

Article

Not peer-reviewed version

Oral Health and Quality of Life of Pediatric Patients with Complex Chronic Conditions

Willian Brito Sampaio , Luanderson Lopes , Ana Rita Guimarães Duarte , [Maria Cristina Teixeira Cangussu](#)*,
Andreia Cristina Leal Figueiredo

Posted Date: 14 November 2025

doi: 10.20944/preprints202511.0999.v1

Keywords: oral health; quality of life; chronic disease; child; pediatric dentistry



Preprints.org is a free multidisciplinary platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This open access article is published under a Creative Commons CC BY 4.0 license, which permit the free download, distribution, and reuse, provided that the author and preprint are cited in any reuse.

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

Article

Oral Health and Quality of Life of Pediatric Patients with Complex Chronic Conditions

Willian Brito Sampaio ¹, Luanderson Lopes ¹, Ana Rita Guimarães Duarte ²,
Maria Cristina Teixeira Cangussu ^{3,*} and Andréia C. Leal Figueiredo ³

¹ Dentistry and Health, Postgraduate Program in Dentistry and Health, Faculty of Dentistry, Federal University of Bahia, Salvador, BA, Brazil

² Universidade Estadual de Feira de Santana, Brazil

³ Faculty of Dentistry, Federal University of Bahia, Salvador, BA, Brazil

* Correspondence: cangussu@ufba.br

Abstract

Objective: To analyze the correlation between clinical and subjective oral health indicators and quality of life in pediatric patients with Complex Chronic Conditions (CCC). **Methods:** A cross-sectional study was conducted with 63 pediatric patients with CCC. Data collection in a hospital setting involved oral clinical examinations using the Simplified Oral Hygiene Index, caries experience (DMFT/dmft), gingival bleeding, and Dental Aesthetic Index. Oral health-related quality of life (OHRQoL) was measured using the Parental-Caregivers Perceptions Questionnaire (P-CPQ), completed by caregivers. Correlations between indicators and quality of life scores were analyzed using Spearman's correlation coefficient (ρ), with a significance level of $p < 0.05$. **Results:** Poor oral hygiene was observed in 34.9% of participants (mean OHI = 2.03) and a dmft index of 1.67. Gingival bleeding was present in more than 30% of sites in 47.6% of children, and severe or very severe malocclusion was observed in 47.6%. Overall oral health-related quality of life (OHRQoL) had a mean score of 26.38, with the functional limitation domain being the most affected. There were no correlations between objective clinical indicators and quality of life domains. However, the subjective perception of "difficulty biting or chewing" showed a strong and significant correlation with the functional limitation domain ($\rho = 0.823$; $p < 0.001$) and with overall quality of life ($\rho = 0.812$; $p < 0.001$). **Conclusion:** Functional perception (chewing difficulty) proved to be a more sensitive indicator of the impact on OHRQoL in children with chronic heart disease (CHD) than traditional clinical indices. These findings underscore the importance of incorporating subjective and functional assessments into oral health care strategies for this vulnerable population.

Keywords: oral health; quality of life; chronic disease; child; pediatric dentistry

Introduction

Advances in medical technologies and the consequent reduction in infant mortality have resulted in a significant increase in the number of pediatric patients with Complex Chronic Conditions (CCC) [1,2]. This population, defined by multisystemic chronic diseases, significant medical frailty, and high utilization of health resources, represents a growing group with unique needs [3,4]. CCC encompasses various diagnoses, including congenital malformations and neurological, genetic, and metabolic disorders, which require continuous care and a multidisciplinary approach to ensure well-being and quality of life [5,6].

Within this context, oral health emerges as a frequently neglected, yet essential, component [7]. Children with CCC, also referred to as children with special health care needs (CHNS), have increased vulnerability to oral diseases such as caries, periodontal disease, and malocclusion [8,9]. Risk factors include motor limitations that hinder hygiene, prolonged use of medications (often sugary), special diets, and barriers to accessing specialized dental services [10,11]. These conditions

are not limited to the oral cavity, having a systemic impact that affects feeding, communication, social interaction, and, consequently, the child's quality of life and their family [12,13].

