



Original Research Article

Evaluation of oral health status of children with special health care needs in Lucknow district

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ABSTRACT

Objective: To assess the prevalence of dental caries, oral hygiene status, deft and oral hygiene habits in special health care needs in Lucknow district.

Materials and Methods: An epidemiological study was conducted including 1041 children to assess the prevalence of dental caries, oral hygiene status, deft, enamel opacities and oral hygiene habits of which data was retrieved. Descriptive statistics that included mean, standard deviation and percentages were calculated for each of the categories. Data were analyzed using Chi- square test and ANOVA test.

Results: Caries prevalence was higher in male handicapped children 24.45% (256) than females 21.49% (225) and the difference was statistically significant ($P < 0.05$). Based on the mode of cleaning teeth, those who clean their teeth by themselves, with other's help and under supervision have got prevalence dental caries 413(85.86%), 34(7.07%) and 34(7.07%) respectively. Dental caries prevalence of 54.22% was observed in children having good oral hygiene, 50% caries prevalence observed in children having fair oral hygiene, 57.85% prevalence among children having poor oral hygiene. The differences between oral hygiene status and caries prevalence was not significant, $\chi^2 = 3.69$, $P > 0.05$.

Conclusion: The dental profession should be aware of its responsibilities and be prepared to play its part in improving the dental health of handicapped children. Doctors, health visitors, teachers, caretakers and parents play a vital role in maintenance of good oral health of handicapped children. School dental health programs should be undertaken including school dental health education, school dental health services and school health environment.

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1. Introduction

Oral health is an integral part of overall health in which oral cavity plays a vital role in the life of human beings, through functions like mastication, esthetics, phonetics, communication, emotional expressions as well linked to happiness and good general health and there is evidence that aesthetically acceptable and functionally adequate dentitions affect self-esteem, confidence and socialization. It is highly essential to safe guard oral health of all

children from childhood otherwise poor oral health will lead to various dental diseases like dental caries, periodontal diseases which adversely affects the overall health.^{1,2}

The World Health Organization (WHO) defined health as “a state of complete physical, mental, and social well-being, rather than solely the absence of disease”.² In almost any community, it is possible to see few individuals suffering from handicaps of varying nature. These handicapped individuals also have the same fundamental rights as any other normal individual.³ They have got equal rights to live and sustain an economically productive life. But their life style has to be adjusted according to their capabilities.

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Initially the teeth and gums of handicapped individuals 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 health providers, all contribute to poor oral health of the handicapped.³

Dental diseases are one of the common problems found in children. Good oral hygiene is important to a normal child for proper mastication, digestion, appearance, speech and health, but it is even more important for handicapped children as some of them use mouth as a functional limb to manipulate a chair and to manipulate bite stick.⁴

It is desirable to safe guard oral health of all children from their childhood. The education regarding upkeep of oral health should be given to growing children, both normal and handicapped, in addition occupation and speech therapy to the later.³ The prevention and treatment of the early stages of dental disease lie in the provision of self-care but this may be difficult for the special health care need (SHCN) children.⁵

In recent years, there have been an increasing number of studies concerning the dental health of normal children. However, very little attention has been paid to the dental health of the handicapped children, who actually require special care and attention. These people cannot maintain proper oral hygiene and dental health as they are physically handicapped.⁶

A number of studies have been conducted variably at times showed that challenges to oral health are more complex for disabled children, who are often unable to adequately apply the techniques necessary to control plaque.³ In many instances, a disabled child's oral hygiene care becomes the responsibility of another person, generally a parent or guardian, many of whom are emotionally or intellectually incapable of dealing with the health problems of their less fortunate affiliates.⁷

When literature is reviewed, the majority of studies agree on the poorer oral hygiene and increased severity of gingivitis and periodontitis in handicapped people. Some reports show a high caries experience in handicapped children, while other studies describe comparable or even lower disease levels. A higher proportion of untreated lesions in handicapped children compared to non-handicapped controls have been documented in many studies.⁸

2. Materials and Methods

An epidemiological study was conducted to assess the prevalence of dental caries, oral hygiene status, deft, enamel opacities and oral hygiene habits among the children 4-15 years of age requiring special health care needs in Lucknow district. There are various special schools including Government and NGO (non government organization) schools for special care needing children in

Lucknow district. A total number of children to be included for the study are 1041. Among them, 605 were males and 436 were females of 8 different schools for special children. A schedule for data collection was prepared before starting of the survey, official permission and informed consent was obtained from the parents or guardians, heads of the special schools.

