



ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2023; 9(4): 114-119
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www.oraljournal.com
Received: 09-10-2023
Accepted: 13-11-2023

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Exploring oral health practices and status: A comparative analysis between normal children and those with special needs

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DOI: <https://doi.org/10.22271/oral.2023.v9.i4b.1857>

Abstract

Background: Oral health is essential for children's overall well-being and predictive of their future health. This importance is widely recognized for typically developing children, but those with special needs face unique challenges that require tailored care. This study aims to assess the oral health status and practices of normal children with those of special children.

Materials and Methods: A cross-sectional study was conducted over ten months, in Chennai, India. The study included 180 participants, comprising equal numbers of normal and special children. Data on demographics, oral health status were collected using questionnaires and oral screenings. Data analysis involved descriptive statistics and relevant statistical tests.

Results: The study revealed significant disparities in self-reported oral health perceptions, toothbrush practices, toothpaste usage, and dental awareness between normal and special children. Special children, more frequently rating their oral health as "fair," face unique challenges, emphasizing the need for tailored oral health education, improved access to dental care products, and effective patient communication during dental visits.

Conclusion: The research underscores the importance of recognizing the distinct oral health challenges faced by special children. It highlights the need for tailored oral health education, improved access to dental care products, and more effective patient communication during dental visits. These steps are crucial to enhance the lifelong oral health and overall well-being of special children and provide comprehensive, accessible oral health education programs to address their specific needs.

Keywords: Oral health, special children, dental care, oral hygiene, tailored education, collaborative efforts, children's health

Introduction

Oral health is a fundamental component of overall well-being, and its significance in the early stages of life cannot be overstated. In children, the state of oral health is not only an indicator of their current physical well-being but also a predictor of future health outcomes [1]. While it is well acknowledged that promoting and maintaining oral health in children is a paramount concern, the landscape of pediatric dentistry presents a unique and multifaceted challenge when dealing with children who have special needs. Oral health is an essential component of overall well-being, but it is often overlooked in specific demographics, particularly among individuals with intellectual and physical disabilities. The term "special children" refers to those who face physical, developmental, or intellectual challenges that set them apart from the general population [2]. These challenges may arise from congenital conditions, acquired disabilities, or complex medical histories. Special children may include those with autism, cerebral palsy, Down syndrome, sensory impairments, and various other conditions that necessitate a distinct approach to healthcare, including oral health. In individuals with special needs, inadequate oral health not only affects digestion, nutrition, and speech but also significantly impacts their overall quality of life [3]. Conversely, maintaining good oral health is seen as a means to improve their general well-being, self-esteem, and dignity, while preventing a substantial burden on their health and daily life [4]. This study embarks on a

comprehensive examination of the oral health status in normal children in contrast to their counterparts, the special children. Ensuring oral hygiene in childhood is essential for all children. While numerous studies focus on the dental health of typical children, there is a relative scarcity of research addressing the oral health needs of children with disabilities, who, in fact, demand more specialized care and attention [5]. We recognize that special children often confront unique barriers to maintaining good oral health. These barriers may include difficulties in communicating pain or discomfort, limited access to oral hygiene resources, adverse effects of medications, and increased susceptibility to dental caries and other oral health issues. The aim of this research is to shed light on these distinctive challenges and assess how they differ from the oral health concerns of typically developing children.

Materials and Methods

This study employed a cross-sectional research design to examine the dental caries and periodontal status of normal children compared to special children in Chennai. The study was conducted over a ten-month period, spanning from January 2023 to October 2023. This timeframe encompassed data collection, analysis, and the compilation of the final report. The study focused on two groups: normal children and special children. Ethical approval for the study was granted by the Institutional Review Board of a private dental college in Chennai. A convenient sample size of 180 participants was determined through systematic sampling, with 90 participants in each group – normal children and special children. Demographic information collected from participants included gender, age, socio-economic status, and specific details regarding whether they were classified as challenged or normal. In the challenged group, further distinctions were made between visually, physically, and mentally challenged individuals. The questionnaire used in this study consisted of 30 questions designed to assess oral health practices, dental caries, and periodontal status. Criteria for recording the dental caries and periodontal status were obtained from WHO Oral health survey 2003. Data was collected using printed questionnaires. Oral screenings were conducted to gather information on decayed, missing, and filled teeth, as well as periodontal status. Prior to data collection, approval was obtained from the institution where the study took place, and parental consent was secured. Informed consent was also acquired from each participant before their participation in the study. Participants were assured of the confidentiality and privacy of their information throughout the research process. The collected data was coded and analysed using IBM SPSS Version 26 software. Descriptive statistics, including measures such as mean, standard deviation, and frequencies, were employed to summarize the data. Furthermore, chi-square tests and independent t test was used to assess the statistical significance, which was kept at $p < 0.05$.

