

Challenges and Innovative Solutions in Oral Health in Children With Disabilities: An Integrative Review

Desafios e Soluções Inovadoras em Saúde Bucal de Crianças com Deficiências: Uma Revisão Integrativa
Desafíos y Soluciones Innovadoras en Salud Bucal en Niños con Discapacidad: Una Revisión Integrativa

RESUMO

Objetivo: analisar a produção científica recente sobre a promoção da saúde bucal em crianças com deficiência, identificando os principais desafios e as soluções apontadas pela literatura. **Método:** revisão integrativa com artigos publicados entre 2019 e 2024, em inglês, nas bases Medline (PubMed), Cochrane, Dentistry & Oral Sciences Source e Cinahl. Foram incluídos estudos primários sobre saúde bucal em crianças com deficiência de 0 a 12 anos. **Resultados:** Foram incluídos 18 artigos na revisão. Os principais desafios incluíram cárie dentária, dificuldades sensoriais e motoras na higiene, comportamentos não cooperativos e barreiras de acesso. As soluções mais citadas foram ações educativas, adaptações de instrumentos, intervenções sensoriais e estratégias de autocuidado. Parte dos estudos não apresentou propostas de ação. **Conclusão:** A promoção da saúde bucal em crianças com deficiência requer estratégias interdisciplinares e suporte contínuo aos cuidadores, com foco em prevenção, adaptação do ambiente e uso de tecnologias acessíveis.

DESCRIPTORES: Crianças com deficiências; Saúde bucal; Promoção da saúde.

ABSTRACT

Objective: to analyze recent scientific literature on promoting oral health in children with disabilities, identifying the main challenges and solutions proposed in the literature. **Method:** an integrative review of articles published between 2019 and 2024 in English, sourced from Medline (PubMed), Cochrane, Dentistry & Oral Sciences Source, and Cinahl. Primary studies focusing on oral health in children with disabilities aged 0–12 were included. **Results:** A total of 18 articles were included in the review. The main challenges included dental caries, sensory and motor difficulties in oral hygiene, uncooperative behaviors, and access barriers. The most frequently cited solutions were educational interventions, adapted tools, sensory-based approaches, and self-care strategies. Some studies did not propose actionable solutions. **Conclusion:** promoting oral health in children with disabilities requires interdisciplinary strategies and ongoing support for caregivers, emphasizing prevention, environmental adaptations, and accessible technologies.

DESCRIPTORS: Children with disabilities; Oral health; Health promotion.

RESUMEN

Objetivo: analizar la producción científica reciente sobre la promoción de la salud bucal en niños con discapacidad, identificando los principales desafíos y las soluciones señaladas por la literatura. **Método:** revisión integradora de artículos publicados entre 2019 y 2024, en inglés, extraídos de las bases Medline (PubMed), Cochrane, Dentistry & Oral Sciences Source y Cinahl. Se incluyeron estudios primarios sobre salud bucal en niños con discapacidad de 0 a 12 años. **Resultados:** Se incluyeron 18 artículos. Los principales desafíos fueron caries dental, dificultades sensoriales y motoras en la higiene, comportamientos no cooperativos y barreras de acceso. Las soluciones destacadas fueron acciones educativas, adaptación de instrumentos, intervenciones sensoriales y estrategias de autocuidado. Algunos estudios no presentaron propuestas de acción. **Conclusión:** la promoción de la salud bucal en niños con discapacidad requiere estrategias interdisciplinarias y apoyo continuo a los cuidadores, con enfoque en prevención, adaptación del entorno y uso de tecnologías accesibles.

DESCRIPTORES: Niños con discapacidad; Salud bucal; Promoción de la salud.

RECEIVED: 06/11/2025 APPROVED: 07/02/2025

How to cite this article: Silva AL, Melo EP, Machado MMT. Challenges and Innovative Solutions in Oral Health in Children With Disabilities: An Integrative Review. *Saúde Coletiva* (Edição Brasileira) [Internet]. 2025 [acesso ano mês dia];15(98):16470-16481. Disponível em: DOI: 10.36489/saudecoletiva.2025v15i98p16470-16481

**Aline Lima Silva**

Master's student in Women's and Children's Health. Federal University of Ceará.
ORCID: <https://orcid.org/0000-0003-0879-0097>

**Márcia Maria Tavares Machado**

Full Professor of the Department of Community Health. Federal University of Ceará.
ORCID: <https://orcid.org/0000-0002-0149-5792>

**Eleonora Pereira Melo**

Doctoral student in Public Health. Federal University of Ceará.
ORCID: <https://orcid.org/0000-0002-9731-5134>

INTRODUCTION

The United Nations (UN) Convention on the Rights of the Child advocates for equal access to health care, including for children with disabilities. However, their experiences are still underrepresented in oral health research, reflecting persistent exclusion.¹ This gap in scientific knowledge compromises the development of public policies and evidence-based clinical practices capable of meeting the specific needs of this group. In addition, it contributes to the invisibility of their demands and reinforces historical inequalities in access to care.

