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ASSESSMENT OF DENTAL CARIES IN CHILDREN WITH SPECIAL HEALTH CARE NEEDS AMONGST DAY SCHOLARS AND BOARDERS IN DELHI REGION – A CROSS SECTIONAL STUDY

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Abstract: Dental caries, particularly affecting 60–90% of school-aged children and 88.8% of children with disabilities, is still prevalent in the majority of wealthy countries. 38% of the disabled children in India's State of Delhi, where special schools for children with disabilities are located, have been found to have prominent dental caries. Aim of this study was to evaluate and compare the Prevalence of Dental Caries in Children with Special Care Health Care Needs amongst Day Scholars and Boarders in Delhi NCR. 400 children of age group 5 to 14 years were included in this study and equally divided into 2 groups as Day scholars and Boarders. Results showed that Dental caries was found to be prevalent in 28% of day scholars and 49.5% of boarders, and the caries experience of the day scholars and boarders were found to be 28% and 56.5% respectively.

***Keywords: Dental Caries, Special Health Care Needs, Prevalence*.**

INTRODUCTION:

Dental caries, found very common in the population of children with special healthcare needs have a negative impact on the quality of their life. Public health issues related to dental decay are serious.[1] Dental caries is a complex illness that often worsens over time and is the most prevalent chronic condition that negatively impacts global population health by causing healthy teeth to shed prematurely.[2]

The distinctive characteristics of varied set of chronic disorders known as developmentally disabled children include problems with cognition, behaviour, or physical functioning.[3] 38% of the disabled children in India's State of Delhi, where special schools for children with disabilities are located, have been found to have prominent dental caries and additionally due to inadequate dental hygiene, 55% of them have gingival ulcers.[4]

According to the American Academy of Pediatric Dentistry (AAPD)[5], the current therapy regimen for infants, children, and teenagers must include various caries risk assessment methods. A child's future dental health, nutrition, overall health, and quality of life can all suffer as a result of poor oral health. Families play a significant role in influencing the oral health habits of children.[6]

Children with better regular dental are more likely to have parents who are more aware of oral health and who act and think in ways to promote it. Children with Special health care needs depend on their parents or other caretakers for assistance and supervision with everyday tasks, medical treatment, and dental care.[7] According to a study by Frank et. al on the how parents perceived dental caries in children who have intellectual disabilities, dental caries has a significant impact on parents' perception of the oral care quality of life of those kids.[8]

In India, there are estimated 18.49 million disabled persons, or 1.8% of the total population, and 0.44 million mentally retarded people, according to the National Sample Survey Organization (NSSO) report. They can receive primary healthcare, which is regarded as the cornerstone of an effective healthcare system.[9] Dental caries, particularly affecting 60–90% of school-aged children and 88.8% of children with disabilities, is still prevalent in the majority of wealthy countries.

School dental health Programmes for children, as it recommends:

- Education about dental health should be provided in schools to both children and carers. Teachers, parents, and carers should also get training on maintaining oral hygiene through good brushing techniques, the use of fluoride toothpaste, and mouthwashes.
- Periodic examinations for diagnostic testing and timely treatment, among other oral health services for students, should be conducted.
- If the fluoride content in the water is low, provisions should be made for fluoride to be available in drinking water or as supplements.

NEED OF THE STUDY:

The difference in dental care provided to healthy children between parents and care givers marks a drastic difference in prevalence of dental caries due to their control on sugary diet.[10] Therefore, the purpose of this study was to ascertain whether there is a comparison in the incidence and prevalence of dental caries between day scholars and boarding students.

Aim of this study was to Evaluate and Compare the Prevalence of Dental Caries in Children with Special Care Health Care Needs amongst Day Scholars and Boarders in Delhi NCR with an additional objective of comparing their caries experience.

METHODOLOGY:

A cross-sectional study was conducted in a dental clinic set up in a school for children with special healthcare needs in Delhi NCR and the study was approved by an Institutional Ethical Committee of Manav Rachna Dental College, FDS, MRIIRS, Faridabad, Haryana under the protocol number MRIIRS/MRDC/FDS/IEC/2020/05. The trial (application number REF/2021/06/044438) was registered with Clinical Trial Registry, India. The registration number for this trial is CTRI/2021/11/037817. Dental examination was conducted after taking written informed consent from the Principal/ Head authorities from special schools.

