

Effectiveness of a school dental education program in improving oral health knowledge and oral hygiene practices in school children

¹Amina Usman, Post graduate student Department of Pediatric and Preventive Dentistry, A.B Shetty Memorial Institute of Dental Sciences, Mangalore

²Aditi Acharya, Post graduate student, Department of Pediatric and Preventive Dentistry, A.B Shetty Memorial Institute of Dental Sciences, Mangalore

³Disha Sharma, Post graduate student, Department of Pediatric and Preventive Dentistry, A.B Shetty Memorial Institute of Dental Sciences, Mangalore

Corresponding Author: Amitha M. Hegde, Senior Professor, Department of Pediatric and Preventive Dentistry, A.B Shetty Memorial Institute of Dental Sciences, Mangalore

Citation of this Article: Amina Usman, Aditi Acharya, Disha Sharma, “Effectiveness of a school dental education program in improving oral health knowledge and oral hygiene practices in school children”, IJDSIR- September - 2021, Vol. – 4, Issue - 5, P. No. 176 – 183.

Copyright: © 2021 Amitha M. Hegde, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Objectives: To determine the effectiveness of school dental education program in improving oral health knowledge, practices, and oral hygiene status among school children.

Materials and Methods: The present study included school children of age 7-12 years. A consent was obtained from the school administration and parents. A questionnaire was distributed amongst school children by well-trained pediatric dentists. Completely answered questionnaires were collected. Oral health education programme was conducted with live demonstration and video presentation. After a period of one month the questionnaires were redistributed, which was filled by the children. The questionnaires were analysed after educating

the children about the correct oral hygiene practices and preventive measures.

Results: The response rate was 98%. As seen, there was a significant improvement in the knowledge and attitude of children. Tooth brushing habits improved post education which was significant. Knowledge regarding tools used, methods used for toothbrushing showed a significant improvement post education. 29% of the children did not have a positive attitude towards toothbrushing owing to the fact that these children did not know the reason for tooth brushing. However, a highly positive response was seen following this dental education and self-motivation program which was conducted specially to motivate and educate these children.

Keywords: Toothbrushing program, school dental education program, brushing methods, brushing techniques, questionnaire study, oral health

Introduction

Mouth is regarded as the mirror of the body; hence it is very important to have a good oral health for maintaining a good general health. It can directly or indirectly influence the quality of life of a person.[1] Oral health diseases remain high all over the world due to the lack of acceptance of healthy oral habits that are crucial in controlling some of the most common oral diseases like, dental caries and periodontal diseases which are mainly considered as behavioural diseases. In children, poor oral hygiene habit can restrict activities in school and home leading to loss of many potential working hours. Oral hygiene is maintained by brushing and flossing to prevent dental caries and gum diseases, which is considered as a lifelong habit which ensures the removal of plaque, which is the primary cause for tooth decay and gum disease.[2] These oral habits should begin in an early stage of life and in order to follow it; it is important to have adequate knowledge and attitude towards it. The knowledge is derived from information, and information when accepted and believed becomes an action which turns into a habit.[3] This information is majorly achieved by children through parents, family and school. However, there is lack of education and awareness regarding the correct methods and techniques of toothbrushing for maintaining good oral hygiene in school curriculum. So it is merely followed by children from parents or siblings without appropriate knowledge regarding the techniques, tools, methods and attitude towards toothbrushing. Hence this study was done to collect a baseline data regarding the methods, habits, tools and attitude and educate the children regarding toothbrushing habits to create awareness and increase knowledge.

Materials and methods

The study was carried out on a total of 70 children, aged 7-12 years, from a higher primary school of a rural area in Mangalore. The study outline was reviewed and approved by the institutional ethical committee. Approval of the school administration was obtained after the purpose of the study, and the procedures that would be followed during its conduct were explained to the principal of the school. The principal was requested to inform the students and their parents about the study, and a day was set to collect the data. The consent was obtained in the presence of schoolteachers and parents

Baseline data was collected from the children by means of questionnaire, which consisted of questions regarding tooth brushing habits, methods, tools and attitude. The questions were framed to obtain information from the school children about their oral hygiene habits. Questionnaires were distributed, filled, and the information data was tabulated and analysed.

Oral health education and motivation programme was conducted by experienced paediatric dentists through live demonstration along with a video presentation. Correct methods and techniques of toothbrushing was demonstrated with its scientific basis.