Oral health assessment has traditionally focused on objective clinical indicators, such as the prevalence and severity of caries and oral hygiene status [14]. Although essential, these parameters may not fully capture the patient's or their caregivers' perception of how oral conditions affect their daily lives [15]. Oral Health-Related Quality of Life (OHRQoL) emerges as a complementary measure that assesses the functional, social, and emotional impact of oral problems, an outcome increasingly valued in research and clinical practice [16,17].

Considering the gap in the literature regarding the interaction between clinical findings and caregivers' perceptions in this population, the present study aimed to analyze the correlation between oral health, assessed by objective and subjective clinical indicators, and the quality of life of pediatric patients with complex chronic conditions.

Methodology

A cross-sectional study was conducted. The study population consisted of 63 pediatric patients diagnosed with complex chronic conditions who were treated at a hospital referral center from January to June 2023.

Data collection was carried out in two stages. The first consisted of applying the Parental-Caregivers Perceptions Questionnaire (P-CPQ) to caregivers to assess their perception of their children's oral health-related quality of life (OHRQoL). The P-CPQ comprises 33 items, distributed across four subscales: oral symptoms (OS), functional limitations (FL), emotional well-being (EWB), and social well-being (SWB). The questions refer only to the frequency of events that have occurred in the previous three months. The items have 5 Likert response options: 'never=0', 'once or twice=1', 'sometimes=2', 'often=3', 'every day or almost every day=4'. A 'don't know' response was also permitted and scored as 0. Global ratings of the child's oral health and the impact of the oral condition on their overall well-being were obtained from the parents/caregivers. The international ratings had a 5-point response format, ranging from 'excellent' (0) to 'poor' (4) for oral health and from 'not at all' (0) to 'very much' (4) for wellbeing [18,19].

The second stage involved a complete clinical dental examination, performed by a calibrated examiner (Kappa > 0.8), to determine the child's oral health conditions. The following indices were used, as recommended by the World Health Organization and relevant literature: Simplified Oral Hygiene Index (OHI), to measure the presence of bacterial plaque and calculus; The DMFT and dmft indices were used to assess caries experience in permanent and deciduous teeth, respectively; the Gingival Bleeding Index (GBI%) was used to evaluate the presence of gingival bleeding. All were performed in the hospital setting.

All were performed in the hospital setting. The data were tabulated and analyzed using SPSS software (Version 25.0). A descriptive analysis of sociodemographic variables and clinical indicators was performed. To test the study hypothesis, Spearman's correlation coefficient (q) was used to measure the association between the scores of the P-CPQ domains and clinical oral health indicators, as well as with specific questionnaire items. The significance level adopted was p < 0.05.

It is worth noting that the children who participated in the study and were examined were those whose parents authorized the oral evaluation by signing the Informed Consent Form. The children themselves agreed to the examination. The ethics committee of the Federal University of Bahia approved the research protocol.

Results

The study population consisted of 63 individuals, of whom 57.1% were female. The mean age was 9.79 years (± 3.78). Regarding schooling, 68.4% attended special schools, and only 1.8% were in mainstream schools without adaptations. The descriptive analysis of clinical indicators revealed a compromised oral health scenario in the studied sample (Table 1). Oral hygiene was classified as

deficient in 34.9% of participants, with an average OHIS score of 2.03. Although 60% of the individuals were caries-free in their permanent teeth, the deciduous dentition presented a dmft index of 1.67. Gingival health was also altered, with 47.6% of children presenting bleeding in more than 30% of the examined sites. Malocclusion was prevalent, with 31.7% classified as having severe malocclusion and 15.9% as having very severe malocclusion, according to the DAI index.

Table 1. Description of Oral Health Indices Observed in Children with Complex Clinical Conditions (n=63). Salvador- BA- Brazil, 2023.