INCLUSION CRITERIA

Children aged between 5 to 14 years.
The child must be a student in the School for Special Children.

EXCLUSION CRITERIA

Uncooperative during the clinical oral examination (definitely negative on Frankl behaviour rating scale).

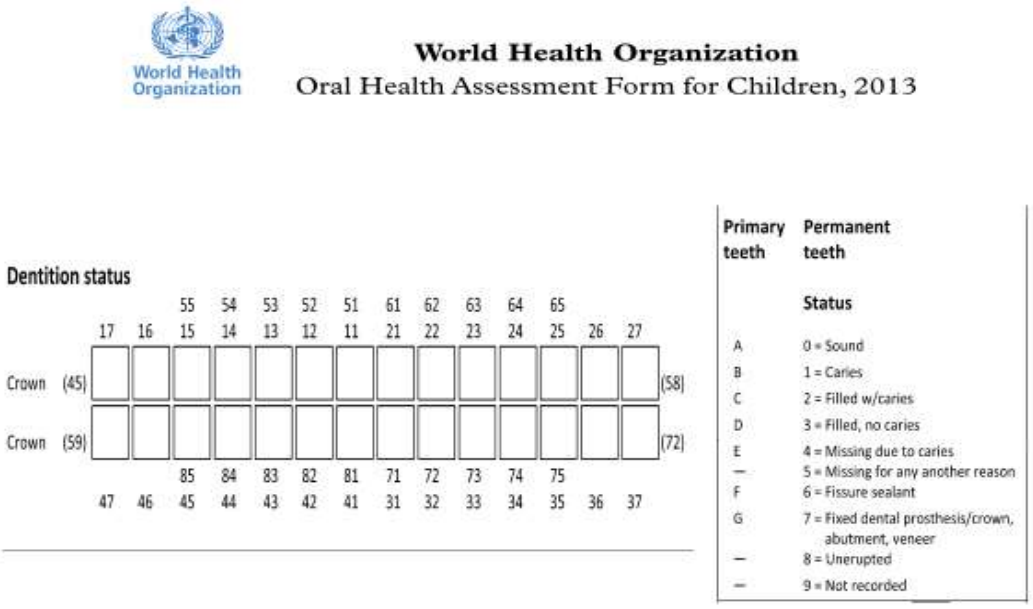
SAMPLE SIZE ESTIMATION

The sample size estimation was done by using GPower software (version 3.1) for t tests – Means: Difference between two independent means (two groups). The assumptions for calculation of sample size are minimum 95% power for an alpha 0.05 and 5% significance level (significant at 95% confidence level) with 0.33 effect size. Thus, the final calculated sample size was 400 with 200 subjects in each group.

EXAMINATION AND ASSESSMENT OF SUBJECTS

- Children was selected according to the inclusion and exclusion criteria.
- Demographic data including Age, Sex, Address, Name of the school were noted.
- Written informed consent was taken from the Institution/parents or guardian after explaining the design of the study.
- Clinical Intra- Oral examination was done under a good light source using a well sterile mouth mirror and explorer.
- Data was recorded as per WHO Oral Health Assessment Form for Children, 2013 (Figure.1).
- Dentition status were marked in the form.

Figure 1: WHO Oral Health Assessment Form For Children, 2013



STATISTICAL ANALYSIS

All the data was collected and tabulated using a Microsoft Excel spreadsheet and then checked for any missing entries. The data were analysed using SPSS version 21.0. (Chicago IL, USA) Descriptive and analytical statistics were done. Intergroup comparison will be done using Independent-t-Test and Mann-Whitney Test. Since the categorical data were compared in the present study, the Chi-square test was used to check the difference in proportions among several variables. The level of significance was set at $p<0.05$

RESULTS:

A total of 400 Special children were selected for the study and divided into 2 groups as:
Group 1 – Day Scholars
Group 2 – Boarders

Table 1: Mean age of the Day Scholars and Boarders by Gender

Day scholar/Boarders		n	Minimum	Maximum	Mean ± SD
Day scholar	**Male**	152	5	14	10.18±2.16
	Female	48	5	14	10.40 ± 2.47
Boarders	**Male**	175	5	14	12.33 ± 2.22
	Female	25	7	14	11.96 ± 2.01

