RESEARCH PAPER

# Challenges in Maintaining Oral Hygiene for Children with Special Needs: A Survey of Parents and Caregivers

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**Abstract**

**Background:**
Children with special health care needs are at increased risk of poor oral health due to sensory, behavioral, physical, and access-related challenges. Although caregivers play a vital role in daily oral hygiene, their perspectives remain underexplored.

**Objective:**
To assess caregiver-reported challenges in maintaining oral hygiene among children with special needs in Tamil Nadu, India.

**Methods:**
A cross-sectional online survey was conducted among 260 primary caregivers of children aged 6–18 years with autism spectrum disorder, cerebral palsy, Down syndrome, or intellectual disability. A validated 34-item questionnaire assessed oral hygiene practices, sensory and behavioral difficulties, dental visits, caregiver knowledge, and socioeconomic barriers. Data were analyzed using descriptive statistics and chi-square tests.

**Results:**
While most caregivers assisted with tooth brushing, many children tolerated brushing for less than two minutes and had irregular dental visits. Sensory aversion, behavioral resistance, high treatment costs, limited availability of specialized care, and inadequate caregiver training were common barriers, especially among lower socioeconomic groups.

**Conclusion:**
Caregivers experience multifactorial challenges in maintaining oral hygiene. Strengthening caregiver education and improving access to specialized dental services may improve oral health outcomes in this vulnerable population.

**Keywords:**
Caregivers; Dental Care for Persons with Disabilities; Health Knowledge, Attitudes, Practice; Health Services Accessibility; Oral Hygiene; Socioeconomic Factors.

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## Introduction

Disability is a major public health concern affecting millions of children worldwide. Developmental disabilities are highly prevalent, with sensory impairments affecting 13% of children worldwide and cerebral palsy affecting 0.2-0.3%. [1] In 2019, nearly 53 million children under five years were estimated to be living with or at risk of developmental disabilities requiring long-term care.[4] These include autism spectrum disorder, intellectual disability, cerebral palsy, attention deficit/hyperactivity disorder, epilepsy, and hearing and vision impairments.[1,4]

Children with special health care needs consistently exhibit poorer oral health compared to typically developing peers, with higher prevalence of dental caries, gingivitis, and untreated oral disease. [2, 3, 19] Contributing factors include sensory and behavioral challenges, physical limitations, dependence on caregivers for daily oral hygiene and financial constraints. [3, 8, 15]

In India, disability combined with socioeconomic limitations may further increase oral health risks. As caregivers play a central role in daily oral hygiene practices, understanding their challenges is essential. Therefore, this study aimed to assess caregiver-reported barriers to maintaining oral hygiene among children with special needs in Tamil Nadu.

## Materials and Methods

This descriptive cross-sectional study was conducted between July and December 2025 after obtaining approval from the Institutional Ethics Committee . The study adhered to the Declaration of Helsinki and followed the STROBE guidelines. The purpose of the study was explained to participants through an information sheet, and informed consent was obtained electronically prior to participation.

The study population comprised parents or primary caregivers of children aged 6–18 years diagnosed with autism spectrum disorder, cerebral palsy, Down syndrome, or intellectual disability in Tamil Nadu, India. Inclusion criteria were primary caregivers actively involved in the child's daily oral hygiene care who provided informed consent prior to participation. Exclusion criteria included non-primary caregivers, caregivers of children without diagnosed special needs, incomplete questionnaire responses, and individuals who had participated in the pilot study.

Participants were recruited using a snowball sampling technique through special schools and caregiver networks. The questionnaire link was shared with eligible caregivers and they were encouraged to share it among similar parents.

Sample size estimation was based on findings from a pilot study conducted among 25 participants. An a priori power analysis was performed at a 5% significance level and 95% power, resulting in a required sample size of 260 participants.

Data were collected using a validated 34-item self-administered questionnaire prepared in English and Tamil and distributed via Google Forms. The questionnaire comprised sections assessing demographic and socioeconomic characteristics, oral hygiene practices, sensory and behavioural challenges, dental visit patterns and access to care, dietary habits, parental knowledge regarding oral health, socioeconomic barriers, and open-ended feedback. Content validity was established by subject experts, and pilot testing ensured clarity and feasibility.

Responses were coded and analysed using IBM SPSS Statistics for Windows, Version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics summarised the data, and associations were assessed using the chi-square test, with statistical significance set at $P < 0.05$.

## Results

Of the 267 responses received, 260 were included in the final analysis, while 7 (2.6%) were excluded due to incomplete data. The distribution of special health care needs is shown in Table 1. Autism spectrum disorder (ASD) was the most frequently reported condition, followed by Down syndrome, intellectual disability, and cerebral palsy. Children were aged 6–18 years, with 36.2% aged 6–9 years, 33.1% aged 10–13 years, and 30.8% aged 14–18 years. The sample comprised 50.4% males and 49.2% females; one child's gender was undisclosed. (0.4%).

