by Arrow et al. in Australia was 11.1 ± 8.2 (13). The oral and dental problems in Arrow's study were more than in our study. The average ECOHIS score of the present study in the children's section was 4.2 ± 4.2, while it was 2.6 ± 3.3 in the study of Scarpelli et al. (14) Also the average ECOHIS score of present study in the family section was 2.3 ± 2.7, while it was 1.4 ± 2.2 in Scarpelli's study. The levels of OHRQoL in both sections of child and family's life in our study were lower than of those in the study of Scarpelli. The average dmft in the present study was 4.39 ± 3.68. Segovia-Villanueva et al. recorded an average of 1.54 ± 2.47 in southeast Mexico (15). Scarpelli et al. recorded 2.1 ± 3.1 in Brazil (14). Altun et al. recorded an average of 2.04 ± 2.24 in Turkey (16). It can be concluded from these findings that the children in the present study had a lower level of dental health than those in some of the studies in other countries, so it was necessary for us to do this study in Iran so that the results would be useful to policy makers for improving the OHRQoL of Iran's population. Baginska et al. recorded average dmft scores of 5.56 ± 4.45 for 5-year-old children and 6.69 ± 3.14 for 7-year-old children in Poland (17). The reasons for the higher dmft averages in their study than in our study were insufficient dental hygiene and the absence of children under the age of 5 in their study population. The results clearly showed that, as a child's birth order increased, the level of OHRQoL decreased. This relationship also was reported by Golkari et al. (18). It can be concluded that an increase in the number of children decreases the amount of attention that parents can devote to the smaller children, especially to the third-born and fourth-born children. Therefore, the third and fourth children will have more undesirable OHRQoL than the first and second children.

The results of the present study indicated that an increase in parental educational level increased the level of the OHRQoL. Golkari et al. (18) and Paula et al. (19) reported similar results. The finding that the mother's educational level had a greater effect than the father's suggested that mothers have a more effective role in improving the quality of life as it relates to oral health. Sajadi et al. (20) found that an increase in only the mother's educational level increased the OHRQoL level of the child and that the father's educational level had no significant relationship with OHRQoL level. In this study, children who lived in households with only their mother present had lower OHRQoL than those with just a father present. These single-parent households had no father present because of divorce or death of the father. Locker et al. (21) found that children who lived with just a single parent had lower level of the OHRQoL. Paula et al. (19) reported that the presence of both parents in a child's life had a significant relationship with quality of life as it relates to oral health of the child. The reason for this is likely the lack of financial support from the father that decreases the family's income. When a family cannot afford dental and oral health costs, focus on this fades for the parent and the OHRQoL level decreases. The present study showed no significant relationship between the child's gender and OHRQoL. Du et al. (22) also found no significant difference for the effect of gender on the effect of oral health on quality of life. Macintyre et al. (23), however, reported that the health of girls had more effect on their quality of life than that of boys. They suggested that this result related to the age of the children in the study population (over 15 years). At this age, girls tended to focus more on the aesthetic aspects of oral health. The lack of a difference related to gender in the present study was related to the age of the study population (2-5 years). Gender differences in children at these ages do not affect their perception of the aesthetic aspects of oral health.

5. Conclusions

The present study showed that the oral and dental health of children aged 2-5 years in the city of Babol, Iran, affected their quality of life and that of their parents. The quality of life related to oral health had a significant inverse relationship with dmft and child's birth order and a direct significant relationship with parental education level and the number of parents in the home. No significant effect was found for the children's ages or gender.

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Conflict of Interest:
There is no conflict of interest to be declared.

Authors' contributions:
All authors contributed to this project and article equally. All authors read and approved the final manuscript.

References:

