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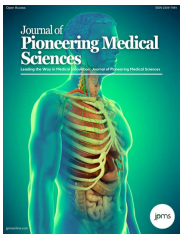

Barriers to Utilization, Unmet Oral Health Needs and Comprehensive Oral Health Profiling for Special Children in Kanchipuram District: A Cross-sectional Study

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Abstract **Objectives:** This research intends to identify and analyse barriers such as lack of awareness, limited access to services and low priority to oral health which hinder the usage of oral health care among special children in the Kanchipuram District. Through the assessment of the unmet oral health needs, to create a comprehensive oral health profile for these disabilities by finding the dental caries experience, oral hygiene status, periodontal status, prevalence of malocclusion and providing a detailed understanding of their oral health status and help in improving their oral health outcomes. **Methods:** A descriptive cross-sectional study was conducted for 411 disabled children. The people were gathered into the mentally, physically, visually and hearing impaired. Clinical assessment was recorded utilizing by the OHIS index, dft/DMFT index, WHO 1997, DAI index and the unmet treatment needs are also assessed. The chi-square test and ANOVA were employed to identify the significant ($p<0.05$) variation in the oral status. **Results:** Out of 411 participants, 68.9% had dental caries. It was seen that the pervasiveness of decay was high in the mentally restrained (31.6%) and least in the hearing impaired (27.3%). The oral hygiene status was good in 21.4%, fair in 37.7% and poor in 40.8% of the research populace. **Conclusions:** Among the disabled children, there was a complete disregard for dental health. When compared with hearing and orthopedically physically challenged, the mentally and visually impaired persons had much worse oral health outcomes. So, enhancing access to dental services and oral health education is imperative.

Key Words Oral hygiene, dental caries, malocclusion, disabled people

INTRODUCTION

Research has shown that globally, it is alarming to know the prevalence of disability is higher in developing countries. Around 670 million were afflicted by disabilities. According to the 2016 national sample survey organization in India, 18.88 million individuals worldwide are impacted by impairments. While developing any health program to this population is should be in holistic and meticulous in approach, the primary focus should always be on the children within that group. It is evident that disabled children are neglected by both society and their own parents [1].

As of the last update in January 2022, Tamil Nadu, like many other states in India, has implemented various oral health schemes and programs aimed at improving oral health outcomes for special children. Some of these initiatives may include: national oral health program and rural oral health program: this program aims at the national level, states like Tamil Nadu may adapt and to provide comprehensive oral healthcare services to urban and rural communities, including special children, through mobile dental clinics, outreach programs and community-based initiatives and then school based oral health program: many schools in Tamil Nadu implement oral health programs that target all students, including those with special needs. These programs often include dental check-ups, oral health education and preventive treatments [2-4].

Tamil Nadu in India, accounts for about 84% of disabled populations, of which 77% are children. The current programs

target the rural population and school children with special emphasis on disabled population and special children who are institutionalized. These programs run with main objective to raise awareness then cut down on barriers to utilization and keep a check on unmet treatment needs [5,6].

The practical difficulties of these programs need to be assessed at grass foot level to make such initiatives for success. Kanchipuram district in Tamil Nadu, ranked 15th in the state level approximately 38 special homes are dedicated to the care and support for disabled children [7]. These children inhabited this home for varied reasons, including healthcare, education and rehabilitation, providing a supportive environment for children with special needs to thrive and develop to their full potential. As a matter of fact, these institutional homes are actually unaware of and have not been properly provided access to government programs and privileges [8,9]. As oral health is the most underrated and overlooked component of general health. the basic oral hygiene and oral health related quality of life are a major concern for these children in comparison to children with normal IQ and cognitive skills [10,11].

Hence the current study was planned as a baseline data to assess the awareness of such programs and reasons for the utilization pattern [12] and also measurements of basic oral parameters like oral hygiene practices, periodontal health, malocclusion, dental caries experience and unmet treatment needs among children with disabilities attending special homes in Kanchipuram. By doing so, it seeks to pave the way for systemic changes that may contribute to greater health outcomes and an improved standard of life for children with disabilities in Kanchipuram.

