

Oral hygiene negligence among institutionalized mentally disabled children in Mysore city—A call for attention

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ABSTRACT

Background: Oral health is integral part of general health. In certain conditions especially among mentally disabled, oral health is neglected. Studies have shown that mentally disabled population has the risk of poor oral health. People with disabilities deserve the same opportunities for oral health and hygiene as those who are healthy, but sadly dental care is the most common unmet health care need of the disabled people. **Methodology:** This comparative, descriptive cross-sectional study was conducted among institutionalized mentally disabled and normal children of age group 6–13 years in Mysore city. **Results:** Majority of mentally disabled children, that is, 36.73% ($n = 180$), had poor oral hygiene when compared with normal children, that is, 9.18% ($n = 45$). This difference was statistically highly significant ($P < 0.000$). The significant differences in the gingival status and severity of mental disability were seen ($P < 0.001$). The result showed that the gingival health worsens with increase in the severity of mental disability. **Conclusion:** The present study showed the dental negligence among mentally disabled children where the parents, caretakers, and dentists are responsible. Oral health promotion programs should be conducted for special group children, their parents, as well as caretakers.

Keywords: Brushing, gingival status, mentally disabled, normal children, oral health promotion, oral hygiene, oral hygiene status

Introduction

Literature shows that the management of mentally disabled children for maintaining their oral hygiene and dental treatment is a big challenge for parents as well as dentists.

Mental retardation has been defined by the American Association of Mental Deficiency (AAMD) as a deficiency in theoretical

intelligence that is congenital or acquired in early life. The AAMD classifies retardation into four categories according to intelligence quotient (IQ): mild IQ score is 50–55 to 70, moderate (IQ score 35–40 to 50); severe (IQ score 20–25–35); or profound retardation (IQ score below 20–25).^[1]

According to the National Sample Survey Organization Report (2002), 18.49 million number of disabled persons were reported, while the mentally retarded population amounted to 0.44 million individuals in India.^[2] “The Persons with Disabilities Act, 1995” states the responsibility of the state toward protection of rights of persons with disabilities; provision of medical care,

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Received: 30-08-2019

Revised: 17-09-2019

Accepted: 31-10-2019

Published: 30-04-2020

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_720_19

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How to cite this article: Bennadi D, Konekeri V, Maurya M, Reddy V, Satish G, Reddy CV. Oral hygiene negligence among institutionalized mentally disabled children in Mysore city—A call for attention. J Family Med Prim Care 2020;9:2045-51.

education, training, employment, and rehabilitation. There is no legislation till date that makes a provision of dental services to the disabled population.^[3] People with disabilities deserve the same opportunities for oral health and hygiene as those who are healthy, but sadly dental care is the most common unmet health care need of the disabled people.^[4] Most of population have access to medical and health care services through primary health care especially rural areas. Through primary health care, we can reach unreachable population too. Primary health care play a very important role in the form of physical, mental, social, financial, and environmental service provider to special children. Where it is not only establishing home visit programmes through ASHA, Anganawadi workers, social workers where proper education to the expecting new parents as well as parents of special children can be done. Through the help of public–private partnerships it helps to mitigate barriers to access health services and medical services at the doorsteps.^[5-7]

Most handicapped individuals start their lives with teeth and gums that are as strong and healthy as those of the normal people. However, their diet, eating pattern, medication, physical limitations, lack of cleaning habits, and attitudes of parents and healthcare providers, all contribute to poor oral health of the handicapped people.^[8]

Studies have shown that individuals with intellectual disabilities have poor oral hygiene and higher rate of gingivitis. Oral hygiene is one of the causal factors in the development of gingival or periodontal disease. These subjects have the highest dental negligence as compared with normal population.^[8-14]

The oral health of subjects is directly dependent upon their physical and mental abilities, their cooperativeness, and motivation of the support staff. Maintenance of good oral hygiene is difficult for mentally disabled children as frequently they lack muscular coordination and recognition of the importance of brushing and flossing. In many instances, the oral hygiene care of these children will be taken care by another person such as generally parent, guardian, or caregiver. Unfortunately, oral health care is one of the greatest unattended health needs of these God forbidden children. It has been observed that oral health disparities among these subjects were associated with practical difficulties in acceptance of routine treatment sessions, inadequate skills of dentists and hygienists to provide dental care, lack of effective preventive strategies to minimize the need for this care and negative attitudes, and lack of supervision by the parent, guardian, or caregiver toward oral health.^[9,15-17]

There are a few reports on the oral hygiene and gingival status of the mentally disabled population from India. Hence, an attempt had been made to assess and compare the oral hygiene and gingival status of institutionalized mentally disabled and normal children of age group 6–13 years in Mysore city and had explored the influence of sociodemographic, level of mental retardation, and clinical variables of this special population.

