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AM D'Cruz
S Aradhya

Authors' affiliations:
AM D'Cruz, Department of Public Health Dentistry, A. B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore, India
S Aradhya, Department of Preventive and Community Dentistry, The Oxford Dental College, Hospital and Research Centre, Bangalore, Karnataka, India

Correspondence to:
AM D'Cruz
Department of Public Health Dentistry
A. B. Shetty Memorial Institute of Dental Sciences
Nitte University
Deralakatte
Mangalore 575018
India
Tel: +91 9880872658
Fax: +91 8242204776
Email: audreydcruz@yahoo.co.in

Impact of oral health education on oral hygiene knowledge, practices, plaque control and gingival health of 13- to 15-year-old school children in Bangalore city

Abstract: *Objectives:* To assess effectiveness of an oral health education (OHE) programme on oral hygiene knowledge, practices, plaque control and gingival health of 13- to 15-year-old school children in Bangalore city. *Methods:* Three schools were randomly selected and assigned to experimental I, experimental II and control groups. At baseline, a 20-item questionnaire was used to assess the oral hygiene knowledge and practices. Clinical examinations (Turesky–Gilmore–Glickman modification of Quigley Hein plaque index; Loe–Silness gingival index) were performed by 2 examiners. OHE was provided by the investigator for experimental groups I (lecture using a PowerPoint presentation) and II (lecture using a PowerPoint presentation with toothbrushing demonstration). Control group did not receive any intervention. Reinforcement was provided for experimental groups at 3 and 6 months. At end of 9 months, questionnaire was administered and clinical examinations were performed. Data were analysed using chi-square, ANOVA and *post hoc* Tukey's tests. *Results:* Nine months post-intervention, there was significant improvement in oral hygiene knowledge and practices in experimental groups. There were significant reductions in mean plaque index and gingival index scores in the experimental groups. The control group did not show any significant improvement. *Conclusion:* Active involvement of school children with reinforcement of OHE can improve oral hygiene knowledge, practices and gingival health and decrease plaque levels.

Key words: gingival health; oral health education; oral health promotion; oral hygiene; plaque control

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Introduction

Health promotion is the process of enabling people to increase control over and to improve their health (1). Oral health education is an important part of oral health promotion and is an essential and basic part of oral health services (2). It aims to promote oral health through educational means, principally the provision of information to improve oral health knowledge for adoption of a healthier lifestyle, changed attitudes and desirable behaviours (3, 4). Oral health education is essential for promoting oral health in adolescents (5, 6). During adolescence, young people

are able to assume responsibility for learning and maintaining health-related attitudes and behaviours that carry over into adulthood (7). The school system is a logical environment in which to teach preventive oral health practices and promote oral health (8, 9).

In India, the general level of oral health is unsatisfactory, particularly among school children. The National Oral Health Survey of India 2002–2003 data show 67.7% prevalence of gingivitis among the 15-year-olds (10). Poor oral hygiene and gingival status characterize the oral health condition of Indian adolescents (10, 11), similar to the situation in many developing countries (12). School children in the age group of 13–15 years are in particular need of oral health promotion programmes because of high levels of plaque leading to gingivitis and early periodontitis. Hence, it is necessary to motivate 13- to 15-year-old school children to improve their oral hygiene.

A study conducted in Bangalore, India (13), has reported a poor oral health knowledge and behaviour among the school children. The utilization of dental services was low and was mainly for relief of pain. Lack of oral health education programmes was the main reason that was attributed to the lack of knowledge and poor behaviour towards oral health. Short-term oral health education programmes have been successful in improving the oral health knowledge and behaviour among school children in India (14–16).

The objective of the study was to assess the effectiveness of an oral health education programme on oral hygiene knowledge and practices, plaque control and gingival health of 13- to 15-year-old school children in Bangalore city and also to compare the active and passive methods of oral health education.

Study population and methodology

Description of the study area

Bangalore lies in the south-east of South Indian state of Karnataka covering an area of 741 km^2. With an estimated population of 8.5 million in 2011, it is the third most populous city in India (http://en.wikipedia.org/wiki/Bangalore, accessed 1 April 2012).

Study design and sampling

A double-blind interventional study was carried out for a period of 9 months. In a two-stage random sampling, Bangalore city was first divided into three zones. Three schools, one from each zone (similar in socioeconomic status and standard of teaching with no previous history of school-based oral health education programmes) were randomly selected by simple random sampling using the table of random numbers. To avoid dissemination of information given to the subjects, the schools were randomly assigned to experimental I (passive group), experimental II (active group) and control groups.