A survey revealed that two-thirds of caregivers did not take their children with disabilities to the dentist in the last 12 months, due to factors such as the length of appointments, limited mobility and logistical barriers.² The lack of regular dental care, in addition to contributing to the worsening of oral problems³, such as cavities and periodontal disease, can negatively impact a child's diet, sleep and general well-being, compromising their overall development.⁴

Family involvement in caring for people with disabilities is essential⁵, because family members usually know the most effective strategies for getting the child's cooperation in different situations. Health professionals who work in

partnership with caregivers tend to feel more prepared to provide care.⁶ However, dental care still tends to prioritize invasive interventions, such as extractions, with little emphasis on prevention.¹

The active participation of children with disabilities in consultations is a guaranteed right, but cognitive and architectural barriers and the lack of training of professionals make this involvement difficult.⁶ Limited professional training, associated with socio-demographic factors, type of disability and access to information, also negatively influences the oral health of these children.⁷

Given this context, this study aims to analyze recent scientific production on the promotion of oral health in children with disabilities, identifying the main challenges and solutions indicated by the literature.

METHOD

This is an integrative literature review, a method chosen because it allows the inclusion of experimental and non-experimental studies, expanding the understanding of the topic.⁸ The study was conducted in six stages⁸: 1) definition of the theme and question; 2) inclusion/exclusion criteria; 3) data search and collection; 4) critical evaluation; 5) interpretation; 6) summary of

results.

The guiding question was constructed based on the PICo strategy, composed of the following elements: Population (P), represented by children with disabilities; Interest (I), which corresponds to the promotion of oral health; and Context (Co), focused on challenges and solutions. Thus, the question that guided this review was: "What are the challenges and solutions for promoting oral health in children with disabilities?"

The search was conducted in October 2024 in the Medline (PubMed), Cochrane Library, Cinahl and Dentistry & Oral Sciences Source databases, accessed by the Federated Academic Community (CAFe) of the CAPES Journal Portal. Original articles in English, made available in full, published between 2019 and 2024, focused on oral health of children with disabilities aged 0 to 12 years were included. Reviews, case reports, series and samples with other populations or ages were excluded.

The search strategy was constructed from the combination of controlled descriptors, extracted from the Medical Subject Headings (MeSH) vocabulary, and similar terms, articulated with the Boolean operators AND and OR. The strategy was adapted for each database, as shown in Table 1.

Integrative Review

Silva AL, Melo EP, Machado MMT

Challenges and Innovative Solutions in Oral Health in Children With Disabilities: An Integrative Review

Table 1: Search strategies. Fortaleza - CE, Brasil, 2025.

Database	Strategy
Medline and Cochrane Library	("Child, disabilities" AND "oral health")
Cinahl and Dentistry & Oral Sciences Source	((children OR kids OR youth OR child) AND (disability OR disabilities OR disabled) AND ("oral health" OR "dental health" OR "dental care" OR "oral care"))

Source: Prepared by the authors.

