

## Research Article

# Oral Health Status and Dental Caries Experience in Mentally Challenged Individuals

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**Abstract**

Scanning the literature reveals that in India there is little data available relating to dental health in mentally challenged. The study aims to determine prevalence of dental caries, oral health status, and periodontal needs in mentally challenged individuals of North Indian population. The cross-sectional study was conducted among patients attending a special education program at Faculty of Dentistry, JMI, and Delhi, India. DMFT Index, Simplified Oral Hygiene Index (OHI-S) and CPITN index were used to evaluate caries, oral hygiene status and periodontal needs, respectively. The chi-square test was used to compare between categorical variables. Depending on the type of disability, 258 patients were classified into five groups' mental retardation (MR), Autistic disorder (AD), Down syndrome (DS), Cerebral palsy (CP) and other. The overall prevalence of dental caries in the study population was 76%. Among the study groups, DS exhibited highest DMFT and CPITN scores. The oral health status of the mentally disabled individuals is influenced by type of the disability.

**INTRODUCTION**

Developmental disabilities can develop due to a variety of conditions which include cerebral palsy, Down's syndrome, mental retardation, autism, seizure disorders, hearing and visual impairments, congenital defects, and even social or intellectual deprivation [1]. Dentists today understand the need to learn subject of mental retardation although it has been observed that very few of the children with this condition seek the services of the dental professionals. Studies have shown that in handicapped persons, all the common dental disorders may occur either more often, with increased severity or at a younger age than might be considered usual for normal individuals. The main cause of the two most common dental diseases (caries and periodontal disease) seen in handicapped and normal children has been identified as the accumulation of bacterial plaque [2]. However in the handicapped there are some modifying influences such as muscular influences, nutritional disturbances and genetic influences. It has been stated that dental caries is the most prevalent disease among mentally retarded children worldwide and dental treatment is the greatest unattended health need of the disabled [3].

Many published studies have reported relatively poor oral hygiene and high level of periodontal disease in challenged

children [4,5]. However, in India there is little data available relating to dental health in mentally challenged. Also with relatively few investigations done into the dental conditions of these children generally in this country, there has been inadequate dental care for handicapped children. Thus the study aims to determine prevalence of dental caries, oral health status and periodontal needs in mentally challenged individuals of North Indian population.

**MATERIAL AND METHODS**

The cross-sectional study was conducted among patients attending a special education program at Faculty of Dentistry, Jamia Millia Islamia, and Delhi, India. The study protocol was approved by Institutional review board prior to the start of the study. Subjects were included in the study if they had parental consent/proxy consent, were present on the day of examination, and were willing to participate. Children were excluded from the study if they were uncooperative or had medical conditions, which contraindicated an oral examination without appropriate modifications, such as infective endocarditis, coagulopathy, abscess, etc.

Informed consent was obtained from their guardian with whom they were accompanied. The intelligence quotient (IQ)

of these children in these schools ranged between 20-80. This IQ had been determined prior to placing the children in schools by educational diagnosticians involved in the assessment of mentally handicapped children. All the mentally handicapped individuals between 6 years and 40 years were examined as the schools comprised of individuals within this age group. Individuals with severe retardation in this age group who were difficult to examine properly were excluded from the study.

The study design consisted of close-ended questions on demographic characteristics (age, gender and education and income of parents), dietary habits, oral hygiene habits, and type of disability. Clinical examination included assessment of oral hygiene, periodontal status, dentition status and treatment needs. Examinations were carried out using a CPI probe and a mouth mirror in accordance with World Health Organization criteria and methods [6].

For dental caries, DMFT index was used, which includes all teeth with known decay experience, i.e. untreated decay (D), missing teeth (extracted) due to caries (M), and filled teeth (F) [7]. To distinguish primary teeth, the notation dmft was used. The World Health Organization (WHO) community periodontal index of treatment needs (CPITN) was used to assess levels of periodontal condition and treatment needs, and the specially designed WHO periodontal probe was used for the examinations [6]. On assessing treatment needs, a code of zero for all six sextants indicates there is no need for treatment, code of one indicates a need for improvement in oral hygiene, code 2 indicates a need for professional cleaning of the teeth including the removal of supra and/or subgingival calculus. A code of 3 indicates need for deep scaling and code 4 involves deep scaling and root planning under local anaesthesia or surgical intervention. Oral hygiene was recorded as good, fair or poor according to the Simplified Oral Hygiene Index (OHI-S) [24]. OHI-S has two constituents - Debris Index (DI) and Calculus index (CI). The average individual debris score and calculus score were measured and added together to get the OHI-S for each individual.

