

Commentary on “A global provision of preventive oral health measures for children with special needs: A scoping review”

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Abstract

Interventional measures: Educational and technical interventions aimed at improving oral hygiene, training caregivers and dentists, and utilizing specialized tools for children with special health care needs (CSHCN).

Perspectives of dentists and caregivers: The challenges faced by dentists in treating CSHCN and the perceptions of caregivers regarding oral health care.

Barriers and unmet treatment needs: Financial constraints, lack of access to dental services, and behavioral challenges of CSHCN.

Governmental policies: The role of policies in improving access to dental care for CSHCN.

The review underscores the higher prevalence of dental caries and periodontal diseases among CSHCN compared to their peers, as well as the systemic barriers that exacerbate these disparities.

Introduction

The scoping review titled “A Global Provision of Preventive Oral Health Measures for Children with Special Needs” provides a comprehensive exploration of the preventive oral health measures available for children with special health care needs (CSHCN) and the barriers to their implementation [1]. The study highlights the urgent need for targeted policies and interventions to address the oral health disparities faced by this vulnerable population. This commentary critically appraises the methodology, findings, strengths, and gaps of the review, reflecting on its scientific contribution and proposing directions for future inquiry.

Methodological Appraisal

The scoping review adheres to a rigorous methodology, following the PRISMA-ScR guidelines [2] and utilizing the nine-step framework suggested by Peters *et al.* [3]. It exhibits commendable breadth in sourcing data, extracting information from five major databases over a ten-year period, and considering qualitative, quantitative, and mixed-method studies.

Notably, the study's use of thematic analysis supported by NVivo software demonstrates a commitment to analytical depth, allowing nuanced synthesis across diverse research designs. The development of LitMap and a conceptual map provides visual representations that enhance the reader's comprehension of complex interrelations among themes a distinctive and valuable feature.

However, while the comprehensive methodological approach is a strength of this review, it introduces some challenges. The heterogeneity of the included studies in terms of design, population, and interventions limits the ability to draw strong generalizable conclusions. Although this is an accepted limitation within scoping review methodology, explicit stratification of findings according to the quality or level of evidence would have further strengthened the analysis. Moreover, while the review consulted an expert panel for the final synthesis, the commentary would benefit from more detail on how expert feedback was integrated systematically into the final conceptual framework, ensuring transparency and reproducibility.

Thematic Insights

Interventional measures: Educational and technical strategies

The review identifies that preventive interventions targeting CSHCN primarily fall into two categories: educational initiatives aimed at caregivers, dental professionals, and the children themselves; and technical interventions such as modified environments and specialized treatment aids. Educational programs, particularly those involving caregiver training [4] and specialized dentist education [5], show promising results in improving oral hygiene practices and willingness among providers. Similarly, interventions using visual aids and sensory-adapted environments demonstrate positive behavioral outcomes among children [6].

Moreover, this review highlights several effective interventions, such as visual aids for teaching brushing techniques to deaf children [7, 8], specialized training programs for dentists [5,9], and the use of sensory-adapted dental environments (SADE) to reduce anxiety during dental visits [10]. These interventions are promising, but their scalability and long-term effectiveness remain understudied. For instance, while training programs for dentists improve their willingness to treat CSHCN [5,11], the review does not address whether these programs are widely accessible or how they can be standardized globally.

However, the review lacks the inclusion of longitudinal follow-up to evaluate the sustained impact of these interventions. Future research must assess whether short-term behavioral improvements translate into long-term oral health benefits. Additionally, there remains insufficient evidence on how interventions can be tailored across varying levels of cognitive, sensory, or motor disabilities among CSHCN.

An important gap highlighted is the insufficient focus on structural determinants such as financial incentives for dentists or systemic infrastructural adaptations that could complement educational efforts. Without addressing systemic enablers and constraints, the efficacy of educational interventions may be limited.

Perspectives of dentists, caregivers, and parents

The scoping review effectively analyzes the crucial role of provider and caregiver attitudes in shaping oral health outcomes for CSHCN. Dentists' reluctance to treat children with disabilities rooted in lack of training, perceived behavioral challenges, and low confidence remains a consistent barrier globally [12,13].

Equally, caregivers' knowledge and attitudes heavily influence oral hygiene maintenance. Studies demonstrate that while caregivers recognize the importance of dental care, competing demands (such as managing primary health conditions) often ignore oral health

[14]. A survey by Adyanthaya *et al.* [13] claimed that the most significant barriers mentioned by dentists were lack of training and motivation for treating these vulnerable groups. Similarly, Alkhubali *et al.* [15] reported that the negative perception of dentists associated with treating CSHCN is a major barrier to the utilization of services.

This finding underscores the need for dual-pronged interventions: improving dental professionals' competency and creating caregiver empowerment programs that accommodate the socioeconomic and psychological realities of families. Moreover, fostering strong partnerships between dentists and caregivers, built on empathy and shared decision-making, may enhance engagement and adherence.