Keeping a confidence level 'α' of 0.05 and power of the study 90%, the sample size was estimated to be 150 in both the experimental groups and 300 in the control group. School children in the age group of 13–15 years and those willing to participate were included in the study. School children having systemic diseases and conditions and under medication and those undergoing orthodontic treatment were excluded from the study. Informed consent was obtained from parents of the school children participating in the study. One hundred and fifty school children (aged 13–15 years) were sampled from each of the experimental schools, and three hundred school children (aged 13–15 years) were sampled from the control school based on systematic random sampling.

Ethical considerations

Ethical approval to conduct the study was obtained from Institutional ethical committee, The Oxford Dental College and Hospital and Research Centre, Bangalore, India. Official permission was obtained from the Deputy Director of Public Instruction and the concerned school authorities before commencing the study.

Data collection using structured questionnaire

A 20-item questionnaire in English and Kannada (local language) was administered to the subjects. The questionnaire (Table 1) included socio-demographic details and questions on oral hygiene knowledge and practices. Ten questions concerning oral hygiene knowledge included topics such as aetiology, self-diagnosis and prevention of caries and gingivitis. Ten questions on oral hygiene practice included type and frequency of toothbrushing, flossing, tongue cleaning, use of fluorides and other aids and a visit to a dentist.

Questionnaire reliability analysis

Test–retest was used to check the reliability and internal consistency of the questionnaire. The results thus obtained were subjected to statistical analysis. Cronbach's alpha value of 0.82 showed good internal consistency of the questionnaire.

Clinical examination for plaque and gingivitis

Clinical examinations were performed by two qualified dentists using the Turesky–Gilmore–Glickman modification of Quigley Hein plaque index (1972) and Loe–Silness gingival index (1963). Training and calibration of the examiners was carried out. The kappa coefficient value (κ) for intraexaminer reliability for examiner 1 was 0.89 for plaque index and 0.88 for gingival index. The kappa coefficient value (κ) for intraexaminer variability for examiner 2 was 0.86 for plaque index and 0.89 for gingival index. Both the examiners showed very good reliability. The interexaminer reliability was 0.90 for plaque index and 0.87 for gingival index.

Details of intervention

Oral health education was provided by the investigator for the experimental groups I and II only. A lecture using a PowerPoint

Table 1. **Questionnaire used to assess the oral hygiene knowledge and practices**

Oral hygiene knowledge			
1. What happens if you do not clean your teeth and mouth?			
a. Bad breath	b. Bleeding gums	c. Decayed teeth	d. All of the above
2. What is the cause for bleeding gums?			
a. Microorganisms	b. Not cleaning teeth	c. Both of the above	d. I don't know
3. How should teeth be cleaned?			
a. Finger	b. Stick	c. Tooth brush	d. Charcoal
4. Which type of tooth brush is good for cleaning teeth?			
a. Soft	b. Medium	c. Hard	d. I don't know
5. How many times in a day should you clean your teeth?			
a. Once a day	b. Twice a day	c. After every meal	d. I don't know
6. How long should you clean your teeth?			
a. Less than a minute	b. 2 min	c. 5 min	d. I don't know
7. When should the tooth brush be changed?			
a. Every 3 months	b. Every year	c. When it frays	d. I don't know
8. Which type of toothpaste should be used?			
a. Fluoride containing	b. Without fluoride	c. Should not use toothpaste	d. I don't know
9. What should be used along with toothbrush and toothpaste to clean the mouth?			
a. Dental floss	b. Mouthwash	c. Tongue cleaner	d. All of the above
10. How should the mouth be kept healthy?			
a. Keep mouth clean	b. Eat nutritious food	c. Visit to dentist every 6 months	d. All of the above

Oral hygiene practices				
1. Do you use toothbrush to clean your teeth?				Yes/No
2. Do you use a fluoride containing toothpaste?				Yes/No
3. How long do you clean your teeth?				
a. Less than a minute	b. 2 min	c. 5 min	d. 10 min	
4. Do you clean your teeth after every meal?				Yes/No
5. Do you use dental floss?				Yes/No
6. Do you use mouth wash?				Yes/No
7. Do you change your toothbrush every 3 months?				Yes/No
8. Do you clean your tongue?				Yes/No
If yes, what do you use to clean your tongue ————————				
9. What measures do you take when you get pain in your teeth?				
a. Take a tablet from medical store	b. Keep a clove in the tooth	c. Visit a dentist	d. Visit a general doctor	
10. Do you visit the dentist twice in a year for dental check-up?				Yes/No

Underlined alternatives denote correct responses.

presentation was delivered to the experimental group I and hence was the passive group. For the experimental group II, along with the lecture which was delivered using a PowerPoint presentation, a demonstration of the toothbrushing method was provided using the study models. The subjects then had to demonstrate the toothbrushing on the study models, which was monitored by the investigator and hence was the active group. The control group did not receive any oral health education.

