

Original Article



Assessment of the Quality of Life Related to Oral Health (OHRQOL) of 3-6-Year-Old Children Suffering from Congenital Heart Disease in Kerman, Iran

Fatemeh Sadat Sajadi¹ , Zahra Salari¹ , Reyhaneh Aftabi¹ , Laya Moeinadini² , Abolfazl Shiri^{3*} ¹Oral and Dental Diseases Research Centre, Kerman University of Medical Sciences, Kerman, Iran²Dentist, Private Practice, Kerman, Iran³Oral and Dental Diseases Research Centre, Kerman University of Medical Sciences, Kerman, Iran*Corresponding Author: Abolfazl Shiri, Email: a.shiri@kmu.ac.ir

Abstract

Background: Children with congenital heart disease (CHD) generally experience poorer overall health. This study aimed to assess the oral health-related quality of life (OHRQOL) of children aged 3 to 6 years old with CHD in Kerman province.**Methods:** This descriptive-analytical cross-sectional study included 254 children (127 healthy controls and 127 children with CHD). Data were collected by recruiting the Persian version of the Early Childhood Oral Health Impact Scale (F-ECOHIS). The questionnaire assesses how oral health affects the daily routines of both children and their families. A higher score means a greater negative impact, more dental problems, and a lower OHRQOL. A clinical oral examination was also performed, and the DMFT index was recorded. Data were analyzed using SPSS version 21 through t-tests, Chi-squared tests, and linear regression, with a significance level set at 0.05.**Results:** The mean OHRQOL score was 9.77 among healthy children versus 15.50 among the CHD group ($P=0.001$). The mean DMFT index was 4.50 in the CHD group and 2.37 in the healthy group ($P=0.0001$). Older age was significantly associated with poorer OHRQOL in both groups ($P=0.0001$). Higher paternal education level was significantly linked to worse OHRQOL only in the CHD group ($P=0.011$). Among affected children, the non-cyanotic subgroup showed a significantly higher DMFT than the cyanotic subgroup ($P=0.005$).**Conclusion:** The findings indicate that children with CHD have significantly lower OHRQOL and a higher DMFT index compared to healthy peers. These findings highlight the need for targeted oral health intervention programs for children with CHD.**Keywords:** F-ECOHIS questionnaire, Congenital heart defect, OHRQOL**Citation:** Sajadi FS, Salari Z, Aftabi R, Moeinadini L, Shiri A. Assessment of the quality of life related to oral health (OHRQOL) of 3-6-year-old children suffering from congenital heart disease in Kerman, Iran. J Oral Health Oral Epidemiol 2026;15:2510.1805. doi:10.34172/johoe.2510.1805**Received:** October 18, 2025, **Revised:** May 3, 2026, **Accepted:** July 12, 2026, **ePublished:** July 28, 2026

Introduction

Oral health conditions influence preschoolers and their OHRQOL. The poorest oral health conditions have more severe negative impacts on the quality of life of both families and children.^{1,2} According to the literature, OHRQOL levels are inversely related to enamel defects, family socio-economic indicators such as residential area, household income, number of children in the family, and paternal education level.³⁻⁵

Congenital heart defects (CHDs) rank among the most common birth anomalies (approximately 8 to 12 per 1000 live births worldwide) and are categorized into cyanotic and non-cyanotic types.⁶ Tetralogy of Fallot is an example of cyanotic CHD, while left-to-right shunts, ventricular septal defects, and autism spectrum disorder fall under the non-cyanotic category.⁷ As a chronic condition, CHD

imposes persistent limitations on quality of life.⁸ Given the duration and severity of heart diseases, various dimensions of quality of life undergo substantial changes, particularly when frequent and complex surgical interventions are required, causing children to face physical, social, and psychological consequences.⁹

Children with CHD experience a lower overall health level.¹⁰ Specific complications include poor oral health, severe dental caries, increased DMFT scores, increased gingivitis and periodontitis^{6,11-15}, reduced calcium and phosphate content in enamel and dentin¹⁶, impaired enamel deposition due to effects on ameloblasts, and a higher prevalence of oral infections along with infective endocarditis following dental and surgical procedures.¹¹

Beyond poor oral health, factors such as paternal education level, negative behaviors, daily medication use,



and single-parent households also influence the incidence, prevalence, and severity of dental caries in children with CHD.^{15,17}

Maintaining oral health in children with CHD requires special attention, as these children face a heightened risk of bacterial endocarditis following invasive dental treatments.^{6,17} Moreover, they often exhibit enamel hypoplastic lesions that increase susceptibility to caries. While parents focus on managing cardiac complications, oral health tends to be neglected. The administration of sucrose-sweetened liquid medications may further raise the incidence of caries and gingivitis. Dental problems can lead to premature tooth extractions or the need for treatment under general anesthesia.¹⁷

Child oral care and parental knowledge play a significant role in the quality of life of children with CHD.^{10,18} Therefore, given the critical importance of assessing oral health and quality of life in this population, along with improving parental knowledge and attitudes to identify oral health needs, and given the limited number of studies in Iran, this study aimed to compare the OHRQOL of 3-to 6-year-old children with CHD versus healthy peers in Kerman using the F-ECOHIS questionnaire.