Prior to the dental examination, demographic information was recorded for each subject: age, gender, diet and nature of handicap. Children included in the study were diagnosed as handicapped, subjects attending special schools and all that give permission to conduct the study and subjects whose parents / caregivers / institutional head give consent. Subjects unable to cooperate during oral examination, mainly due to severe intellectual disability were not included.

Oral hygiene status will be assessed using dental caries, oral hygiene status malocclusion, deft, fluorosis and oral hygiene habits by survey performa prepared with , the help of WHO oral health assessment form (1997).⁹ According to nature of handicap, they were divided into following categories: Blind, Deaf and Dumb, Mentally Retarded, Orthopedic Handicapped and Multiple Groups. Before starting the study, the purpose of study was informed and explained to the children and the respective authorities of the institution. However help from the teachers/caretakers were taken to explain the purpose of study and general information regarding name, age and oral hygiene practices were recorded with the help of respective class teachers/caretakers who were used as co-coordinators for the study as they are the means of communication. General information and oral hygiene practices of deaf and dumb children were obtained through a sign language by teachers. The examination of oral health status was done by using various indices OHI-S (Green and Vermilion), Dental Caries (WHO criteria), Fluorosis and Dentition Status was done according to WHO oral health assessment form (1997).⁹ Natural light was used for the examination of the children. Clinical assessment was done using plane mouth mirrors, periodontal index probes, explorers, tweezers, kidney trays, cotton holder, disposable mouth masks, disposable gloves, sterilized cotton and gauze pieces and sterilization medium - Cidex. Clinical findings of the children were been recorded according to the Performa prepared using WHO (1997) criteria and reported to the class teachers at the end of the day of the examination. Reference slips were forwarded to the parents or guardians of the students for information and necessary treatment required for children. The data was retrieved from pre-coded survey Performa to an excel format in computers. A master file was created for the purpose of data analysis. Descriptive statistics that included mean, standard deviation and percentages were calculated for each of the categories. Data were analyzed using Chi- square test and ANOVA test.

3. Results

The study sample comprised of 1041 children with special health care needs with age group of 4-15 years of which 605 were males and 436 were females. The study shows that out of 58.07% of males 24.45% were affected with caries whereas out of 41.92% of females 21.49% of females were affected with dental caries according to sex [Table-1]. Caries prevalence between handicap groups, $X^2 = 3.274$, $P < .001$ highly significant. According to mode of cleaning teeth in handicap groups caries prevalence it was observed maximum in the children cleaning their teeth at themselves and least in the group of children cleaning their teeth under supervision [Table-2]. DMFT component was seen maximum in cerebral palsy with mean DMFT \pm Sd 2.1 \pm 1.7 and the value is significant [Table-3]. The dmft component was seen maximum in orthopedic impaired with dmft \pm Sd 0.8 \pm 0.1 and the value is not significant [Table-4]. Oral hygiene status according to sex wise distribution shows significant value [Table-5]. Oral hygiene status according to mode of cleaning teeth among handicap group compared with intra group and the value was not significant [Table-6]. Oral hygiene status and caries prevalence among handicap groups the mean value obtained was not significant [Table-7].

4. Discussion

Oral health care for children with disabilities is a health care area that has received scant attention. Handicapped are often termed as disadvantaged group, because they are deprived of many social benefits in the society ranging from mental, social, economical, physical, and educational and various others. Hence the prevalence of dental caries and oral hygiene status in physically handicapped children has drawn the attention of many researchers towards this side.

Studies have been done in various geographical areas of India and abroad to assess the prevalence of dental caries and oral hygiene in handicapped children.¹⁰⁻¹² So the present study was carried out on special care needing children to assess the prevalence of dental caries and oral hygiene status in eight special schools of Lucknow district.

The study population consists of 1041 special care needing children attending eight special schools, out of which, 45.94% (481) had dental caries with mean DMFT being 1.0 \pm 0.9 and dmft being 0.9 \pm 1.04.