Clinical Indicator	Mean (SD)	Highlight Categories	Percentual (%)
OIHS	2.03 (0.85)	Poor Hygiene	34.9
DMFT	-	Caries free	60.0
dmft	1.67 (2.87)	-	-
Gingival Bleeding	-	>30% of sites with bleeding	47.6
DAI	42.09 (17.05)	Severe Malocclusion	31.7
		Very Severe Malocclusion	15.9

SD: Standard Deviation; IHOS: Simplified Oral Hygiene Index; DMFT: Decayed, Missing, and Filled Permanent Teeth; dmft: decayed, extracted, and filled Deciduous Teeth; DAI: Dental Aesthetic Index.

Regarding quality of life, the overall mean P-CPQ score was 26.38. The most affected domain was functional limitation (mean = 12.18), followed by oral symptoms, emotional well-being, and social well-being. There was a high prevalence of oral impacts in all domains. (Table 2).

Table 2. Prevalence and impact scores of each item by domain of the Parental-Caregivers Perceptions Questionnaire (P-CPQ). Salvador-BA, Brazil, 2023. (n=63).

During the last 3 months, how often did your child (have/was)	Prevalence (%)	Mean	Standard Deviation (SD)
ORAL SYMPTOMS			
Pain in teeth, lips, jaw, or mouth?	40.90	3.48	1.90
Bleeding gums?	47.70	2.72	1.45
Mouth sores?	54.50	2.17	1.11
Bad breath?	36.40	3.00	1.18
Has food ever been stuck in the palate?	51.10	2.67	1.35
Has food ever been stuck between the teeth?	52.30	2.81	1.40
Difficulty biting or chewing foods like a fresh apple, corn, or meat?	38.60	3.10	1.56
FUNCTIONAL LIMITATIONS			
Have you been breathing through your mouth?	27.30	3.21	1.55
Have you been having trouble sleeping?	43.21	2.83	1.48
Have you been having difficulty pronouncing some words?	34.10	2.90	1.60
Have you been having difficulty drinking or eating hot or cold foods?	43.20	2.80	1.42
Have you been having difficulty eating what you always liked?	45.50	2.95	1.53
Have you been on a diet restricted to certain foods (e.g., a pureed diet)?	27.05	3.05	1.62
EMOTIONAL WELL-BEING			
Uncomfortable?	38.60	3.15	1.54
Irritated or unhappy?	36.40	3.12	1.52
Anxious or scared?	45.50	2.95	1.49
Missed school due to pain, medical appointments, or surgery?	68.20	2.40	1.35
Had difficulty paying attention in class?	50.00	2.60	1.41

Refused to speak or read aloud in class?	61.40	2.55	1.32
Refused to talk to other children?	61.40	2.62	1.36
Avoided speaking or smiling when with other children?	70.50	2.50	1.30
SOCIAL WELL-BEING			
Worried about not being as healthy as other children?	56.80	2.70	1.40
Worried about being different from others?	61.40	2.65	1.38
Were you worried about not being as good-looking as the others?	72.70	2.75	1.42
Did you behave shyly or feel embarrassed?	65.90	2.80	1.44
Were you the target of teasing or name-calling by other children?	68.20	2.60	1.36
Were you excluded from the group by other children?	68.20	2.55	1.33
DURING THE LAST 3 MONTHS, HOW OFTEN DID YOUR CHILD (HAVE/WAS)			
Feel unenthusiastic or unable to interact with other children?	61.40	2.68	1.39
Did you not want to or lack the energy to participate in activities such as sports, theater, music, or school trips?	61.40	2.72	1.41
Were you worried about having few friends?	70.50	2.66	1.37
Were you worried about what other people think about your teeth, lips, mouth, or jaw?	72.70	2.78	1.43
Did you receive questions from other children about your teeth, lips, mouth, or jaw?	59.10	2.70	1.40

The correlation analysis between objective clinical indicators and quality of life domains showed weak associations without statistical significance (Table 3). For example, the correlation between gingival bleeding and overall quality of life was $\rho = 0.268$ ($p = 0.076$), and between DAI classification and overall quality of life was $\rho = 0.103$ ($p = 0.458$).