Two dentists, who were blinded to the study groups, carried out all the examinations. However throughout the examinations, every 10th child was re-examined independently by each examiner to test for possible intra- and interexaminer variation, which was less than 5% for each of the studied variables. Recording procedures were carried out according to the criteria described by WHO [7].

## STATISTICAL ANALYSIS

The chi-square test was used to compare between categorical variables. Independent sample t-tests were performed for comparison of means between two groups for quantitative variables, with  $p < 0.05$  indicating statistical significance. Statistical analysis of the data was done using Statistical Package for Social Sciences (SPSS) version 11.

## RESULTS

Out of 310 individuals selected for the study, 258 patients could be examined. The rest did not cooperate for an oral examination, which gave a response rate of 83%. Depending on the type of disability, patients were classified into five groups

mental retardation (MR) (n=168), autistic disorder (AD) (n=24), Down syndrome (DS) (n=30), cerebral palsy (CP) (n=15) and other (OTH) (hemiplegia, spinal muscular atrophy, dysmorphic syndrome, hydrocephaly, goldenhar syndrome (n=21). Patients were further subdivided into four groups according to their age, 1-10 years (n=42), 11-20 years (n=156), 21-30 years (n=51) and 31-40 years (n=9).

The demographic profile of the study population revealed that the majority of the patients were males (n=171; 66%) with age ranging from 6-40 years (Table 1).

Brushing frequency in the majority of population was once a day, with toothbrush and toothpaste (72%). 90% of the participants used a toothbrush for cleaning the teeth and only 10% had never used a brush. The IQ score of the patients indicated that majority had moderate mental disability (49%).

The overall prevalence of dental caries in the study population was 76%. The distribution of DMFT and CPITN scores by type of disability exhibited that DS group had the highest DMFT ( $3.6 \pm 2.63$ ) and CPITN scores ( $2.23 \pm 1.10$ ) (Table 2).

CPITN score indicated that the vast majority of those requiring treatment had a code of 2 which required scaling, root planing, and oral hygiene education. 181 subjects had calculus and/or shallow pockets (4-5 mm), so they required removal of supra- and/or subgingival calculus; 18 subjects had periodontal pockets exceeding 6 mm. The distribution of CPITN scores among patients presented that the MR group reported the largest percent (16%) of CPITN scores of 0 (healthy periodontal status) and the DS group reported the least (10%), however the DS reported the largest percent (23%) of CPITN scores of 4 (deep pockets requiring complex periodontal care) and the AD group accounted for the least (0%) (Table 3).

The distribution of OHI score revealed highest OHI score among the AD group and least in OTH group (Table 2). DMFT indexes, OHI and CPITN indexes did not vary significantly by disability type ( $P > .05$ ).

## DISCUSSION

Maintaining good oral health is particularly challenging among individuals with disabilities because of increased oral health risks due to underlying disease, limitations on access to care and competing demands. The lack of oral hygiene has been implicated as a fundamental factor in the development of periodontal diseases and dental caries in mentally challenged individuals [2,9]. Thus the study aims to determine the prevalence of dental caries and oral hygiene status in mentally challenged individuals.

The findings of this study regarding brushing frequency were consistent with the National Oral Health Survey (2002-2003) [10]. However, our findings did not concur with National Survey in terms of mode of cleaning teeth which reported that approximately 60% children were using toothpaste and toothbrush, whereas in the present study majority of subjects used toothpaste and toothbrush (90%). The disparities could be ascribed to improved living conditions of the study groups in terms of their socio-economic status and higher literacy level affecting oral health behavior.

**Table 1:** Demographic characteristics of study population.

		Mental Retardation	Autism	Downs syndrome	Cerebral palsy	Others	df	P value
AGE	6-10	30	3	3	0	6	12	0.612
	11-20	87	21	21	15	12		
	21-30	42	0	6	0	3		
	31-40	9	0	0	0	0		
Gender	Male	114	12	27	9	9	4	0.355
	Female	54	12	3	6	12		
Diet	Vegetarian	108	4	5	9	9	8	0.004
	Mixed	60	20	25	6	12		
IQ score	Mild (50-70)	75	2	21	9	3	8	0.168
	Moderate(35-49)	78	22	6	6	15		
	Severe (20-34)	15	0	3	0	3		
Brushing frequency	Once daily	111	16	18	10	14	8	0.890
	Two or more times/day	42	8	10	2	3		
Mode of cleaning teeth	Toothpaste	153	24	28	12	17	8	0.998
	Toothpowder	15	0	2	3	4		
Material used for cleaning teeth	Toothbrush	153	24	28	11	15	8	0.998
	Finger	15	0	2	4	6		