Methods

This descriptive-analytical cross-sectional study was conducted on 254 children aged 3 to 6 years, comprising 127 healthy children and 127 children with CHD. The data collection instrument was the F-ECOHIS (Farsi Version of the Early Childhood Oral Health Impact Scale) as proposed by Jabarifar et al.¹⁹ The validity and reliability of the questionnaire have been previously confirmed.¹⁹

At the start of the questionnaire, demographic information (age and sex), social-behavioral variables (parental education level), and medical history of heart disease (cyanotic vs. non-cyanotic) were recorded for the patient group. ECOHIS contains 13 questions regarding the impact of oral health on children's daily activities (9 items) and their families (4 items). The child impact section covers disease symptoms, child function, psychological aspects, self-confidence, and social interactions. The parent impact section addresses parental distress and function. Responses were scored based on a Likert scale from 0 to 4 (never = 0, a little = 1, sometimes = 2, often = 3, most of the time = 4, and "I don't know" treated as missing). Thus, the child impact subscale ranges from 0 to 36, the family impact subscale from 0 to 16, and the total score from 0 to 52. Higher scores indicate greater impact, more dental problems, and poorer OHRQOL.

Sample size was calculated using G POWER software with 80% power, $\alpha = 0.05$, and an effect size of 0.39. The minimum required sample was 105 per group, but to account for possible attrition, it was increased to 127 per group.

After obtaining written informed consent from parents, the questionnaire was first completed by parents of the CHD group. Subsequently, based on the registered address of the health center, healthy children attending the same center were selected as controls, and their questionnaires

were completed.

Patients were selected via simple random sampling according to inclusion and exclusion criteria. Inclusion criteria: healthy children or those with CHD, aged 3-6 years. Exclusion criteria: developmental-cognitive disorders (e.g., Down syndrome, cerebral palsy) or any other systemic disease besides cardiac disease.

The study proceeded in two stages. First, an oral examination was performed by a trained final-year dental student using a dental probe and an intraoral mirror on a standard chair with a flashlight. The DMFT index (decayed, missing due to caries, and filled teeth) was calculated according to the WHO criteria and recorded. Second, the questionnaire was completed by the parents.

Data were entered into SPSS version 21. Independent t-tests (for continuous variables), Chi-squared tests (for categorical variables), and multivariable linear regression were used to determine significant differences between the groups. The significance level was set at 0.05.

Ethical approval was obtained from the Ethics Committee of Kerman University of Medical Sciences (Ethical code: IR.KMU.REC.1399.080).

Results

Among the 127 healthy children, 60 (47.2%) were female, and 67 (52.8%) were male. In the CHD group, 81 (63.8%) were female, and 46 (36.2%) were male. The largest age category was 5-6 years.

No significant inter-group differences were observed regarding child age, parental education, or the person completing the questionnaire (mother, father, etc.). However, the patient group had significantly more girls than the control group ($P = 0.008$).

The mean DMFT index was 2.37 (± 1.58) in the healthy group and 4.50 (± 1.88) in the CHD group, a statistically significant difference ($P = 0.0001$) (Table 1).

In the patient group, 18.9% (24 children) had cyanotic heart disease and 81.1% (103 children) had non-cyanotic CHD. As shown in Table 2, the DMFT in the non-cyanotic subgroup was significantly higher than that in the cyanotic subgroup ($P = 0.005$).

According to Table 3, OHRQOL scores were significantly higher in the CHD group, indicating a poorer condition.

No significant gender difference in OHRQOL was found within the CHD group. However, in the control group, families with a boy showed a significantly higher score on family impact questions ($P = 0.033$), although overall quality of life and the family impact domain did not differ significantly. Overall, there was no significant gender-based difference in total OHRQOL.

Linear regression revealed that in the CHD group,

Table 1. Comparison of DMFT between healthy and CHD groups

	CHD	Healthy	P-value*
	Mean (SD)	Mean (SD)	
DMFT	4.5 (1.88)	2.37 (1.58)	0.0001

*Independent t-test. SD = Standard Deviation.

Table 2. The correlation between OHRQOL and DMFT with type of CHD

		Mean (SD)	P-value*
OHRQOL family impact	Cyanotic	5.70 (4.12)	0.87
	Non-cyanotic	5.86 (5.33)	
DMFT	Cyanotic	3.97 (1.14)	0.005
	Non-cyanotic	4.66 (1.99)	

*Independent t-test. SD = Standard Deviation.