Table 3. Spearman correlation between Oral Health Indicators and Quality of Life Domains of the Parental-Caregivers Perceptions Questionnaire (P-CPQ). Salvador-BA, 2023 (n=63).

Variables	FUNCTIONAL LIMITATIONS	ORAL SYMPTOMS	EMOTIONAL WELL-BEING	SOCIAL WELL-BEING	Quality of life (All)
Objective Clinical Indicators					
Gingival Bleeding (%)	$\rho=0.25$ ($p=0.10$)	$\rho=0.28$ ($p=0.06$)	$\rho=0.20$ ($p=0.20$)	$\rho=0.15$ ($p=0.30$)	$\rho=0.27$ ($p=0.08$)
DAI Classification	$\rho=0.01$ ($p=0.48$)	$\rho=0.12$ ($p=0.41$)	$\rho=0.052$ ($p=0.71$)	$\rho=0.03$ ($p=0.82$)	$\rho=0.10$ ($p=0.46$)
Subjective Indicator					
Difficulty biting/chewing	$\rho=0.82$ ($p<0.001$)*	$\rho=0.49$ ($p=0.001$)*	$\rho=0.48$ ($p=0.001$)*	$\rho=0.33$ ($p=0.028$)*	$\rho=0.81$ ($p<0.001$)*

Statistically significant correlation ($p < 0.05$). Values in bold highlight the most substantial correlations in the study.

Conversely, the analysis of subjective items from the questionnaire revealed substantial and statistically significant correlations. The self-reported variable “difficulty biting or chewing food” showed a robust correlation with the functional limitation domain ($\rho = 0.823$; $p < 0.001$) and with overall quality of life ($\rho = 0.812$; $p < 0.001$). Moderate and significant correlations were also observed between this item and the oral symptoms domain ($\rho = 0.490$; $p = 0.001$) and the emotional well-being domain ($\rho = 0.481$; $p = 0.001$) (Table 3).

Discussion

The results of this study reveal a dissociation between clinical indicators of oral health and the perceived impact on the quality of life of children with complex chronic conditions. Although the population presented a high prevalence of poor oral hygiene, gingival bleeding, and severe malocclusion—findings consistent with the literature on pediatric populations with special needs [9,21,22]—these objective findings did not correlate significantly with the QOL-R scores reported by caregivers. This finding is of extreme clinical relevance and suggests that, for this population, clinical signs of disease may not be the primary determinant of well-being.

One possible explanation is the phenomenon of response shift or adaptive response change. Proposed by Sprangers and Schwartz. This theoretical model suggests that individuals facing chronic conditions may recalibrate their internal patterns of severity and impact of the conditions presented, values, and their own conceptualization of quality of life [23,24]. Children with CCC and their caregivers deal with significant health challenges daily, which can lead to a reassessment of what constitutes a “problem” [25]. Although clinically relevant, conditions such as bacterial plaque or gingival bleeding may be seen as secondary or less urgent compared to the manifestations of the underlying chronic condition. Thus, the impact on quality of life would only be perceived when the oral condition reaches a threshold that directly interferes with an essential function, such as feeding.

At this point, the most critical finding of our study is the strong correlation between “difficulty biting or chewing” and the deterioration of quality of life in multiple domains. The masticatory function is a fundamental daily activity directly linked to nutrition, eating pleasure, and socialization [26]. When this function is compromised, the impact is immediate and easily noticeable, affecting the child’s ability to feed adequately (a functional limitation), generating discomfort (oral symptoms), and possibly causing frustration or embarrassment (affecting emotional well-being). This result is consistent with a robust body of evidence demonstrating the association between impaired masticatory function and worsened quality of life in general pediatric populations and adults [27,28]. Yeung et al. (2024) emphasize that chewing is essential for breaking down food and absorbing nutrients, which is crucial for child development [29].