Results

In the study, a total of 180 children participated, with 58.9% being males and 41.1% females. The average age of the participants was 12.5 years. Regarding socio-economic status, 50.6% belonged to the upper middle class, and 46.6% were from the lower middle class. Half of the participants were normal children and the other half were special children, with 34.4% being visually challenged, 13.3% physically challenged, and 2.2% mentally challenged (Table 1). In terms of self-reported oral health, 43.3% of normal children

described their teeth and gums as good, while 12.2% described it as poor. Among special children, 25.6% described it as good, and 20.1% as fair. Regarding toothpaste usage, 96.7% of normal children used toothpaste, as did 94.4% of special children. However, only 43.3% of special children used toothpaste containing fluoride, compared to 95.6% of normal children. Awareness of additional oral health practices like mouthwash and floss was reported by 73.3% of normal children and 62% of special children. When asked about the presence of cavities in their teeth, 64.4% of normal children reported having 1-2 cavities, while 44.1% of special children reported the same. Toothache experiences within the last year varied, with 88.1% of normal children not having experienced toothaches, while 33.2% of special children had. Concerning bad breath, 82.2% of normal children had experienced it in the last year, compared to 46% of special children (Table 2). When it came to toothbrush replacement frequency, 60% of normal children replaced their toothbrushes every two months, whereas most special children (32.4%) replaced theirs every three months. A significant number (31.1%) were unsure when they last replaced their toothbrush. While 48.9% of normal children placed their toothbrush in a separate holder, 60% of special children used a common brush holder. Both groups recognized bleeding from the gums as a potential sign of gum disease, with 35.6% of normal children and 45.2% of special children providing the correct response. Similarly, both groups associated bleeding from the gums with improper brushing technique, with 41% of normal children and 51.3% of special children giving this response. Furthermore, 46.2% of normal children believed that gum bleeding could be due to general illness. A majority of both normal and special children (64.8% and 54.4%, respectively) had visited a dentist before. Within the past 12 months, 34.4% of normal children and 46.7% of special children had visited a dentist. A significant percentage of both groups (41.1% of normal children and 43% of special children) were unsure about the reason for their last dental visit. In terms of recognizing the importance of regular dental visits, 50% of both normal and special children acknowledged their significance. Personal oral health care education was reported by 100% of normal children, whereas 80% of special children mentioned receiving the same. Teachers played a role in teaching personal oral health care to 70% of normal children and 66% of special children. As for reasons for not treating primary teeth, 47.8% of normal children and 51.1% of special children cited fear (Table 3). While 54.4% of normal children and 38.9% of special children consumed carbonated juices, cookies, and chocolates daily. Daily tooth brushing frequency was reported as 8.9% of normal children and 4.4% of special children brushing 2 or more times a day. Before bedtime, 63.3% of normal children and 58.2% of special children never brushed their teeth. About 63.4% of normal children and 58.7% of special children brushed their teeth for 2 minutes. Almost all (98.9%) of normal children did not face difficulties in brushing their teeth, while 51.2% of special children found it challenging. Placing toothpaste on the toothbrush was not problematic for 98.9% of normal children, but 31.1% of special children encountered difficulties. Cleaning the tongue was practiced by 80% of normal children, while only 35% of special children did the same. When it came to using toothbrushes for cleaning their teeth or gums, 93.3% of normal children and 84.5% of special children employed this method (Table 4). The mean value of decayed tooth is 1.83 in normal children and 1.38 in special children. The mean value

of missing tooth is 0.11 in normal children and 0.16 in special children. The mean filled tooth is 0.12 in normal children and 0.00 in special children (Table 5). Gingivitis was reported in 95.2% of normal children and 81% of special children. Periodontitis was identified in 7.2% of special children (Table 6).

