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Impact of oral health education on oral health of 12 and 15 year old schoolchildren of Vadodara city, Gujarat state

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Abstract

Aim: To evaluate the impact of oral health education on plaque, gingival and caries status among 12 and 15 year old children attending Government schools of Vadodara city.

Material and method: A total of 372 study-subjects, aged 12 and 15 years were examined at baseline, 335 of which were examined after three months period at the time of follow-up for plaque, gingival and caries status by using Silness and Loe Plaque index, Loe and Silness Gingival index and WHO modified DMFT index. Oral health education was given to the study subjects. At the end of the third month from collection of baseline data, the study subjects were examined again for plaque status, gingival status, and caries status.

Results: Mean plaque scores of all study subjects decreased after oral health education. There was no significant difference in plaque scores of male study subjects, while among 15 year old female study subjects, significant decrease was observed. Mean gingival and mean caries scores did not show any

significant reduction among 12 and 15 year old male and female study subjects.
Conclusion: The results showed that short-term oral health education programmes may be useful in improving oral hygiene but not effective in improving gingival health and caries status.
Keywords : oral health education, plaque, gingival status, caries

Introduction:

Oral health is an integral part of general health. Good oral health enables individuals to communicate effectively, to eat and enjoy a variety of foods and is important in overall quality of life, self-esteem and social confidence. However oral diseases are major health problems, especially in children, owing to their high prevalence and incidence in all regions of the world.

India, a developing country faces many challenges in rendering oral health needs. The majority of Indian population resides in rural areas, of which more than 40% constitute children. These children can not avail dental facilities due to inaccessibility, financial constraints and stagnation of public dental healthcare services (1). Schools provide an ideal platform for reaching out to all sections of children and thus, classroom education has been considered an important effort to improve preventive dental behavior in the general population.

Evaluation of the effectiveness of the school health education programmes is probably one of the most neglected activities in the practice of public health. Evaluation studies have an important role in the further development of these kinds of interventions. Exploration of the available literature has revealed that such impact evaluation studies of oral health education programmes have not been conducted in Vadodara city. Hence present study has been undertaken with the aim of evaluating the impact of oral health education on plaque, gingival and caries status among 12 and 15 year old children attending Government schools of Vadodara city.

Material and methods:

The target population was 12 and 15 year old schoolchildren studying in government schools of Vadodara city. A list of all government high schools (ie 70 high schools) was obtained from the office of Vadodara district education officer. Seven schools were selected from the list of seventy schools by simple random sampling methodology, as for the larger groups 10 % of the total population can be used as representative of the total population.

A total of 372 school children were examined, of which 140 were girls and 232 boys. Follow-up was carried out after a period of three months from the day of first visit. At the time of follow-up, 335 students were examined, which included 122 girls and 213 boys.

Inclusion criteria –

- All the 12 and 15 year old school children attending government high schools in Vadodara city (boys and girls).

Exclusion criteria –

- Children contraindicated for examination.
- Students not present on the day of examination.

Prior to conduct the study, the purpose of the study was clearly explained to the higher authorities of these selected schools and written permission was obtained from them. Ethical approval was obtained from Ethics Committee, Sumandeep Vidyapeeth.

The present study was scheduled to spread over a period of six months, from October 2007 to March 2008. The data was collected by a single investigator (principal investigator) and recorded by a trained internee. The investigator was calibrated for intra examiner variability. Kappa statistics showed higher degree conformity with the observations. (kappa co-efficient = 0.86).
Participation in the study was voluntary. A one time verbal assent was taken from each study subject in the presence of class – teacher before conducting the study.

Clinical assessment and data collection –

Clinical examination was carried out in classrooms under natural day-light. Subjects were

asked to sit comfortably on a wooden chair. They were examined for plaque, gingival and caries status by using Silness and Loe Plaque index, Loe and Silness Gingival index (2) and WHO modified DMFT index (3) by the principal investigator. A trained recorder was made to stand close to the examiner so that the instructions could be heard easily.

After collecting the baseline data, oral health education was given to the study subjects. Questions related to oral health were asked by principal investigator in order to determine the priorities of oral health education and level of understanding. Oral health education sessions were held in classrooms. A brief oral health education session for a period of about 20 minutes was prepared on a range of topics related to dentistry. The local language (i.e., Gujarati) was used for the education because it was frequently spoken at home and understood by all children.

Daily tooth brushing was emphasized for prevention of bad breath and tooth decay. Chalk and blackboards, models, charts and posters were used as oral health education aids.

Statistical analysis:

The survey data so obtained from the study subjects was compiled, coded and tabulated. Statistical analyses were performed using the software SPSS version 12.0.

Wilcoxon signed rank sum test was used to find the difference in mean caries status (DT) of the study subjects before and after oral health education.

Paired t-test was used to evaluate the changes in plaque and gingival status at baseline and after three months. Significance level was set at $P < 0.05$.

Results:

A total of 372 schoolchildren were examined at base line and 335 schoolchildren were examined after three months period at the time of follow-up. In the index age group '12 years' 70 females and 128 males were examined while in the index age group '15 years' 52 females and 85 males were examined.

Figure 1 shows the distribution of study subjects according to age and sex. In the index age group '12 years' 70 females and 128 males were there while in the index age group '15 years' 52 females and 85 males were examined.