Methodology

The descriptive cross-sectional study was conducted among institutionalized mentally disabled and normal children of age group 6–13 years in Mysore city. The list of institutions for disabled children was obtained from the Occupational Therapy and Rehabilitation Center in Mysore, and list of residential schools were obtained from Block Education Office, Mysore. Before the start of the survey, informed consent was obtained from the concerned school authorities and from the parents to examine the children.

All the children available during the time of survey from all the 10 institutions for disabled, and an equal number of age- and gender-matched normal children from six residential schools was included in the study by stratified random sampling method. Ethical clearance was obtained from the Institutional Ethics Committee JSS Dental College and Hospital ethical committee board in October 2009.

Exclusion criteria

- Study group: Uncooperative children
- Control group: Subjects with systemic diseases, on long-term medication.

Training and calibration of the examiner were done on 20 subjects, who were examined twice using diagnostic criteria on successive days, and then the results were compared to know the diagnostic variability. Agreement for assessment was 90%.

Examination and collection of data

The investigator carried out the examination solely. Earlier to the main study, a pilot study was carried out on 20 disabled children to check the feasibility and relevance of format.

A total of 490 mentally disabled children comprising 300 males and 190 females attending all the 10 institutions for disabled children in the age group of 6–13 years were examined, and age- and gender-matched equal number of normal children was examined in their respective schools in an ordinary chair or in their wheel chair under natural daylight using mouth mirror and probe (American Dental Association Type 3 examination).

The study involved completion of predesigned questionnaire and examination using indices such as Oral Hygiene Index-Simplified (OHI-S) of Greene and Vermillion (1964)^[18] and Gingival Index by Loe and Silness (1963).^[19] The examination was carried out in their respective institutions. The IQ level record which was available in the institution was utilized during the process study. Samples were divided into four groups according to the World Health Organization Classification of Mental Retardation (1994).^[20]

Socioeconomic status

Socioeconomic status has been classified according to the Modified B.G. Prasad Classification.^[21]

Statistical analysis

Collected data subjected to statistical analysis using SPSS version 16.0 (SPSS Inc., New York, USA) was used. The statistical significance was fixed at 0.05.

Results

Study population consisted of 490 children in each mentally disabled and normal children group in the age group of 6–13 years of Mysore city. Table 1 shows distribution of the mentally disabled subjects according to severity of mental retardation.

Oral hygiene aid used, frequency, and method of brushing

Majority of the study subjects, that is, 92.85% mentally disabled children ($n = 455$) and 91.83% normal children ($n = 450$) used toothbrush and toothpaste to clean their teeth; 7% mentally disabled children ($n = 35$) and 5% normal children ($n = 25$) used finger and tooth powder; and 1% of mentally disabled ($n = 5$) and 1% normal children ($n = 5$) used other aids (neem stick, coal powder, brick powder, etc.) to clean their teeth. Graph 1 shows significant difference in regard to frequency of toothbrushing among study population ($P = 0.001$). Majority of the study subjects, that is, 76.53% mentally disabled children ($n = 375$) and 43.88% normal children ($n = 215$), brushed in horizontal direction, whereas 9.18% mentally disabled children ($n = 45$) and 29.59%

normal children ($n = 145$) brushed in vertical direction. The difference was statistically significant ($P = 0.001$). Majority of the study subjects, that is, 76.53% mentally disabled children ($n = 375$) and 75.51% normal children ($n = 370$) used medium bristled tooth brush to clean their teeth. A majority of the study subjects, that is, 77.55% mentally disabled children ($n = 380$) and 91.84% normal children ($n = 465$) used to change their toothbrush within 6 months. A majority of mentally disabled children, that is, 56.12% ($n = 275$), needed complete assistance, 32.65% ($n = 160$) needed partial assistance of caretaker/parents for oral hygiene practices, whereas only 11.92% ($n = 55$) did not need help [Graph 2]. Majority of children visited dentist for pain.

