

Different Modes of Oral Health Education and Its Effect on Oral Health Status In Special Children: A Comparative Study

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ABSTRACT

Background: Oral health education is effective in improving the knowledge, attitude and practice of oral health along with plaque control. Video based learning and teaching in dentistry has been documented in various fields. This mode of education have beneficial effects on the development of interpersonal and communication skills, more in situations like treatment of children as observed in previous studies. In children with special needs like Cognitive impairment, dental care is taken as low priority due to their fear of discomfort. Feeding problems among them leads to offering foods that will be accepted, without regard for nutrient content. All these increase their susceptibility for poor oral hygiene. So this study is aimed to assess the acceptance and benefits of Oral Health Education Program in these children by means of video based clips over conventional methods of oral health education for the prevention of periodontal problems.

Material and Methods: Total of 100 children with cognitive impairment were enrolled in the present trial. Caries status and oral hygiene status were assessed by DMFT Index and Simplified Oral Hygiene Index (OHI-S) of Greene and Vermillion respectively. The subjects were randomly assigned to 2 experimental groups. Group (1) was given oral education with help of tooth brush model, child himself/herself in front of the mirror and Group (2) was given video based oral health education. Results of both groups were compared on the basis of outcome of Simplified Oral Hygiene Index at baseline, 3 months and 6 months. Assessment of their brushing skills and their involvement in oral hygiene maintenance was performed by OHI-s index. Paired 't' test and student t-test were employed for statistical analysis.

Results: According to evaluation of plaque made at 3 months and 6 months, both Group I showed similar plaque control as Group II. At 6 months also both the groups showed similar results. Both groups showed increased involvement in their oral hygiene maintenance after 3 months and 6 months.

Conclusion: Video based oral health education is widely gaining popularity and is being used for communication in school and at home for pediatric patients including children with mental disorders. The present study showed that use of audiovisual aids have similar benefits as manual mode of oral hygiene education and thus can be used as adjunctive, reinforcement tool for improving oral hygiene of these children with special needs.

Keywords: Oral Health Education, special child, oral hygiene.

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Oral health education is one of the successful mode in improving the knowledge, attitude and practice of oral health. School based oral health education programs can control the growing burden of oral diseases and promote oral health. In Children with special needs oral hygiene maintenance is challenging for both parents and caregivers¹. Comparative studies have shown poor oral hygiene and increased periodontal disease in children with disabilities. Factors such as limited dexterity, grasping power along with low confidence and interest may interfere in comprehension of conventional means oral hygiene education^{1,2}. Thus the strategy to provide motivation for behavioral change towards oral health becomes crucial for them. The use of audiovisual aids for teaching purposes has been documented in various fields of dentistry such as for infection control education, demonstration for surgical endodontics, orthodontic auxillary training, preclinical teaching of crown preparations, behavior shaping for pediatric patients³. It has shown beneficial effects for the development of interpersonal and communication skills, moreover in psychological demanding situations like treatment of children. It enhances multisensory imagination and visualization and can also be used repeatedly for reinforcement^{3,4}. Unfortunately there exists little empirical evidence regarding intervention to improve oral health of these children. Thus this study is aimed to compare the two modes of oral health education i.e. given by use of audiovisual aid and conventional means to suggest more effective means for improving their oral health.

MATERIAL AND METHODS

A total of 100 children of age group 10-15 years with moderate level of mental retardation studying in Ashankura Special Child School, Bangaluru were enrolled in the study. The study was approved by the Ethical Committee for research. Study protocol was explained to teachers of participating students and informed consent was obtained before their enrollment. Prior to the dental examination demographic information was recorded for each subject: age, gender and education and income of parents. Clinical assessment of their brushing skill was done prior to the demonstration and children who were not able to brush effectively were

enrolled for this study. For all the participants in the study clinical assessment of oral hygiene status was done by single examiner with mouth mirror and No.23 explorer according to Simplified oral hygiene index⁵. Dental caries was recorded according to the WHO caries diagnostic criteria using mouth mirror and CPI probe⁶. A single masked/ blinded examiner carried out all clinical examinations to ensure an unbiased evaluation. Prior to the study, to decrease intra-operator bias the examiner was calibrated by the evaluation of study parameters on two separate occasions on 5 children.

Oral hygiene program:

Children enrolled in the study were randomly divided into two groups.

In Group I children were orally explained about the importance of teeth and methods of maintenance. Circular technique of brushing was demonstrated on the giant toothbrush model for all teeth and tooth surfaces. Timing of brush and cleaning of tongue was also emphasized along with importance of healthy diet intake. Regular visit to dentist was also given importance.

In Group II children received oral education by means of audiovisual aid. With the help of prepared slide and video clips they were explained about importance of teeth and gums. Different ways of maintaining their oral hygiene i.e. brushing, fluoride mouthwash was shown. Brushing technique for all the surfaces of teeth were demonstrated by small video clips. All the other instructions provided were similar to group I. Evaluation of plaque present along with reinforcement of oral hygiene by their respective mode of education was performed after 3 and 6 months for both groups.

Statistical analysis:

Data were statistically analysed by the software statistical package for the social sciences (SPSS), version 23.0 for windows. Statistical analysis followed a descriptive and inferential analysis of data. The mean and standard deviation were used to describe the patterns of oral hygiene and caries status in all groups. Paired 't' test was used to compare the OHI-s scores after 3 and 6 months. DMFT scores were compared at baseline and after 6

Table 1: General profile and characteristics of the study population

Items (Age: years)	Gender (n=100)	
	Male	Female
9-10	12%	5%
10-12	56%	43%
12-14	18%	15%
Oral hygiene status:		
Good	12.4%	6.2%
Fair	33.3%	10.7%
Poor	34 %	5.7%
Socio economic status		
Very poor	15.5%	3.1%
Poor	38.6%	14.6%
Middle class and higher	19.5%	3.1%

Table 2: Comparison of DMFT score at baseline and 6 months.

