

Evaluation of Oral Health Education Programme among Parents of Intellectually Disabled Children In Bengaluru.

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Abstract

Introduction: Good oral hygiene maintenance is one of the most important factors in oral health care, which of course is exceptionally difficult for a mentally or physically handicapped. Since parents are responsible for almost all health issues related to their children, their role in modelling their children toward practicing preventive oral health throughout life is crucial.

Objectives: The program aimed to educate the parents about the importance of oral health care and to motivate them with regard to prevention and improve the oral hygiene and oral health of their intellectually disabled children.

Materials and methods: Data was collected from the parents and their disabled children. The questionnaire for parents contains demographic data and KAP towards oral health of intellectually disabled children and baseline and post interventional Gingival and Plaque scores were recorded for their children. Paired and unpaired t tests were used to assess the change in plaque and gingival scores and KAP scores with 5% as level of significance.

Results: At baseline, no significant differences were found at Plaque and Gingival scores of the disabled children and Knowledge, Attitude and Practice of their parents between the interventional and control groups. At post intervention, Plaque and Gingival scores were significantly decreased ($p < 0.001$) and significant improvement in the Knowledge, Attitude and Practice was observed ($p < 0.001$) in interventional group when compared to controls.

Conclusion: The intervention was thus deemed successful in improving parents Knowledge, Attitude and practicing behaviours and also improved the oral hygiene status of their disabled children.

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I. Introduction

Oral health is a vital component of overall health that contributes to every individual's well-being and quality of life by completely touching physical and mental well-being, appearance, and social relations¹. Intellectual incapacity is outlined as "a condition of inactive or incomplete development of the mind, which is particularly characterized by impairment of skills manifested throughout the biological process amount, which contribute to the overall level of intelligence, i.e., cognitive, language, motor, and social abilities²." Globally, the incidence of intellectual disabilities or rather the number of diagnosed cases has increased dramatically since the 1980s³.

For many children with these disabilities, their smile is their most effective way of interacting with the world. One of the most important factors in oral health care is the maintenance of good oral hygiene, which of course is exceptionally difficult for a person who may be mentally or physically handicapped, to achieve by his or her own efforts. Unfortunately, the oral health of this population is compromised by their lack of preventive dental treatment and by their inability to adequately brush and/or floss their own teeth. Reliance is then placed on parents, guardians, helpers and teachers who neither themselves practice appropriate oral hygiene nor choose a proper diet⁴. Many of them are emotionally or intellectually incapable of dealing with the health problems of their less fortunate affiliates⁵. Because of this, oral health care is progressively neglected with often unhappy avoidable consequences. It has been demonstrated that there is a strong trend for oral hygiene to be less adequate and to deteriorate with age in mentally and physically handicapped individuals than with the normal population⁶.

But, parents are the decision makers in matters of health care for these children. Since they are responsible for almost all health issues related to their children, their role in modelling their children toward practicing preventive oral health throughout life is crucial. Parents often only clean the anterior teeth, ignoring the posterior teeth and causing the posterior oropharyngeal area to be at risk for colonization with bacteria and infection⁷. Thus, parents should be educated about importance of oral health care which in turn influences the general health of their children. There are lack of studies which have elicited parental knowledge, attitudes, and practice (KAP) behaviours towards oral health of children with intellectual disabilities in India.

Thus, the aim of this study was to evaluate the effect of oral health education programme among parents of intellectually disabled children in Bengaluru city, Karnataka, India.

II. Materials and methods

The present interventional study was done in the month of August and September 2016 among the parents and the intellectually disabled children of 5-20 years age group at Sri Sajjan Rao School, Bengaluru. The ethical clearance and permission to conduct the study was taken from the concerned authorities. Informed consent was obtained from the study participants.

Sample size determination

Simple random sampling method was followed. Based on the secondary data³ the sample size was estimated to be 60.