This result is consistent with studies that suggest functional and subjective indicators are often more sensitive to capturing the actual impact of oral diseases than traditional clinical indices [15,30]. The perception of parents or caregivers is a crucial factor, but it can also be influenced by their own oral health literacy and experiences [31,32]. However, functional difficulty is a concrete event and difficult to ignore. Severe malocclusion, prevalent in the study population, is a direct cause of chewing difficulties, and although the DAI index itself did not correlate with OHRQoL, the symptom it causes (chewing difficulties) was present. This suggests that it is not the presence of malocclusion per se that impacts quality of life, but rather its functional consequence [12].

The clinical implications of these findings are clear. Oral health assessment in children with CCC should transcend mere clinical inspection of signs and symptoms. It is essential that healthcare professionals, particularly pediatric dentists, include direct questions about masticatory function and other functional difficulties in their anamnesis. Addressing “chewing difficulties” can be a more effective gateway to planning treatment that genuinely improves the patient’s quality of life, whether through occlusal rehabilitation, treatment of dentin hypersensitivity, or periodontal therapy. The American Academy of Pediatric Dentistry (AAPD) already recommends a patient- and family-centered approach for children with special needs, which includes consideration of functional and quality-of-life aspects [33].

This study has limitations, including its cross-sectional design, which does not permit the establishment of causality. In addition, caregivers collected perceptions, which may not perfectly reflect the child’s experience; however, this is a widely validated method for pediatric populations [18,34]. However, the strength of the correlations provides robust evidence for formulating new hypotheses and, more importantly, for reorienting clinical practice to align with a more holistic and functional approach centered on what matters to the patient and their family [35].

Conclusions

In pediatric patients with complex chronic conditions, traditional clinical indicators of oral health have proved insufficient to predict the impact on quality of life. In contrast, the subjective perception of functional difficulty, especially masticatory difficulty, correlated strongly with a poorer quality of life. It is concluded that the assessment of oral health in this population must necessarily include both functional and subjective indicators for a comprehensive diagnosis and a treatment plan that aims to promote health and the child's overall well-being.

