# The Oral Health Status and Treatment Needs of Institutionalized and non Institutionalized Disabled Children in Navi Mumbai, India

**Bhatia Rupinder[1], Mathrawala Namrata R[2]**

**ABSTRACT**

**Introduction:** Dental care is the most common unmet health care need in children with special health care needs. The aim of this study was to assess and compare oral health status and treatment needs of institutionalized and non institutionalized children between the ages of 5 and 13 in Navi Mumbai, India.
**Material and Methods:** The study consisted of 100 institutionalized and 100 non institutionalized children disabled. For each child, caries, oral hygiene status and treatment need was assessed.
**Results:** The institutionalized disabled children showed lower caries experience in both primary and permanent teeth as compared to that of non institutionalized disabled children. Poor oral hygiene was seen in institutionalized disabled children as compared to non institutionalized disabled children.
**Conclusions:** The oral hygiene measures used and degree of mental retardation were significantly associated with oral hygiene status in both institutionalized and non institutionalized disabled children.

**Keywords:** caries, disabled, oral hygiene status, treatment needs.

## INTRODUCTION

As per WHO, disabilities are an umbrella term, covering impairments, activity limitations, and participation restrictions.[1] As per WHO report it is estimated that the total disability in the world is about 10%. According to the Census 2001, there are 21.9 million persons with disabilities in India who constitute 2.13 percent of the total population.[2] This includes persons with visual, hearing, speech, locomotor and mental disabilities. In Maharashtra the population of disabled is found to be 1569582.[2]

Dental care is reported to be the most common unmet health care need in children with special health care needs.[3] Numerous studies have been reported on the prevalence of dental disease in persons with handicapping conditions. Much of the evidence has been conflicting, especially with regard to the prevalence of dental caries. Generally, there appears to be agreement with the high prevalence of periodontal disease, malocclusion, and oral cleanliness; however, agreement about dental caries is not as great. Much of the disagreement stems from the residence of the population. Whether a person is institutionalized or non institutionalized makes a considerable difference with regard to the daily personal care provided to that patient.[4] Very few studies compare the occurrence of dental diseases between children in institutions and those at home.[5]

The present study was undertaken with the aim of assessing and comparing the oral health status and treatment need of the institutionalized disabled children (group A) and non institutionalized disabled children (group B).

## MATERIAL AND METHODS

The present study was conducted by the Department of Pediatric and Preventive Dentistry, Navi Mumbai, India, in association with special schools and institutions for disabled children in and around Navi Mumbai.

Random sampling was used for the study, and sample size was determined as hundred (100) in each group. The ethical committee clearance was obtained from the concerning authority of the institution. Prior consent was obtained from the respective schools, institutions, and individual group B child's parent to conduct the study.

Children were distributed for disabling conditions, as per classification given by Nowak A.J modified to suit the present study as Physically Handicapped, Mentally Retarded, Congenitally abnormal, Childhood autism and Blind.[6] Those children who fell under more than one category were combined under multihandicapped. Children belonging to group A were those who resided within the premises of the institution. The group B children were those who live at home with their families attending special schools. Uncooperative children who did not allow oral examination were excluded from the study.

The study was carried out by using specific proforma. The first part of the proforma sought information on the individual's identity, age and sex, type of disability, IQ level, cooperation, oral hygiene practices and medical history. These were obtained from the child's medical reports, questionnaire filled by parent/caregiver and school/institution records. Children were categorized based on their intelligence quotient (IQ) as mild, moderate and severe mental retardation available from their records as per Wechsler Intelligence Scale for Children.[7]

The second part of the proforma had the clinical oral examination using dentition status and treatment need index as recommended by World Health Organization 1997 and Simplified Oral Hygiene Index Score given by Greene and Vermillion.[8,9] Clinical examination was carried out in natural light in their respective institutions with children seated on an ordinary chair, using plane mouth mirror, using WHO

[1]Professor and Head, [2]Associate Professor, Department of Pediatric and Preventive Dentistry, D.Y.Patil University School of Dentistry, Nerul, Navi Mumbai

**Corresponding author:** Dr Rupinder Bhatia, Department of Pediatric and Preventive Dentistry, D.Y.Patil University School of Dentistry, Sector 7, Nerul, Navi Mumbai – 400 706, Maharashtra, India

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criteria. The same examiner conducted all the examinations.