			Mean	SD	Mean difference (95% CI)	t	df	p-value
Group 1	0 day	50	3.31	4.05	2.05 (1.02, 2.07)	4.17	14	0.001*
	6 month	50	2.26	0.03				
Group 2	0 day	50	3.34	0.06	2.07 (1.05, 2.09)	6.84	14	<0.001*
	6 month	50	2.27	0.04				

Paired t test, *p<0.05 statistically significant, p>0.05 Non significant- NS

Table 3: Comparison of OHI- S control and test group at different time intervals.

		N	Mean	SD	Mean difference (95% CI)	T	df	p-value
Baseline	Group 1	50	12.39	1.02	-0.83 (-1.22, -0.44)	-4.55	14	<0.001*
	Group 2	50	13.21	1.30				
3 months	Group 1	50	12.39	1.02	-27.63 (-30.13, -25.13)	-23.70	14	<0.001*
	Group 2	50	40.02	4.46				
6 months	Group 1	50	12.39	1.02	-0.12 (-1.18, 0.93)	-0.25	14	0.81(NS)
	Group 2	50	12.51	1.49				

Paired t test ; *p<0.05 statistically significant, p>0.05 Non significant-NS

months by student 't' test. The test used allowed us to verify the relation between the variables. Significance was set at 5% (p<<0.05).

RESULTS

All children enrolled in the study were medically healthy other than mental disabilities. Table 1 shows the results regarding general profile of the study population. Of the 100 students examined, the predominant age group was between 10- 12 years,

which represented 56% of sample. The majority were males (67%). Regarding brushing 34% presented with poor oral hygiene. Table 2 shows the mean DMFT in both the groups. There was not statistically significance between both groups. Among the evaluated students, 53.2% had DMFT index ≤ 10 , and 53.4% had debris index 1.85, calculus index 0.71. At beginning of the study children showed increased OHI-S score which was reduced significantly after 3 and 6 months follow up (Table 3). There was a statistically significant

difference ($P = 0.001$) in both the groups for Oral hygiene index after 3 and 6 months. There was no significant difference in the results obtained in DMFT score after 6 months in both the groups.

DISCUSSION

Children with special needs often have weaker focus, memory and attention pattern and attention span. They have difficulty with communication. Motivation is more even difficult to achieve for these children because they have difficulty to understand logically and retain. Furthermore fear of dental treatment can be obstacle for achieving adequate oral health care.⁶⁻⁸ Although it has been reported that teaching in patients with mental disorders proper tooth brushing techniques can lead to improvement in oral hygiene, but regressed after 1 month, suggesting that regular oral health programs are needed.⁷ Result of this study show that the OHI- S index was decreased in both the groups when proper tooth brushing technique was demonstrated. There was non significant difference in both the groups after 3 and 6 months follow up. Children with mental disorders requires individual attention that have influence the result of the present study. The mentally disabled subjects of the present study had a higher caries prevalence, poorer standard of oral hygiene and greater prevalence of periodontal disease than that found in normal children of comparable age groups. The overall oral hygiene status of the study population was poor with a prevalence rate of 12%, 34.0% and 33.3% for good, fair and poor components, respectively, which was worse than that of a previous study conducted on handicapped children attending special schools in Birmingham, UK¹⁰, where the corresponding values in hearing impaired children were 69%, 29% and 2%, respectively. On the other hand, it was similar to a study by Oredugba which showed that 23%, 37% and 40% of the subjects had good, fair and poor oral hygiene status, respectively^{8,9}. Caries experience seems quite comparable with that seen in non-handicapped children of the same age. A study by Gizani et al. showed a mean DMFT score of 3.3 versus 2.7, respectively in 12-year-old children in Belgium⁷. Pilebro et al in 2005 concluded visual pedagogy as useful method of teaching oral hygiene in children with autism.² Study by Munn et al in 2014 has shown that a dental hygiene programme using a short 10 min flash-based video and

brochures every 4 weeks was effective in reducing dental plaque index in patients with mental disorders^{3,9,10}. In the present study there is significant difference ($p < 0.05$) in both the groups after 3 and 6 months. There was non significant reduction in OHI-S between 3 and 6 months. The lack of regular dental care, which is available to normal school children, was reflected in the dental status of the disabled when their oral health was compared with that of normal school children¹²⁻¹⁴. In comparison with normal children, the disabled subjects were not given enough dental care with respect to their treatment needs^{15,16}.

Professional tooth brushing was implemented in both the groups but most important factor in oral health education for these children is effective behavioral changes. In further follow up time with increased motivation better reduction in plaque control can be achieved.

Future studies must be carried out to emphasize the need for research into different ways for oral hygiene maintenance in children with mental retardation and to explore new treatment methods for them. Further in coordination with parents/caregivers and teachers oral hygiene of these children can be improved in a better way by multiple reinforcement sessions at regular intervals about proper oral hygiene maintenance and re-evaluating their brushing skills.

CONCLUSION

Video based oral health education is widely used as a tool for communication in school and at home for children with mental disorders. The present study shows that it can be used as effective tool for demonstration along with manual demonstration for improving oral hygiene of these special children.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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