References

- Oliveira PV, Brocchi BS, Enes CC, Nucci LB. Hospitalizations of children and adolescents with complex chronic conditions in Brazil: a temporal analysis from 2009 to 2020. *Eur J Pediatr*. 2023 Sep;182(9):4153-4161. doi: 10.1007/s00431-023-05071-4. Epub 2023 Jul 12. PMID: 374347.
- Cohen E, Kuo DZ, Agrawal R, Berry JG, Bhagat SK, Simon TD, et al. Children with medical complexity: an emerging population for clinical and research initiatives. *Pediatrics*. 2011 Mar;127(3):529-38.
- Parmar A, Hsieh C, Glogauer M, Siddiqi A. Dental care in children with medical complexity. *CMAJ*. 2022 Jun 13;194(23):E809-E814.
- Leyenaar JK, Schaefer AP, Freyleue SD, et al. Prevalence of Children With Medical Complexity and Associations With Health Care Utilization and In-Hospital Mortality. *JAMA Pediatr*. 2022;176(6):e220687. doi:10.1001/jamapediatrics.
- Bjur KA, Wi CI, Ryu E, Crow SS, King KS, Juhn YJ. Epidemiology of Children With Multiple Complex Chronic Conditions in a Mixed Urban-Rural US Community. *Hosp Pediatr*. 2019 Apr;9(4):281-290. doi: 10.1542/hpeds.2018-0091.
- Eiser C, Morse R. A review of measures of quality of life for children with chronic illness. *Arch Dis Child*. 2001 Mar;84(3):205-11. doi: 10.1136/ad.84.3.205.
- Doğan, G.K., Polat, Y. & Özüdoğru, S. Parental awareness and attitudes towards pediatric dentistry and children's oral health. *BMC Oral Health* **25**, 672 (2025). <https://doi.org/10.1186/s12903-025-06037-8>.
- Lebrun-Harris LA, Ghandour RM, Kogan MD, Warren MD. Oral Health Among Children and Youth With Special Health Care Needs. *Pediatrics*. 2021 Aug;148(2):e2020025700.
- Alamri H. Oral Care for Children with Special Healthcare Needs in Dentistry: A Literature Review. *J Clin Med*. 2022 Sep 26;11(19):5557.
- Zhou N, Wong HM, McGrath C. Oral health and associated factors among preschool children with special healthcare needs. *Oral Dis*. 2019 May;25(4):1221-1228. doi: 10.1111/odi.13057. Epub 2019 Feb 21. PMID: 30725497.
- Patidar D, Sogi S, Patidar DC. Oral Health Status of Children with Special Healthcare Need: A Retrospective Analysis. *Int J Clin Pediatr Dent*. 2022 Jul-Aug;15(4):433-437. doi: 10.5005/jp-journals-10005-2419. PMID: 36875986; PMCID: PMC9983592.
- Göransson E, Sonesson M, Naimi-Akbar A, Dimberg L. Malocclusions and quality of life among adolescents: a systematic review and meta-analysis. *Eur J Orthod*. 2023 May 31;45(3):295-307. doi: 10.1093/ejo/cjad009.
- Das P, Mishra L, Jena D, Govind S, Panda S, Lapinska B. Oral Health-Related Quality of Life in Children and Adolescents with a Traumatic Injury of Permanent Teeth and the Impact on Their Families: A Systematic Review. *Int J Environ Res Public Health*. 2022 Mar 6;19(5):3087. doi: 10.3390/ijerph19053087.
- World Health Organization. Oral health surveys: basic methods. 5th ed. Geneva: WHO; 2013.
- Locker D. Measuring oral health: a conceptual framework. *Community Dent Health*. 1988 Mar;5(1):3-18.
- Sischo L, Broder HL. Oral health-related quality of life: what, why, how, and future implications. *J Dent Res*. 2011 Nov;90(11):1264-70. doi: 10.1177/0022034511399918. Epub 2011 Mar 21. PMID: 21422477.
- Hettiarachchi RM, Kularatna S, Byrnes J, Scuffham PA. Pediatric Quality of Life Instruments in Oral Health Research: A Systematic Review. *Value Health*. 2019 Jan;22(1):129-135. doi: 10.1016/j.jval.2018.06.019. Epub 2018 Sep 8.
- Jokovic A, Locker D, Stephens M, Kenny D, Tompson B, Guyatt G. Validity and reliability of a questionnaire for measuring child oral-health-related quality of life. *J Dent Res*. 2002 Jul;81(7):459-63.