Table 2: Distribution of study population according to age

		Day scholar/Boarders		Total	Chi-square test	
		Day scholar	Boarders		Chi-square value	p-value
Age group	**5-9 years**	74	26	100	30.72	0.001*
		37.0%	13.0%	25.0%		
	10-14 years	126	174	300		
		63.0%	87.0%	75.0%		
Total		200	200	400		
		100.0%	100.0%	100.0%		

Table 3: Distribution of study population by gender

		Day scholar/Boarders		Total	Chi-square test	
		Day scholar	Boarders		Chi-square value	p-value
Gender	**Male**	152	175	327	8,864	0.003
		76.0%	87.5%	81.8%		
	Female	48	25	73		
		24.0%	12.5%	18.3%		
Total		200	200	400		
		100.0%	100.0%	100.0%		

Table 1 depicts the Maximum and minimum values of the age and their mean and standard deviation among the two study groups; day scholars and boarders. Day scholars were of the lower age compared to boarders. The mean age of male and female day scholars were 10.18±2.16 and 10.40 ± 2.47 respectively. The mean age of male and female boarders were 12.33 ± 2.22 and 11.96 ± 2.01 respectively.

Table 2 depicts the frequency distribution of the study population based on the two age groups; day scholars and boarders. Majority of the population belonged to the higher age group of 10-14 years with day scholars (63%) and boarders (87%), where as 37% as day scholars and 13 % as boarders belonged to the age group 5- 9 years. There was significant association between the different age groups and the type of students, when Chi-square test was applied.

Table 3 depicts the frequency distribution of the study participants based on the gender. Majority of the study participants were males in both day scholars (76 %) and boarders (87.5 %). Females were only 24% and 12.5% in both the groups. When the Chi-square test was used, there was a strong correlation between gender and the type of students.

Table 4: Distribution of study population by dentition status

		Day scholar/Boarders		Total	Chi-square test	
		Day scholar	Boarders		Chi-square value	p-value
Dentition status	**Primary dentition**	12	3	15	68.834	0.001*
		6.0%	1.5%	3.8%		
	Mixed dentition	115	42	157		
		57.5%	21.0%	39.3%		
	Permanent dentition	73	155	228		
		36.5%	77.5%	57.0%		
Total		200	200	400		
		100.0%	100.0%	100.0%		

Table 5: Comparison of caries prevalence, caries experience in day scholars and boarders

		Day scholar/Boarders		Total	Chi-square test	
		Day scholar	Boarders		Chi-square value	p-value
Caries Prevalence (DT + Filled with caries)	Absent	144	101	245	19.476	0.001*
		72.0%	50.5%	61.3%		
	Present	56	99	155		
		28.0%	49.5%	38.8%		
Missing Teeth (MT)	Absent	192	170	362	14.074	0.001*
		96.0%	85.0%	90.5%		
	Present	8	30	38		
		4.0%	15.0%	9.5%		
Filled Teeth (FT)	Absent	200	199	399	1.003	0.317
		100.0%	99.5%	99.8%		
	Present	0	1	1		
		0.0%	0.5%	0.3%		
Caries Experience (DMFT)	Absent	144	87	231	33.29	0.001*
		72.0%	43.5%	57.8%		
	Present	56	113	169		
		28.0%	56.5%	42.3%		
Total		200	200	400		
		100.0%	100.0%	100.0%		

Table 6: Association between caries prevalence with Day scholars/Boarders, age, gender and dentition status

Parameters	Odds ratio	95% CI	*p*-value
Day scholars/Boarders			
Day scholars	1[a]	1.64-4.16	0.001*
Boarders	2.61		
Age			
5-9 years	1[a]	0.58-2.24	0.710
10-14 years	1.14		
Gender			
Female	1[a]	0.99-3.18	0.056
Male	1.77		
Dentition status			
Permanent	1[a]	0.42-4.28	0.615
Mixed	1.35		

Table 7: Association between caries experience with Day scholars/Boarders, age, gender and dentition status

Parameters	Odds ratio	95% CI	*p*-value
Day scholars/Boarders			
Day scholars	1[a]	2.12-5.39	0.001*
Boarders	3.38		
Age			
5-9 years	1[a]	0.62-2.44	0.553
10-14 years	1.23		
Gender			
Female	1[a]	1.13-3.69	0.018
Male	2.05		
Dentition status			
Permanent	1[a]	0.58-5.86	0.300
Mixed	1.84		

*p < 0.05 – Statistically Significant

Table 4 depicts the frequency distribution of the study participants based on their dentition status. Majority (57.5%) of day scholars had mixed dentition, where as a clear majority of boarders (77.5%) had permanent dentition. Among the total study population, majority (57.0%) had permanent dentition. When the Chi-square test was used, there was a substantial correlation between the children' types and their dental status. Only 6% and 1.5% of day scholars and boarders, respectively, had primary dentition.

