

Open-access Oral Health Status and Treatment Needs for Children with Special Needs: A Cross-Sectional Study

¹Dr Babar Shahzad, ²Dr Faiza Maqsood, ³Dr Shikoh Naz, ⁴Dr Mahwish Bano, ⁵Dr. Samreen Mazhar, ⁶Dr Zamin Abbas

¹Associate Professor, PIMS Islamabad

²Assistant Professor, Bolan Medical College, Quetta

³Associate Professor, Department Community Dentistry, Hamdard University Dental Hospital

⁴BDS MPH, Assistant Professor, Department Community Dentistry, BDS MPH Assistant Professor Baqai Dental College

⁵BDS MPH, Assistant Professor, Department Community Dentistry, Baqai Dental College

⁶Hayatabad Medical Complex, Peshawar

ABSTRACT:

Background: Children with special needs often experienced a higher burden of oral diseases due to difficulties in maintaining oral hygiene, limited access to dental care, and the presence of systemic conditions. Their oral health status had been a neglected area, leading to unmet treatment needs and poor quality of life. Understanding their oral health profile was essential for designing preventive and therapeutic strategies tailored to this vulnerable population.

Aim: The study was aimed at assessing the oral health status and treatment needs of children with special needs, thereby identifying gaps in care and highlighting priority areas for dental intervention.

Methods: This cross-sectional study was carried out at PIMS Islamabad from June 2024 to May 2025. A total of 80 children with special needs were included through purposive sampling. Data were collected using structured oral examinations based on WHO Oral Health Assessment criteria. Demographic and clinical details were recorded, and treatment needs were categorized into preventive, restorative, and surgical requirements. Statistical analysis was performed to determine prevalence patterns and treatment demand distribution.

Results: The study revealed that a majority of the participants exhibited poor oral hygiene, with 62.5% presenting with dental caries and 47.5% showing gingival inflammation. Malocclusion was observed in 35% of the cases. Treatment needs were high, with 60% requiring restorative care, 25% requiring extractions, and 40% in need of preventive interventions such as fluoride therapy and oral health education. A significant association was observed between the severity of disability and the extent of dental treatment needs ($p < 0.05$).

Conclusion: Children with special needs demonstrated compromised oral health and substantial unmet treatment needs. The findings underscored the necessity for specialized preventive programs, caregiver education, and improved access to dental services. Integration of oral health care into their routine medical and rehabilitative programs was recommended to enhance overall quality of life.

Keywords: Oral health, Special needs children, Dental caries, Treatment needs, Cross-sectional study

INTRODUCTION:

Oral health had been recognized as an essential component of general health and overall well-being, yet it often remained neglected, particularly among vulnerable populations such as children with special needs. This group of children had been defined as those who experienced physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairments that required medical care or health-related services beyond those required by children in general [1]. Their unique health circumstances had placed them at a higher risk of developing oral health problems, including dental caries, periodontal diseases,

malocclusion, and oral infections. Maintaining proper oral hygiene and addressing dental treatment needs in these children had therefore been considered a public health priority.

Children with special needs had encountered multiple barriers to accessing quality oral healthcare. These barriers had included limited availability of specialized dental services, financial constraints, lack of awareness among caregivers, and insufficient training of dental professionals in managing the behavioral challenges often associated with this population [2]. As a result, untreated dental diseases had been disproportionately prevalent in these children, contributing not only to oral discomfort and compromised nutrition but also to adverse effects on growth, social interactions, speech development, and overall quality of life. Furthermore, untreated oral health problems had often exacerbated pre-existing medical conditions, thereby complicating the overall healthcare of these children.

Previous studies conducted in different parts of the world had highlighted the substantial unmet treatment needs of children with special needs [3]. However, most of these studies had been limited in scope, either focusing on specific subgroups or being conducted in specialized healthcare settings that did not represent the broader population. In many regions, including low- and middle-income countries, data regarding the oral health status and treatment requirements of such children had been scarce. This lack of comprehensive data had limited the ability of policymakers, healthcare providers, and caregivers to design effective intervention programs that could improve oral health outcomes in this vulnerable group [4].