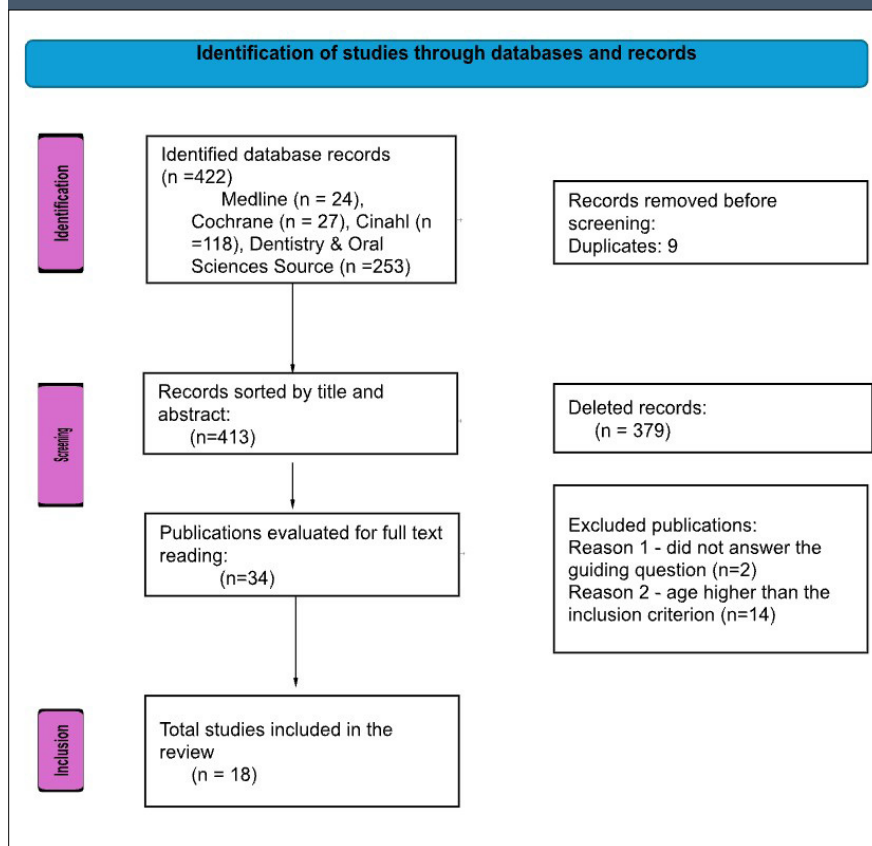
The references were managed using Mendeley software. The studies were selected manually in two stages: 1) initial screening by title and abstract, according to the inclusion criteria; 2) reading of the texts in full. The data extraction instrument was developed by the authors and organized in Excel spreadsheets, gathering information on the characteristics of the studies, their methodological designs, the challenges presented, the proposed solutions and the level of evidence.

To classify the level of evidence, the following hierarchy was adopted, as proposed by Melnyk and Fine-out-Overholt 9: Level I for systematic reviews or meta-analyses of clinical trials; Level II for randomized clinical trials; Level III for non-randomized experimental studies; Level IV for cohort or case-control studies; Level V for systematic reviews of qualitative or descriptive studies; Level VI for isolated qualitative or descriptive studies; and Level VII for expert opinions or committee guidelines.

RESULTS

The review included 18 primary studies that met the eligibility criteria as presented in the PRISMA flow-chart (Figure 1).

Figura1: Fluxograma PRISMA de seleção dos artigos. Fortaleza - CE, Brasil, 2025.



Of the 18 studies included in the review, most were published in 2023 (n=5) and 2024 (n=4), followed by 2022 (n=3), 2021 (n=3), 2020 (n=2) and 2019 (n=1). The most frequent methodological designs were cross-sectional (n=6) and qualitative (n=4) studies, followed by ran-

domized clinical trials (n=3), cohort studies (n=3) and experimental and quasi-experimental studies (n=2). Regarding the level of evidence, level IV (n=8) predominated, followed by levels II (n=4), III (n=3) and VI (n=3). Their characteristics are better described in Table 2.

Table 2: Summary of reviewed articles. Fortaleza - CE, Brazil, 2025.

