



COMPARATIVE EVALUATION OF ORAL HEALTH-RELATED QUALITY OF LIFE, ORAL HEALTH KNOWLEDGE, AND ORAL HYGIENE PRACTICES AMONG PARENTS OF CHILDREN WITH AND WITHOUT CARDIAC DISEASE: A CROSS-SECTIONAL STUDY

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ABSTRACT Childhood dental outcomes are systematically influenced by household social indicators and home behavioral environments. Aim: To evaluate Oral Health-Related Quality of Life (OHRQoL), home oral hygiene habits, and parental health literacy gaps. Materials and Methods: A validated questionnaire covering socio-demographics, the Early Childhood Oral Health Impact Scale (ECOHIS), and behavioral metrics was administered to parents of 102 children, divided evenly into a study group (Group A, Congenital Heart Disease) and a control group (Group B, healthy children). Results: In Group A, 90.2% had never visited a dentist, mainly due to the misconception that their child's 'teeth were all good' (54.3%), and 43.1% consumed cariogenic liquid medications daily. Additionally, 96.1% lacked knowledge of infective endocarditis prophylaxis requirements. ECOHIS scores showed significantly greater functional impact in Group A (30.4%) versus Group B (3.9%, $p < 0.001$). Conclusion: Substantial gaps exist in preventive guidance and oral-systemic health literacy, warranting integrated pediatric public health strategies.

KEYWORDS : Oral Health-Related Quality of Life, ECOHIS, Congenital Heart Disease, Infective Endocarditis, Parental Oral Health Literacy, Pediatric Dentistry, Antibiotic Prophylaxis

INTRODUCTION

Health is recognized globally as a complex paradigm encompassing physical, psychological, and social equilibrium, extending far beyond the mere clinical absence of active pathologies.¹ In modern multi-disciplinary healthcare systems, pediatric oral health is increasingly understood to be intrinsically connected with general physiological wellness. Early development metrics and dental profiles depend heavily upon structural household socioeconomic indicators, caregiver behaviors, and specialized pediatric clinical conditions.^{2,3}

The baseline evaluation of Oral Health-Related Quality of Life (OHRQoL) provides highly sensitive markers for assessing the operational impact of pediatric conditions. The Early Childhood Oral Health Impact Scale (ECOHIS) serves as a globally validated instrument to quantitatively document child symptom domains and subsequent household functional disruptions.¹⁷ Furthermore, analyzing advanced parental oral health literacy—especially in cohorts where children present with complex cardiovascular anomalies like Congenital Heart Disease (CHD)—is critical. Untreated primary dentition pathologies regularly trigger transient bacteremia via chewing or routine hygiene friction, serving as a dangerous mechanism for the onset of Infective Endocarditis (IE).^{4,5}

A clear discrepancy often manifests between a caregiver's self-reported 'perceived need' and the professional 'normative need' determined by clinical criteria. Parents regularly delay preventive clinical screening until a severe milestone complication occurs, creating unnecessary strain on tertiary hospital units. This study addresses these issues by using a structured questionnaire tool to contrast behavioral, cognitive, and quality-of-life differences between specialized pediatric groups and healthy controls, establishing vital data to guide integrated inter-professional health strategies.¹⁰

MATERIALS AND METHODS

This descriptive cross-sectional questionnaire study was conducted within an institutional dental college hospital and associated pediatric care facilities. Institutional Ethics Committee clear certification was secured prior to launching any field operations. Formal voluntary written informed consent was acquired from each parent or legal guardian before allocating tracking sheets.

The sample cohort comprised 102 parental respondents representing children aged 3-6 years. The study population was systematically split into two distinct, matched operational groups: Group A (the study group, $n=51$ parents of children diagnosed with Congenital Heart Disease) and Group B (the control group, $n=51$ parents of systemically healthy age-matched children).⁶

The primary evaluation instrument consisted of a multi-part, validated,

pre-tested investigator-administered questionnaire structured into three sequential focus areas. Part A tracked essential family backgrounds, child age, gender, and birth weights.¹⁸ Part B deployed the formal 13-item ECOHIS framework, which scores frequencies across Child Impact Domains (symptoms, function, psychology, self-image) and Family Impact Domains (distress, financial constraints) using a 5-point Likert gradient.¹⁷ Part C assessed behavioral patterns, documenting exact brushing configurations, past clinical attendance logs, primary reasons for delaying professional checkups, and parental knowledge regarding advanced cardiac risks (IE pathways and antibiotic prophylaxis indications), with oral examination findings recorded using the oral hygiene, caries, and gingival health indices.¹⁴⁻¹⁶

Statistical operations were performed via SPSS Version 22.0. Descriptive variables were compiled using numeric counts and explicit percentage frequencies. Continuous variables were tabulated as Mean $\pm$ Standard Deviation. Associations across categorical questionnaire outcomes were calculated utilizing Pearson Chi-Square tests and Fisher's Exact tests. Likert scale data derived from the ECOHIS domain matrix were dichotomized into 'With Impact' vs. 'Without Impact' groupings and systematically analyzed using the non-parametric Mann-Whitney U test, maintaining a critical significance cut-off threshold of $p < 0.05$.