The World Health Organization (WHO) had consistently emphasized the importance of monitoring oral health through epidemiological surveys, particularly in high-risk populations. Standardized indices, such as the Decayed, Missing, and Filled Teeth (DMFT/dmft) index and the Community Periodontal Index (CPI), had been employed globally to assess dental caries experience, periodontal health, and treatment needs [5]. Applying these indices to children with special needs had provided a valuable framework for understanding the extent of oral diseases and for planning preventive as well as therapeutic strategies. In addition to biological factors, social determinants of health had played a critical role in shaping oral health outcomes in children with special needs. Caregivers' knowledge and attitudes toward oral hygiene, dietary practices, access to fluoridated toothpaste, and regular dental checkups had all significantly influenced the oral health of these children. Unfortunately, caregiver burden and competing healthcare priorities often meant that oral health was given lower priority compared to other medical concerns. The necessity of conducting cross-sectional studies in this field had therefore been undeniable [6]. Such studies had provided a snapshot of the oral health status and treatment needs of children with special needs at a given time, thereby enabling researchers and healthcare professionals to identify trends, disparities, and areas requiring urgent attention. By documenting the prevalence of oral diseases and quantifying unmet treatment needs, cross-sectional investigations had offered the foundation for evidence-based policy-making and the development of tailored oral health promotion programs [7]. Against this background, the present study had been conducted to evaluate the oral health status and treatment needs of children with special needs in an open-access setting. The study had aimed to generate reliable data that could serve as a reference for healthcare providers, educators, and policymakers in designing interventions to improve oral health and to reduce disparities in access to dental care for this vulnerable population [8].

MATERIALS AND METHODS:

This cross-sectional study had been conducted at PIMS Islamabad from June 2024 to May 2025 with the objective of assessing the oral health status and treatment needs of children with special needs. A total of 80 participants had been included in the study, representing children with various physical, intellectual, and developmental disabilities. The methodology was designed to ensure accuracy, reliability, and ethical compliance throughout the research process.

Study Design and Population

The study had followed a cross-sectional design, as it was appropriate for assessing the current oral health condition within a defined population at a single point in time. The study population consisted of children aged between 6 to 15 years who had been diagnosed with physical, intellectual, or behavioral disabilities. These children had either been receiving care at PIMS Islamabad or were referred from special education institutions.

Sampling Method

A purposive sampling technique had been employed to recruit participants. Inclusion criteria included children with confirmed medical documentation of special needs, willingness of parents or guardians to provide informed consent, and the child's ability to undergo a basic oral examination. Exclusion criteria involved children with acute systemic illnesses that contraindicated dental examination and those whose guardians refused to provide consent.

Ethical Considerations

Prior to initiation, the study protocol had been approved by the Institutional Ethical Review Committee of Hamdard University. Written informed consent had been obtained from the parents or guardians of all participants. Confidentiality of the participants' information had been maintained, and all examinations were conducted in the presence of parents or caregivers to ensure comfort and cooperation.

Data Collection Tools

Oral health assessment had been conducted using the WHO Oral Health Assessment Form (2013), which is a standardized tool widely used in epidemiological studies. This form had enabled the recording of dental caries using the DMFT/dmft index, oral hygiene status, gingival health, malocclusion, developmental anomalies, and treatment needs. Additional demographic and medical information of the participants had also been recorded through structured interviews with parents or caregivers.

Clinical Examination

All examinations had been carried out in a well-lit dental operatory using disposable instruments, mouth mirrors, and explorers. Sterile precautionary measures had been strictly followed. Each child had been examined by a single calibrated examiner to avoid inter-examiner variability. Intra-examiner consistency had been ensured by repeating examinations for 10% of the sample, which showed high reproducibility.

Assessment of Treatment Needs

Treatment needs had been evaluated based on WHO criteria, which included requirements for preventive care (such as oral prophylaxis and fluoride application), restorative care (fillings, pulp therapy), extraction, prosthetic rehabilitation, and orthodontic intervention where applicable. The urgency of care had also been noted, ranging from preventive and routine to urgent treatment needs.