Authors and year	Method	Challenges Identified	Proposed Solutions	Level of evidence
Constance et al. (2023) ¹⁰	Qualitative with focus group	Resistance to brushing; pain; uncooperative behaviors; functional difficulty (spitting/swallowing); caregiver burden.	Not specified.	VI
Paino Sant'Ana et al. (2022) ¹¹	Cross-sectional cohort	High plaque levels in young children (0 to 3 years)	Education for parents about oral hygiene, biofilm and caries; public policies to promote oral health.	IV
Junnarkar et al. (2022) ¹²	Exploratory qualitative	Hypotonia and apraxia make it difficult to spit, favoring the ingestion of toothpaste; prolonged use of baby bottles with sugary liquids increases the risk of cavities.	Not specified.	VI
Tsai et al. (2024) ¹³	Quasi-experimental, cross-sectional	Oral self-care compromised by behavioral and clinical barriers.	Educational kits and early guidance by dentists.	III
Castilho et al. (2021) ¹⁴	Retrospective cohort	High sugar intake; poor oral hygiene; mouth breathing.	Dietary education for caregivers; more frequent dental follow-up.	IV
Junnarkar et al. (2023) ¹⁵	Exploratory qualitative	Sensory and behavioral difficulties in oral hygiene; inappropriate use of fluoridated toothpaste.	Sensory evaluation; acclimatization sessions; continuous and accessible care.	VI
Zhou et al. (2019) ¹⁶	Cross-sectional study	Delayed toothbrushing associated with worse hygiene habits.	Early initiation of toothbrushing; encouragement of self-care.	IV
Sherriff et al. (2023) ¹⁷	Cohort study	High prevalence of caries in children with additional support needs; extractions under general anaesthesia; limited access to dental care.	Not specified.	IV
Takle et al. (2024) ¹⁸	Randomized clinical trial	Not specified.	Use of GumChucks dental floss for children with low motor skills.	II
Yadav et al. (2024) ¹⁹	Cross-sectional study	Not specified.	Promotion of healthy habits and use of electric toothbrushes for children with ASD.	IV
Stein Duker et al. (2023) ²⁰	Randomized crossover clinical trial	Stress in traditional dental settings.	Sensory adaptation of the office in a simple and scalable way.	II
Kamelia et al. (2023) ²¹	Cross-sectional study of development and validation	Low autonomy in brushing teeth among deaf children.	Videos with Libras; use of visual resources (mirrors, revealing tablets); brushing calendar.	III
Zhou et al. (2020) ²²	Double-blind, parallel RCT	Social limitations and parental availability make care difficult.	Use of social stories as an educational tool.	II
Pamungkas et al. (2024) ²³	Experimental clinical study	Not specified.	Gigiku Sehat application for oral health education with offline access.	III
Kang et al. (2021) ²⁴	Experimental study	Not specified.	Use of video games with positive reinforcement to teach tooth brushing.	II
Rabello et al. (2021) ²⁵	Qualitative study	Barriers to access to services; fragmented perception of oral health.	Not specified.	IV
Ferreira et al. (2020) ²⁶	Cross-sectional study	High prevalence of caries in children with disabilities; limitations in services to address contextual factors.	Preventive actions and training of professionals and caregivers.	IV
França et al. (2022) ²⁷	Cross-sectional observational	Oral comorbidities; drug-induced salivary changes; bleeding and gingival hyperplasia.	Not specified.	IV

Source: Prepared by the authors.

Among the most frequent challenges, the prevalence of dental caries stood out ^{12,17,26}, uncooperative behaviors and sensory difficulties during hygiene ^{10,15}, in addition to functional, cognitive or motor limitations for brushing. ^{10,13} Barriers to access to services were also highlighted ^{17,25}, low

autonomy or adherence²¹⁻²², comorbidities and use of medications with oral impact²⁷ and caregiver burden.¹⁰

As for solutions, educational actions aimed at caregivers and children prevailed, through videos²¹, applications²³, educational kits¹³ and early guidance.^{13,16} Adaptations of hygiene instruments and techniques^{15,18,21}, sensory modifications in the clinical environment^{15,20}, professional training and strengthening of public policies^{11,26}, in addition to the promotion of early self-care and the use of motivational strategies.^{16,24} were also mentioned. Five studies^{10,12,17,25,27} did not present practical solutions, which reveals a relevant gap in the translation of scientific knowledge into effective care actions.

DISCUSSION

Children with disabilities face significant barriers to maintaining oral health, influenced by factors such as functional limitations, lack of caregiver training and difficulty in accessing specialized services.¹⁰ In the case of cerebral palsy, even with parents' awareness of the importance of oral health, problems such as cavities and the need for extractions persist, highlighting the gap between knowledge and practice.¹¹

Among children with Autism Spectrum Disorder (ASD), the lack of specific guidance on oral hygiene and the postponement of dental appointments reinforce the importance of individualized strategies and awareness-raising among health teams.¹² The emotional and physical burden on caregivers can affect their engagement with preventive practices, requiring approaches that include motivational communication and ongoing support.¹³

Nutritional education was highlighted as an effective way to prevent tooth decay, suggesting the need for interdisciplinary interventions aimed at caregivers and professionals¹⁴, with

the inclusion of occupational therapists and speech therapists, it contributes to sensory adaptation and the preparation of children for dental appointments, strengthening the preventive approach.¹⁵

Brushing performance is directly related to the level of adaptive functioning, indicating the importance of personalized care plans aimed at promoting autonomy.¹⁶ A study highlighted marked inequalities in access to and quality of dental care provided to children with additional support needs, with a higher burden of oral diseases and high rates of extractions under general anesthesia among children with intellectual disabilities.¹⁷ Expanding access to preventive care is a crucial measure to mitigate these disparities.