RESULTS

The demographic profile of the 102 participating family blocks showed highly consistent parameters. The mean age of children in Group A was 4.17 ± 1.19 years (27 females, 24 males), while the mean age in Group B was 4.21 ± 1.14 years (26 females, 25 males), establishing no statistically significant differences in age or gender criteria. Socioeconomic status assessment indicated that 52.9% of Group A households belonged to the lower socioeconomic stratum, whereas 70.5% of Group B households belonged to the middle socioeconomic tier.¹⁸ Birth weight records revealed that 15% of Group A children were classified as low birth weight (<2.5 kg), compared to 0% in Group B.

The past dental facility utilization metrics revealed significant structural behavioral variations. In Group A, a vast majority of 90.2% of caregivers reported a completely negative history of prior dental clinic visits, with a meager 9.8% reporting any professional contact. Crucially, 100% of those Group A children who had visited a dentist did so strictly as an emergency intervention triggered by acute pain. In comparison, 31.4% of Group B children reported a positive history of dental visits, with 60% of that sub-cohort attending routine preventive appointments every 6 months. This group difference was statistically highly significant ($p = 0.007$).

The primary caregiver-reported reasons for avoiding routine dental

evaluations centered on misconceptions of pediatric development. In Group A, 54.3% of parents who had never taken their child to a dentist stated that the 'teeth all are good,' while 26% believed that primary teeth are 'not important,' and 13% asserted the child was simply 'too young.' For Group B, the predominant reason for non-attendance was similarly the perception that teeth were in good condition (77.8%).

Table 14: Dental Visit History and Primary Caregiver Configurations

Variable Parameter Category	Group A (n=51)	Group B (n=51)	P value
Prior Dental Visit: Yes	5 (9.8%)	16 (31.4%)	0.007**
Prior Dental Visit: No	46 (90.2%)	35 (68.6%)	
Reason: Too Young	6 (13.0%)	4 (11.1%)	-
Reason: Teeth Not Important	12 (26.0%)	4 (11.1%)	-
Reason: Perceived Teeth Good	25 (54.3%)	28 (77.8%)	-
Reason: Child Too Sick / Other	3 (6.5%)	0 (0.0%)	-

Home oral hygiene behavior profiling highlighted additional variations. Parental responsibility during brushing was significantly higher in Group A (41.2% brushed by parents, 31.4% under supervision) than in Group B, where 76.5% brushed under parental supervision. Regarding daily frequency, 51% of Group A parents reported brushing twice daily, while 100% of Group B reported brushing only once per day. Manual toothbrushes were overwhelmingly the primary aid across both cohorts (Group A: 100%, Group B: 98%). However, replacement schedules revealed that 84.3% of Group B parents delayed changing the toothbrush until the bristles were completely frayed, whereas 49% of Group A parents replaced the brush regularly every 3 months ($p = 0.000$).

The evaluation of cariogenic risk histories indicated alarming trends for children with cardiac conditions. A positive history of frequent vomiting episodes was reported by 47.1% of Group A parents, compared to only 2% in Group B ($p = 0.000$). Furthermore, 43.1% of Group A children required daily oral liquid medications in the form of sugar-sweetened medicinal syrups, administered twice daily (59%) or thrice daily (40%). In contrast, 0% of Group B children were on daily liquid medication regimen, yielding a highly significant statistical difference ($p = 0.000$).

Table 15: Home Oral Hygiene Habits and Risk Exposures

Behavioral / Environmental Metric	Group A (n=51)	Group B (n=51)	P value
Brushing Carried Out By Parent	21 (41.2%)	2 (3.9%)	0.000***
Brushing Under Supervision	16 (31.4%)	39 (76.5%)	
Brushing Frequency: Once Daily	25 (49.0%)	51 (100.0%)	1.000
Brushing Frequency: Twice Daily	26 (51.0%)	0 (0.0%)	
Frequent Vomiting History: Yes	24 (47.1%)	1 (2.0%)	0.000***
Daily Oral Syrup Medication: Yes	22 (43.1%)	0 (0.0%)	0.000***

Cognitive awareness evaluation exposed severe systemic health literacy gaps among parents. Only 5.9% of parents in Group A and 3.9% in Group B recognized the fundamental principle that oral health is important for general health. Alarmingly, 58.8% of Group A parents and 23.5% of Group B parents explicitly stated that oral status has no effect on cardiac functions, while 39.2% and 74.5% respectively reported they did not know. Regarding Infective Endocarditis (IE), 84.3% of Group A parents and 88.2% of Group B parents lacked any baseline awareness of the condition. Most critically, 96.1% of Group A parents—whose children are actively vulnerable—were completely unaware of the clinical need for antibiotic prophylaxis prior to invasive dental procedures.