Three, six and nine months post-intervention, the same baseline questionnaire was administered to all the groups to assess any improvement in oral hygiene knowledge and practices. Also, clinical examinations were carried out to assess any changes in plaque control and gingival health. Reinforcement of oral health education was provided by the investigator for the experimental groups I and II only at 3 and 6 months. After the completion of the study, oral health education was imparted to the control group for ethical reasons.

Evaluation of intervention

Intervention was evaluated by assessing improvements in oral hygiene knowledge and practices (correct answers) and also changes in plaque index scores and gingival index scores in the intervention groups in comparison with the control group. This comparison involved mean and percentage changes in oral hygiene knowledge, practice, plaque index scores and gingival index scores. Right answer for knowledge of oral hygiene was given a score of 1, and wrong answer was scored 0. Scores of all 10 knowledge questions were summed up to get the total score for each individual. The mean knowledge score for each group was calculated. Similarly, every correct answer for oral hygiene practice was scored as 1, and wrong answer was scored 0. Scores of all 10 practice questions were summed up to get the total score for each individual. The mean practice score for each group was calculated. The percentage change was calculated by $100 \times$ (baseline mean score $\sim$ 9 month score)/baseline score.

Data management and processing

Data were entered in Microsoft Excel 2007 and statistically analysed using the SPSS version 15.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistical analysis has been carried out in the present study. Significance is assessed at 5% level of

significance. Chi-square test has been used to find the significance of study characteristics on categorical scale. Analysis of variance (ANOVA) has been used to find the significance of study parameters (oral hygiene knowledge, practice, plaque index scores and gingival index scores) between the three groups. Repeated-measures ANOVA has been used to find the significance of oral hygiene knowledge, practice, plaque index scores and gingival index scores at baseline, 3, 6 and 9 months. *Post hoc* Tukey's test has been used to find the pairwise significance between the groups.

Results

One hundred and forty-one subjects from experimental I, 143 from experimental II and 284 from control groups completed the study. The dropout rate was 6% for experimental I, 4.7% for experimental II and 5.3% for the control groups. Table 2 shows the age and gender distribution of the subjects in the experimental I, experimental II and control groups, respectively. Comparison of age of participants between the three groups did not reveal any statistically significant differences ($\chi^2 = 4.212$, $P = 0.378$). Also, the gender comparison of participants did not reveal any statistically significant differences between the three groups ($\chi^2 = 0.602$, $P = 1.014$).

Table 3 shows the intragroup and intergroup comparison of oral hygiene knowledge and practice scores in all the three groups. Regarding oral hygiene knowledge, there were no significant differences seen between the three groups (intergroup comparison) at baseline. However, the intergroup comparison showed significant changes at 3, 6 and 9 months between the groups. Intragroup comparison of each group revealed that there were a 123.3% change in the experimental group I, 132.3% change in the experimental group II and 28.1% change in the control group at the end of 9 months when compared to the baseline mean scores ($P < 0.001$). The results became significant 3 months after the oral health education. However, as the time span increased, the significance between the experimental groups I and II decreased, and at 9 months, there was no significant difference between the two methods of intervention with regard to the oral hygiene knowledge (Table 4).