Most children brushed once daily (81.5%) and required parental assistance. Manual toothbrushes were predominantly used (82.7%) and 45% used non-fluoridated toothpaste. Disability-wise comparisons revealed significant differences (Table 2). Parental assistance was universal among children with ASD (100%) but lower among those with Down syndrome (54%) and intellectual disability (56%) ($\chi^2 = 77.5$, $P < 0.001$). Use of electric or modified toothbrushes was highest among children with cerebral palsy (43%) ($\chi^2 = 43.5$, $P < 0.001$).

Resistance to brushing was highest among children with ASD (68%) ($\chi^2 = 166.9$, $P < 0.001$). Brushing tolerance of less than one minute was also most common in this group (59%) ($\chi^2 = 86.3$, $P < 0.001$)

along with sensory aversion to toothpaste (97%) and toothbrush (97%).

Dental visits were most commonly reported only when treatment was required (48.5%), while 32.3% had never visited a dentist. Among those with prior visits, 74.5% exhibited anxious or uncooperative behaviour, and 36.2% required sedation. A significant association was observed between age and previous dental visits ($\chi^2 = 7.42$, df = 2, $P = 0.024$), with older children more likely to have visited a dentist.

Sugary snacks were frequently consumed by 64.2% of children. Significant disability-wise differences were observed in difficulty finding a dentist ($\chi^2 = 57.3$, $P< 0.001$), provision of sugary snacks ($\chi^2 = 23.5$, $P< 0.001$), financial barriers ($\chi^2 = 10.0$, $P = 0.019$), and interest in educational workshops ($\chi^2 = 23.6$, $P< 0.001$) (Table 3).

Although awareness regarding the importance of oral health (91.9%), periodic dental visits (88.8%), and the role of sugar in caries (93.1%) was high, knowledge regarding fluoride use was limited (31.5%). Confidence in managing their child's oral health was low among 82.3% of caregivers. Financial constraints prevented access to care for 40.8% of respondents, and access to specialised services was reported as limited. Only 15.8% had previously received oral health guidance, whereas 83.8% expressed interest in attending workshops.

Open-ended responses were obtained from 23 participants (8.6%). Thematic analysis identified five major categories of challenges, with resistance to brushing being the most frequently reported theme (34.8%), followed by motor or physical limitations, sensory difficulties, communication barriers, and access-related issues (Table 4).

**Discussion**

The present study highlights the multifactorial challenges faced by caregivers of children with special needs. Although 81.5% of caregivers reported brushing their child's teeth at least once daily, more than half of the children tolerated brushing for less than two minutes, suggesting that reported practices may not always end up in effective plaque control. Considering high caregiver dependence, sensory intolerance, and financial constraints, these findings suggest that oral hygiene difficulties are influenced by a combination of behavioural, functional, and socioeconomic factors.

Caregiver assistance was required for 81.9% of children, indicating that many were not able to perform oral hygiene independently due to motor, cognitive, or behavioural challenges. Similar findings have been reported among children with intellectual and developmental disabilities, where improvements in oral hygiene were observed only after structured caregiver training with consistent reinforcement. [7, 8, 9, 13] These findings suggest that supervision alone is insufficient and practical, skill-based training is needed.

Sensory aversion and behavioural resistance were especially noticeable among children with autism spectrum disorder. Similar patterns have been reported in earlier studies [1], where limited cooperation made routine oral hygiene practices difficult. In the present study, these behavioural challenges were also evident in the dental setting, with many children showing anxiety or uncooperative behaviour, and 36.2% requiring sedation during treatment. Earlier research has also linked poor oral hygiene and higher caries levels with reduced oral health-related quality of life among children with special needs.[5,14,17,19] Together, these findings highlight the importance of adopting sensory-adapted strategies at home and in dental clinics.[6,9]

Socioeconomic factors were identified as important determinants of access to care. Financial barriers and difficulty in finding a willing dentist to treat their child were frequently reported, leading to low rates of preventive visits and high rates of children who had never visited a dentist. This is in line with previous studies where parental socioeconomic status is linked to oral hygiene practices, caries risk, and dental service utilization. [10, 11, 15]

Dietary practices further increase caries risk. About one-third of families reported giving sugary snacks daily and nearly half weekly, with higher frequency among low-SES families. Parental education and income are important predictors of children's eating patterns, influencing snack selection, the use of sweets as rewards, and overall caries experience. [10,11, 14]In children with special needs, frequent consumption of sugary foods has been associated with higher DMFT/dmft and plaque scores, showcasing the combined effect of frequent sugar intake and inadequate plaque removal due to sensory sensitivities and resistance to tooth brushing. [2, 14]

An important finding was the gap between awareness and confidence. Although most caregivers recognized the connection between oral and general health (91.9%) and understood the importance of regular dental visits, only 17.7% felt confident in their oral health knowledge. This gap between awareness and practical ability reflects previous studies showing that limited caregiver confidence often leads to inconsistent hygiene

practices. Structured, theory-based interventions have been shown to enhance knowledge, build confidence, and improve oral hygiene behaviors, resulting in lower plaque levels and better oral health–related quality of life. [4, 6, 7, 9, 13, 18]High interest in workshops (83.8%) suggests demand for practical, hands-on training.