This general lack of knowledge aligns with a documented deficit in professional guidance: 72.5% of Group A parents reported they had never received any oral health counseling. Among the 27.4% who had received information, the primary source was dental/medical students (35.7%), whereas specialized pediatricians (14.3%) and cardiologists (7.1%) rarely provided dental counsel. For Group B, 50.9% had received oral information, primarily from child dentists (34.6%) and mass media channels (30.8%).

Table 17: Parental Systemic Cognitive Literacy Profiles

Knowledge Assessment Category	Group A (n=51)	Group B (n=51)	P value
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Oral health linked to general health: Yes	3 (5.9%)	2 (3.9%)	1.000
Oral health linked to general health: No/Don't Know	48 (94.1%)	49 (96.1%)	
Oral pathology affects cardiac health: Yes	1 (2.0%)	1 (2.0%)	1.000
Aware of Infective Endocarditis: Yes	8 (15.7%)	10 (19.6%)	0.000***
Aware of Antibiotic Prophylaxis Prerequisites: Yes	2 (3.9%)	1 (2.0%)	1.000
Never Received Oral Health Guidance: Yes	37 (72.5%)	25 (49.0%)	-

The Early Childhood Oral Health Impact Scale (ECOHIS) demonstrated distinct functional outcomes between the groups. In the child symptom domain, 25% of Group A parents reported a severe impact of dental pain, compared to only 5.8% in Group B. Functional limitations, such as difficulty chewing solid foods or drinking hot or cold fluids, were reported by 30.4% of Group A parents, contrasting sharply with just 3.9% in Group B. These differences in symptom and function metrics were statistically highly significant ($p < 0.001$). However, psychological impact, child self-image, and familial distress domains showed minimal divergence. The mean total ECOHIS score was notably higher in the cardiac group (14.56 ± 2.35) than in the healthy control group (10.19 ± 2.04), reflecting a significantly compromised oral health-related quality of life for children with CHD.

Table 25: OHRQoL Impact Configurations (ECOHIS Domain Analysis)

ECOHIS Sub-Domain Evaluated	Group A With Impact	Group A Without Impact	Group B With Impact	Group B Without Impact	P value
Child Symptoms (Pain)	25.0%	74.5%	5.8%	94.2%	<0.001* **
Child Function (Chewing/Drinking)	30.4%	69.6%	3.9%	96.1%	<0.001* **
Psychological Comfort	0.0%	100.0%	0.0%	100.0%	1.000
Social Self-Image	0.0%	100.0%	0.0%	100.0%	1.000

DISCUSSION

The results of this survey reveal critical insights into the relationships between home-based pediatric hygiene behaviors, family oral health literacy, and a child's overall oral health-related quality of life. A central finding is the stark divergence between parental 'perceived need' and professional 'normative need.' A significant portion of parents completely skipped routine dental evaluations because they assumed their child's teeth were 'all good' (54.3% in Group A) or believed the child was too young for care, despite underlying dental conditions. This passive approach highlights a widespread cultural reliance on symptomatic treatment, where professional care is sought only when dental pain disrupts daily function.^{7,8}

This behavioral pattern is worsened by a clear deficiency in professional anticipatory guidance from primary healthcare providers. A striking 72.5% of parents of children with Congenital Heart Disease (CHD) reported receiving no foundational oral preventive education. When counseling did occur, it was primarily delivered by dental or medical students rather than the child's primary pediatricians or cardiologists. This lack of communication from specialists leaves caregivers without crucial preventive strategies, reinforcing the misconception that dental care is separate from general pediatric medical surveillance.^{7,11}

The clinical risk environment is further compromised by frequent exposure to cariogenic substrates. Nearly half (47.1%) of the children in Group A experienced frequent vomiting, and 43.1% required daily, multiple doses of sugar-sweetened liquid medicinal syrups. These liquid medications, often formulated with high sucrose concentrations to mask bitter tastes, regularly coat the primary dentition. When combined with a lack of post-intake oral clearance routines or a reliance on single daily brushing, this continuous sugar exposure creates a highly acidic environment that accelerates enamel demineralization.^{9,10}

Most critically, the study reveals a dangerous deficiency in parental literacy regarding oral-systemic connections. The vast majority of caregivers were entirely unaware that untreated chronic dental diseases can lead to transient bacteremia, increasing the risk of life-

threatening complications like Infective Endocarditis (IE) in vulnerable children. Furthermore, 96.1% of parents whose children are actively at risk lacked any awareness of the mandatory guidelines for antibiotic prophylaxis prior to invasive dental care. These findings demonstrate that relying solely on basic home brushing habits is insufficient without structured, professional education that connects oral hygiene directly to systemic health outcomes.^{12,13,19}

CONCLUSION

Although basic home brushing routines are widely practiced, critical parental oral health literacy regarding systemic health implications and professional preventive guidance remains severely deficient. This lack of awareness is particularly concerning for children with chronic conditions like Congenital Heart Disease, where poor oral health presents serious systemic risks. To bridge these literacy barriers, closer integration between pediatrics and pediatric dentistry is essential. Implementing targeted distribution of preventive health literature and establishing early dental screening protocols within pediatric medical centers will help eliminate these educational gaps and significantly improve health outcomes for young children.

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