## STATISTICAL ANALYSIS

SPSS package was used for data entry and analysis. Descriptive statistics were obtained, including percentages and frequencies for categorical data and means and standard deviations for numerical data. The categorical outcomes were analyzed by chi-square tests and the quantitative outcomes were analysed by either a t test or ANOVA, as appropriate. A $p$ value<0.05 was considered significant.

## RESULTS

Hundred disabled children aged 5-13 years were examined in institutions and those attending special school each. The mean age of group A was 10.13 years and of group B was 10.26 years. In group A, 45% were males and 55 % were females, whereas in group B, 51% were males and 49% were females. Distribution for type of disability across both groups is shown in table 1(A). It was found that 79% of group A and 81% of group B were cooperative (table 1(B)).

In the group B, 84% used toothbrush, 15% used a finger, and 1% used a power brush for brushing their teeth whereas 9% of group A did not clean their teeth at all (table 1(C)). 63% of group A children brushed once a day without help, as compared to 49% of group B who brushed once a day with help. 19% of Group B children brushed more than once a day (table 1(D)). In group A only 3% had visited a dentist as compared to 20% in the group B. Visit to the dentist was seen low in both groups. (Table 1(E))

The mean deft score in group A was 2.77 (d=2.73, e=0.01, f=0.03), which is lower as compared to mean deft (3.55) of the group B with the mean d, e and f values 3.43, 0.09 and 0.03 respectively (Table 2a). Statistically significant ($p$ <0.05) difference between the deft index of group A and group B was predicted by the paired t test. The paired t test showed that the difference between the d component of group A and group B was statistically significant ($p$ <0.05).

No significant differences were seen for the extracted and filled components. It was seen that the mean DMFT score in the group A was 1.68 (D=1.66, M=0.02, F=0.0), which is lower as compared to mean DMFT of the group B (1.93; with D=1.80, M=0.01, F=0.12).

In group A, 61 individuals required one surface filling, 33 required two surface fillings, 15 required pulp care and restoration and 24 required extraction treatment. Of the 100 group B children 60 children required one surface filling, 30 required two surface fillings, 20 required pulp care and restoration and 32 require extraction (Table 2b). Further statistical analysis showed that differences between the groups were not significant.

There was no significant difference in the mean OHI-S scores between the group A (2.42) and Group B (2.22) (Table 2c). Significant difference was found in the oral hygiene index scores based on oral hygiene measures in both groups. Further, significant difference was found in the oral hygiene index scores based on degree of retardation in both groups. (Table 3)

## DISCUSSION

Higher percentages of children were multi-handicapped and physically handicapped in group A, as compared to group B. This was due to the sample selection which included a residential school, society for education of crippled, catering mainly to the physical and multi-handicap children who are often admitted to the institutions due to the nature of care required.

The present study shows 91% of group A and 84% of group B childen used toothbrush for cleaning their teeth. A difference in the use of tooth brushing aids was seen in children across the group A and groups B, where 9% of the group A children did not clean their teeth whereas15% of group B used finger for cleaning their teeth. Only 1 group B child used a power brush and none of the groups reported use of a modified brush.

| Percentage distribution | | Group A (%) | Group B (%) |
|---|---|---|---|
| (A) Type of disability | Physically handicapped | 24 | 5 |
| | Mental retardation | 45 | 72 |
| | Congenital | 2 | 0 |
| | Childhood autism | 2 | 6 |
| | Blind | 1 | 2 |
| | Combination | 26 | 15 |
| (B) Co operation | Good | 79 | 81 |
| | Poor | 21 | 19 |
| (C) Tooth brushing AIDS | Toothbrush | 91 | 84 |
| | Finger | 0 | 15 |
| | Modified toothbrush | 0 | 0 |
| | Power toothbrush | 0 | 1 |
| | None | 9 | 0 |
| (D) Oral hygiene measures | Once a day with help | 28 | 49 |
| | Once a day without help | 63 | 32 |
| | No cleaning | 9 | 0 |
| | More than once a day | 0 | 19 |
| (E) Visit to dentist | Yes | 3 | 20 |
| | No | 97 | 80 |