Oral hygiene status

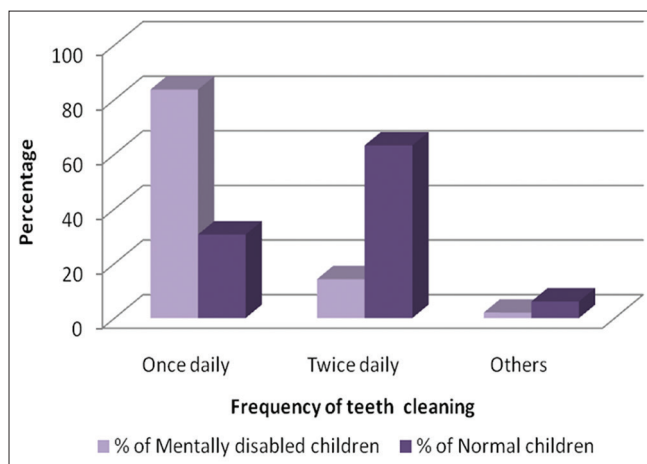
Majority of mentally disabled children, that is, 36.73% ($n = 180$) had poor oral hygiene when compared with normal children, that is, 9.18% ($n = 45$). This difference was statistically highly significant ($P < 0.000$) [Table 2].

Majority of mild mentally disabled children, that is, 21.7% ($n = 25$), had good oral hygiene status, whereas 66.7% ($n = 10$) profound mentally disabled children had fair oral hygiene status and severely mentally disabled children, that is, 35.3% ($n = 30$), had poor oral hygiene status. This difference was statistically highly significant ($P < 0.001$). This result depicts that as severity of mental disability increases, the oral hygiene status worsens [Table 3].

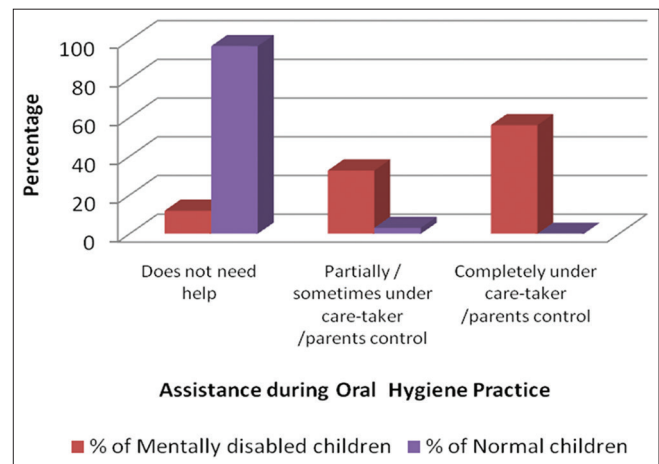
Table 1: Distribution of the mentally disabled children according to severity of mental retardation

Age	Level of severity of MR				Total
	Mild (%)	Moderate (%)	Severe (%)	Profound (%)	
6-9	55 (20.75)	160 (60.37)	40 (15.09)	10 (3.77)	265
10-13	55 (24.44)	115 (51.11)	45 (20)	10 (4.44)	225
Total	110	275	85	20	490

Contingency Coefficient=0.102934709; $P=0.267>0.05$ (Not Significant). MR=Mentally retarded



Graph 1: Distribution of Study Population [mentally disabled and normal children] according to frequency of teeth cleaning cc: contingency coefficient, 0.472901; $P < 0.001$ (HS- highly significant)



Graph 2: Distribution of Study Population according to assistance during Oral Hygiene practice CC: 0.652856 $P < 0.001$ (HS- highly significant)

Table 2: Distribution of the study population [Mentally disabled and normal children] according to oral hygiene status (According to simplified oral hygiene index by John. C. Greene and Jack. R. Vermillion, 1964)

OHI-S STATUS	DI-S		CI-S		OHI-S	
	MR % (n)	NC % (n)	MR % (n)	NC % (n)	MR % (n)	NC % (n)
Good	6.12% (30)	16.33 (80)	17.35 (85)	42.86 (210)	6.12 (30)	29.59 (145)
Fair	57.14% (280)	69.39 (340)	63.27 (310)	54.08 (265)	57.14 (280)	61.22 (300)
Poor	36.73% (180)	14.29 (70)	19.39 (95)	3.08 (15)	36.73 (180)	9.18 (45)
	100.00% (490)	100.00 (490)	100.00 (490)	100.00 (490)	100.00 (490)	100.00 (490)
	P=0.000, cc=0.2697 highly significant		P=0.000, cc=0.32365 highly significant		P=0.000, cc=0.3718 highly significant	