The use of accessible technologies, such as GumChucks dental floss, electric toothbrushes, mobile apps and educational games, has shown a positive impact on adherence to oral hygiene routines and the reduction of plaque.¹⁸⁻²⁴ tools facilitate the teaching and practice of brushing, especially among children with motor coordination deficits or cognitive difficulties.

A qualitative study showed that a diagnosis of cerebral palsy significantly changes family priorities and routines. Mothers identified themselves as the main caregivers and pointed to difficult access to dental services as a central barrier.²⁵ Another study highlighted the need for oral health programs focused on prevention and training for dentists and caregivers.²⁶

Finally, children with complex clinical conditions, who require home care, are at greater risk for periodontal diseases and salivary changes associated with the use of medications, which reinforces the importance of early and continuous preventive actions.²⁷

CONCLUSION

Promoting oral health in children

with disabilities involves multifactorial challenges that require coordinated responses between clinical care, family support, and public policies. The evidence gathered in this review points to the need for an integrated approach that is sensitive to the functional, cognitive, and sensory specificities of these children. Continuous training of caregivers, specialized training of dental professionals, and collaborative work by interprofessional teams, combined with the adaptation of instruments and environments, are essential to overcome barriers related to adherence and access.

Technological resources, such as mobile applications, educational games, adapted visual materials, and interactive systems, demonstrate potential to support oral health education and the qualification of preventive practices, especially when integrated with motivational communication strategies. However, their effectiveness depends on coordination with public policies that ensure equitable access to services, especially in contexts of social vulnerability.

The implementation of inclusive policies, combined with the construction of intersectoral support networks, is essential to guarantee comprehensive and quality care. Strengthening primary care actions and continued investment in innovative and accessible strategies represent a promising path to reducing inequalities and promoting oral health among children with disabilities.