METHODS

A descriptive cross-sectional study was conducted in the Chennai district of Kanchipuram, a total of 38 exceptional special homes were chosen and vetted. Because Kanchipuram ranking 23rd place in national level for dedicating homes for special children. The study comprised special children of index age range of 5-15, 16-24 and 25-34.

Ethical Clearance

Prior to the study commencing, the institutional ethics committee at Saveetha university granted the ethical clearance.

Inclusion Criteria

The study included children who had little to no support from their families. Children who were willing and present during the time of examination were included in the study.

Exclusion Criteria

Students who absented even after 3 consecutive visits to their homes were excluded in the study. Children who are terminally ill and with complex systemic illness were excluded. All study participants received written informed permission from the institution's head after being fully told about the study's objectives and methods.

Using the G-power 3.0 sample size calculation software, a sample size of 411 was calculated with 90% power and 5% alpha error [13]. The current research was done over a period of 3 months from July 2023 to September 2023. A pilot survey with 20 participants was carried out to determine the sample size and to assess the validity and reliability of the survey. The calculated kappa coefficient was 0.87.

This study is about raising awareness of oral health for disabled children emphasizes the unique challenges they face, such as difficulties with brushing, sensory sensitivities, or medical conditions impacting dental health. It stresses the importance of adapted dental care strategies, regular dental check-ups and collaboration between caregivers, healthcare providers and dentists. Educating caregivers about oral hygiene techniques tailored to the child's needs and advocating for accessible dental care services are crucial.

Study Sample Data Collection and Sampling Method

Examination Procedure

The initial section gathered basic data about those who participated, including their age, sex and kind of disability. The second section collecting information from special homes regarding awareness about schemes and government privileges. The following portion contained organized information on their oral hygiene status as measured by the OHIS index presented by John C Greene and Jack R Vermillion in 1964, as well as dental caries experience as measured by the dft index for the primary teeth by Gruebbel ad 1944 and DMFT index for permanent dentition given by Henry Klein, Carrole E Palmer and JW Knutson 1931. A dentition was considered decaying (d/D component) if it showed apparent evidence of a cavity, notably undiagnosed decay. There were no x-rays taken throughout the research. The tooth that was missing (M component) included teeth that required extraction or had to be removed due to caries. The filled (f/F component) included filled teeth. Periodontal (loss of attachment) and gingival (cpi) state was then determined based on gingival bleeding and the presence of pockets suggested by the World Health Organisation (WHO) 1997. The severity of malocclusion was measured using the DAI index given by peter hunter. N Z Dent J 2006. Unmet treatment needs were assessed in relation to their oral conditions in relation to prior studies, such as the need for oral prophylaxis, one surface restorations, two surface restorations, pulp therapy and trauma status [14-17].

Prior to the investigation, investigators had clinical trainings at Saveetha dental college in Chennai, where they were trained in public health dentistry. A proforma was used to record the demographic data, which included name, age, gender, any disabilities and about knowledge and experience regarding their own benefits from the governance, that were gathered during the clinical examination for dental caries, oral hygiene, periodontal disease and orthodontic status.

Adolescents and kids were seated in a regular chair for the dental examination. For the examination, a periodontal probe, an explorer and a disposable mouth mirror were utilized. The probe was utilized especially to validate the gingival diagnosis and the explorer was handled very carefully to avoid damaging the sound, unbroken enamel surface. Following instruction on screening and brushing practices, school children received oral health education.

Statistical Analysis

SPSS software (version 23) was used to evaluate data that had been placed into a Microsoft excel spread sheet.

There was use of descriptive and inferential statistics. ANOVA and the chi-square test were utilized to ascertain the relationship between the patients' oral hygiene state, treatment requirements and status as disabled ($p<0.05$).