**Table-1:** Percentage distribution of type of disability, cooperation and responses to questionnaire.

| | | | Group A | Group B | Pearson Chi-Square |
|---|---|---|---|---|---|
| (a) Caries | Primary teeth | deft | 2.77 | 3.55 | 0.000* |
| | | d | 2.73 | 3.43 | 0.000* |
| | | e | 0.01 | 0-09 | 0.439 |
| | | f | 0.03 | 0-03 | 0.576 |
| | Permanent teeth | DMFT | 1.68 | 1.93 | |
| | | D | 1.66 | 1.80 | |
| | | M | 0.02 | 0.01 | |
| | | F | 0 | 0.12 | |
| (b) Treatment need | One surface filling | No of teeth | 164 | 188 | 0.335 |
| | | No of children | 61 | 60 | |
| | Two surface filling | No of teeth | 81 | 95 | 0.189 |
| | | No of children | 33 | 30 | |
| | Pulp care and restoration | No of teeth | 43 | 39 | 0.423 |
| | | No of children | 15 | 20 | |
| | Extraction | No of teeth | 55 | 80 | 0.150 |
| | | No of children | 24 | 32 | |
| (c) OHIS | | | 2.42 | 2.22 | 0.301 |
| *P* VALUE *significant when $p<0.05$ | | | | | |

**Table-2:** deft/DMFT, treatment needs and Oral Hygiene Index Simplfied (OHIS) scores

| | | Simplified oral hygiene index | | | | | |
|---|---|---|---|---|---|---|---|
| | | Group A | | | Group B | | |
| | | Good | Fair | Poor | Good | Fair | Poor |
| OHIS (%) | | 24 | 46 | 30 | 24 | 53 | 23 |
| Oral hygiene measures (%) | Once a day with help | 14.3 | 64.3 | 21.4 | 20.4 | 55.1 | 24.5 |
| | Once a day without help | 28.6 | 42.9 | 28.6 | 21.9 | 40.6 | 37.5 |
| | No cleaning | 88.9 | 11.1 | 0 | 0 | 0 | 0 |
| | More than once a day | 0 | 0 | 0 | 31.6 | 68.4 | 0 |
| Degree of retardation (%) | Mild | 60 | 30 | 10 | 40 | 50 | 10 |
| | Moderate | 43.5 | 34.8 | 21.7 | 21.7 | 60.9 | 17.4 |
| | Severe | 26.8 | 61 | 12.2 | 26.8 | 58.5 | 14.6 |
| | Normal | 12 | 36 | 52 | 12 | 36 | 52 |

**Table-3:** Percentage distribution of Oral Hygiene Index simplified (OHIS) by oral hygiene measures and degree of retardation for both groups.

All group B in our study had their teeth brushed at least once (81%) or more (19%) times a day which was also seen in a few studies.[4,10] In group A, it was seen that no cleaning was performed in 9% of the children. Of this, majority showed moderate to severe retardation which explains neglect by care takers in the institutional setting. It was seen that the percentage of group A brushing on their own without help was higher (63%). This may be due to lack of motivation, awareness of oral hygiene among care takers, neglect due to non cooperation by child and untrained staff.

In a study by Storhaug, interviews with parents of non institutionalized handicapped children showed that most of the children brushed their teeth alone.[11] The problems reported by parents related to tooth brushing were lack of cooperation or difficulties associated with rinsing, spitting or opening the mouth. This was not the case in our study where, majority i.e. 49% of the group B brushed their teeth with help from a parent. Another study by the same author, published two years later on a sample comparable to our study showed 91% of non institutionalized disabled children had their teeth brushed once daily, in most cases the children brushed their teeth themselves (53%) or with little help (25%).[12] Our study results also differ with that of Gizani S where majority of handicapped children (86.2%) did not receive any help with tooth brushing.[13] None of the responses were positive for once a week hence it was not considered in the results.

In a study by Murray JJ and McLeod, 66% of the children attending school had visited the dentist.[14] Another study by Storhaug reported that 83% of children had regular dental visits.[12] In our study, though more children in the group B had visited the dentist as compared to group A, the number is still far below that in the above mentioned studies. This may be attributed to more pressing medical issues in the handicapped children, lack of awareness among parents, lack of cooperation by child, and lack of facilities available.[15-17] This lack of access to dental care for the group A, is evident from our study where only 3% had visited a dentist. None of the institutions were attached to a dental health service provider. Our study showed that the mean deft scores of group A (2.77) was significantly lower than those of group B (3.55). For the DMFT score also a similar trend was seen where group A(mean DMFT – 1.68) showed lesser caries experience than group B (mean DMFT-1.93). This is in agreement with few studies done in an institution, which found decreased prevalence of caries due to dietary restriction than those staying at home with fewer opportunities of eating between meals.[15,18,19]