Sample size calculation using the formula:

$$n = \frac{(Z_{\alpha} + Z_{\beta})^2 S^2}{\Delta^2}$$

$$n = \frac{(1.96 + 0.84)^2 \times 2 \times 1}{(0.9)^2}$$

$$n = \frac{7.84 \times 2}{0.81}$$

$$n = \frac{15.68}{0.81}$$

$$n = 19.35$$

Δ Confidence interval - 95% (0.95),

Power = 80% (0.80), $Z_{\alpha} = Z_{0.95} = 1.96$, $Z_{\beta} = Z_{0.80} = 0.84$, $\Delta^2 = 0.9$ (Expected Difference)

The estimated sample size was 29 and this was rounded off to 30 for each group and total sample size was 60.

Sampling Method

A total 84 children were present on the day of examination of which 60 children were randomly selected based on the inclusion and exclusion criteria and they were randomly allotted to interventional and control group of 30 participants each.

Inclusion criteria

- Parents who gave consent to participate in the study and also willing to allow their children to participate.
- Child's co-operation to permit a dental examination

Exclusion criteria

- Parents who not give consented to participate in the study and also not willing to allow their children to participate.
- Children who are not co-operative.

Duration of the study

The study was conducted for a period of 21 days (The majority of individuals develop gingivitis clinically after 21 days of continued bacterial biofilm growth. If, at this stage, the bacterial biofilm is removed and appropriate plaque control methods are applied, remission of gingival inflammation occurs⁸). For the intervention and control group, the duration of study was from 25/08/2016 - 16/09/2016 with clinical examination on day 0 (25/08/2016) and day 22 (16/09/2016) respectively. A pilot study was conducted among 5 participants prior to the study to check the reliability of the questionnaire($\chi = 0.80$) and to check the feasibility of clinical examination of the indices according to the criteria. Intra examiner reliability of the examiner was assessed using kappa statistics which was found to be 0.90 for both gingival and plaque scores and it was considered to be good.

Study Method

After randomization of the study participants, a structured questionnaire consisting of socio-demographic information, knowledge, attitude and practice (KAP)^{9,10} of the parents towards oral health care of the intellectually disabled children was given to both the interventional and the control group by the investigator. Each participant took around 10 minutes to fill the questionnaire. Clinical examination of the intellectually disabled children was done to record the gingival index and plaque index, according to Loe and Silness¹¹ and Silness and Loe¹¹ criteria to assess the plaque accumulation and gingival inflammation respectively.

Oral health education intervention programme

Oral health education was provided to the interventional group by educating about the importance of milk teeth, importance of maintaining proper oral hygiene, demonstration of brushing techniques, flossing methods, other oral hygiene aids, management of dental trauma of disabled children through flipchart intervention along with booklets. All the parents of the interventional group were instructed to follow the instructions whereas for the control group parents, no intervention was provided and were allowed to follow their regular oral hygiene practices for their children.

Post intervention

After 21 days of follow up, parents of both the groups were recalled and the same questionnaire was given again by the investigator to assess the post intervention KAP data followed by oral examination of their disabled children to record the gingival and plaque scores by same investigator. The scores of index teeth were recorded and average of scores represented study subjects score. All the data was recorded by the calibrated examiner at baseline and post intervention. The post interventional KAP data and index scores were then compared with the baseline scores to assess the effect of oral health education programme. During the assessment of disabled children, the study participants (parents) were informed if any treatment is required and were referred to V.S Dental College and Hospital.

Instrument used were sterilised using standard protocol and only completely filled forms were considered for analysis.

Statistical Analysis-

Statistical analysis was done by Statistical Package for Social Sciences (SPSS) version 21 for descriptive data analysis. Descriptive statistics was done for demographic data. Paired and unpaired t test was used for the comparison of baseline and post intervention within each group and between the groups.

III. Results

Table 1: Distribution of disabled children and their parents according to Gender and Age.