RESULTS

A total of 411 children (195 guys and 216 females) comprised the sample and according to that 78 (18.9%) were visually disabled, 112 (27.3%) were hearing impaired and 126 (31.6%) were mentally retarded and 95 (23%) were physically challenged. The socio-demographic characteristic of the study participants is shown in Table 1. The evaluation of oral health benefits and schemes from the government according to their type of disability found that around 65% and 50% of special homes in Kanchipuram are not cognizant of their own advantages. (Table 1), statistically significant difference was found ($p = 0.011$) among the four gatherings. And the mentally restrained groups had the most elevated mean decayed, missing and filled teeth (dft and DMFT) (Table 2) among the 411 youngsters, the mean value of intellectually limited populace had the biggest number of caries (2.54) trailed by the visually challenged (2.38), orthopedically physically challenged (1.85) then followed by the hearing impaired and the difference was statistically significant. The mentally restrained populace had the biggest number of the populace (52) who had poor OHIS scores followed by hearing-impeded (45) and orthopedically physically challenged populace (38) and the least will be visually challenged (33) with less population compared to others, the difference was statistically significant (Figure 1). The hearing impaired (33) had the highest number of the population who had good OHIS scores trailed by physically challenged (26) and mentally restrained (17), then the least will be the same visually challenged populace (12).

The mentally restrained populace (108) had the largest number of the populace who had gingival bleeding followed by hearing disabled (84) and orthopedically physically challenged (72) then the visually challenged (64) had minute difference with physically challenged people got the lowest value. Within the presence of pockets, the mentally restrained populace (51) had the largest number of the populace who have pockets followed by hearing hindered

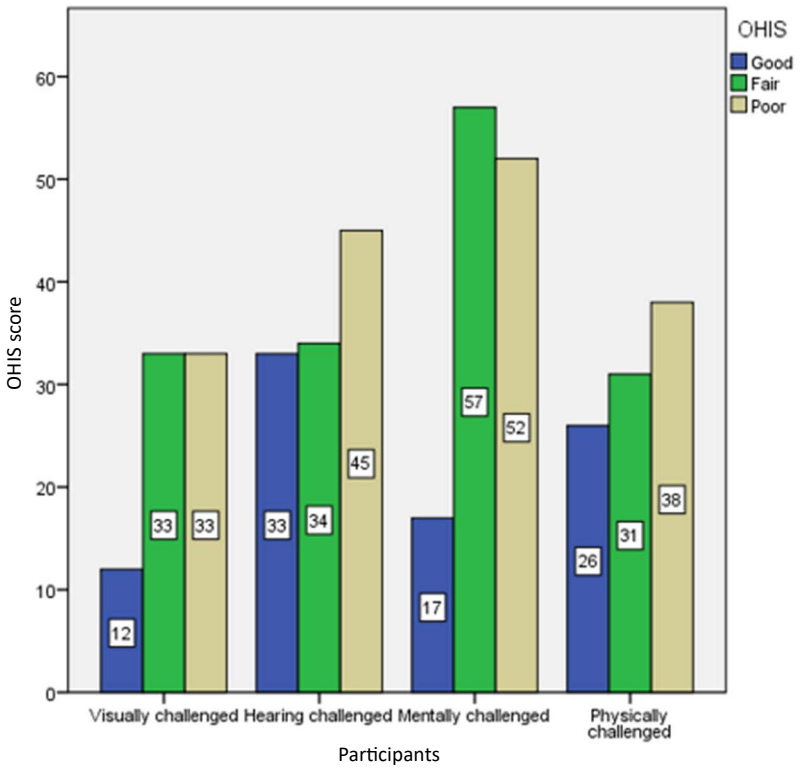

Figure 1: Oral hygiene status of the study population stratified with different type of developmental disorder status *p <0.001

Table 1: Demographic details of the study participants and Knowledge of special homes about their benefits