Table 5 summarize the association between the components of DMFT with the type of students. It was found that there was a significant association between Caries Prevalence (DT + Filled with caries) (P< 0.001), Missing Teeth (MT) (P<0.001) and Caries Experience (DMFT) (P<0.001) with the type of student. Filled teeth (FT) did not show any such association. Figures 4 and 5 depicts the dental caries prevalence and caries experience, respectively. Dental caries was found to be prevalent in 28% of day scholars and 49.5% of boarders. Day students and boarders experienced caries at rates of 28% and 56.5%, respectively.

Binomial logistic regression was performed between caries prevalence with type of student, age gender and dentition status which was represented in Table 6. There was significant association seen between caries prevalence and the type of student (P <0.001). It revealed that boarders had 2.61 times increased odds of having more caries than day scholars. There was no association seen between caries prevalence with age (P= 0.710), gender (P = 0.056) and dentition status (P = 0.615).

Table 7 shows Binomial logistic regression performed between caries experience with type of student, age gender and dentition status. There was significant association seen between caries experience with the type of student (P <0.001) and gender (P= 0.018). The results showed that the probabilities of developing caries were 3.38 times higher for boarders than for day scholars, and that the odds were 2.05 times higher for males than for females. There was no association seen between caries experience with age (P= 0.553) and dentition status (P = 0.300)

DISCUSSION:

Children with Special Health Care Needs (CSHCN) was defined by the American Academy of Pediatric Dentistry (AAPD) as, "any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs. The condition may be congenital, developmental, or acquired through disease, trauma, or environmental cause and may impose limitations in performing daily self-maintenance activities or substantial limitations in a major life activity. Health care for individuals with special needs requires specialized knowledge, as well as increased awareness and attention, adaptation, and accommodative measures beyond what are considered routine."[11]

Children in India are increasingly suffering from dental caries, which is a problem for their oral health. The frequency and prevalence of dental caries in a community are influenced by a variety of risk factors, including age, sex, ethnic background, dietary habits, and oral hygiene practices.[12] Dental decays have been linked to various aspects of quality of life, including how it affects children's social, functional, and psychological well-being as well as how distressed parents feel.[8]

According to National Oral Health Survey, India's prevalence of caries was 51.9 %, 53.8 %, and 63.1 % at ages 5, 12, and 15, respectively. It controls growth, early childhood development, gastrointestinal issues, eating habits, nutritional intake, and school readiness in children, which contributes to absenteeism from school.[13] In India, there are more than 12 million children with specific healthcare needs, and just 1% of them have access to education yet still it is difficult to provide with the assistance they require.[14]

The incidence of cavities varies from nation to nation and within a single nation from area to region. The occurrence of cavities is also influenced by geographical characteristics like race, climate, nutrition, culture, and economic considerations. Our study was the first of its kind to analyze the dental caries in Children with Special Care Health Care Needs amongst day scholars and boarders in Delhi-NCR.

Caries prevalence was found to be 28% for day scholars and 49.5% for boarders and 38.8% in overall which was found to be similar in an equivalent study by Grewal H et.al where 52.3% of caries prevalence was reported in special health care children worldwide.[15] Special health care children in Delhi NCR who were either day students or boarders and had DMFT values between 28% and 56.5%. In comparable studies, DMFT scores of 22.2% were recorded for patients with cerebral palsy and in patients with Down syndrome had a DMFT score of 31.8% by Prasad et.al.[16] Day scholars and boarders between the ages of 5 and 14 had a caries frequency of 49.5%. In contrast, Das et.al exhibited higher frequency in the age groups of 7-8 and 9-10, with 82.2% and 82.6%, respectively.[17]

Among day scholars and boarders in Delhi NCR, this was the first in-depth dental and oral hygiene health programme offered. This initiative has given us the baseline information on the prevalence of dentistry and oral health issues, which has been useful in developing the fundamental oral and dental care for these children.