Variables	Frequency Number (%)
Interventional group	30 (100%)
Boys	19 (63.3%)
Girls	11 (36.7%)
Control group	30 (100%)
Boys	20 (66.7%)
Girls	10 (33.3%)
Mean age of the children	
Interventional group	11.13±2.16
Control group	11.01±2.14
Mean age of the parents	
Interventional group	39.43 ± 2.43
Control group	39.23 ± 2.54

A total of 60 children were recruited for the study of which 30 children each were randomized into interventional group and control group. In the interventional group, boys were 19 (63.3%) and girls were 11 (36.7%) whereas in control group, 20 (66.7%) were boys and 10 (33.3%) were girls. The mean age of the children in both the groups were 11.13 ± 2.16 and 11.01 ± 2.14 and the mean age of the parents in both the groups were 39.43 ± 2.43 and 39.23 ± 2.54 respectively.

Table 2: Distribution of study participants based on plaque scores at baseline

	Plaque Scores						
Groups	N	Mean	Std Deviation	95% confidence interval		H value	p value
				Lower bound	Upper bound		
Interventional group	30	1.2931	.19258	1.1315	1.3305	0.05	0.97(NS)
Control group	30	1.2590	.20191	1.1393	1.3187		

The mean plaque scores of the interventional group at baseline was 1.29 with a standard deviation of 0.19 and the control group was 1.25 with a standard deviation of 0.20 and the results were found to be not significant.

Table 3: Distribution of study participants based on gingival scores at baseline

	Gingival Scores						
Groups	N	Mean	Std Deviation	95% confidence interval		H value	p value
				Lower	Upper		

				bound	bound		
Interventional group	30	1.1180	.03372	1.1199	1.3761	0.05	0.81 (NS)
Control group	30	0.9065	.37511	1.1499	1.3231		

The mean gingival scores of the interventional group at baseline was 1.11 with a standard deviation of 0.03 and the control group was 0.90 with a standard deviation of 0.37 and the results were found to be not significant.

Table 4: Comparison of baseline and post intervention within interventional group for plaque scores

Groups	Plaque Index	N	Mean	Std Deviation	z value	p value
Interventional group	Baseline	30	1.2910	.19258	3.45	0.001(S)
	Post interventional		.9070	.24405		

- **Significance(S)=p value<0.05, Non-Significance>0.05**

The mean plaque scores of the interventional group at baseline was 1.29 ± 0.19 which was reduced to 0.90 ± 0.24 at post intervention and the results were found to be statistically significant.

Table 5: Comparison of baseline and post intervention within control group for plaque scores

Groups	Plaque Index	N	Mean	Std Deviation	z value	p value
Control	Baseline	30	1.2590	.20191	1.42	0.01(S)
	Post interventional		1.3425	.20553		

- **Significance(S)=p value<0.05, Non-Significance>0.05**

The mean plaque scores of the control group at baseline was 1.25 ± 0.20 which was increased to 1.34 ± 0.20 at post intervention and the results were found to be statistically significant.

Table 6: Comparison of baseline and post intervention within interventional group for Gingival scores

Groups	Gingival scores	N	Mean	Std Deviation	z value	p value
Interventional group	Baseline	30	1.1180	0.3327	3.28	0.001(S)
	Post interventional		0.6845	0.3364		

- **Significance(S)=p value<0.05, Non-Significance>0.05**

The mean gingival scores of the interventional group at baseline were 1.11 ± 0.33 which was reduced to 0.68 ± 0.33 at post intervention and the results were found to be statistically significant.

Table 7: Comparison of baseline and post intervention within control group for Gingival scores

Groups	Gingival scores	N	Mean	Std Deviation	z value	p value
Control	Baseline	30	0.9065	0.3751	0.79	0.42(NS)
	Post interventional		0.9505	0.3149		

- **Significance(S)=p value<0.05, Non-Significance>0.05**

The mean gingival scores of the control group at baseline were 0.90 ± 0.37 which was increased to 0.95 ± 0.331 at post intervention and the results were found to be not statistically significant.

Table 8: Distribution of the parent's mean knowledge, attitude and practice of the interventional and control groups at post intervention.