Intergroup comparison at baseline showed that there were no significant differences in the oral hygiene practices between the three groups. However, the intergroup comparison showed significant changes at 3, 6 and 9 months between the groups. Intragroup comparison of each group revealed that there were 21.9% in the experimental I, 37.2% change in experimental II ($P < 0.001$) and 5.9% change in control groups (not significant) at the end of 9 months. There were significant differences

Table 2. **Age and gender distribution of children studied**

	Experimental I		Experimental II		Control		
	No	%	No	%	No	%	*P* value
Age (years)							
13	43	30.5	41	28.7	75	26.4	$\chi^2 = 4.212$, $P = 0.378$
14	47	33.3	61	42.6	121	42.6	
15	51	36.2	41	28.7	88	31.0	
Total	141	100.0	143	100.0	284	100.0	
Gender							
Male	67	47.5	68	47.6	147	51.8	$\chi^2 = 0.602$, $P = 1.014$
Female	74	52.5	75	52.4	137	48.2	
Total	141	100.0	143	100.0	284	100.0	

Table 3. **Intragroup and intergroup comparisons of oral hygiene knowledge and practice score among experimental I, experimental II and control groups**

	Group	Baseline	3 months	6 months	9 months	*P* value	% Change
Oral hygiene knowledge	Experimental I	3.89 ± 1.17	6.17 ± 1.58	8.01 ± 1.66	8.69 ± 1.31	<0.001*	123.3
	Experimental II	3.93 ± 1.05	7.34 ± 1.55	8.53 ± 1.15	9.13 ± 0.98	<0.001*	132.3
	Control	3.77 ± 1.62	3.86 ± 1.60	4.09 ± 1.81	4.83 ± 2.44	<0.001*	28.1
	Significance	$F = 0.722$; $P = 0.486$	$F = 272.981$; $P < 0.001$*	$F = 500.474$; $P < 0.001$*	$F = 327.235$; $P < 0.001$*	–	–
Oral hygiene practice	Experimental I	5.61 ± 1.12	5.25 ± 1.46	6.25 ± 1.24	6.84 ± 1.12	<0.001*	21.9
	Experimental II	5.88 ± 1.79	7.29 ± 1.18	7.67 ± 1.19	8.07 ± 1.19	<0.001*	37.2
	Control	5.86 ± 1.56	5.86 ± 1.55	5.93 ± 1.53	6.21 ± 1.69	NS	5.9
	Significance	$F = 1.580$; $P = 0.211$	$F = 80.888$; $P < 0.001$*	$F = 81.261$; $P < 0.001$*	$F = 77.925$; $P < 0.001$*	–	–

*Significant ($P \leq 0.05$).
NS, not significant.

Table 4. **Pairwise significance of change between groups for all the study parameters using *post hoc* Tukey's test**

	Group	Baseline	3 months post-intervention	6 months post-intervention	9 months post-intervention
Oral hygiene knowledge	Control–Experimental I	0.960	<0.001*	<0.001*	<0.001*
	Control–Experimental II	0.693	<0.001*	<0.001*	<0.001*
	Experimental I–Experimental II	0.512	<0.001*	0.014*	0.122
Oral hygiene practice	Control–Experimental I	0.239	<0.001*	0.061	<0.001*
	Control–Experimental II	0.991	<0.001*	<0.001*	<0.001*
	Experimental I–Experimental II	0.285	<0.001*	<0.001*	<0.001*
Plaque index scores	Control–Experimental I	0.475	<0.001*	<0.001*	<0.001*
	Control–Experimental II	0.288	<0.001*	<0.001*	<0.001*
	Experimental I–Experimental II	0.953	0.995	0.048*	<0.001*
Gingival index scores	Control–Experimental I	0.979	0.423	0.001*	0.141
	Control–Experimental II	0.288	0.015*	<0.001*	<0.001*
	Experimental I–Experimental II	0.953	0.374	0.235	<0.001*

*Significant ($P \leq 0.05$).

Table 5. **Intragroup and intergroup comparisons of mean plaque index and mean gingival index scores among the experimental I, experimental II and control groups**

	Group	Baseline	3 months	6 months	9 months	*P* value	% Change
Plaque index	Experimental I	3.91 ± 0.31	3.59 ± 0.24	3.15 ± 0.12	3.02 ± 0.13	<0.001*	22.8
	Experimental II	3.90 ± 0.30	3.59 ± 0.25	3.03 ± 0.29	2.79 ± 0.3	<0.001*	28.5
	Control	3.95 ± 0.30	3.91 ± 0.31	3.52 ± 0.56	3.59 ± 0.31	NS	9.1
	Significance	$F = 1.382$; $P = 0.252$	$F = 100.339$; $P < 0.001$*	$F = 77.085$; $P < 0.001$*	$F = 467.94$; $P < 0.001$*	–	–
Gingival index	Experimental I	1.46 ± 0.26	1.40 ± 0.22	1.26 ± 0.20	1.31 ± 0.25	<0.050*	10.3
	Experimental II	1.44 ± 0.25	1.37 ± 0.19	1.22 ± 0.11	1.07 ± 0.11	<0.001*	25.7
	Control	1.46 ± 0.25	1.43 ± 0.25	1.33 ± 0.25	1.35 ± 0.23	NS	7.5
	Significance	$F = 0.331$; $P = 0.718$	$F = 3.971$; $P = 0.019$*	$F = 17.752$; $P < 0.001$*	$F = 82.414$; $P < 0.001$*	–	–

*Significant ($P \leq 0.05$).
NS, not significant.

between the 3 groups 3, 6 and 9 months after the oral health education (Table 4).