**Table 2:** Distribution of mean dmft / DMFT and CPITN scores by type of disability.

Variables	Mental Retardation (Mean±SD)	Autism (Mean±SD)	Downs syndrome (Mean±SD)	Cerebral palsy (Mean±SD)	Others (Mean±SD)	P value
dmft / DMFT scores	3.54±4.22	2.25±1.39	3.6±2.63	3.5±3.51	2.43±2.15	0.856
CPITN scores	1.82 ±0.97	1.75±0.89	2.23±1.10	1.67±0.89	2.05±1.46	0.689
OHI score	1.90±1.31	1.91±1.39	1.84±0.88	1.78±1.24	1.31±0.99	0.839

**Table 3:** Distribution of CPITN scores by type of disability.

CPITN scores	Mental Retardation (%)	Autism (%)	Downs syndrome (%)	Cerebral palsy (%)	Others (%)	P value
0 (Healthy)	27(16.1)	3 (12.5)	3 (10)	2 (13.3)	3 (14.3)	0.697
1 (Bleeding)	9 (5.4)	3 (12.5)	3 (10)	3 (20)	3 (14.3)	
2 (calculus)	105 (62.5)	15 (62.5)	15 (50)	9 (60)	9 (42.9)	
3 (shallow pockets)	21 (12.5)	3(12.5)	2 (6.7)	0 (0)	2 (9.5)	
4 (deep pockets)	6 (3.6)	0 (0)	7 (23.3)	1 (6.7)	4 (19.1)	
Total	168	24	30	15	21	
Treatment needs (TN)						
TN0 (no need for treatment)	27(16.1)	3 (12.5)	3 (10)	2 (13.3)	3 (14.3)	0.710
TN1 (oral hygiene instruction)	9 (5.4)	3 (12.5)	3 (10)	3 (20)	3 (14.3)	
TN2 (prophylaxis)	126 (75)	18 (75)	17 (56.7)	9 (60)	11 (52.4)	
TN3 (complex treatment)	6 (3.6)	0 (0)	7 (23.3)	1 (6.7)	4 (19.1)	

It was evident from the results of our study that the prevalence of dental caries in disabled individuals was higher than that found in national oral health surveys of normal individuals [11]. These findings were consistent with previous studies which reported prevalence of dental caries ranging from 78% to 90% in disabled individuals [12]. We hypothesize that this could be attributed to muscle weakness and inadequate muscular coordination

meddling with daily hygiene procedures. Moreover, less frequent brushing, and some sociodemographic factors may be important determinants of dental caries risk in these individuals.

The mean DMFT score in the present study was 3.08 which conform to that reported in other studies [15-17]. The present study revealed that the mean DMFT score was higher than those with other disabilities. Previous studies suggest that there

have been a disagreement regarding the caries susceptibility in individuals with Down's syndrome. Caries incidence has been reported to be both higher [5,18] and lower [16] in patients with Down's syndrome compared to individuals with other mental disabilities.

The mean oral hygiene index of the study population was 1.75, which is consistent with the findings of previous studies implying poor level of oral hygiene and high prevalence of periodontal disease among individuals with disabilities [21-23].

The findings of this study showed that the mentally handicapped individuals had poor oral hygiene and a high level of gingivitis and periodontal disease. Furthermore a significant proportion of these subjects (77%) had calculus and pockets that will need scaling, root planing, and oral hygiene education. These results are in agreement with previous studies [15-16] who also reported high prevalence of periodontal disease in mentally disabled individuals. These results may be related to the low physical abilities of these individuals, inadequate understanding of oral health management [26], problems in conveying oral health needs [23], anxiety of oral health procedures [24] and dependence on other people, such as parents or employees with assisted living services [5]. Moreover, the proportion of subjects with poor oral hygiene and periodontal status was significantly higher in Down's syndrome patients than in those with other disabilities. This finding was consistent with previous studies [13,16] who also observed increased occurrence of periodontal disease in patients of Down's syndrome. However our findings revealed that most subjects with healthy periodontal status fall into MR group suggesting that type of disability can affect periodontal health.

## SIGNIFICANCE FOR PUBLIC HEALTH

The oral health status of the mentally disabled individuals showed increased prevalence of caries, poor oral hygiene and a high level of gingivitis and periodontal disease. Thus, it is highly important to provide preventive measures at an early stage for these individuals. The best way to improve oral health in such patients is to develop effective prevention. Future studies should target on strategies to encourage self care and improving daily hygiene procedures performed by caregiver.

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