MR- Mentally retarded NC-Normal Children. MR=Mentally retarded, NC=Normal children, OHI-S=Simplified oral hygiene index, DI-S=Simplified debris index, CI-S=Simplified calculus index

Table 3: Distribution of mentally disabled children according to oral hygiene status and severity of mental disability

OHI-S Status	Mild		Moderate		Severe		Profound		Total	
	n	Percentage	n	Percentage	n	Percentage	n	Percentage	n	Percentage
Good	25	21.7	15	5.5	10	11.8	0	0.0	50	10.2
Fair	60	52.2	165	60.0	45	52.9	10	66.7	280	57.1
Poor	30	26.1	95	34.5	30	35.3	5	33.3	160	32.7
Total	115	100	275	100	85	100	15	100	490	100

Chi- Square 26.20; df 6; P<0.001(HS) HS=Highly significant, OHI-S=Simplified oral hygiene index

Gingival status

The gingival status was assessed by criteria given by Loe and Sillness (1963) on four selected teeth (functional disability inventory: 16, 12, 32, and 36). 13.3% (*n* = 65) mentally disabled and only 6.1% (*n* = 30) normal children had severe gingivitis. Findings showed statistically highly significant difference between two groups in the gingival status (*P* < 0.001). The result shows that mentally disabled children had poorer gingival health than the normal children [Table 4]. The significant differences in the gingival status and severity of mental disability were seen (*P* < 0.001). The result showed that the gingival health worsens with increase in the severity of mental disability [Table 5]. There was no statistical significant difference between gingival and socioeconomic status among mentally disabled children ($\chi^2 = 10.0$; *P* < 0.26).

Nine percent (*n* = 25) mentally disabled children had severe, 32% (*n* = 85) moderate, and 53% (*n* = 155) mild gingivitis of graduate parents. Similar observation was found in normal group, and the differences in gingival status and literacy were statistically significant (*P* < 0.01). The result depicts that the gingival health worsens with decrease in parent’s level of education. There was statistically significant difference between oral hygiene status and gender of study population, and the results showed that the gingival status was significantly better in females than the males in both disabled and normal children [Table 5].

Discussion

The three principal components—impairment, disability, and handicap—would operate independently, with impairment addressing impact on the body; disability to impact on the person; and handicap to impact on the person interacting with the environment.^[22] The main factor related to gingival/periodontal

problems in disabled individuals is the inadequacy of the plaque removal from the teeth. The children face greater challenges to proper oral hygiene, often due to a lack of basic manual skills and intellectual abilities that preclude adequate practices, such as tooth brushing.^[23]

Oral hygiene status

A highly significant difference in oral hygiene status in the two groups was observed. Mentally disabled children had significantly poorer oral hygiene. The findings of the study were in agreement with studies.^[3,14,23-33]

Oral hygiene status according to severity of mental disability

Differences in level of oral cleanliness between different degrees of mental disability were statistically highly significant. From data, it was observed that as degree of mental disability increases the oral hygiene status worsens. The findings of our study were in agreement with other studies.^[17,28,32] This can be attributed to the fact that because of poor muscle coordination, associated systemic and physical conditions, medications, these children were unable to perform their daily oral hygiene measures.

Oral hygiene status according to socioeconomic status

It was observed that in normal children, higher social class children had better oral hygiene than the lower class. The OHI-S scores significantly increased steadily as the economic status decreased. In disabled children, there was no significant difference in OHI-S status. This was in agreement with other studies.^[3,23] Studies showed that parents of children with mental retardation go through adjustment, including shock, despair, guilt, withdrawal, acceptance, and adjustment.^[34] Moreover, the presence of another disabled child demands

Table 4: Distribution of the study population [[Mentally disabled and normal children]] according to gingival status

Gingival status	Mentally Disabled		Normal children		Total	
	n	Percentage	n	Percentage	n	Percentage
Mild Gingivitis	255	52.0	330	67.3	585	59.7
Moderate Gingivitis	170	34.7	130	26.5	300	30.6
Severe Gingivitis	65	13.3	30	6.1	95	9.7
Total	490	100	490	100	980	100