Future research should further explore how socio-demographic variables (caregiver education, income, ethnicity) mediate these perceptions and practices, allowing for more targeted intervention development.

Barriers and unmet needs

The review thoroughly documents barriers to dental care utilization among CSHCN, categorizing them into financial, geographical, behavioral, and systemic factors. Financial obstacles, including lack of insurance coverage and high out-of-pocket expenses, emerge as dominant themes [16,17]. A 2024 review study flagged barriers such as long travel distances, inadequate clinical infrastructure, scarcity of specialists, inefficient referral systems, and financial strain; limited facilitators included personal connections and disability-friendly clinics [18]. Physical access barriers, such as clinic inaccessibility and transportation difficulties, particularly afflict rural populations. Meanwhile, behavioral challenges both children's and dentists' compound difficulties in receiving timely and effective care.

A significant contribution of the review is highlighting the interplay between caregiver burden and dental neglect [19]. Bastani *et al.* [16], in their review, emphasized the development of insurance policies for CSHCN, which will eventually reduce the cost of treatment. Krishnan *et al.* reported that the major barriers are the cost of treatment, inconvenience, organizations, and patient-dentist relationships [20]. The association between increased caregiver strain and decreased preventive dental utilization is a critical finding with direct policy implications. Despite this rich analysis, the review could have expanded by categorizing barriers into modifiable versus non-modifiable factors, aiding in strategic prioritization for policy and practice interventions.

Governmental policies and system-level initiatives

Perhaps the most novel contribution of the scoping review is its synthesis of how governmental policies impact dental care access and preventive service utilization among CSHCN. Programs like Medicaid expansions [21] and community-based dental service integration [22] illustrate that systemic support significantly enhances service uptake. However, as Song *et al.* (2020) caution, simply including CSHCN in broader health programs without disability-specific accommodations may not yield optimal benefits [23]. U.S. data from 2020–2022 reveal persistent disparities in unmet dental needs among SHCN children, with no significant post-pandemic rebound in visit rates. Policies must therefore be tailored, flexible, and informed by real-world barriers identified at community levels [24]. Systematic reviews evaluated global oral health policies for CSHCN amid the pandemic, emphasizing

need for resilient, inclusive, patient-centered frameworks but often finding limited practical effectiveness [25]. The review's call for the inclusion of oral health components in early intervention and pediatric primary care services is especially pertinent. Integrating dental health into broader child health programs, rather than siloing services, may offer the most sustainable model.

Implications for Policy and Practice

Strengthening training programs

The review underscores the importance of specialized training for dentists and dental hygienists. Integrating courses on special care dentistry into undergraduate and postgraduate curricula could bridge the knowledge gap [26,27]. Policymakers should collaborate with dental schools to mandate such training and provide continuing education opportunities for practicing dentists.

Expanding access to care

To address geographical and financial barriers, governments should invest in community-based programs and mobile dental units, as suggested by Cruz *et al.* [28]. Additionally, telehealth platforms could be leveraged to provide remote consultations and education for caregivers in underserved areas.

Enhancing caregiver education

Educational programs for parents and caregivers are critical for improving oral hygiene practices at home. The review highlights the success of interventions like the Visual-Verbal Integration Model (VVIM) for teaching brushing techniques [29]. Such programs should be scaled up and tailored to different cultural contexts.

Policy recommendations

The review advocates for policies that incentivize dentists to treat CSHCN, such as higher reimbursements or tax benefits [18]. Additionally, governments should expand insurance coverage for dental care and establish referral networks to connect CSHCN with specialized providers. The success of programs like ABCD [30] and POHS [22] demonstrates the potential of policy-driven interventions.

Future Research Directions

While the review provides a valuable synthesis of existing literature, several gaps remain:

Longitudinal studies

Most interventions are evaluated over short periods. Longitudinal studies are needed to assess their sustained impact on oral health outcomes.

Global perspectives

The review primarily includes studies from high-income countries. Future research should explore interventions in low- and middle-income countries, where barriers to care are often more severe.

Technological innovations

The role of digital tools (apps for oral hygiene tracking, virtual reality for anxiety reduction) in improving oral health for CSHCN warrants further investigation.

Intersectoral collaboration

Research should examine how collaboration between dental professionals, pediatricians, and educators can improve oral health outcomes for CSHCN.

Conclusion

The scoping review by Alholimie *et al.* 2025 [1], provides a timely and comprehensive overview of the preventive oral health measures for CSHCN and the systemic barriers. The findings highlight the need for multi-faceted interventions that address training gaps, caregiver education, and policy reform. By leveraging the insights from this review, stakeholders can work towards reducing oral health disparities and ensuring equitable access to dental care for all children, regardless of their special needs. Given the current global emphasis on health equity and inclusion, the findings of this review have high relevance. They align with the Sustainable Development Goals (Good Health and Well-being) and global disability rights frameworks advocating for equitable health care access. Moreover, with continued scholarly and policy attention, informed by studies such as this, it is possible to move toward a future where oral health equity for children with special needs is not aspirational but achievable.

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