Table 3. OHRQOL in the healthy and CHD groups

Group	CHD	Healthy	P-value*
	Mean (SD)	Mean (SD)	
OHRQOL (Impact on child)	9.66 (8.70)	5.96 (7.14)	0.0001
OHRQOL (Impact on family)	5.83 (5.11)	3.80 (4.75)	0.001
OHRQOL	15.49 (12.78)	9.77 (11.12)	0.0001

*Independent t-test. SD = Standard Deviation.

increasing age, higher DMFT, and higher paternal education were associated with worse OHRQOL. In the healthy group, poorer quality of life was significantly associated with increasing age and higher DMFT.

Discussion

In the present study, the mean F-ECOHIS score in 3- to 6-year-old children with CHD was significantly higher than that in healthy peers (in both subscales and overall), which is consistent with the findings of Amirabad et al. in Zahedan.¹⁴

Several earlier studies have shown that children with CHD have more decayed teeth^{20,21}, more dental plaque and gingivitis²², and consequently worse OHRQOL.²³

In the present study, the mean OHRQOL score in the healthy group was 9.77 out of 52 (18.79%). This value differed from those reported by Golkari et al.⁴ and Sajadi et al.¹⁸. Sajadi et al., who evaluated children aged 2–5 years in Kerman, reported a mean score of 7.35 out of 52 (14.13%), whereas Golkari et al., in a study conducted in Shiraz, reported a mean score of 20.70 out of 85 (24.35%).

Our OHRQOL score for children with CHD was 15.49/52 (29.79%), indicating significantly poorer OHRQOL compared to healthy children. This finding aligns with Bsesa et al.'s study¹¹ in Syria, indicating that children with CHD exhibit poor oral health and significantly reduced OHRQOL relative to controls.

The difference in DMFT between healthy (2.37) and CHD participants (4.50) was significant, which is consistent with the findings of Amirabad et al.¹⁴ and Carrilo et al.¹³ Due to dental problems¹⁷, lack of awareness of non-dental healthcare providers, and competing health priorities, oral care is often neglected in these patients.¹³

In the study by Pourmoghadas et al., the DMFT of healthy children was lower than that of the patient group, though the difference was not significant.¹²

In our study, higher DMFT was associated with increased F-ECOHIS scores, consistent with the findings of Amirabad et al.¹⁴ and Sajadi et al.¹⁸

F-ECOHIS scores rose with both age and DMFT. Since DMFT typically increases with age²⁴, the presence of caries, untreated teeth, infection, and other dental problems affects both the child and parents, thereby increasing F-ECOHIS scores as expected.¹⁴

Studies indicate that socio-economic status influences oral health and OHRQOL.^{9,19} Therefore, the two groups were matched by place of residence to isolate the impact of CHD on OHRQOL. No significant differences were found between groups regarding age or parental education.

Our study found no significant gender differences in OHRQOL, in agreement with the findings of Amirabad et al.¹⁴ and Golkari et al.⁴

However, in the control group, families who had boys showed higher family-impact scores, possibly reflecting greater parental attention to boys.

In the patient group, higher parental education was associated with poorer OHRQOL, which is consistent with the findings of Farrokh et al.³ By contrast, Golkari et al.⁴ found a direct positive relationship between education level and OHRQOL. Higher education may improve occupational status and facilitate dental care expenses. Nevertheless, in our CHD group, higher parental education correlated with worse quality of life, possibly because more educated fathers may have less time to attend to their child's dental care.

Conclusion

The findings of the present study demonstrate that children with CHD have significantly worse OHRQOL and a higher DMFT index compared to healthy children. These results emphasize the importance of oral and dental health in children with CHD and highlight the necessity of implementing programs to manage oral health problems in this population.

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Authors' Contribution

Conceptualization: Fatemeh Sadat Sajadi.

Data Curation: Laya Moeinadini.

Formal Analysis: Laya Moeinadini.

Investigation: Abolfazl Shiri.

Methodology: Fatemeh Sadat Sajadi, Abolfazl Shiri.

Project Administration: Fatemeh Sadat Sajadi.

Resource: Zahra Salari.

Software: Reyhaneh Aftabi.

Supervision: Zahra Salari, Reyhaneh Aftabi.

Validation: Zahra Salari.

Visualization: Fatemeh Sadat Sajadi, Reyhaneh Aftabi.

Writing-Original Draft: Fatemeh Sadat Sajadi, Zahra Salari, Reyhaneh Aftabi, Laya Moeinadini, Abolfazl Shiri.

Writing-Review & Editing: Fatemeh Sadat Sajadi, Zahra Salari, Reyhaneh Aftabi, Laya Moeinadini, Abolfazl Shiri.

Competing Interests

The authors declare that they have no competing interests.

Data Availability Statement

Not applicable.

Ethical Approval

This study was approved by the Ethics Committee of Kerman University of Medical Sciences (Ethical code: ID IR.KMU.REC.1399.080).

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