Overall, these findings highlight the need for interventions at multiple levels. At the family level, sensory-adapted strategies, desensitization techniques, and individualized caregiver training can help improve daily oral hygiene practices. [16] In the clinical setting, enhanced behavior management training and sensory-friendly dental environments may reduce anxiety and limit the need for pharmacological approaches. At the policy level, efforts to improve affordability, accessibility, and incentives for dentists to treat children with special health care needs are essential to build an inclusive and equitable oral health system. [12, 20]

**Limitations**

This study relied on caregiver-reported information and did not include clinical assessments such as DMFT scores or plaque indices, which would have allowed correlation between reported practices and actual oral health status. The modest sample size may limit the generalizability of the findings to the broader population of children with special health care needs.

**Future prospects**

Future studies should combine clinical data with caregiver reports to provide a complete view of oral health status in these children. Longitudinal and controlled intervention studies are needed to assess the effectiveness of a comprehensive approach that combines sensory-modified oral hygiene procedures, caregiver education programs, dietary recommendations, and service improvements to achieve long-term benefits. It is important that socioeconomic differences remain a priority in future research to ensure that all children with special health care need benefit from improvements in oral health.

**Conclusion**

Children with special health care needs in this study showed a significant dependence on caregivers for oral hygiene practices and faced significant barriers in terms of sensory, behavioural, financial, and access factors. Despite the high level of awareness of the importance of oral health, caregiver confidence and readiness were limited, particularly in families of lower socioeconomic status. The level of interest in educational support clearly indicates the need for skill-based interventions. Overall, the results highlight the need for system-level strategies to address these issues and improve the oral health outcomes of these children.

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**Table 1:** Participant Characteristics by special needs type (n=260)

| Special Needs Type | n (%) |
|---|---|
| Autism Spectrum Disorder | 118 (45.4%) |
| Cerebral Palsy | 44 (16.9%) |
| Down Syndrome | 50 (19.2%) |
| Intellectual Disability | 48 (18.5%) |

**Table 2:** Oral Hygiene Practices and Challenges by special needs type

| Variable | ASD n(%) | CP n(%) | DS n(%) | ID n(%) | $\chi^2$(df); *P* |
|---|---|---|---|---|---|
| Parent assists brushing | 118 (100%) | 41 (93%) | 27 (54%) | 27(56%) | 77.5(3); *P* < 0.001 |
| Electric/Modified toothbrush | 10 (8%) | 19 (43%) | 15 (30%) | 1 (2%) | 43.5(6); *P* < 0.001 |
| Always resists brushing | 80 (68%) | 11 (25%) | 6 (12%) | 3 (6%) | 166.9(12);*P* < 0.001 |
| Dislikes toothpaste feel | 114 (97%) | 12 (27%) | 8 (16%) | 2 (4%) | 174.9(3); *P* < 0.001 |
| Dislikes toothbrush feel | 114 (97%) | 13 (30%) | 8 (16%) | 4 (8%) | 165.9(3); *P* < 0.001 |
| Brushing tolerance <1 min | 70 (59%) | 17 (39%) | 11 (22%) | 8 (17%) | 86.3(9); *P* < 0.001 |

**ASD: Autism spectrum disorder; CP: Cerebral palsy; DS: Down syndrome; ID: Intellectual disability. Values are expressed as number (%). Chi-square test used; *P < 0.05 was considered statistically significant*

**Table 3:** Dental Access, Diet, and Preferences by special needs type

| Variable | ASD n(%) | CP n(%) | DS n(%) | ID n(%) | $\chi^2$(df); *P* |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Struggled finding dentist | 67 (57 %) | 27 (61 %) | 11 (22 %) | 1 (2%) | 57.3(3); $P < 0.001$ |
| Offers sugary snacks | 93 (79 %) | 18 (41 %) | 28 (56 %) | 28 (58 %) | 23.5(3); $P < 0.001$ |
| Cost prevented care | 50 (42 %) | 24 (55 %) | 21 (42 %) | 11 (23 %) | 10.0(3); $P = 0.019$ |
| Interested in workshops | 104 (88 %) | 42 (95 %) | 41 (82 %) | 31 (65 %) | 23.6(3); $P < 0.001$ |

**ASD: Autism spectrum disorder; CP: Cerebral palsy; DS: Down syndrome; ID: Intellectual disability. Values are expressed as number (%). Chi-square test used;* $P < 0.05$ was considered statistically significant*

**Table 4:** Themes from Parental Open-Ended Responses (n=23)

| Themes | No. of participants | Percentage |
|---|---|---|
| Resistance to brushing | 8 | 34.80% |
| Motor/Physical limitations | 4 | 17.40% |
| Sensory difficulties | 4 | 17.40% |
| Communication barriers | 4 | 17.40% |
| Access barriers | 3 | 13.00% |
| Total | 23 | 100% |

**Percentages calculated based on respondents who provided open-ended responses (n = 23).*