Similar results were seen in studies done by Nagaraja Rao G (1985)¹³, Rawlani et al (2001)⁶, Nunn JH and Murray JJ (1987)¹⁴, Ohito FA. et al (1993)¹⁵ and Jitender Solanki (2013)¹² where the prevalence rate was 47.0%, 50.4%, 50.0%, 44.0% and 60% respectively.

The higher prevalence of dental caries in handicapped children could be attributed to low power of co-ordination and comprehension leading to negligence of oral hygiene and improper brushing¹⁶. On the other

hand, communicating oral health needs, anticonvulsant medications also impact on the oral health of the children.¹²

It was observed that the caries prevalence was higher in male handicapped children 24.45% (256) than females 21.49% (225). The difference was statistically significant ($P < 0.05$). Similar results were obtained by Al-Alousi (2009)¹⁷, Jain M et al. (2009)¹¹, AL-Dafaai RR. (2010)⁹, Ballal JL. (2010)¹⁸ in their studies.

It was seen that the highest prevalence of dental caries was observed in deaf and dumb group 15.28% (160) with DMFT 150 (27.12%) mean DMFT of 1.2 \pm 1.1, and dmft 93 (21.67%) and mean dmft 0.4 \pm 0.2 and least was seen in cerebral palsy group 0.76% (8) with mean DMFT of 2.1 \pm 1.7, and dmft 0.32 \pm 1.02 respectively. This difference was found to be significant with ($P < 0.05$).

It is in accordance with the study done by Ajami BA et al (2007)¹⁹ Simon E.N.M. et al (2008)²⁰, AL-Dafaai RR. (2010)⁹, have shown higher prevalence of dental caries in deaf and dumb group compared with various other group. On the other hand, Singh A et al (2014)²¹ showed the lower prevalence of dental caries in deaf and dumb as compared to blind children. The high caries activity in these children can be attributed to their difficulty in maintaining oral hygiene, poor muscular co-ordination and muscle weakness interfering with routine oral hygiene practices²².

Similarly, in blind group caries prevalence is 9.27% (97) with DMFT 150 (30.36%) & dmft 137 (31.9%), mean DMFT & dmft are 0.8 \pm 1.3, 0.6 \pm 0.2 respectively. Almost similar results were observed in study done by Rao D B (2001)¹⁰ and McAlister T (2003)²³ in mixed dentition group. In blind children caries prevalence may be due to a higher level of fear and anxiety in these children which may reflect a lack of regular dental care and poor past dental experience.²⁴ In our study lower caries prevalence was observed in this blind group due to the special preventive treatment programs provided by dental institutions regularly.

In cerebral palsy group, with the least caries prevalence of 0.77% (8) with DMFT 09 (1.82%) & dmft 07 (1.63%), mean DMFT & dmft are 2.1 \pm 1.7 & 0.32 \pm 1.02 respectively. In our study it is resulted to be least may be due to less number of children. According to Adenubi J O (1997)²⁵, children under this group are presented with problems in behavioral management and these mishaps take place are due to congenital, natal and perinatal causes.

In orthopedic impaired group caries prevalence is 11.55% (121) with DMFT 90 (18.21%) & dmft 96 (22.37%) and mean DMFT & dmft are 1.4 \pm 1.2 & 0.8 \pm 0.1 respectively. Rao D B (2001)¹⁰ also stated and observed the same results in his study on the prevalence of dental caries. In orthopedic children caries prevalence may be raised due to dependency on caregivers for daily work as they play a pivotal role in prevention and children are totally dependent on them.²⁴ In our study caries prevalence showed low prevalence in this

Table 1: Showing caries prevalence among handicap groups according to sex

Handicap Groups	Males	Caries Affected	Females	Caries Affected	Total M+F	Caries Affected
Blind	119 (11.36%)	54 (5.15%)	94 (8.9%)	43 (4.11)	213 (20.34%)	97 (9.27%)
Deaf and Dumb	185 (17.66%)	81 (7.73%)	145 (13.84%)	79 (7.54%)	330 (31.51%)	160 (15.28%)
Orthopedic Impaired	167 (15.95%)	64 (6.11%)	103 (9.83%)	57 (5.44%)	270 (25.78%)	121 (11.55%)
Mentally Retarded	68 (6.49%)	31 (2.96%)	49 (4.68%)	19 (1.81%)	117 (11.17%)	50 (4.77%)
Cerebral Palsy	8 (0.76%)	5 (0.48%)	5 (0.47%)	3 (0.28)	13 (1.24%)	8 (0.77%)
Multiple Disability	61 (5.82%)	21 (2.01%)	43 (4.10%)	24 (2.29%)	104 (9.93)	45 (4.30%)
Total	608 (58.07%)	256 (24.45%)	439 (41.92%)	225 (21.49%)	1041 (100%)	481 (45.94%)

Males v/s Female, $X^2 = 2.568$, $P < 0.05$ Significant.