Discussion

In our study, a notable finding was the divergence in self-reported oral health perceptions between normal and special children. While a higher percentage of normal children considered their oral health as "good," special children more frequently described it as "fair." Several factors, including the challenges faced by special children, potentially affecting their ability to maintain optimal oral health, may contribute to this difference. Additionally, our study revealed variations in toothbrush replacement practices, akin to those in the general population. The majority of normal children replaced their toothbrushes every two months, whereas many special children either replaced theirs every three months or were uncertain about the last replacement. These distinctions could indicate disparities in awareness and access to dental care supplies between the two groups. Sushanthi Suresh *et al.* reported a lower toothpaste usage of 45.5% compared to our study's higher 94.6%. Similarly, their study found only 15.2% had visited a dentist, whereas our study showed a majority of both normal and special children (64.8% and 54.4%, respectively) had done so [6]. Notably, our study demonstrated a substantial difference in the ease of brushing, with almost all (98.9%) of normal children finding it easy, while 51.2% of special children faced challenges. Surprisingly, 47% of participants were unaware of their oral health status, aligning with Purohit *et al.*'s findings [7]. Furthermore, the awareness of additional oral health practices such as mouthwash and floss was notably lower among special children, highlighting the importance of comprehensive oral health education tailored to this group. A significant portion of both groups in our study expressed uncertainty about the reasons for their last dental visit, underscoring the importance of patient education and effective communication during dental appointments. The significance of regular dental visits was acknowledged by half of both groups. It's worth noting that more special children in our study mentioned that they received personal oral health education from their parents, whereas more normal children reported being taught by their teachers. This suggests variations in the sources of oral health education between the two groups [8]. Our research also shed light on differences in toothpaste usage, with fewer special children using fluoride-containing toothpaste, a critical factor in preventing tooth

decay. This underscores the potential necessity for improved oral health education and increased access to suitable oral care products tailored to the specific needs of special children. Gingivitis affected 95.2% of normal children and 81% of special children in our study, mainly due to inadequate plaque removal, which presents a significant challenge for individuals with intellectual disabilities and limited manual dexterity [8]. KM Shivakumar *et al.* noted that approximately two-thirds of children brushed once daily, similar to our study, consistent with Gardens *et al.*'s 2014 findings [9, 10]. Oredugba *et al.* reported a higher proportion (43.6%) of special healthcare needs children with good oral hygiene, akin to our study's 48% [11]. Pandiyan I *et al.* highlighted that individuals with intellectual disabilities displayed the least favourable oral hygiene. Lastly, our study reported variations in dental hygiene practices, including daily brushing frequency and brushing duration [12]. Special children encountered more challenges in these areas, highlighting the need for tailored approaches and support to effectively address their unique oral health needs. To ensure the future oral health of individuals with special needs, it is imperative to engage those in their daily lives in oral care practices [13]. With the increasing population of individuals with special needs, the dental healthcare community should work collaboratively with various segments of society to enhance their lifelong oral health and overall well-being [14]. Special needs children may be at higher risk of dental caries due to issues like poor muscular coordination, muscular weakness affecting regular oral hygiene, sugary food intake, prolonged use of sweetened medications, and infrequent brushing [14].

Conclusion

In conclusion, our study revealed differences in self-reported oral health perceptions, toothbrush practices, toothpaste usage, and dental awareness between normal and special children. Special children often rated their oral health as "fair," potentially due to their unique challenges. This calls for tailored oral health education and improved access to dental care products for special children. Effective patient communication during dental visits is crucial, as uncertainty about the last visit's reasons was prevalent in both groups. Both groups recognized the importance of regular dental visits, but the sources of oral health education varied. Special children faced more challenges in dental hygiene, necessitating customized approaches. Collaborative efforts involving the dental community and caregivers are vital to enhance special children's lifelong oral health and overall wellbeing. Comprehensive, accessible oral health education programs are needed to address their specific needs.

Table 1: Distribution of subjects based on demographic details

Variables	Categories	Mean	Standard Deviation
Age	5-17	12.56	6.0
		Frequency [N]	Percentage [%]
Gender	Male	106	58.9
	Female	74	41.1
Socio-Economic Status	Lower Middle	86	47.8
	Upper Middle	94	52.2
Challenged	None	90	50.0
	Mentally	4	2.2
	Physically	24	13.3
	Visually	62	34.4
Total		146	100.0

Table 2: Distribution of study subjects based upon their self-description of oral health