Another set of questionnaires were distributed amongst the children, one month after the education programme in order to assess their knowledge and attitudes post education. The response rate was tabulated and analysed.

Results

Out of 70 total participants, the response rate was 98.3%. The overall results of the pre-education questionnaires are depicted in Table 1 and Graph 1. The overall results post education questionnaires are depicted in Table 2 and Graph 2.

Tooth Brushing Habits

It was seen that before education 97% of the children brushed their teeth every day. The children were asked to brush twice daily; once in the morning and night and also requested their teachers to advice the parents/guardians to assist their wards in tooth brushing up till the age of 9years. Following this a 100% improvement was observed through the post education questionnaire.

Tools used for tooth brushing

98% of the children claimed to brush their teeth with a tooth paste and a tooth brush amongst which 60% of the children brushed their teeth with soft bristles, 24% with medium and 16% with hard bristles. And only 42% of the children used fluoridated toothpaste and 35% didn't know of it. Through the educational session we advised them to brush their teeth using a toothbrush with soft bristles with a pea sized amount of tooth paste containing fluoride. We also advised them to discard their brushes every 3months. Following this 80% of the children started using tooth brushes with soft bristles. And 65% of the children switched to using fluoridated tooth pastes. This shows a significant level of improvement in their attitude.

Method used for toothbrushing

When the direction of brushing was asked; 36% of the children claimed to use a circular motion, 14% used scrub

technique, 5% used a vertical motion 28% used a combination of all the three motions and 11% did not use any of these techniques. It was taught by us that the combination of all these three motions done both buccally and lingually covering small areas for 1-2mins would be the best way to brush their teeth. There was no significant improvement noticed in post-test questionnaire regarding this.

Attitude towards Toothbrushing

On asking the children if they thought brushing is important, 75% of the children agreed, 15% disagreed and 10% didn't know the importance and only 71% of the children brushed their teeth out of self-motivation. Children were educated on the deleterious effects of dental caries on the tooth surface and the shortcoming of this condition on the general wellbeing and on their aesthetic appearance. Post-education 95% of the children knew the importance of brushing and 80% were self-driven and started brushing their teeth promptly.

The overall results of our study showed that the children were well aware and informed about the importance of toothbrushing but with the education, children learnt about the scientific importance and they realised that a lot of things that they were following in their routine methods needed a reform which was immediately put into effect.

Table 1: Questionnaire response before oral health education programme

Question	A (%)	B (%)	C (%)	D (%)	E (%)
Category 1 – Tooth Brushing Habits					
Q.1 Do you brush your teeth?	97	0	3	-	-
Q.2 How many times do you brush your teeth?	1	93	5	1	-
Q.3 When do you brush your teeth?	94	63	1	-	-
Q.4 At what age did you start brushing your teeth by yourself?	32	33	3	3	29
Category 2: Tools Used For Toothbrushing					
Q.5 What do you use to brush your teeth?	3	94	0	0	3
Q.6 What type of toothbrush do you use?	60	24	0	16	-

Q.7 How much toothpaste do you put?	5	91	0	4	-
Q.8 How often do you change your toothbrush?	40	34	2	12	12
Q.9 Do you use a fluoridated toothpaste?	42	23	35	-	-
Category 3: Methods Used For Toothbrushing					
Q.10 What direction do you follow while brushing your teeth?	14	36	5	28	11
Q.11 How long do you usually take to brush your teeth?	4	24	46	11	23
Category 4: Attitude Towards Toothbrushing					
Q.12 Do you think toothbrushing is important?	75	15	10	-	-
Q.13 Why do you brush your teeth? Because,	4	71	5	3	17