19. Pahel BT, Rozier RG, Slade GD. Parental perceptions of children's oral health: the Early Childhood Oral Health Impact Scale (ECHOIS). *Health Qual Life Outcomes*. 2007 Jan 30;5:6. doi: 10.1186/1477-7525-5-6. PMID: 17263880.
20. GREENE JC, VERMILLION JR. THE SIMPLIFIED ORAL HYGIENE INDEX. *J Am Dent Assoc*. 1964 Jan;68:7-13. doi: 10.14219/jada.archive.1964.0034. PMID: 14076341.
21. da Silva ACF, Barbosa TS, Gavião MBD. Parental Perception of the Oral Health-Related Quality of Life of Children and Adolescents with Autism Spectrum Disorder (ASD). *Int J Environ Res Public Health*. 2023 Jan 9;20(2):1151. doi: 10.3390/ijerph20021151. PMID: 36673908.
22. Yang L, Zhao S, Zhu Y, Lai G, Wang J. Oral health-related quality of life and associated factors among a sample from East China with severe early childhood caries: a cross-sectional study. *BMC Oral Health*. 2023 Nov 7;23(1):837. doi: 10.1186/s12903-023-03560-4. PMID: 37936111.
23. Sprangers MA, Schwartz CE. Integrating response shift into health-related quality of life research: a theoretical model. *Soc Sci Med*. 1999 Jun;48(11):1507-15. doi: 10.1016/s0277-9536(99)00045-3. PMID: 10400253.
24. Vanier A, Oort FJ, McClimans L, Ow N, Gulek BG, Böhnke JR, Sprangers M, Sébille V, Mayo N; Response Shift - in Sync Working Group. Response shift in patient-reported outcomes: definition, theory, and a revised model. *Qual Life Res*. 2021 Dec;30(12):3309-3322. doi: 10.1007/s11136-021-02846-w. Epub 2021 Apr 28. Erratum in: *Qual Life Res*. 2021 Dec;30(12):3323-3324. doi: 10.1007/s11136-021-02890-6. PMID: 33909187.
25. Ortega-Gómez, E., Vicente-Galindo, P., Martín-Rodero, H. et al. Detection of response shift in health-related quality of life studies: a systematic review. *Health Qual Life Outcomes* 20, 20 (2022). <https://doi.org/10.1186/s12955-022-01926-w>.
26. Barbosa Tde S, Tureli MC, Nobre-dos-Santos M, Puppini-Rontani RM, Gavião MB. The relationship between oral conditions, masticatory performance and oral health-related quality of life in children. *Arch Oral Biol*. 2013 Sep;58(9):1070-7. doi: 10.1016/j.archoralbio.2013.01.012. Epub 2013 Feb 28. PMID: 23453082.
27. Yamamoto S, Shiga H. Masticatory performance and oral health-related quality of life before and after complete denture treatment. *J Prosthodont Res*. 2018 Jul;62(3):370-374. doi: 10.1016/j.jpor.2018.01.006. Epub 2018 Mar 13. PMID: 29548978.
28. Medeiros LH, Bueno PM, Fidelis da Silva LV, Fukushima AP, Trindade-Suedam IK. Evaluation of masticatory function in the pediatric and adult populations with Treacher Collins syndrome. *J Oral Biol Craniofac Res*. 2025 Nov-Dec;15(6):1460-1466. doi: 10.1016/j.jobcr.2025.08.033. Epub 2025 Sep 6. PMID: 40989145; PMCID: PMC10845510.
29. Au Yeung KSR, Shan Z, Sum FHKMH, Wong KWF, Lee HMG, Yang Y. Association between occlusal features and masticatory function in Hong Kong preschool children: a survey with one-year longitudinal follow-up. *BMC Oral Health*. 2024 Feb 5;24(1):187. doi: 10.1186/s12903-024-03895-6. PMID: 38317203; PMCID: PMC10845510.
30. Slade GD. Derivation and validation of a short-form oral health impact profile. *Community Dent Oral Epidemiol*. 1997 Aug;25(4):284-90. doi: 10.1111/j.1600-0528.1997.tb00941.x. PMID: 9332805.
31. Alzahrani AY, El Meligy O, Bahdila D, Aljawi R, Bamashmous NO, Almushayt A. The influence of parental oral health literacy on children's oral health: a scoping review. *J Clin Pediatr Dent*. 2024 Jul;48(4):16-25. doi: 10.22514/jocpd.2024.074. Epub 2024 Jul 3. PMID: 39087210.
32. Kaushik M, Sood S. A Systematic Review of Parents' Knowledge of Children's Oral Health. *Cureus*. 2023 Jul 6;15(7):e41485. doi: 10.7759/cureus.41485. PMID: 37551253; PMCID: PMC10404335.
33. American Academy of Pediatric Dentistry. Management of Dental Patients with Special Health Care Needs. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2024:5:278-84.
34. Gomes MC, Clementino MA, Pinto-Sarmiento TC, Costa EM, Martins CC, Granville-Garcia AF, Paiva SM. Parental Perceptions of Oral Health Status in Preschool Children and Associated Factors. *Braz Dent J*. 2015 Jul-Aug;26(4):428-34. doi: 10.1590/0103-6440201300245. PMID: 26312985.
35. Ribas-Perez D, Muñoz-Viveros C, Formoso-Veloso AL, Carrillo-Sanchez FJ, El Khoury-Moreno L, Torrejon-Martinez J, Castaño-Seiquer A. Oral Health-Related Quality of Life in a Paediatric Population in the

Dominican Republic. J Clin Med. 2024 Apr 23;13(9):2449. doi: 10.3390/jcm13092449. PMID: 38730978; PMCID: PMC11084811.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.