A nationwide survey conducted in 2005, included 7 districts of India, of which one was Maharashtra, revealed mean DMFT score of 1.3 and 1.7 for 12 and 15 year old normal children respectively.[20] Our study suggests similar caries trends as in normal population. Caries prevalence among normal children in Mumbai, Maharashtra as per a study in 1991 showed mean DMFT as 2.52.[21] In the same study he found the prevalence of caries in normal children highest as compared to different handicapped population. Our study agrees with the above study as DMFT scores in our study are also lower for both groups when compared to scores for normal children residing in Mumbai obtained from his study. Our study agrees with few other studies which attributed this difference to environmental conditions i.e. dietary habits, oral hygiene practices etc.[19,21-24] The high caries activity in these children can be attributed to their diet, difficulty in maintaining oral hygiene, poor muscular coordination and muscle weakness interfering with routine oral hygiene procedure.[19]

When component part of the deft and DMFT were analyzed, the decay component occupied all or major part of the index for both group A and group B. This is in accordance with study by Rao DB and Naveenkumar PG.[25,26] This finding shows the lack of conservative approach to the treatment of dental caries as observed in various other studies.[13,14,24,25] It becomes apparent how helpless handicapped children are in regards to dental care. In our study lack of access to dental care was observed, which itself eliminates the possibilities of increased extractions and fillings, resulting in a higher decayed component.

Treatment need for dental caries was assessed where it was seen that in both groups teeth requiring 1 surface restoration was higher than 2 or more surface restorations. This is in accordance with study by Bhavsar JP.[27] Extractions formed an integral part of the treatment need. The group B required higher one surface fillings, two surface fillings and extractions as compared to group A children. Various studies show similar results for handicapped children, but these studies compare them to normal children.[5,15,28] Treatment needs among normal children in Bombay, Maharashtra as per a study in 1991 showed requirement of 199 one surface and 111 two surface fillings.[19] Though no comparative conclusions can be made, the treatment need of normal children exceeds that of children in our study. In a study by Gizani S, 7.9% of non institutionalized handicapped children had sealants placed.[13] In our study, none of the group B children had sealants.

A number of factors explain why there is so much unmet treatment need such as lack of knowledge and motivation about good oral hygiene practices among the concerned authorities, low priority given to dental care in the society, lack of facilities for early and regular oral health checkup and prompt treatment, poor socioeconomic status of the parents and guardians, and cost of treatment.[25]

Institutionalized individuals have been reported to have significantly poor oral hygiene than non institutionalized individuals.[14,29] Our study found similar results though no significant statistical difference was seen. Results for oral hygiene show that in group A 30% showed poor oral hygiene, 46% showed fair oral hygiene and only 24% showed good oral hygiene. This is in accordance with studies which show that group A children have poor oral hygiene.[14,29] Our study showed that higher number of children fell in the fair (53%) and poor (23%) category that is in agreement with many studies that report poor oral hygiene in non institutionalized handicapped children.[13,29]

The present study shows that, oral hygiene status was significantly associated with the oral hygiene measures used in both groups. In group A, where 9% reported no cleaning, of them 88.9% showed poor oral hygiene. Number of group B who brushed once a day with help had better oral hygiene than group A disabled children who took help while brushing. In group A, we found that as the severity of the mental retardation increases, the number of children having poor oral hygiene decreases. The children that showed normal IQ had significantly better oral hygiene than mild, moderate and severe retardation children as seen in many studies.[5,24] Poor oral hygiene does not always correlate with a poorer dental condition and more caries as seen in our study where though group A children had poorer oral hygiene, their dental caries experience was lower.

## CONCLUSIONS

Institutionalized disabled children showed lower caries experience in both primary and permanent teeth as compared to that of non institutionalized disabled children. Poor oral hygiene was seen in institutionalized disabled children as compared to non institutionalized disabled children. Highly unmet treatment needs were seen regardless of status of institutionalization. Oral hygiene measures used and degree of mental retardation were significantly associated with oral hygiene status in both groups. Lack of access to dental care in this population is evident, as the decayed component formed a major part of the index. The lack of care reflects both, the inability to seek treatment and the attitudes of the persons caring for them on one hand, and the attitudes and abilities of dentists and health care services on the other.

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