Age	Visually challenged N (%)	Hearing impaired N (%)	Mentally restrained N (%)	Physically challenged N (%)
5-15	61 (78.2)	96 (76.2)	99 (88.4)	73 (76.8)
16-24	13 (16.7)	12 (8.2)	20 (18.1)	20 (21.1)
25-34	4 (5.1)	4 (3.6)	7 (5.6)	2 (2.1)
Gender	Visually challenged N (%)	Hearing impaired N (%)	Mentally restrained N (%)	Physically challenged N (%)
Male	35 (44.9)	40 (35.7)	55 (43.7)	34 (35.8)
Female	43 (55.1)	72 (64.3)	71 (56.3)	61 (64.2)
Total	78 (18.9)	112 (27.3)	126 (31.6)	95 (23)

Knowledge of special homes	Yes	No	Don't know
Awareness about government privileges	7(18)	25(65)	6(15)
Utilization of dental health services	12(5)	19(50)	7(16)

Table 2: One way ANOVA

Caries experience	Visually disabled	Hearing impaired	Mentally retarred	Physically challenged	p-value
	----------Mean±SD ----------				
Decayed and filled teeth	2.29±1.71	1.82±1.61	2.42±1.78	1.85±1.34	0.011**
Decayed teeth	2.02±1.31	1.45±1.62	2.14±1.61	1.87±1.62	
Missing teeth	0.89±0.46	0	0.11±0.5	0	
Filled teeth	0	0	0	0	
Decayed, missing and filled teeth	2.38±1.86	1.82±1.67	2.54±1.87	1.85±1.62	

*Significant, SD: Standard deviation

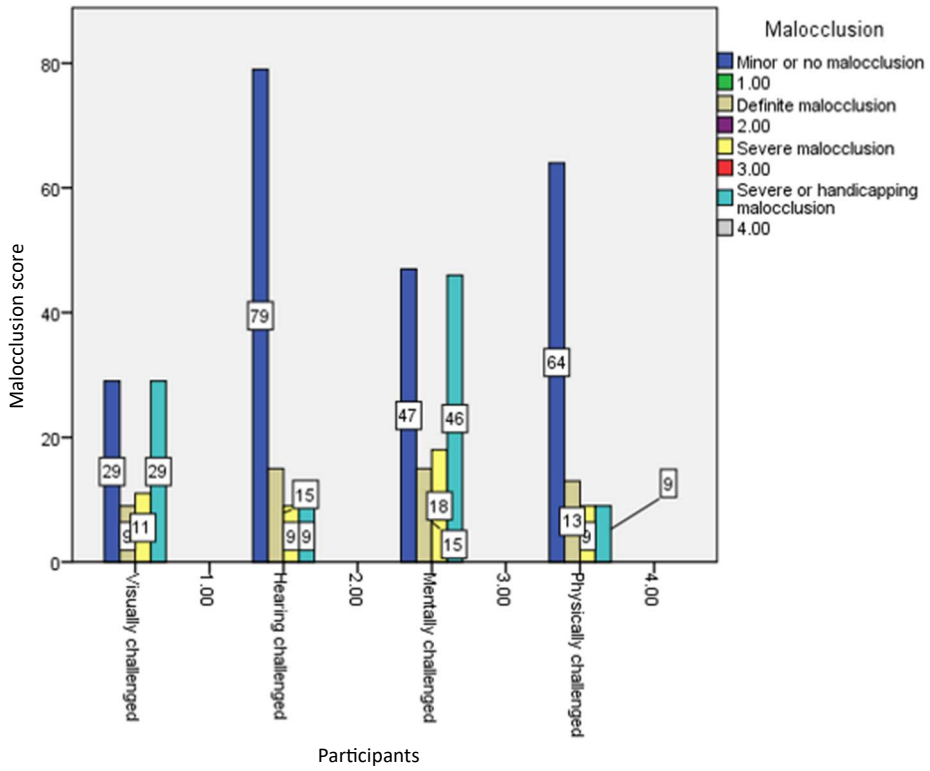

Figure 2: Severity of malocclusion status of the study population stratified with different type of developmental disorder status *p<0.005

(42) and visually challenged (33), then the lowest value with the orthopedically physically challenged [(8).