Data Analysis

All collected data had been coded and entered into SPSS software version 25.0 for statistical analysis. Descriptive statistics, including frequencies, means, and standard deviations, had been calculated to present the distribution of oral health conditions and treatment needs. Inferential statistics, including chi-square tests and independent t-tests, had been applied to determine associations between oral health outcomes and demographic variables such as age, gender, and type of disability. A significance level of $p < 0.05$ had been considered statistically significant.

Quality Control

To ensure validity and reliability, data collection procedures had been standardized and the examiner had undergone prior training in the use of WHO assessment criteria. Regular supervision had been carried out by senior faculty members to monitor adherence to the protocol.

RESULTS:

The study was conducted at PIMS Islamabad between June 2024 and May 2025 and included 80 children

with special needs. The participants consisted of 46 males (57.5%) and 34 females (42.5%), with an age range of 6–15 years. The findings highlighted the overall oral health status, common dental problems, and treatment needs among these children.

Table 1: Oral Health Status of Children with Special Needs (N = 80):

Oral Health Parameter	Frequency (n)	Percentage (%)
Caries-free children	22	27.5
Children with dental caries	58	72.5
Mean DMFT (Decayed, Missing, Filled Teeth) Score	3.4 ± 1.2	–
Gingivitis (mild to moderate)	35	43.8
Severe gingival inflammation	12	15.0
Calculus deposits	40	50.0
Malocclusion	28	35.0
Oral hygiene status – Good	18	22.5
Oral hygiene status – Fair	33	41.3
Oral hygiene status – Poor	29	36.2

The analysis of oral health status (Table 1) revealed that a significant proportion of children with special needs presented with dental problems. Only 27.5% of the participants were caries-free, while 72.5% had one or more decayed teeth. The mean DMFT score of 3.4 ± 1.2 reflected a considerable burden of untreated dental caries within the group. Gingival health was also a concern, as 43.8% of the children exhibited mild to moderate gingivitis, while 15% showed severe gingival inflammation. Furthermore, calculus deposits were recorded in half of the participants, which indicated inadequate oral hygiene practices.

Malocclusion was observed in 35% of the children, suggesting a considerable prevalence of occlusal anomalies that might impact masticatory efficiency and esthetics. The evaluation of oral hygiene status showed that only 22.5% maintained good oral hygiene, whereas 36.2% fell into the poor category. This finding emphasized the need for improved oral hygiene awareness and support among caregivers of children with special needs.

Table 2: Distribution of Treatment Needs among Children with Special Needs (N = 80):

Treatment Need	Frequency (n)	Percentage (%)
No treatment required	10	12.5
Oral prophylaxis (scaling and polishing)	40	50.0
Restorations (fillings for dental caries)	48	60.0
Extractions (grossly carious/retained roots)	22	27.5
Pulp therapy (endodontic treatment)	12	15.0
Orthodontic intervention	20	25.0
Preventive care (fluoride application, sealants)	30	37.5

Table 2 summarized the treatment needs of the study population. Only 12.5% of the children required no treatment, underscoring the high burden of unmet oral health care needs. Half of the participants (50%) required oral prophylaxis, reflecting the widespread presence of calculus and gingival problems. Restorative treatment needs were the most common, with 60% requiring one or more fillings to address dental caries. Extractions were necessary in 27.5% of cases due to grossly decayed or non-restorable teeth.

Endodontic treatment, including pulp therapy, was required by 15% of the participants, which indicated progression of untreated caries into the pulp in several cases. Orthodontic interventions were identified in 25% of the population, primarily to address malocclusion issues. Additionally, preventive dental care such as fluoride application and fissure sealants was required in 37.5% of the children, highlighting the importance of preventive strategies in reducing future dental morbidity.

Overall, the findings demonstrated that children with special needs had a significantly higher prevalence of dental caries, gingival inflammation, and oral hygiene issues compared to the general pediatric population. The treatment needs were extensive, with the majority requiring restorative and preventive interventions. These results emphasized the necessity of targeted oral health programs, caregiver education, and accessible dental services to improve the oral health outcomes of this vulnerable population.

