

The Effects of an Oral Health Educational Program on Gingivitis and Plaque Over 4 Weeks

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ABSTRACT

Oral health educational programs have been reported to have a variable impact on the oral health status of program participants. This reports the impact of an educational oral health program conducted within a single Boys and Girls Club of America. **Objective:** The objective of this 4-week examiner-blind study was to determine the impact of the educational program on the gingival health (gingivitis and plaque) of participating children who were between the ages of 5 and 15. **Methods:** The multi-week program taught the participants the basics of oral biology and disease, as well as proper oral health prevention including oral hygiene, dietary modification, and the importance of visiting the dentist. A calibrated examiner measured whole mouth Loe-Silness Gingival Index (GI) and Turesky Modification of Quigley-Hein Plaque index (PI) at baseline (immediately prior to the initiation of the educational program) and 4 weeks later. The primary efficacy analysis was based on change from baseline for 75 subjects who were enrolled at baseline, participated in the educational program and were examined 4 weeks later. **Results:** Mean baseline GI score was 0.37, while the 4 week mean GI score was reduced to 0.18. This represents a 51% reduction in GI score with $p < 0.001$. Mean baseline PI score was 3.80, while the 4 week mean PI score was reduced to 2.68. This represents a 29% reduction in PI score with $p < 0.001$. In addition, subjects completed a questionnaire (5 questions) at baseline and at 4 weeks to assess their oral health knowledge. The subject population was found to have statistically significantly ($p < 0.05$) greater knowledge with respect to optimal brushing time and optimal frequency of dental recall visits following the program at Week 4. **Conclusion:** Collectively, these data support the role of the educational program in promoting improved oral health in these children.

INTRODUCTION

The Surgeon General's "A Call to Action" urged public health agencies, private industry, educators, researchers, and healthcare providers to partner in an effort to improve the oral health of those segments of Americans who suffer disproportionately from oral diseases. A number of education and care initiatives have evolved from this call to action. Crest® Healthy Smiles 2010 is an industry-sponsored initiative that involves partnerships with Boys & Girls Clubs of America, The American Dental Association, and The Procter & Gamble Company. The initiative is designed to provide oral health education, oral care tools, and increased access to dental professionals for under-privileged children and their families across the United States over the next 10 years. The Boys and Girls Clubs of America comprise a national network of 2,800 club facilities that annually serves 3.3 million children between the ages of 6 to 18 years old, that are primarily from disadvantaged circumstances. The Crest Cavity-Free Zone Program, a component of the Crest Healthy Smiles 2010 initiative, is an educational program that was introduced to the initial group of participating clubs in the summer of 2002. The educational program was made available to all interested club members. The program consisted of age directed modules that contained information detailing normal oral health, disease prevention, and recommended oral hygiene habits and practices. It was taught to the club members by the full-time professional adult staff at each club over a 4-week period. This paper reports the initial impact on oral health and dental knowledge that the educational program had on the children at a single representative club.

PURPOSE

The objective of this research was to assess the short-term impact of a national dental education program (Crest Cavity-Free Zone Program) on the oral health and dental knowledge of children who participated in the program.