As indicated by the severity of malocclusion, (Figure 2) it was seen that hearing impaired (79) had no anomaly or minor malocclusion and followed by physically challenged (64) and mentally challenged (47) and lowest value with visually challenged (29). As the mentally restrained people (46) had very severe malocclusion followed by visually impaired (29) and hearing impaired (15) and the physically challenged people (9) had the lowest score of very severe malocclusion.

The maximum needed treatment, (Figure 3) was oral prophylaxis with one surface restoration and the highest level with mentally restrained population (52) and followed by

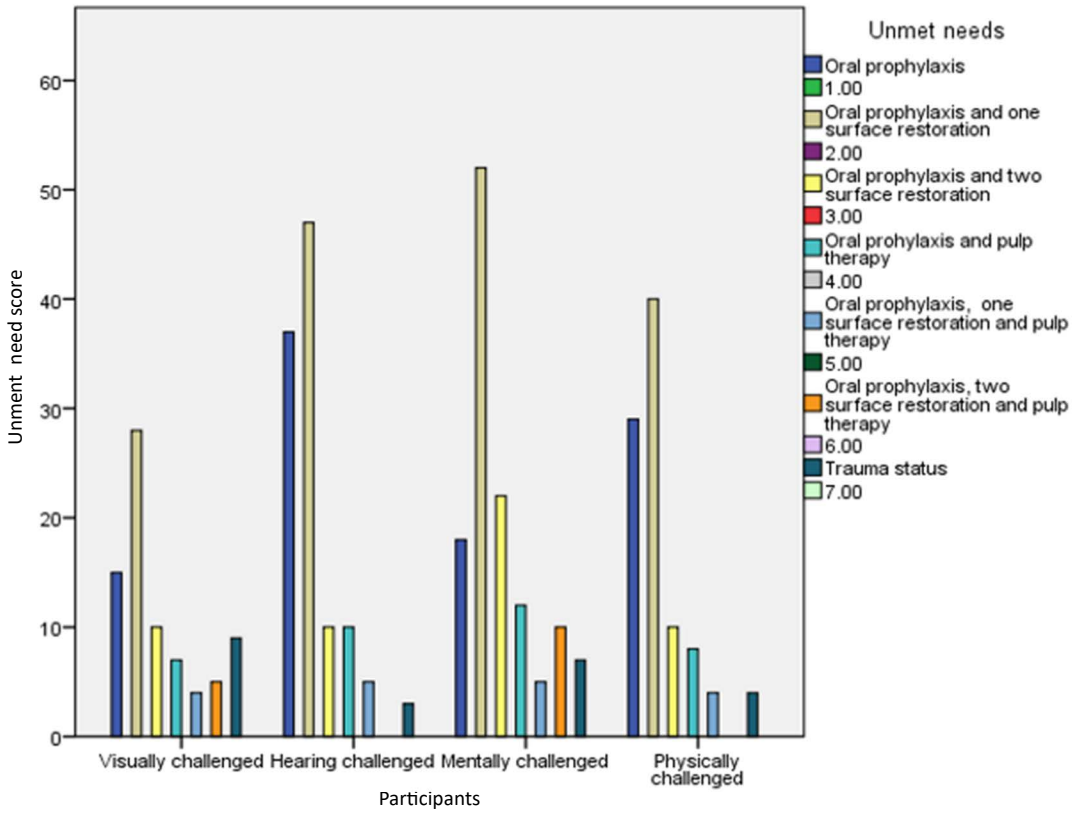

Figure 3: Unmet treatment status of the study population stratified with different type of developmental disorder status *p<0.000

hearing impaired (47) and physically challenged (40) and the lowest value with visually challenged (28). For treating the traumatic conditions, the visually challenged (9) were the superiors, trailed by mentally restrained (7) and physically challenged and the least value is for hearing impaired populace (3).