Table 2: Questionnaire response after oral health education programme

Question	A (%)	B (%)	C (%)	D (%)	E (%)
Category 1: Toothbrushing Habits					
Q.1 Do you brush your teeth?	100	0	0	-	-
Q.2 How many times do you brush your teeth?	1	95	2	2	-
Q.3 When do you brush your teeth?	98	68	1	-	-
Q.4 At what age did you start brushing your teeth by yourself?	32	33	3	3	29
Category 2: Tools Used For Toothbrushing					
Q.5 What do you use to brush your teeth?	2	98	0	0	0
Q.6 What type of toothbrush do you use?	80	10	10	0	-
Q.7 How much toothpaste do you put?	7	88	0	5	-
Q.8 How often do you change your toothbrush?	45	30	2	11	12
Q.9 Do you use fluoridated toothpaste?	65	28	7	-	-
Category 3: Methods Used For Toothbrushing					
Q.10 What direction do you follow while brushing your teeth?	15	39	6	35	5
Q.11 How long do you usually take to brush your teeth?	3	15	48	22	12
Category 4: Attitude Towards Toothbrushing					
Q.12 Do you think toothbrushing is important?	95	0	5	-	-
Q.13 Why do you brush your teeth? Because,	3	80	7	4	6

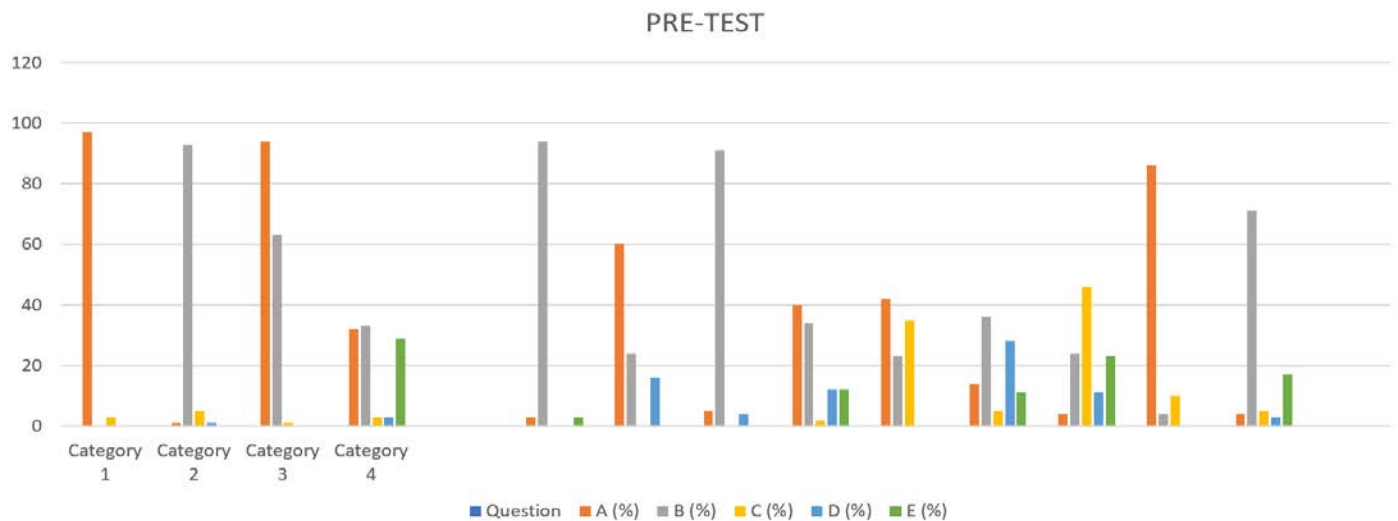


Figure 1: Questionnaire response before oral health education programme

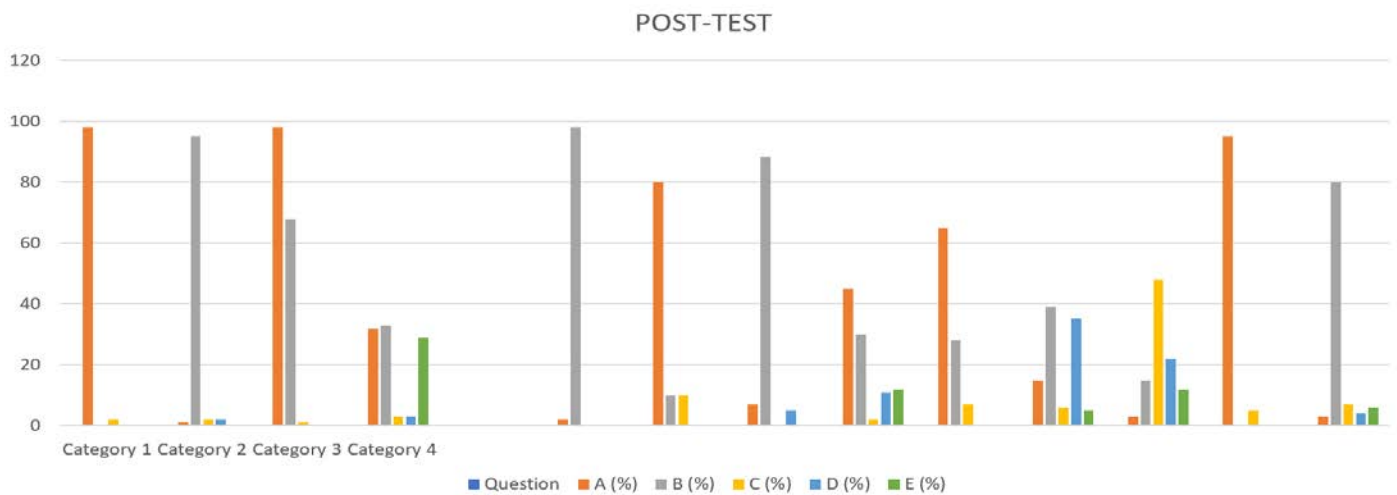


Figure 2 Questionnaire responses after oral health education programme

Discussion

Oral health habits, attitudes, and behaviour are best established during childhood. It is very important to maintain good oral health as it can influence the general health of an individual. Good oral health practices can be accomplished mainly through self-induced habits like maintenance of dental hygiene. It is important to prevent dental diseases before they start. The easiest way is to practice daily brushing and flossing that in turn will reduce the dental diseases. In literature, knowledge and awareness about oral health is reported to be very low in children.[4]It is believed that visualization, active

participation, skill training, and reinforcement are of paramount importance in establishing good oral hygiene practice in a child.[5]

In the present study, school was considered as an ideal setting to conduct a supervised toothbrushing programme, as the largest and the most significant group of children accessible for oral health education are present here. The selected age group was from 7-12 years, since 6 years is considered as the age for the eruption of first permanent molars. As per the WHO recommendation 12 years is regarded as an age for international comparison and global monitoring of disease trends including dental

caries.[6]The present study was carried out in a rural area of Ullal in Dakshina Kannada district, Mangalore in the age group of 7 -12 years. Similar results were seen in studies done by Fotedar et al., Taani DQ and Antunes et al where they found better oral hygiene in private school children compared to public school children. This difference was attributed to irregular oral hygiene practices among public schoolchildren which in turn could be due to a lower socio-economic status and lower utilization of dental services.[7] We selected a public school for the teaching as it is often seen that these children have poor oral health due to their lower socio-economic status and lack of knowledge.