Question	Options	Normal children [N%]	Special Children [N%]	Total [N%]	p Value
How would you describe the health of your teeth and gums?	Excellent	1 (1.1%)	3 (3.3%)	4 (2.2%)	0.066
	Fair	39 (43.3%)	38 (42.2%)	77 (42.8%)	
	Good	11 (12.2%)	1 (1.1%)	14 (7.6%)	
	Poor	39 (43.3%)	46 (51.1%)	85 (47.2%)	
Do you use toothpaste to clean your teeth?	No	3 [3.3%]	5 [5.6%]	8 [4.4%]	0.469
	Yes	87 [96.7%]	85 [94.4%]	172 [95.6%]	
Do you use toothpaste that contains fluoride?	Yes	4 [4.4%]	51 [56.7%]	55 [30.6%]	0.000*
	No	86 [95.6%]	39 [43.3%]	125 [69.4%]	
Are you aware about any other oral hygiene practices?	Floss	16 [17.8%]	8 [8.9%]	24 [13.3%]	0.000*
	Mouth wash	66 [73.3%]	46 [51.1%]	112 [62.2%]	
	No	8 [8.9%]	35 [38.9%]	43 [23.9%]	
Have you experienced bad smell from your mouth during the past 1 year?	Don't know	7 [7.8%]	10 [11.1%]	17 [9.4%]	0.000*
	Yes	9 [10.0%]	42 [46.7%]	51 [28.3%]	
	No	74 [82.2%]	38 [42.2%]	112 [62.2%]	
Have you experienced toothache in past one year?	No	80 [88.9%]	60 [66.7%]	140 [77.8%]	0.000*
	Yes	10 [11.1%]	30 [33.3%]	40 [22.2%]	
Are there any cavities in your teeth?	1-2 cavities	58 [64.4%]	40 [44.4%]	98 [54.4%]	0.000*
	Don't know	0 [0.0%]	19 [21.1%]	19 [10.6%]	
	No cavities at all	32 [35.6%]	31 [34.4%]	63 [35.0%]	

Pearson's Chi-square test

* Statistically significant

Table 3: Distribution of study subjects based upon oral health knowledge

Question	Options	Normal Children [N%]	Special Children [N%]	Total [N%]	p Value
How often do you change your toothbrush?	2 months once	54 [60.0%]	24 [26.7%]	78 [43.3%]	0.000*
	3 months once	26 [28.9%]	29 [32.2%]	55 [30.6%]	
	Not sure	4 [4.4%]	28 [31.1%]	32 [17.8%]	
	Once a month	6 [6.7%]	9 [10.0%]	15 [8.3%]	
Blood on your tooth brush during brushing may be a sign of:	Gum disease	34 [37.8%]	41 [45.6%]	75 [41.7%]	0.000*
	Not sure	1 [1.1%]	28 [31.1%]	29 [16.1%]	
	Tooth decay	55 [61.1%]	21 [23.3%]	76 [42.2%]	
Bleeding from the gums can be because of	Do not know	1 [1.1%]	24 [26.7%]	25 [13.9%]	0.000*
	General illness	44 [48.9%]	12 [13.3%]	56 [31.1%]	
	Improper brushing	37 [41.1%]	46 [51.1%]	83 [46.1%]	
	Mixing hot and cold food	8 [8.9%]	8 [8.9%]	16 [8.9%]	
Where do you place your toothbrush?	Airtight container	11 [12.2%]	6 [6.7%]	17 [9.4%]	0.017
	Common brush holder	35 [38.9%]	54 [60.0%]	89 [49.4%]	
	Separate brush holder	44 [48.9%]	30 [33.3%]	74 [41.1%]	
Have you visited dentist before?	Yes	32 [35.6%]	41 [45.6%]	73 [40.6%]	0.172
	No	58 [64.4%]	49 [54.4%]	107 [59.4%]	
What was the reason of your last visit to the dentist?	Don't Know	37 [41.1%]	38 [42.2%]	75 [41.7%]	0.025
	Pain	17 [18.9%]	31 [34.4%]	48 [26.7%]	
	Check up	29 [32.2%]	14 [15.6%]	43 [23.9%]	
	Follow up	7 [7.8%]	7 [7.8%]	14 [7.8%]	
How often did you visit the dentist during last 12 months?	Never	31 [34.4%]	42 [46.7%]	73 [40.6%]	0.228
	Once	45 [50.0%]	38 [42.2%]	83 [46.1%]	
	Twice	14 [15.6%]	9 [10.0%]	23 [12.8%]	
Did anyone teach your personal oral health care?	No	0 [0.0%]	17 [18.9%]	17 [9.4%]	0.000*
	Yes	90 [100.0%]	72 [80.0%]	162 [90.0%]	
If Yes	Dentist	3 [3.3%]	1 [1.1%]	4 [2.2%]	0.000*
	Parents	10 [11.1%]	6 [6.7%]	16 [8.9%]	
	Teachers	14 [15.6%]	55 [61.1%]	69 [38.3%]	
	Media	63 [70.0%]	28 [31.1%]	91 [50.6%]	
Reasons for not treating primary tooth	Fear	43 [50.0%]	46 [51.1%]	89 [49.4%]	0.664
	High Cost	22 [24.4%]	17 [18.9%]	39 [21.7%]	
	Unaware of pediatric oral care	25 [27.8%]	27 [30.0%]	52 [28.9%]	
Regular visits to the dentist are important	No	5 [5.6%]	4 [4.4%]	9 [5.0%]	0.255
	Not Sure	40 [44.4%]	29 [32.2%]	69 [38.3%]	
	Yes	45 [50.0%]	56 [62.2%]	101 [56.1%]	