Chi-Square 27.8; df 2; P<0.001(HS) NC=Normal children, NS=Not significant, S=Significant, OHI-S=Simplified oral hygiene index

Table 5: Gender wise distribution of study population [Mentally disabled and normal children] according oral hygiene status, gingival status

OHI-S Status	Mentally Disabled Children		Normal Children	
	Male n %	Female n %	Male n %	Female n %
Good	30 (10)	20 (11)	80 (27)	70 (36)
Fair	170 (57)	110 (58)	190 (63)	115 (61)
Poor	100 (33)	60 (32)	30 (10)	5 (3)
Gingival Status	X²=0.17; P<0.92(NS)		X²=12.9; P<0.01(S)	
	Male n %	Female n %	Male n %	Female n %
Mild Gingivitis	140 (47)	115 (61)	180 (60)	150 (79)
Moderate Gingivitis	115 (38)	55 (29)	95 (32)	35 (18)
Severe Gingivitis	45 (15)	20 (11)	25 (8)	5 (3)
	X²=9.00; P<0.05(S)		X²=20.1; P<0.01(S)	

NC=Normal children, NS=Not significant, S=Significant, OHI-S=Oral hygiene index- Simplified

extra efforts from parents in performing daily oral hygiene procedures.

Oral hygiene status according to parent’s education level

The present study was in agreement with other study^[23] where parental educational level directly related to oral hygiene status of the children as there were significant differences in OHI-S status and level of parent’s education in both disabled and normal children. This can be due to differences in oral health awareness and provision of oral health aids and parental attitude toward the importance of oral health.

Gingival status

In the present study, the gingival status in disabled was universally poor compared to the normal children. Findings of the study were in agreement with studies conducted.^[26,32,35-38] This can be attributed to the fact that because of poor muscle coordination, associated systemic and physical conditions, and medications, these children were unable to perform their daily oral hygiene measures.

Gingival status according to severity of mental disability

In the present study, it was observed that as severity of mental disability increases, the gingival health worsens. Similar results were found other studies.^[3,32,39]

Gingival status according to socioeconomic status

In the present study, it was observed that the socioeconomic status was directly correlated with the gingival health of normal children, whereas in disabled children, no statistical significant difference between socioeconomic status and gingival health.

Gingival status according to parent’s education level

In the present study, it was also observed that in both groups gingival health directly correlated with the parental educational level. Children of illiterate parents had poorer gingival health than the graduate parents. This can be attributed to family income which can affect the food habits, health values, life styles, access to healthcare information, and affordability.

Oral hygiene status and gingival status according to gender

In the present study, it was observed that in normal children, females had significantly better gingival and oral hygiene status than the males. This can be attributed to the differences in oral hygiene practices, dietary habits, and parental/caretaker’s oral hygiene awareness. It can also be attributed to the fact that females are more conscious about oral hygiene than the males. However, contradictory findings were observed among schoolchildren in Sharjah, UAE.^[40] In mentally disabled children, there was no significant difference in oral hygiene status between the two genders, but there was a significant difference in the gingival status. Females had significantly better gingival health than the males. The findings of our study are not in agreement with studies conducted in Singapore in 1991,^[41] Nigeria in 1995,^[42] and Udaipur,^[3] where they found that there was no significant difference between males and females. A possible explanation for the findings of our study might be due to the differences in severity of mental disability and associated systemic conditions, medication and differences in parental/caregiver’s oral hygiene awareness, and oral hygiene care provided. Male subjects had poorer oral hygiene and periodontal status than their female counterparts as shown by the logistic regression analysis. Other studies^[3,42] have shown the similar trend among mentally retarded children’s oral hygiene in regard to gender.

Conclusion

The present study showed the dental negligence among mentally disabled children where the parents, caretakers, and dentists are responsible. Hence, it is a call for attention toward these populations. Our national oral health policy should have special consideration for special group population. The oral hygiene and gingival status of the present population are poor and were influenced by medical diagnosis, parent’s level of education, and economic status. Dental Council of India should make it mandatory that each dental college should adopt some special groups and reinforcing of adopting oral hygiene preventive procedures and incorporation of dental care services at regular intervals.^[43] Oral health promotion programs should be conducted for special group children, their parents, as well as

caretakers. Effective oral health education with audiovisual aids, diet counseling, and step-by-step demonstration of oral hygiene practices to the children and parents/caretakers can be given.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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