DISCUSSION

The truly tested population comprises a substantial portion of the community; it is estimated that there are approximately 977 million physically and mentally disabled people worldwide and their number is rising relative to everyone else.

Dental caries is a rapidly growing dental health condition among Indian children. The mean age limit for children with disabilities was 5-15, 16-24 and 25-34, in that the he mentally restrained population from 5-15 had a large number of members (99), while the visually challenged community had the lowest number of members (61). In the group of children with disabilities, there were more females than men. As seen by Table 1, both groups were similar in terms of age and sex.

Socio-demographic data showed no difference existed between the two groups as regards of age limit and gender, respectively showed similar results conducted by Onol and Kırzıoğlu, [18] turkey. The evidence of low use of any dental services among disabled people and less conscious about their own benefits among special homes was similar with findings of Obeidat *et al.* [19]

The mean dft of the primary and early mixed dentition years of mentally restrained was 2.42±1.78 while the mean DMFT of the late mixed dentition and permanent dentition was 2.54±1.87 are the highest of other three groups. The lowest mean dft of the hearing impaired was 1.82±1.61 and mean dmft was 1.82±1.67 as shown in Table 2. Some authors reported that the major concern was the highest occurrence of caries in the groups of disabilities conducted by Oredugba [15].

Twenty-one (21.4%) had good oral hygiene, 155 (37.7%) fair oral hygiene and 168 (41.8%) poor oral hygiene, with significant differences between oral hygiene and gender or age groups. However, there was a similar differences between oral hygiene and the type of disabilities as shown in the Figure 1, in prior authors reported the relation between the degree of poor oral hygiene status with type of disabilities given by Alkhabuli [20] United Arab Emirates.

The more elevated levels of gingival bleeding (85.7%) and periodontal pockets (51%) are seen in the mentally restrained populace compared with other disabilities respectively as shown in the Figure 2 and 3, the low priority given to oral care compared to other daily problems was

conducted by Khatib *et al.* [21] the highest fifty-three population (53%) had minor or no malocclusion, where the definite malocclusion was (11%), then the severe malocclusion was same as the last (11%) and the second highest condition of severe or handicapping malocclusion was (24.1%) respectively, so there is the high prevalence of malocclusion (60%) among the disabled people as shown in Figure 4 conducted by Dheepthasri *et al.* [22].

The most wanted unmet treatment needs includes oral prophylaxis with one surface restorations and including pulpal therapy along with patients with poor traumatic status as shown in the Figure 5, this goes similar with the findings which was conducted by Vishnu *et al.* [23].

There is a need for dental awareness among the parents of these children because it appears that these honestly tested children were the result of negligent utilization of dental services. To ensure that these less fortunate kids can attain optimal dental wellness, more transparency in dental administrations and training in oral health are needed [13].

It is suggested that: initiatives promoting school dental health should be welcomed by various groups such dental health education in schools: teachers, parents and guardians should be prepared to maintain oral hygiene by using fluoride tooth gel, using mouthwashes and practicing proper brushing techniques. This includes teaching understudies and overseers about dental health. Additionally, treatments like short-term therapy and periodic testing for early diagnosis should be completed.

CONCLUSION

From the outcomes, it tends to be presumed that the general oral well-being status was poor in these disabled people. Besides, youngsters with mental and visually challenged disabilities have significantly less fortunate oral well-being when contrasted with the hearing disability, orthopedically physically challenged group. The mean dft/DMFT, the poor gingival condition was significantly higher among mentally disabled and visually disabled people. To encourage collaboration among government agencies, non-governmental organizations and the community in improving the oral health, overcoming barriers and general well-being of special children in the region.

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