Caries prevalence between handicap groups, $X^2 = 3.274$, $P < 0.001$ Highly Significant.

Table 2: Caries prevalence according to mode of cleaning teeth in handicap groups

Handicap groups	Themselves Caries affected	Other's help Caries affected	Under supervision Caries affected
Blind	89 (21.54%)	2 (5.88%)	6 (17.64%)
Deaf and dumb	160 (38.74%)	0 (0.0%)	0 (0.0%)
Orthopedic Impaired	113 (27.36%)	8 (23.52%)	0 (0.0%)
Mentally Retarded	16 (3.87%)	21 (61.76%)	13 (38.23%)
Cerebral Palsy	1 (0.24%)	1 (2.94%)	6 (17.64%)
Multiple Disability	34 (8.23%)	2 (5.88%)	9 (26.47%)
Total	413 (100%)	34 (100%)	34 (100%)

Table 3: Showing distribution of dmft components among handicap groups

Handicap Group	Decayed	Missing	Filled	DMFT	Mean DMFT+/- Sd
Blind	81 (25.15%)	08 (33.33%)	61 (41.21%)	150 (30.36%)	0.8+/- 1.3
Deaf and Dumb	96 (29.8%)	03 (12.5%)	35 (23.64%)	134 (27.12%)	1.2+/- 1.1
Orthopedic Impaired	72 (22.36%)	01 (4.16%)	17 (11.48%)	90 (18.21%)	1.4+/- 1.2
Mentally Retarded	28 (8.69%)	09 (37.5%)	14 (9.45%)	51 (10.32%)	1.6+/- 1.4
Cerebral Palsy	06 (1.86)	00 (0.0 %)	03 (2.02%)	09 (1.82%)	2.1+/- 1.7
Multiple Disability	39 (12.11%)	03 (12.5%)	18 (12.16%)	60 (12.14%)	1.1+/- 0.6
Total	322	24	148	494	1.0+/- 0.9

$F = 8.34$, $P < 0.05$, Significant.

Table 4: Showing distribution of DMFT components among handicap groups

Handicap Group	Decayed	Missing	Filled	DMFT	Mean dmft+/- Sd
Blind	78 (18.18%)	18 (4.19%)	41 (9.55%)	137 (31.9%)	0.6 +/- 0.2
Deaf and Dumb	68 (15.8%)	04 (0.93%)	21 (4.89%)	93 (21.67%)	0.4 +/- 0.2
Orthopedic Impaired	61 (14.21%)	07 (1.63%)	28 (6.52%)	96 (22.37%)	0.8 +/- 0.1
Mentally Retarded	33 (7.69%)	02 (0.47%)	08 (1.86%)	43 (10.02%)	0.38 +/- 0.9
Cerebral Palsy	05 (1.16%)	00 (0.00%)	02 (0.46%)	07 (1.63%)	0.32 +/- 1.02
Multiple Disability	29 (6.75%)	11 (2.65%)	13 (3.03%)	53 (12.35%)	0.33 +/- 1.1
Total	274 (63.87%)	42 (9.79%)	113 (26.34%)	429 (100%)	0.9 +/- 1.04

$F = 2.69$, $P > 0.05$, Not Significant

group as compared to other groups.

In mentally retarded group caries prevalence is 4.77% (50) with DMFT 51 (10.32%) & dmft 43 (10.02%) and mean DMFT & dmft are 1.6+/-1.4 & 0.38+/-0.9 respectively. Simon E. N. M. (2008)²⁰ also reported similar results in mentally handicapped children. Khadem P (2011)²⁶ and Hashemi Z (2012)²⁷ observed higher caries prevalence in mentally retarded children due to wide range of handicapping and learning disability. In our

study caries prevalence reported to be very low due to the special programme been conducted by government in the institutions (Hapse and Tapse) and availability of trained staff who supervised children for 2 times brushing in school.