Data was collected using a questionnaire that reflects on the awareness, technique and practices of toothbrushing and other oral hygiene measures in children. Children were sensitized by giving oral hygiene instructions and live demonstration on the brushing technique using a video presentation was done as it is often noticed that children are able to recall and recreate acts when taught through virtual platforms. After which they were instructed to follow the correct method of toothbrushing practices at home. Data was then collected using the same questionnaire and the responses were compared and tabulated.

According to the pre - education results obtained; the questionnaires show that the students are well aware of the oral hygiene measures. Majority of the students have emphasized on the routine dental check-up for the prevention of oral health problems and that they brush their teeth twice daily (95%). Once in the morning and the second time before going to bed at the end of the day. In our study it was observed that unsupervised brushing started in most of the children before the age of 7 which is an inappropriate habit as children at this age have not developed manual dexterity. In a study done by Gerber

R.J et al in 2015 stated children completely develop manual dexterity by the age of 8 which enables them to brush all areas of the mouth by themselves.[8] Post education result reflected an improvement in tooth brushing habits. Sandstrom et al 2011 said that children could be given an increasing responsibility from 7 to 8 year of age but parental help is motivated up to 10 years of age. However, it was not statistically significant.

According to the present study, majority of children used a toothbrush and toothpaste to clean their teeth. Tooth powder and ash were among other materials used to clean their teeth. Several authors have reported the use of tooth powder, paddy husk powder and Ayurvedic tooth powder amongst the adjunct. Rao et al studied about the toothbrushing materials used in urban and rural schoolchildren and reported use of Manjan, ash, coal and dantum (twig of babul or neem).[3] The use of other recommended oral hygiene methods such as dental floss and mouthwash were rare. Fotedar et al. reported statistically higher number of children in private schools using toothbrush and toothpaste when compared with public schools. 60% of the children brushed their teeth with soft bristled toothbrush whereas the other 24% used medium bristled toothbrush. Studies have shown that soft toothbrushes do as good a job of cleaning the teeth as medium toothbrushes. As the intensity with which the child brushes his/her teeth is not measurable, there is a possible damage to the developing oral structures.