Table 5 shows the intragroup and intergroup comparison of mean plaque index scores and mean gingival index scores for all the three groups. The *post hoc* Tukey's test for intergroup comparison of mean plaque index scores shows that there were no differences between the various groups at baseline (Table 4). However, the differences became significant between the three groups 3, 6 and 9 months after the oral health education. There was no significant difference between the experimental groups I and II 3 months after the oral health education. However, after 6 and 9 months, significant differences were seen between the experimental groups I and II.

The *post hoc* Tukey's test for intergroup comparison of mean gingival index scores shows that there were no differences between the various groups at baseline (Table 4). However, the differences became significant between the experimental II and control groups after 3 months. There was no significant difference between the experimental I and control groups and also between the experimental groups I and II. However, 6 months after the oral health education, the differences between the experimental I and control groups were significant, but no difference was seen between the experimental groups I and II. Nine months after the oral health education, the significant differences were seen between the experimental groups I and II.

Discussion

India is a vast country where 75% of its population resides in the rural areas. In India, dental care scenario is unique. At present, there are more than 290 dental colleges, producing approximately 19 000 dental graduates/year and almost 3000 specialists. As per the Dental Council of India, there are more than 79 000 dentists for population of about 1 billion with dentists–population ratio 1:10 000 in urban areas and 1:1 50 000 in rural areas. 75% of the dentists practising in the

urban areas cater to only 25% of the total Indian population. Oral diseases, especially dental caries and periodontal diseases, are highly prevalent. Cost of dental treatment is high and cannot be afforded by the rural people. Decreased availability of toothbrushes in rural areas and the taxes levied upon the toothbrushes and toothpastes in India (as it is considered to be a cosmetic commodity) make it difficult for an average Indian school child to afford them. In the light of the scarce resources and the burden of oral diseases in India, a prevention-oriented oral healthcare policy would be more advantageous than the curative approach.

'Oral health education is a planned package of information, learning activities, or experiences that are intended to promote oral health' (17). This level of knowledge is known to be a necessary and be one of the key determinants of behaviour change (18). The cornerstone of the prevention of the two major oral diseases, dental caries and periodontal disease, is maintenance of a clean mouth or a clean tooth surface to be particular, that is, a tooth surface free from dental plaque. Well-planned and executed oral health promotion programmes could greatly accelerate the decline of the dental caries problem, periodontal problems, etc. (19). The development of health education as a scientific discipline within dentistry has been slow. All too often action takes precedence over evaluation.

Bangalore, a large city and the second fastest growing metropolis of India, is a major educational, economic, information technology and cultural hub. The cosmopolitan nature of this city has resulted in the migration of people from other states to Bangalore. Thus, the city of Bangalore can be regarded as a representative for India. In the present study, the schools were selected from different zones of Bangalore to avoid the contact of subjects from the different groups. The schools were allocated randomly to the experimental and control groups. Such a design ensures that the responses were attributable to the intervention and overcomes the problem of 'contamination of information' given to the subjects if the experimental and control groups are within the same school.

The participants' knowledge was evaluated using a self-designed questionnaire. Close-ended questions were used as it would be easy for the comparison of correct responses at baseline, 3, 6 and 9 months. Although open-ended questions are more reliable and avoid the risk of answering by chance, it is difficult to analyse the responses at repeated intervals. It has been shown that Indian children have a low level of oral health knowledge and poor oral health behaviour when compared to their Western counterparts (20). Hence, the questions were self-constructed, tested by carrying out a pilot study and modified accordingly.