In multiple disabilities group caries prevalence is 4.30% (45) with DMFT 60 (12.14%) & dmft 43 (10.02%) and mean DMFT & dmft are 1.1+/-0.6 & 0.33+/-1.1 respectively. In multiple disability, all the children having more than one disability were included in this group.

Table 5: Showing sex wise distribution of oral hygiene status among handicap groups

Handicap Groups	Good			Fair			Poor		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Blind	31	21	52	55	44	99	33	29	62
Deaf and Dumb	52	47	99	81	51	132	52	47	99
Orthopedic Impaired	57	34	91	49	29	78	61	40	101
Mentally Retarded	11	09	20	26	23	49	31	17	48
Cerebral Palsy	03	01	04	02	02	04	03	02	05
Multiple Disability	29	20	49	21	13	34	11	10	21
Total	183	132	315	234	162	396	191	145	336

$X^2 = 29.2$, Significant, $P=0.001$

Males v/s Females $X^2 = 0.36$, Not Significant

*A total of 22 cases were excluded as the index teeth were not present in younger subjects.

Table 6: Showing oral hygiene status according to mode of cleaning teeth among handicap group

Handicap Group	Themselves				Other's help				Under Supervision			
	Good	Fair	Poor	Total	Good	Fair	Poor	Total	Good	Fair	Poor	Total
Blind	32 (7.9%)	22 (5.4%)	34 (8.4%)	88 (21.9%)	9 (11.4%)	5 (11.9%)	1 (2.3%)	15 (35.7%)	14 (27.4%)	7 (13.7%)	1 (1.46%)	22 (43.13%)
Deaf and Dumb	90 (22.4%)	30 (7.4%)	34 (8.4%)	154 (38.4%)	5 (1.2%)	3 (7.1%)	3 (7.1%)	11 (26.1%)	3 (5.8%)	4 (7.8%)	1 (1.9%)	8 (15.6%)
Orthopedic Impaired	62 (15.4%)	13 (3.2%)	35 (8.7%)	110 (27.4%)	1 (0.24%)	4 (9.5%)	2 (4.7%)	7 (16.6%)	3 (5.8%)	3 (5.8%)	0 (0.00%)	6 (11.76%)
Mentally Retarded	7 (1.7%)	6 (1.4%)	3 (0.7%)	16 (3.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	32 (0.0%)	1 (1.96%)	1 (1.9%)	2 (3.92%)
Cerebral Palsy	0 (0.0%)	1 (0.2%)	0 (0.0%)	1 (0.24%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.96%)	3 (5.8%)	4 (7.8%)	8 (15.6%)
Multiple Disability	11 (2.7%)	13 (3.2%)	8 (1.9%)	32 (7.9%)	2 (4.76%)	3 (7.1%)	4 (9.5%)	9 (21.4%)	3 (5.8%)	2 (3.9%)	0 (0.0%)	5 (9.80%)
Total	202 (50.3%)	85 (21.1%)	114 (28.4%)	401 (100%)	17 (40.4%)	15 (35.7%)	10 (23.8%)	42 (100%)	24 (47.0%)	20 (39.2%)	7 (13.7%)	51 (100%)

$X^2=5.96$, $P>0.05$. Not Significant

Table 7: Showing oral hygiene status and caries prevalence among handicap groups

Handicap Groups	Good	Caries Affected	Fair	Caries Affected	Poor	Caries Affected
	Blind	65 (32.33%)	40 (19.9%)	54 (31.39%)	28 (16.55%)	42 (34.7%)
Deaf and Dumb	78 (38.8%)	35 (17.41%)	44 (25.28%)	21 (12.20%)	31 (25.6%)	17 (14.05%)
Orthopedic Impaired	15 (7.4%)	7 (3.48%)	21 (12%)	15 (8.49%)	16 (13.2%)	9 (7.44%)
Mentally Retarded	18 (8.9%)	11 (5.47%)	19 (11.04%)	7 (4.06%)	6 (4.9%)	2 (1.65%)
Cerebral Palsy	14 (6.9%)	9 (4.48%)	7 (4.06%)	4 (2.32%)	17 (14.0%)	11 (9.09%)
Multiple Disability	11 (5.4%)	7 (3.48%)	27 (15.69%)	11 (6.39%)	9 (7.4%)	7 (5.79%)
Total	201	106 (54.22%)	172	86 (50%)	121	70 (57.85%)

$X^2 = 3.69$, $P > 0.05$, Not Significant.