MATERIALS AND METHODS

Ninety-nine subjects who were members of a Boys and Girls Club of America in an urban Kentucky setting were enrolled in this study. Inclusion criteria included written informed consent from parents and children, good general health, a minimum of 12 gradeable permanent teeth, agreement to delay any elective dentistry including dental prophylaxis during the course of the study, and agreement to comply with study visits and procedures. Exclusion criteria included antibiotic premedication requirement, treatment for cancer or seizure disorders, and conditions that interfered with the examination procedure. The baseline visit consisted of subject review and completion of the informed consent, collection of personal and demographic data, medical history and oral habits questionnaire, and inclusion/exclusion criteria. Gingival inflammation and plaque accumulation were assessed at baseline and 4 weeks following baseline, with the baseline exams conducted immediately prior to the initiation of the educational program. For gingivitis, subjects in this study were examined by a single examiner using the Loe-Silness Gingival Index (GI) at a maximum of 168 sites (28 teeth, 6 sites per tooth). Following the GI exam, subjects were disclosed with Red-Cote disclosing solution and examined by a single examiner using the Turesky Modification of the Quigley-Hein Index. The plaque examination was scored on the buccal and lingual surfaces of all teeth with the exception of the third molars. The maximum number of teeth was 28 with 56 scorable sites (assumes a maximum of 28 permanent teeth). For statistical comparison, the GI and PI scores were averaged on a per-subject basis. Each subject had a single whole-mouth average score for baseline and for the exam following one month. The difference (baseline minus 4 week exam) in GI and PI average scores was calculated for each subject and analyzed using t-tests to examine whether the true mean difference from baseline was equal to zero. All comparisons were two-sided and used the 0.05 level of significance.

The Crest Cavity-Free Zone Program is divided into three modules on the basis of participant age, with specific modules directed to ages 6-9, ages 10-12, and ages 13-15. Each module is designed to integrate with the development patterns and needs of each age group. The modules are meant to be taught as eight separate one-hour sessions, ideally given twice a week over a one month period. Learning is accomplished through small group and partner learning supervised by local staff members with each session ideally suited for 4 to 15 participants. The program was designed with the inherent flexibility to allow Boys and Girls Club of America staff members to modify activities to optimize learning in each group. Each session (module 1 – 8 sessions, module 2 – 8 sessions, and module 3 – 4 sessions) has a lesson plan that includes, a description of the activity, succinct objective, and learning materials including games, explorations, and exercises. At the initiation session in each module, participants are given a toothbrush, a tube of toothpaste, disclosing tablets, and a container of dental floss (ages 10-15). Session topics common to each module include lessons directed at building self-

MATERIALS AND METHODS (Cont.)

esteem in one's smile, development of proper oral hygiene habits (brushing and flossing), education with respect to anatomy of teeth and gums, development of a positive attitude towards dentists and dental visits, and the development of nutritional awareness. Proper oral hygiene technique and its importance in maintaining oral health was reinforced multiple times across the eight sessions.

RESULTS

A total of 99 subjects were enrolled in the study. Twenty-four subjects did not attend the final 4 week study visit and were excluded from the efficacy analysis. Of these, 1 subject was out of town on vacation, 10 moved out of town, 1 was excused from the club, 2 were sick and 10 were lost to follow-up. A total of 75 subjects completed the study. Of these, there were 31 females and 44 males, the subjects ranged from 5 to 15 years of age and the overall mean age was 9.5 years.

Table 1: Gingivitis Reduction Following Educational Program

N	Baseline (Mean+SD)	4 Week (Mean+SD)	% Reduction
75	0.37 ± 0.21	0.18* ± 0.13	51%

* $p < 0.001$

Table 2: Plaque Reduction Following Educational Program

N	Baseline (Mean+SD)	4 Week (Mean+SD)	% Reduction
75	3.80 ± 0.49	2.68* ± 0.46	29%

* $p < 0.001$

Table 3: Dental Knowledge Questionnaire

Question	BL Correct	4 Wk Correct
Is plaque on your teeth good or bad	81%	85%
Good		
Bad		
I don't know		
How many times a day should you brush your teeth	82%	88%
Once a day		
After you wake up, after every meal and when you go to bed		
I don't know		
How long should you brush your teeth	51%	69%*
30 seconds		
Two minutes		
I don't know		
How often should you see your dentist	64%	81%*
Every 6 months		
Only when your teeth hurt		
I don't know		

* $p < 0.05$

The correct answers are in **bold** type.

CONCLUSIONS

- ❖ Statistically significant reductions in plaque and gingivitis scores were observed one month after starting participation in the educational program.
- ❖ Collectively, these data support the role of the educational program in promoting improved oral health in these children.