The present study showed a 123.3% change in the experimental group I, 132.3% change in experimental group II ($P < 0.001$) and 28.1% change in control group (not significant) when compared to the baseline knowledge. These changes were greater than those in Biesbrock *et al.*'s (21) study, who have reported an 86% increase in knowledge ($P < 0.001$) 4 weeks following an oral health education programme. Walsh (22) reported a 44.8% change in the knowledge level among the experimental groups and 5.4% change in the control group. Rajesh *et al.* (16) have reported a 58% increase in oral health knowledge 3 months following oral health education programme which was delivered using a computer (computer group) when compared to the other groups. Greater improvement in knowledge in the present study could be attributed to the reinforcement of intervention, which was provided at a 3-month interval rather than a single lecture. Lachapelle (23) showed an improvement in knowledge following oral health education and also revealed that oral health education using audiovisual aids was better than a just a verbal presentation. However, the results were no longer significant after 2 months. Lack of reinforcement/motivation and a shorter duration of the study period could be the reason for a lesser change in the level of oral hygiene knowledge.

There were 21.9% and 37.2% changes in the oral hygiene practices in the experimental groups I and II, respectively ($P < 0.001$), and 5.9% change in control group (not significant) when compared to the baseline. Walsh (22) observed that 96% had reported use of toothbrush at baseline at least once a day. Although the author did not find a significant change in reported practices, there was an increased frequency in the reported use of the toothbrush, a finding that is similar to the results of the current study. Use of animations and stepwise representation of concepts may have helped the school children to understand the importance of maintaining a clean mouth and may have created an interest to bring about behavioural change. Although the difference of 1–2 points seems to be too little to be statistically significant, it must be borne in mind that such a subtle difference too can be of clinical significance, which has been reflected in the decrease in the mean plaque index and mean gingival index scores.

There were 22.8% and 28.5% reduction ($P < 0.001$) in the mean plaque index scores in experimental groups I and II, respectively, and 9.1% change in control group. There were 10.3% and 25.7% reduction in the mean gingival index scores in the experimental groups I and II, respectively ($P < 0.001$), and 7.5% reduction in control group (non-significant) 9 months following an oral health education programme. These findings were in accordance to those reported by Biesbrock *et al.* (6) and Ganesh *et al.* (15). Craft *et al.* (24) have shown an improvement in knowledge and behaviour among the study subjects, which led to 16% reduction in mean plaque levels with improvement in the gingival condition in the experimental groups. Albandar *et al.* (25) have reported on the long-term effect of oral health education programmes for the reduction in plaque and gingival inflammation in adolescents for 3 years. Their programme included regular follow-ups and constant communication with parents. It was found that the plaque scores were least in the group wherein the preventive programme was most comprehensive followed by the less comprehensive programme, and the least improvement was noted in the control group.

In addition, the present study also attempted to find out which method of educational motivation is effective. It was seen that although there was an improvement in both the experimental groups, the change was better in the experimental group II (active group) than in experimental group I (passive group). These findings show that although a lecture method can improve the knowledge and practices, reinforcing the lecture with individual toothbrushing demonstration can yield better results. This will help a long way in decreasing plaque levels and subsequently improving gingival health.

The control group, even without taking part in the educational intervention, had improvement in oral hygiene knowledge and practices although the differences were not significant. These changes would have occurred as a result of the Hawthorne effect (26). The mere presence of the dentist in the school and the possibility of greater dental attention provided to the students (26) and a questionnaire (27) likely had some influence in motivating them to better self-care.

The limitations of the study include the following: (i) school children were not randomly allocated to intervention and control groups; (ii) long-term value of the improvements seen need to be confirmed by further studies; (iii) no environmental or lifestyle changes were advocated; (iv) over-reporting of favourable behaviour might be expected. Within the limits of this study, the practical experience gained from this programme may be useful in the future extension of the school-based oral health education programmes.

In general, the positive effects of educational programmes on oral health are thought to be transient over time, with obvious benefits observed shortly after the programme that disappear at later visits (6). The sustainability of the findings, therefore, remains unknown, a limitation identified in several studies regarding oral health education (28). However, some programmes have resulted in improvements that were maintained for at least 3.5 years following the termination of the oral health programme (29).

Oral health education is thus a powerful tool in improving the oral hygiene knowledge and practices, which can lead to better plaque control and subsequent improvement in gingival health. Hands-on training like toothbrushing drill, flossing and rinsing can act as motivational tools in promotion of oral health. Reinforcement of oral health information is of utmost importance and is the key to success of any oral health education programme. Implementing an easy-to-organize and inexpensive school-based educational intervention can improve oral cleanliness and gingival health among school children, in particular in countries with a developing oral healthcare system.

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