*22 cases were excluded as the index teeth were not present in younger subjects.

Regarding the mode of cleaning teeth, those who clean their teeth by themselves, with other's help and under supervision have got prevalence dental caries 413(85.86%), 34(7.07%) and 34(7.07%) respectively. Higher prevalence among those who clean teeth themselves may be due to improper and unability to clean teeth at own where as other group with others help and under supervision may be due to some of the key factors like ability of the supervision, the position of the child, the selection of tooth brush and technique of brushing and the co-operation of patient. ⁴

The overall oral hygiene status among study population was recorded as fair in 396, 336 in poor and 315 of the study population showed good oral hygiene status and oral hygiene status among different handicap groups was statistically significant < 0.001 . There was no significant difference between males and females. Studies done by Shaw L. et al (1986)²⁸, Gizani S. et al (1997)¹¹ and Kamatchy KRJ. et al (2003)² have shown similar results with a poor oral hygiene status of 7.0%, 10.1% and 13.16% respectively. This may be due to cumulative neglect of oral

health which can be due to various reasons and lack of regular dental care.²⁹

According to oral hygiene status, the majority of the study population had fair to good oral hygiene status. This may be attributed to their institutionalization in special schools and under direct supervision of the teachers of the institutions, accompanied with cooperation of non-government organization and local dental institutions taking part in improvement of the oral hygiene and betterment of the special children. Few subjects with poor score may be because of their extent of handicapped nature and un-cooperation.

In this study oral hygiene status was found to be poor among deaf and dumb groups, where as studies done by Greeley CB. et al (1976)⁷, showed that oral hygiene was worse in blind students. This is because the maintenance of oral hygiene remains the most outstanding challenge in the care of blind patients⁶.

The poor oral hygiene status described above could partly be explained by limitations in personal abilities or technical difficulties (e.g. The inability to reach the tooth brush), but there is quite a strong feeling that nurses and caregivers are more interested in general hygiene than in oral hygiene. Parents and educators of handicapped children are aware of the presence of oral problems such as bleeding gums, halitosis, and the presence of plaque or calculus. Many have reported that they had never received any advice on oral health care.³⁰

Regarding the mode of cleaning in different handicap groups, there has not been much difference between cleaning their teeth by themselves, or with other's help or under supervision, as majority of them had fair to good oral hygiene status. This may be due to the psychological competition, to show that they are as good as others, and this may also be due to strict instruction and supervision of teachers to the students to clean their teeth regularly after taking food.

Oral hygiene has played a major role as a causative factor in the prevalence of dental caries. Even though oral hygiene status of majority of the study population was between fair and good, 45.94% were affected with caries in the present study. Statistically significant difference was seen between oral hygiene status and dental caries

The present study showed some unexpected observation in contrast to general belief that "A clean tooth never decays". Dental caries prevalence of 54.22% was observed in children having good oral hygiene, 50% caries prevalence observed in children having fair oral hygiene, 57.85% prevalence among children having poor oral hygiene. The differences between oral hygiene status and caries prevalence was not significant, $\chi^2= 3.69$, $P>0.05$. Some other factors like fluoride, environment, genetics etc., might have influencing the caries prevalence rather than oral hygiene and diet in study population.

5. Conclusion

The dental profession should be aware of its responsibilities and be prepared to play its part in improving the dental health of handicapped children. Doctors, health visitors, teachers, caretakers and parents play a vital role in maintenance of good oral health of handicapped children. School dental health programs should be undertaken in these institutions accordingly:

1. School dental health education – in which teaching the students regarding dental health and training of teachers and parents regarding maintenance of oral hygiene through proper brushing techniques, use of fluoride tooth paste and mouth washes.
2. School dental health services - like providing both periodic check up for early diagnosis and prompt treatment.
3. School health environment - including availability of fluoride in drinking water or supplements if fluoride concentration is low or measures to control concentration in water.
4. Restricting the sale of chocolates, candies and cariogenic snacks in school premises.

6. Source of Funding

None.

7. Conflict of Interest

None.

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