1) Guyatt GH, Feeny DH, Patrick DL. Measuring health-related quality of life. Ann Intern Med. 1993; 118(8): 622-9. doi: 10.7326/0003-4819-118-8-199304150-00009, PMID: 8452328.
2) Gift HC, Reisine ST, Larach DC. The social impact of dental problems and visits. Am J Public Health. 1992; 82(12): 1663-8. doi: 10.2105/AJPH.82.12.1663, PMID: 1456343, PMCID: PMC1694558.
3) Sisson KL. Theoretical explanations for social inequalities in oral health. Community Dent Oral Epidemiol. 2007; 35(2): 81-8. doi: 10.1111/j.1600-0528.2007.00354.x. PMID: 17331149.
4) Hagglin C, Berggren U, Hakeberg M, Edvardsson A, Eriksson M. Evaluation of a Swedish version of the OHIP-14 among patients in general and specialist dental care. Swed Dent J. 2007; 31(2): 91-101. PMID: 17695054.
5) Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century--the approach of the WHO Global Oral Health Programme. Community Dent Oral Epidemiol. 2003; 31 Suppl 1:3-23. doi: 10.1046/j..2003.com122.x, PMID: 15015736.
6) Pahel BT, Rozier RG, Slade GD. Parental perceptions of children's oral health: the Early Childhood Oral Health Impact Scale (ECOHIS). Health Qual Life Outcomes. 2007; 5: 6. doi: 10.1186/1477-7525-5-6, PMID: 17263880. PMCID: PMC1802739.
7) Li S, Veronneau J, Allison PJ. Validation of a French language version of the Early Childhood Oral Health Impact Scale (ECOHIS). Health Qual Life Outcomes. 2008; 6: 9. doi: 10.1186/1477-7525-6-9, PMID: 18211711, PMCID: PMC2245912.
8) Lee GH, McGrath C, Yiu CK, King NM. Translation and validation of a Chinese language version of the Early Childhood Oral Health Impact Scale (ECOHIS). Int J Paediatr Dent. 2009; 19(6): 399-405. doi: 10.1111/j.1365-263X.2009.01000.x, PMID: 19811551.
9) Toutouni H, Nokhostin MR, Amaechi BT, Zafarmand AH. The Prevalence of Early Childhood Caries among 24 to 36 Months Old Children of Iran: Using the Novel ICDAS-II Method. J Dent (shiraz). 2015; 16(4): 362-70. PMID: 26636126, PMCID: PMC4664035.
10) Mohebbi SZ, Virtanen JI, Vahid-Golpayegani M, Vehkalahti MM. Early childhood caries and dental plaque among 1-3-year-olds in Tehran, Iran. J Indian Soc Pedod Prev Dent. 2006; 24(4): 177-81. PMID: 17183180.
11) Jabarifar SE, Golkari A, Ijadi MH, Jafarzadeh M, Khadem P. Validation of a Farsi version of the early childhood oral health impact scale (F-ECOHIS). BMC Oral Health. 2010; 10: 4. doi: 10.1186/1472-6831-10-4, PMID: 20367888, PMCID: PMC2858088.
12) Li MY, Zhi QH, Zhou Y, Qiu RM, Lin HC. Impact of early childhood caries on oral health-related quality of life of preschool children. Eur J Paediatr Dent. 2015; 16(1): 65-72. PMID: 25793957.
13) Arrow P, Klobas E. Child oral health-related quality of life and early childhood caries: a non-inferiority randomised control trial. Aust Dent J. 2015. doi: 10.1111/adj.12352, PMID: 26250076.
14) Scarpelli AC, Oliveira BH, Tesch FC, Leao AT, Pordeus IA, Paiva SM. Psychometric properties of the Brazilian version of the Early Childhood Oral Health Impact Scale (B-ECOHIS). BMC Oral Health. 2011;11:19. doi: 10.1186/1472-6831-11-19, PMID: 21668959, PMCID: PMC3125235.
15) Segovia-Villanueva A, Estrella-Rodriguez R, Medina-Solis CE, Maupome G. Dental caries experience and factors among preschoolers in southeastern Mexico: a brief communication. J Public Health Dent. 2006; 66(2): 88-91. PMID: 16711626.
16) Altun C, Guven G, Akgun OM, Akkurt MD, Basak F, Akbulut E. Oral health status of disabled individuals attending special schools. Eur J Dent. 2010; 4(4): 361-6. PMID: 20922154, PMCID: PMC2948746.
17) Baginska J, Rodakowska E, Wilczynska-Borawska M, Jamiolkowski J. Index of clinical consequences of untreated dental caries (pufa) in primary dentition of children from north-east Poland. Adv Med Sci. 2013; 58(2): 442-7. doi: 10.2478/v10039-012-0075-x, PMID: 23793065.

18) 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 Isfahan Dent Sch. 2014; 9(6): 534-41.
19) Paula JS, Leite IC, Almeida AB, Ambrosano GM, Pereira AC, Mialhe FL. The influence of oral health conditions, socioeconomic status and home environment factors on schoolchildren's self-perception of quality of life. Health Qual Life Outcomes. 2012; 10: 6. doi: 10.1111/j.1600-0528.2006.00323.x, PMID: 22244092, PMCID: PMC3285522.
20) Sajadi FS, Pishbin L, Azhari SH, Moosazadeh M. Impact of Oral and Dental Health on Children's and Parents' Quality of Life Based on Early Childhood Oral Health Impact Scale (ECOHIS) Index. International Journal. 2015; 3(2): 28-31. doi: 10.12691/ijdsr-3-2-2.
21) Locker D. Disparities in oral health-related quality of life in a population of Canadian children. Community Dent Oral Epidemiol. 2007; 35(5): 348-56. doi: 10.1111/j.1600-0528.2006.00323.x, PMID: 17822483.
22) Du RY, McGrath C, Yiu CK, King NM. Health- and oral health-related quality of life among preschool children with cerebral palsy. Qual Life Res. 2010; 19(9): 1367-71. doi: 10.1007/s11136-010-9693-6, PMID: 20582721, PMCID: PMC2963742.
23) Macintyre S, Ford G, Hunt K. Do women 'over-report' morbidity? Men's and women's responses to structured prompting on a standard question on long standing illness. Soc Sci Med. 1999; 48(1): 89-98. doi: 10.1016/S0277-9536(98)00292-5, PMID: 10048840.