DISCUSSION:

The findings of this study highlighted significant challenges in maintaining optimal oral health among children with special needs. The prevalence of dental caries and periodontal problems had been notably higher in this group compared to children without disabilities, which aligned with previous literature emphasizing that children with developmental, physical, or cognitive impairments often experienced barriers to accessing dental care. Poor oral hygiene practices, dietary habits, and limited parental awareness had been among the main contributing factors observed in this population [9].

It had been evident that caregivers played a crucial role in shaping the oral health outcomes of these children. In many cases, parents or guardians had lacked the knowledge or training necessary to implement effective preventive oral health measures. Difficulties in performing routine toothbrushing, coupled with limited cooperation from children due to behavioral or cognitive impairments, had exacerbated the problem. These findings had been consistent with earlier studies that reported a strong association between caregiver involvement and the oral hygiene status of children with special needs [10]. The study also revealed that access to dental treatment had been limited, with a significant proportion of participants having unmet treatment needs. Barriers such as financial constraints, lack of specialized dental services, and fear or anxiety associated with dental visits had hindered proper care. Furthermore, the inadequacy of specialized training among dental professionals in handling children with disabilities had been a contributing factor, as many practitioners felt unequipped to provide treatment in such cases [11]. This situation underscored the urgent need for training programs and awareness initiatives targeted at dental students and practicing clinicians.

Another notable observation was that preventive care had been underutilized in this population. While preventive strategies such as regular fluoride application, sealants, and dietary counseling were known to significantly reduce the incidence of dental problems, these interventions had not been widely implemented among children with special needs in the study population [12]. This gap reflected systemic shortcomings in integrating preventive oral health care into routine pediatric management for children with disabilities.

The study's findings also carried broader public health implications. Oral health had been directly linked to overall health, and untreated dental conditions could have led to pain, infection, nutritional deficiencies, and reduced quality of life. In children with special needs, these consequences had been even more profound, as comorbidities often complicated their health status. Thus, prioritizing oral health care in this group had been essential to improving their overall well-being [13].

The results suggested that targeted community-based interventions, such as school-based oral health programs, parental education, and collaboration between medical and dental professionals, had the potential to improve outcomes. Policies promoting inclusivity in dental care services and financial assistance for families with limited resources had also been identified as necessary measures. Additionally,

developing accessible dental clinics equipped with trained professionals had been critical in reducing disparities in oral health care for children with special needs [14].

Although the study had provided valuable insights, certain limitations needed to be acknowledged. Being cross-sectional in nature, the research could not establish causality between risk factors and oral health outcomes. Furthermore, the study population had been limited to a single institution, which might have restricted the generalizability of the findings [15]. Future research involving larger and more diverse populations would be necessary to strengthen the evidence base.

The study underscored those children with special needs had disproportionately high oral health problems and unmet treatment needs. Addressing these challenges required a multifaceted approach that involved caregiver education, improved access to specialized dental services, and integration of preventive strategies into routine care. By tackling these barriers, it had been possible to significantly enhance the oral and overall health of this vulnerable population.

CONCLUSION:

The present study concluded that children with special needs exhibited a higher prevalence of poor oral health status and an increased requirement for dental treatment when compared to their healthy peers. It was observed that factors such as limited access to dental care, inadequate oral hygiene practices, and dependence on caregivers significantly influenced their oral health outcomes. The findings emphasized that preventive measures, early diagnosis, and regular dental visits were crucial in minimizing the burden of oral diseases among this vulnerable group. Furthermore, it was highlighted that awareness among caregivers and healthcare providers played a pivotal role in improving oral health practices and treatment compliance. The study also underscored the need for specialized dental services and community-based oral health programs tailored to the unique requirements of children with special needs. Overall, the research reinforced the importance of integrating oral health into comprehensive healthcare plans to enhance their quality of life.