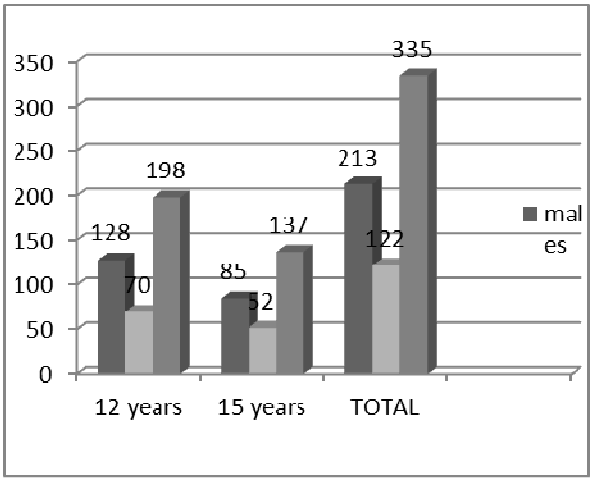

Figure 1. Multiple bar diagram showing age and sex wise distribution of the study subjects

There was no significant difference in mean plaque scores of 12 year old study subjects before and after oral health education. There was significant reduction in mean plaque scores of 15 year old study subjects before and after oral health education. (Table 1)

No significant reduction was observed in mean gingival scores of "12 years" and '15 years' old study subjects at baseline and after oral health education. (Table 2).

There was no significant reduction in mean caries status among study subjects after oral health education. (Table 3)

Discussion:

Schools form an important environmental setting which can contribute to the achievement of public health goals in conjunction with their educational commitments. A school is a closed environment that concentrates a considerable number of individuals of the same age group.

In 15 year age group, there was no significant reduction found in male study subjects, while reduction was significant in females. Reason for the lack of improvement of oral hygiene of 12

year old study subjects may be because of failure of study subjects in complying with practices they had learned at school. Insufficient parental support may also be contributed.

Reduction in plaque levels partly may be contributed to change of tooth-bushing frequency, adoption of appropriate tooth-brushing technique

Age group	Gender	Number of study subjects (%)	Gingival scores				t- value	df	p- value
			At baseline		After 3 months				
			Total gingival score	Mean± SD	Total gingival score	Mean ±SD			
12-year	Male	128 (64.6)	66.39	0.52±0.56	57.2	0.45±0.58	1.00	254	0.32
	Female	70 (35.4)	28.74	0.41±0.44	27.88	0.39±0.52	0.15	138	0.88
	Total	198 (100)	95.13	0.48±0.52	85.08	0.43±0.56	0.93	394	0.35
15 year	Male	85 (62.04)	53.2	0.62±0.65	49.1	0.58±0.69	0.46	168	0.64
	Female	52 (37.96)	31.43	0.60±0.58	26.06	0.50±0.68	0.83	102	0.41
	Total	137(100)	84.63	0.62±0.63	75.16	0.55±0.69	0.87	272	0.39

df =degree of freedom level of significance $p < 0.05$

Table 2 - Mean gingival scores of study subjects at baseline and after oral health education

Age group	Gender	Number of Study subjects (%)	Caries status				Wilcoxon value(df)	p- value
			At baseline		After 3 months			
			Total car status	Mean± SD	Total car status	Mean ±SD		
12 year	Male	128 (64.6)	80	0.62±1.07	87	0.68±1.13	0.40(254)	0.69
	Females	70 (35.4)	81	1.16±1.61	67	0.96±1.37	0.87(138)	0.38
	Total	198(100)	161	0.81±1.31	154	0.78±1.22	0.21(394)	0.83
15 year	Male	85(62.04)	70	0.82±1.01	76	0.89±1.53	0.36(168)	0.72
	Females	52(37.96)	44	0.85±1.26	32	0.61±0.89	0.63(102)	0.52
	Total	137(100)	114	0.83±1.11	108	0.79±1.33	0.49(172)	0.62

df =degree of freedom level of significance $p < 0.05$

Table 3 - Mean caries status of study subjects at baseline and after oral health education

after oral health education and also to change in dietary habits. Older study subjects and particularly females showed better understanding to our oral health education programmes. They also seemed to be more enthusiastic and more concerned regarding their personal hygiene and health care. In agreement with our findings, Ivanovic et al (4), Shyamma M et al (5) found significant reduction in mean plaque levels of school children after a short-term education programme.

In contrast to our findings, Frenken JE et al (6) observed no statistically significant reduction in the plaque levels of the study subjects after oral health education by school teachers in Zimbabwe in primary schools after 3.5 years. Biesbrock AR et al (7) found no significant reduction in plaque scores of the children after short-term dental health education programme.

We found no significant impact of oral health education on the gingival status of the study subjects. Helderman et al (8) also observed no significant reduction in mean gingival scores in primary school children.

In contrast to our findings, Ivanovic et al (4), Biesbrock AR et al (7) found transient improvement of gingival health. Peterson PE et al (9), Yazdani R et al (10) found significant decrease in gingival bleeding scores after providing oral health education.

No significant difference was found in the mean caries status of the study subjects, in agreement with the study results conducted by Peterson PE et al (9) in China. Consistent with our findings, Franken JE et al (6), Vanobbergen et al (11) found no significant difference in caries increment before and after oral health education to primary school children in Zimbabwe. An oral health education program for a longer period of time may show some favorable results.

The above mentioned comparisons cannot be exactly justified due to difference in target age group, methods of health education and period of oral health education for study subjects in different studies.

In our study, parental participation was not included, it may be essential that the parents be involved and motivated for the achievement of long-term benefits it might have affected the effectiveness of oral health education to their children. There may be bias in school selection process, as we selected seven schools among the seventy schools randomly, they may not be true representative of all government-aided schools of Vadodara city. Teachers were not trained and actively participated. They might have affected the outcomes of the oral health education.

Conclusion:

From the results observed, it can be concluded that short-term oral health education programmes may be useful in improving oral hygiene but not effective in improving gingival health and caries status. This study confirmed that an oral-care school initiative can lead children to be motivated to maintain oral health care.

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