Variable	Group	Pre-intervention	Post- intervention	Result of the paired t test
		Mean (SD)	Mean (SD)	
Knowledge	Interventional group	4.45 (1.28)	7.83 (0.53)	p<0.001 T= 13.36
	Control group	4.43 (1.30)	4.20 (1.40)	P=0.51 T=0.65
	Result of independent t	P= 0.95	P=0.001	

	test	T=0.06	T=13.28	
Attitude	Interventional group	3.06(1.01)	4.73(0.69)	p<0.001 T= 0.54
	Control group	2.34 (1.21)	2.47 (1.01)	P= 0.64 T= 0.55
	Result of independent t test	P= 0.15 T= 2.50	P=0.24 T=1.16	
Practice	Interventional group	3.26(1.31)	4.63 (1.37)	p<0.001 T= 0.69
	Control group	2.86(1.03)	2.28(1.37)	P= 0.53 T=0.49
	Result of independent t test	P= 0.19 T= 1.31	P=0.001 T=6.64	

The mean Knowledge score of the interventional group at baseline was 4.45 ± 1.28 which was increased to 7.83 ± 0.53 at post intervention and the result were statistically significant whereas the mean Knowledge scores of the control group was decreased from 4.43 ± 1.30 at baseline to 4.20 ± 1.40 at post intervention and the result were not statistically significant. When the post interventional scores were compared between the interventional and the control groups the results were statistically significant.

- The mean Attitude score of the interventional group at baseline was 3.06 ± 1.01 which was increased to 4.73 ± 0.69 at post intervention and the results were statistically significant whereas the mean Attitude score of the control group was slightly increased from baseline (2.34 ± 1.21) to post intervention (2.47 ± 1.01) and the results were not significant. When the post interventional scores were compared between the interventional and the control groups the results were not statistically significant.

- The mean Practice score of the interventional group at baseline was 3.26 ± 1.31 which was increased to 4.63 ± 1.37 at post intervention and the results were statistically significant whereas the mean Practice score of the control group was decreased from baseline (2.86 ± 1.03) to post intervention

(2.28 ± 1.37) and the results were not significant. When the post interventional scores were compared between the interventional and the control groups the results were statistically significant.

IV. Discussion

Over the past decade, the intellectually disabled cases has emerged as a major public health concern in many countries, characterized by a complex, behaviourally defined, static immature brain disorder¹². It has been recognized for many years that oral health is perhaps the most neglected aspect of care for persons with intellectual disabilities¹³. The degree of unmet dental need is far greater for these persons than for the general population¹⁴. There have been many attempts to explain the reasons for this in public health terms such as the reduced access to care for this sector of the population including financial, social, and physical barriers and indirect relation to mental disability, anxiety and subject's inability to co-operate¹⁵.

Providing oral care to these types of children requires patience and a thorough understanding of the patient's degree of intellectual ability. In day to day life, parents function as role models for their children, and, therefore, parents' knowledge about oral health is very crucial. Moreover, children with these disabilities are totally dependent on their parents even for basic necessities of life. Thus, parental characteristics and beliefs are vital concerns to boost children's oral health. Therefore, in makes an attempt to attain the most effective oral health outcomes for kids, parents should be considered as key persons.

In the present study, the total number of boys and girls in both the groups were found to be 65% and 35% which showed a higher prevalence in males. This was in accordance to the study done by Magoo J et al³ which showed a higher prevalence for males.

The parent's responses to questions related to their knowledge about the causes of major dental diseases and their perceived susceptibility and preventability clearly revealed that some of the important objectives of health education will be in the dissemination of knowledge about the aetiology, pathogenesis, prevention and therapy of the diseases.

Wide spread misconception and ignorance about oral diseases and oral health exist among the parents of both the groups. From these findings it can be concluded that the promotion of more scientific orientation to the understanding of the causes of tooth decay and periodontal diseases should be initiated without delay.

After the health education intervention of the interventional group, their mean Knowledge, Attitude and Practice scores was higher when compared to the control group which was similar to the studies done by Blinkhorn et al¹⁶ whereas it was in contrast to the studies done by Faulks et al¹⁷ wherein not much differences were observed between the interventional and the control groups. The parent's knowledge of dental disease improved and the children had their teeth cleaned more thoroughly and more often than before the intervention.