Pearson's Chi-square test

* Statistically significant

Table 4: Distribution of study subjects based upon oral health practices

Question	Options	Normal Children [N%]	Special Children [N%]	Total [N%]	p Value
How often you eat or drink the following fruits, cookies, chocolates?	Everyday	49 [54.4%]	35 [38.9%]	84 [46.7%]	0.000*
	Never	6 [6.7%]	26 [28.9%]	32 [17.8%]	
	Several times a day	6 [6.7%]	16 [17.8%]	22 [12.2%]	
	Several times a month	17 [18.9%]	7 [7.8%]	24 [13.3%]	
	Several times a week	12 [13.3%]	6 [6.7%]	18 [10.0%]	
How many times do you brush your teeth?	Never	0 [0.0%]	12 [13.3%]	12 [6.7%]	0.001*
	Once a day	74 [82.2%]	65 [72.2%]	139 [77.2%]	
	Once a week	0 [0.0%]	2 [2.2%]	2 [1.1%]	
	Several times a month	0 [0.0%]	2 [2.2%]	2 [1.1%]	
Do you brush your teeth before going to bed?	No	57 [63.3%]	52 [57.8%]	109 [60.6%]	0.446
	Yes	33 [36.7%]	38 [42.2%]	71 [39.4%]	
What is the duration of brushing your teeth?	1 minute	19 [21.1%]	21 [23.3%]	40 [22.2%]	0.669
	2 minutes	0 [0.0%]	1 [1.1%]	1 [0.6%]	
	3 minutes	57 [63.3%]	52 [57.8%]	109 [60.6%]	
	5 minutes	0 [0.0%]	1 [1.1%]	1 [0.6%]	
	10 minutes	14 [15.6%]	15 [16.7%]	29 [16.1%]	
Do you find difficulty in tooth brushing?	No	89 [98.9%]	42 [46.7%]	131 [72.8%]	0.000*
	Yes	1 [1.1%]	47 [52.2%]	48 [26.7%]	
Do you find difficulty in placing toothpaste in tooth brush?	No	89 [98.9%]	32 [35.6%]	121 [67.2%]	0.000*
	Yes	1 [1.1%]	57 [63.3%]	58 [32.2%]	
Do you clean your tongue?	No	18 [20.0%]	58 [64.4%]	76 [42.2%]	0.000*
	yes	72 [80.0%]	32 [35.6%]	104 [57.8%]	
Do you use any of the following to clean your teeth or gums?	Floss	3 [3.3%]	5 [5.6%]	8 [4.4%]	0.142
	Tooth brush	84 [93.3%]	76 [84.4%]	160 [88.9%]	
	Wooden tooth picks	3 [3.3%]	9 [10.0%]	12 [6.7%]	

Pearson's Chi-square test

* Statistically significant

Table 5: Mean dental caries experience among the study participants

Caries Experience	Challenged	Mean	Standard Deviation	Standard Error of Mean	p Value
Decayed tooth	No	1.83	2.215	0.233	0.13
	Yes	1.38	1.827	0.193	
Missing tooth	No	0.11	0.381	0.040	0.58
	Yes	0.16	0.669	0.071	
Filled tooth	No	0.12	0.362	0.038	0.23
	Yes	0.00	0.000	0.000	

Pearson's Chi-square test

* Statistically significant

Table 6: Periodontal status among the study participants

Question	Options	Normal Children [N%]	Special Children [N%]	Total [N%]	p Value
Periodontal status	Gingivitis	86 [95.6%]	65 [72.2%]	151 [83.9%]	0.000*
	Periodontitis	0 [0.0%]	6 [6.7%]	10 [5.6%]	
	None	4 [4.4%]	13 [14.4%]	13 [7.2%]	

Pearson's Chi-square test

* Statistically significant

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How to Cite This Article

Kesavan R, Vinita Mary A, Oviya P, Priyadarshini K, Priyadarshini KS. Exploring oral health practices and status: A comparative analysis between normal children and those with special needs. *International Journal of Applied Dental Sciences.* 2023;9(4):114-119.

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