REFERENCES

1. Alwadi MAM, Baker SR, Owens J. Oral health experiences and perceptions of children with disabilities in the Kingdom of Saudi Arabia. *Int J Paediatr Dent.* 2022;32(6):856-64. doi:10.1111/ipd.12985.
2. Hendaus MA, Shaltout D, Yasrab D, et al. Parental perception of a dental home for children with special needs. *Pediatr Health Med Ther.* 2020;11:379-84. doi:10.2147/PHMT.S263947.
3. Ferreira LRG, Ribeiro EA, Prestes GB, Brum JR. Acesso de pessoas com deficiência aos serviços de saúde bucal. *Rev JRG Estudos Acad.* 2024;7(14):e14999.
4. Sheiham A. Dental caries affects body weight, growth and quality of life in pre-school children. *Br Dent J.* 2006;201(10):625-6. doi:10.1038/sj.bdj.4814259.
5. Da Rosa SV, Moysés SJ, Theis LC, et al. Barriers in access to dental services hindering the treatment of people with disabilities: a systematic review. *Int J Dent.* 2020;2020:9076418. doi:10.1155/2020/9076418.
6. Stensson M, Norderyd J, Van Riper M, et al. Dental health care for children with Down syndrome: parents' description of their children's needs in dental health care settings. *Eur J Oral Sci.* 2022;130(3):e12872. doi:10.1111/eos.12872.
7. Tefera AT, Girma B, Adane A, et al. Dental health problems and treatment-seeking behavior among special needs school students in Amhara region, Ethiopia. *BMC Oral Health.* 2021;21(1):521. doi:10.1186/s12903-021-01881-w.
8. Mendes KDS, Silveira RCCP, Galvão CM. Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem. *Texto Contexto Enferm.* 2008;17(4):758-64.
9. Melnyk BM, Fineout-Overholt E. Evidence-based practice in nursing & healthcare: a guide to best practice. 5th ed. Philadelphia: Wolters Kluwer; 2023.
10. Constance D, Subbiah R, Sukumaran A, et al. Barriers in maintaining oral health among children with cerebral palsy: parent/caregiver's perspective. *J Indian Soc Pedod Prev Dent.* 2023;41(3):234-8. doi:10.4103/jisppd.jisppd_185_23.
11. Paino-Sant'Ana A, Stein MCRV, Rodrigues JVS, et al. Impact of parental care on oral health of children with intellectual disabilities from zero to six years of age. *Rev Odontol UNE-SP.* 2022;51:e20220001. doi:10.1590/1807-3107bor-2022.vol51.0001.
12. Junnarkar VS, Tong HJ, Hanna KMB, et al. Occupational and speech therapists' perceptions of their role in dental care for children with autism spectrum disorder: A qualitative exploration. *Int J Paediatr Dent.* 2022;32(6):865-76. doi:10.1111/ipd.12993.
13. Tsai CE, Boynton JR, Gumber S, et al. Parents of children with versus without special health care needs and oral health promotion: challenges and best practices. *J Dent Child.* 2024;91(1).
14. Castilho LS, Diniz IMA, Santos BPDR, et al. Carious lesions recurrence in children with developmental disabilities: a longitudinal study. *Braz Oral Res.* 2021;35:e048. doi:10.1590/1807-3107bor-2021.vol35.0048.
15. Junnarkar VS, Tong HJ, Hanna KMB, et al. Qualitative study on barriers and coping strategies for dental care in autistic children: Parents' perspective. *Int J Paediatr Dent.* 2023;33(2):203-15. doi:10.1111/ipd.13032.
16. Zhou N, Wong HM, McGrath C. The impact of adaptive functioning and oral hygiene practices on observed tooth-brushing performance among preschool children with special health care needs. *Matern Child Health J.* 2019;23(12):1587-94. doi:10.1007/s10995-019-02784-7.
17. Sherriff A, Stewart R, Macpherson LMD, et al. Child oral health and preventive dental service access among children with intellectual disabilities, autism and other educational additional support needs: A population-based record linkage cohort study. *Community Dent Oral Epidemiol.* 2023;51(3):494-502. doi:10.1111/cdoe.12847.
18. Takle TV, Vishwakarma PY, Dodamani AS, et al. Comparative assessment of the efficacy of the GumChucks flossing system and string floss for plaque removal in mentally disabled children: A randomized clinical trial. *Int J Clin Pediatr Dent.* 2024;17(3):255-9. doi:10.5005/jp-journals-10005-2763.
19. Yadav P, Marwah N, Yadav S, Lekhwani PS. Evaluation of oral health status and brushing habits in children with autism: A cross sectional study. *J Clin Pediatr Dent.* 2024;48(2).
20. Stein Duker LI, Como DH, Jolette C, et al. Sensory adaptations to improve physiological and behavioral distress during dental visits in autistic children. *JAMA Netw Open.* 2023;6(6):e2316346. doi:10.1001/jamanetworkopen.2023.16346.
21. Kamelia E, Rismayani L, Miko H. Feasibility test of the "BA-HUTE" model: Technique for cleaning teeth in deaf children. *J Int Dent Med Res.* 2023;16(1).
22. Zhou N, Wong HM, McGrath C. Social story-based oral health promotion for preschool children with special healthcare needs: A 24-month randomized controlled trial. *Community Dent Oral Epidemiol.* 2020;48(5):415-22. doi:10.1111/cdoe.12558.
23. Pamungkas AC, Suharsini M, Rizal F. Enhancing cognitive comprehension of dental health education using mobile apps in Down syndrome children. *J Int Dent Med Res.* 2024;17(1).
24. Kang YS, Chang YJ, Howell SR. Using a kinect-based game to teach oral hygiene in four elementary students with intellectual disabilities. *J Appl Res Intellect Disabil.* 2021;34(2):606-14. doi:10.1111/jar.12839.
25. Rabello F, Prado HV, Angelo GL, et al. Mothers of a child with cerebral palsy: Perception on the diagnosis moment and the child's general and oral health. *Pesqui Bras Odontopediatria Clin Integr.* 2021;21:e210047.
26. Ferreira AMB, Almeida HCR, Heimer MV, et al. Oral health status and treatment needs among disabled children in Recife, Brazil. *Oral Health Prev Dent.* 2020;18(3):467-74. doi:10.3290/j.ohpd.a44679.
27. França K, Cintra G, Cardoso-Sousa L, et al. Salivary and dental plaque composition in disabled children who require home care: A cross-sectional investigation. *J Int Soc Prev Community Dent.* 2022;12(3):336-44. doi:10.4103/jispcd.JISPCD_15_22.