Most of the parents were aware of the importance of proper tooth brushing in the prevention of dental caries. However, as to the prevention of periodontal diseases, the role of proper oral hygiene was less frequently

stated by the parents. Though 76.2% of the parents assisted their child while brushing, oral hygiene was poor, so it is important to educate parents about appropriate techniques of brushing. Parents should also be educated and made aware about the advantages of modified toothbrushes as 84.7% used the conventional brushes. 89.7% parents reported no usage of any additional oral hygiene aids which reflected poor oral health practices among the groups. Marshall et al¹⁸ in their study confirmed the validity of considering intellectual disability as an indicator of high caries risk. They reported oral hygiene may be the most influential risk indicator associated with new caries in children with these disabilities. 56.9% of the parents were aware that dental health affects the overall health of their child yet 61.8% of the children had never visited a dentist. This may be due to their socioeconomic backgrounds, including family income, parental education, area of residence along with fear of the parents and cost of dental care, believe in that their child lacked cooperative ability which might have influenced dental service utilization. It is highly recommended that dental services must be provided at the special schools for intellectually disabled children at subsidized rates and also fear of the parents can be eliminated by educating them about the various aspects of dental treatment and cleaning various misconceptions regarding the same¹⁹.

The removal of plaque and debris from the teeth may be an ability which will be down only if a person has the deftness to control the toothbrush and understands the objectives of these activities²⁰. Most of the studies²¹ performed for evaluating the oral hygiene status of disabled children found poor oral hygiene levels, which is confirmed in the present study as well. Nicolaci and Tessini²² had observed that the high prevalence of poor oral hygiene among handicapped individuals is usually more evident in the mentally retarded, and there seems to be a correlation between the levels of oral hygiene and severity of the disability. The reasons for poor oral hygiene in disabled children have been attributed to decreased incidence of rinsing mouth after meals, along with lack of interest in maintenance of oral hygiene, accumulation of food in the mouth for a longer time, low powers of concentration and lack of motor skills²³.

In the present study, the mean plaque and gingival scores of the interventional group was subsequently decreased from baseline to post intervention compared to the control group which was in contrast to the study done by Murshid et al²⁴ wherein much difference were not observed between plaque and gingival scores.

Following demonstration of oral hygiene techniques, the number of children who had their teeth cleaned more than once a day rose from 28% to 48% ($p < 0.05$) in interventional group and no difference in frequency of brushing observed in control group which was similar to the studies done by Faulks et al¹⁷.

The percentage of parents able to clean both posterior and anterior teeth of their children increased from 24% to 45% ($p < 0.05$) and the percentage finding tooth cleaning easy increased from 32% to 58% (non-significant) which was similar to the studies done by Faulks et al¹⁷.

It is observed that the disabled individuals are generally incapable of obtaining an adequate oral hygiene level by manual brushing because of their limited motor skills and lack of knowledge of oral hygiene and effective brushing technique¹. Some suggest that complete plaque removal with a conventional toothbrush is not realistic for this group¹. According to some investigators, electric tooth brushes are especially well suited for people with reduced motor skills²⁵. A specially designed manual toothbrush called the triple-headed brush has also been

developed, which is designed to clean the oral, buccal, and occlusal surfaces of the teeth with a single stroke and is recommended for certain individuals with limited manual skills²⁶.

Overall, the behavioural changes expressed by the parents were generally significant, and the impact of the program in terms of change in attitudes and habits were positive.

As to future oral health education programmes, information given to the parents should also aim at improving knowledge about the negative effect of sweet drinks and the interplay of bacteria and sugar in the development of dental caries. The limitations and recommendations of the study were being a shorter duration so a trial with longer duration is recommended (Reinforcement of training programmes). The information acquired from the parent's of these intellectually disabled children may not be accurate with regard to the condition and behaviour of the child. The development of validated, standardized methods of assessing behaviour change in parents is essential and should form the basis of further research. It is important for dentists to make worthwhile attempts to conduct regular oral health education programs, with stress on preventive measures and regular dental checkups among parents of such children at special schools or care centres. Education of parents, access to dental care and affordability of oral health care services for this special group are critical factors for achieving optimal oral health in these patients.

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