CONCLUSION:

THE study has shown a higher caries prevalence in children with special needs residing in boarding schools as compared to those staying at home. The frequency of caries was greater and oral hygiene was poorer in children with special healthcare needs. At home the parent or guardian has to take care of one or two children while at boarding schools a care taker usually has to take care of a relatively larger nUMBER of children. This dilutes the attention that each child receives creating gaps and thus compromising the dental health. Pediatric dentists need to increase awareness regarding the importance of direct supervision in maintaining good oral health and prevention of dental diseases especially in young children and children with special needs.

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REFERENCES

[1] Lee JN, Scott JM, Chi DL. Oral health behaviours and dental caries in low – income children with special healthcare needs: A prospective observational study. International Journal of Paediatric Dentistry. 2020 May 4.
[2] Uwayezu D, Gatarayiha A, Nzayirambaho M. Prevalence of dental caries and associated risk factors in children living with disabilities in Rwanda: a cross-sectional study. The Pan African Medical Journal. 2020;36.
[3] Liu HY, Chen JR, Hsiao SY, Huang ST. Caregivers' oral health knowledge, attitude and behaviour toward their children with disabilities. Journal of Dental Sciences. 2017 Dec 1;12(4):388-95.
[4] Makkar A, Indushekar KR, Saraf BG, Sardana D, Sheoran N. A cross sectional study to evaluate the oral health status of children with intellectual disabilities in the National Capital Region of India (Delhi-NCR). J Intellect Disabil Res. 2019 Jan;63(1):31-39.
[5] American Academy of Pediatric Dentistry. Policy on early childhood caries (ECC): Consequences and preventive strategies. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023:88-91.
[6] Duddu MK, Muppa R, Nallanchakrava S, Bhupatiraju P. Prevalence of dental caries in people attending special schools in Hyderabad-Secunderabad, India. Journal of Dr. NTR University of Health Sciences. 2016 Apr 1;5(2):137.
[7] Baskaradoss JK, AlSumait A, Behbehani E, Qudeimat MA (2022) Association between the caregivers' oral health literacy and the oral health of children and youth with special health care needs. PLoS ONE 17(1): e0263153.

[8] Frank M, Keels MA, Quinonez R, Roberts M, Divaris K. Dental Caries Risk Varies Among Subgroups of Children with Special Health Care Needs. Pediatr Dent 2019;41(5):378-84.
[9] Goud V, Gupta R, Suresh Babu AM, Das D, Kulkarni G, Swathi K. Oral health status and treatment needs among deaf, mute and visually impaired children of Gulbarga district – A population based cross sectional study. J Family Med Prim Care 2021; 10:3664-9.
[10] Verma J, Srivastava A, Gupta K. Prevalence of dental caries and oral hygiene status among institutionalized special children and normal children in district Mandi of Himachal Pradesh: A comparative study. Int J Pedod Rehabil 2021; 6:11-6.
[11] American Academy of Pediatric Dentistry. Management of dental patients with special health care needs. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2024:343-50.
[12] Reddy K, Sharma A. Prevalence of oral health status in visually impaired children. J Indian Soc Pedod Prev Dent 2011; 29:25-7.
[13] Saravanan S, Kalyani V, Vijayarani M P, Jayakodi P, Felix J, Arunmozhi P, Krishnan V, Sampath Kumar P. Caries prevalence and treatment needs of rural school children in Chidambaram Taluk, Tamil Nadu, South India. Indian J Dent Res 2008; 19:186-90
[14] Sedky NA. Assessment of oral and dental health status in children with cerebral palsy: An exploratory study. Int J Health Sci (Qassim). 2018 Jan-Feb;12(1):4-14.
[15] Grewal H, Verma M, Kumar A. Prevalence of dental caries and treatment needs amongst the school children of three educational zones of urban Delhi, India. Indian J Dent Res 2011; 22:517-9
[16] Prasad M, Patthi B, Singla A, Gupta R, Niraj LK, Ali I. Special care with special child-oral health status of differently abled children attending special schools in Delhi: A cross-sectional study. J Indian Assoc Public Health Dent 2018; 16:137-43
[17] Das UM, Beena JP, Azher U. Oral health status of 6- and 12-year-old school going children in Bangalore city: an epidemiological study. J Indian Soc Pedod Prev Dent 2009; 27:6-8.