Majority of children changed their toothbrush within 1 month of use. Changing a toothbrush is dictated not only by duration of use, but also by fraying of bristles which reduces efficiency of the toothbrush. Fluoridated toothpaste is used by 42% of the children, however 23% of the children used herbal toothpaste. It is very important to use fluoridated tooth paste as fluoride strengthens the developing tooth enamel and also helps in rebuilding

weakened enamel structure thereby preventing development of dental caries. Hegde et al (2014) stated that the median fluoride values in unfiltered municipal, borewell and open well water samples in Mangalore city showed values of 0.18 ppm, 0.285 ppm and 0.13 ppm respectively. Since, the fluoride concentration in drinking water is below optimum level, supplementing fluoride is necessary for reduction of caries incidence.[9]

Most of the children dispensed toothpaste across the whole length of toothbrush and very few children used pea sized toothpaste. Post treatment questionnaire reflected, a statistically significant improvement in the knowledge of tooth brushing aids used by the children. In our study it was observed that the circular tooth brushing method was the most common method (36%) which was followed by vertical method (28%) of tooth brushing. 48% of the total children were seen to brush their teeth for 2 minutes, which is the ideal time recommended by ADA. Post education results showed a significant increase in following the correct method of toothbrushing

According to the children's opinion, 86% of the children believed that toothbrushing was important while there still remained 4% children who did not believe that it is necessary for them to brush their teeth. 29% of the children did not know the exact reason for toothbrushing and did not have a positive attitude towards toothbrushing. Post education results showed an improvement of attitude towards toothbrushing by children. In the present study, a highly positive response was seen from the children by virtue of participating in the study, by undergoing dental education and self-motivation to improve brushing methods and techniques.

Conclusion

Poor oral health can have a detrimental effect on children's quality of life and in turn can affect their performance at school as well as daily activities, this

program aimed at instituting oral health promotion activities for schoolchildren with focus on improving knowledge, awareness and motivation regarding methods and techniques of toothbrushing. It provided basic oral health education and motivated them to adopt good oral hygiene practices. There was a significant improvement in knowledge, methods and attitudes towards tooth brushing in these children after education programme.

References

1. Gift HC, Atchison KA. Oral health, health, and health-related quality of life. *Medical care*. 1995 Nov 1;NS57-77.
2. Al-Attas SA. The effect of socio-demographic factors on the oral health knowledge, attitude and behavior in a female population. *Saudi Dent J*. 2007 Jan;19(1):27-35.
3. Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bulletin of the World Health Organization*. 2005;83:661-9.
4. Okada M, Kawamura M, Kaihara Y, Matsuzaki Y, Kuwahara S, Ishidori H, Miura K. Influence of parents' oral health behaviour on oral health status of their school children: an exploratory study employing a causal modelling technique. *International journal of paediatric dentistry*. 2002 Mar;12(2):101-8.
5. Damle SG, Patil A, Jain S, Damle D, Chopal N. Effectiveness of supervised toothbrushing and oral health education in improving oral hygiene status and practices of urban and rural school children: A comparative study. *Journal of International Society of Preventive & Community Dentistry*. 2014 Sep;4(3):175.
6. Shenoy RP, Salam T. A. A, Agrawal R, Shenoy K. P. Oral hygiene practices and their influence on the oral

- health of adolescents. *Int J Community Med Public Health*. 2020;7(7):2556.
7. Rao SP, Bharambe MS. Dental caries and periodontal diseases among urban, rural and tribal school children. *Indian pediatrics*. 1993 Jun 1;30:759-.
 8. Gerber RJ, Wilks T, Erdie-Lalena C. Developmental milestones: motor development. *Pediatrics in review*. 2010 Jul 1;31(7):267-77.
 9. Dodhiya SS, Bhat GT, Bhandari S, Shetty A, Hegde MN. *Journal of Water Research*. *Journal of Water Research*. Photon. 2014;136:289-94.