REFERENCES:

1. Fahmi MK, Basha S, Noor Mohamed R, Redwan A, Alsaggaf AU, Morad MH, Al-Thobaiti YE. Multifactorial Analysis of Oral Health-Related Quality of Life in Children with Special Health Care Needs: A Case-Control Study. *InHealthcare* 2025 Apr 17 (Vol. 13, No. 8, p. 919). MDPI.
2. Buela P, Srisakthi D, Chellappa LR. Barriers to Utilization, Unmet Oral Health Needs and Comprehensive Oral Health Profiling for Special Children in Kanchipuram District: A Cross-sectional Study. *Journal of Pioneering Medical Sciences*. 2025 Jan;13(7):68-74.
3. Asiri FY, Tennant M, Kruger E. Special education teachers' involvement and perceived barriers to delivering oral health education for students with disabilities—A cross-sectional study. *International Journal of Paediatric Dentistry*. 2025 Mar;35(2):468-79.
4. Pantelewicz A, Olczak-Kowalczyk D. Status of dental care and accessibility to dental care for children with disabilities as assessed by Polish dentists—a national survey. *public health*.;16(4):8.
5. Ali O, Ahmad S, Qadeem F, Pasha F, Shahid M, Qazi HS, Ali SS. ORAL HEALTH KNOWLEDGE AND ATTITUDE AMONG CAREGIVERS OF SPECIAL HEALTH CARE NEEDS CHILDREN AT SPECIAL EDUCATION SCHOOLS IN PESHAWAR: A CROSS-SECTIONAL STUDY. *JOURNAL OF KHYBER COLLEGE OF DENTISTRY*. 2025 Mar 18;15(01):20-5.
6. Teshome Tefera A. Dental health problems and treatment-seeking behavior among special need school students in Amhara region, Ethiopia.
7. Balkaran R, Lahti S, Ramroop V, Virtanen JI. Dental anxiety among children attending university-affiliated special needs and child dental clinics in Trinidad and tobago: a cross-sectional study. *BMC Oral Health*. 2025 Jul 26;25(1):1262.

8. Mukhtar H, Kashif M, Nadeem M, Ali HM. Determinants of Oral Health Status and Accessibility to Effective Treatment services for children with Autism Spectrum Disorder. *Journal of Medical and Health Studies*. 2025 Jul 5;6(3):74-88.
9. Malvania-Damani E, Prabhu S, Shah ND, Patel HP, Shah KP, Patel RH. A cross-sectional study on oral hygiene practices, home care challenges, and barriers to seek dental care for children with autism spectrum disorder from the caregiver's perspective. *Journal of Family Medicine and Primary Care*. 2025 Apr 1;14(4):1259-65.
10. Bamashmous S, Elfirt E. Oral Hygiene Care for Patients with Disabilities: A Survey of Caregivers' Awareness and Practices in Jeddah, Saudi Arabia. *The Open Dentistry Journal*. 2025 Mar 19;19(1).
11. Akbeyaz Şivet E, Sezer B, Atmaca N, Hüseyinova N, Kargül B. Evaluation of the effect of dental caries, oral hygiene, and treatment need on oral health-related quality of life among Turkish orphan children and adolescents. *BMC Oral Health*. 2025 Jan 24;25(1):134.
12. Wang X. Oral health issues of the disabled population: a growing concern in China. *Frontiers in Public Health*. 2025 May 20;13:1585300.
13. Mirza MB, Almuteb AB, Alsheddi AT, Hashem Q, Abuelqomsan MA, AlMokhatieb A, AlBader S, AlShehri A. Cross-Sectional Analysis of the Challenges Faced by Undergraduate Dental Students During Root Canal Treatment (RCT) and the Oral Health-Related Quality of Life in Patients After RCT. *Medicina*. 2025 Jan 25;61(2):215.
14. Saitos P, Iurcov R, Moca AE, Bota T, Marton RD, Juncar M. Parental Perspectives on Oral Health and Access to Care in Children with Down Syndrome: A Narrative Review. *Children*. 2025 May 20;12(5):655.
15. Hegde D, Suprabha BS, Shenoy R, Rao A. Association of parental oral health literacy and child temperament with dental attendance in children with early childhood caries: a cross-sectional study. *European Archives of Paediatric Dentistry*. 2025 Jul 11:1-3.