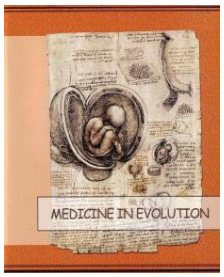
Evaluation of different education methods used in oral health education for adolescents



Adomnicai M. F.[1], Podariu A. C.[2], Sava-Rosianu R.[2], Mihalcioiu C. V.[1], Matichescu A. M.[2], Cosoroaba R. M.[3], Tanase A. D.[3]

[1]*PhD student, University of Medicine and Pharmacy "Victor Babes" Timisoara*
[2]*Department of Preventive, Community Dentistry and Oral Health, University of Medicine and Pharmacy "Victor Babes", Timisoara*
[3]*Department of Dental Office Management, University of Medicine and Pharmacy "Victor Babes" Timisoara*

Correspondence to:
Name: Sava-Rosianu Ruxandra
Address: Spl. T. Vladimirescu no.14A
Phone: +40 740 315848
E-mail address: savarosianu@yahoo.com

Abstract

Background: Oral diseases are one of the most prevalent conditions in the world and are largely preventable. In recent years, attention has been drawn toward assessing the effectiveness of oral health education programs. The aim of study is **to** investigate the most effective method used in oral health education according to the Adolescents perception.

Material and methods: In the prospective cohort study the initial sample of 832 students was subdivided into 4 subgroups, each group being implemented an educational program Results: At the initial evaluation, for each study group, the following average value of the toothbrush frequency score was found: 1.54 students in group I, 1.59 for students in group II, 1.59 for students in group III and 1.50 for students in group IV, control. The average value of the initial score of the frequency of tooth brushing does not show statistically significant differences in the four study groups ($p = 0.615$). On reassessment, the average value of the toothbrush frequency score was as follows: 1.66 for students in group I, 1.65 for students in group II, 1.76 for students in group II and 1.55 for students in group IV, Control. The average value of the final toothbrush frequency score has a significant upward trend ($p = 0.001$)

Conclusion: Educational methods influence the knowledge about oral health, with individual demonstration proving to be the most effective method for acquiring knowledge. In the adolescents' view, the participatory activity was the preferred method.

Keywords: adolescents, oral health education, educational methods, oral health program

INTRODUCTION

Oral diseases are one of the most prevalent conditions in the world and are largely preventable. In recent years, attention has been drawn toward assessing the effectiveness of oral health education programs [1].

Prevention of disease, disability and suffering should be a primary goal of any society that hopes to provide a decent quality of life for its people [2, 3]. Prevention on the community or population-based level is the most cost-effective approach and has the greatest impact on a community or population, whether it is a school, neighborhood, or nation [4]. An effective community prevention program is a planned procedure that prevents the onset of a disease among a group of individuals. Many different approaches to preventing dental diseases exist and the most cost-effective method is health education [5, 6].

Health education is any combination of learning experiences designed to facilitate voluntary actions conducive to health. These actions or behaviors may be on the part of individuals, families, institutions, or communities. Thus, the scope of health education may include educational interventions for children, parents, policy makers, or health care providers [7]. It has been well-documented in dentistry and other health areas that correct health information or knowledge alone does not necessarily lead to desirable health behaviors [8]. However, knowledge gained may serve as a tool to empower population groups with accurate information about health and health care technologies, enabling them to take action to protect their health [9].

Aim and objectives

The aim of study was to investigate the most effective method used in oral health education according to the adolescent's perception.

MATERIAL AND METHODS

The initial sample of 832 students was subdivided into 4 subgroups, each group being implemented an educational program, which included the following stages:

Stage I - assessment of knowledge, attitudes and behavior towards oral health, using the questionnaire survey (with 22 questions and assertions);

Stage II - implementation of the health education method as follows:

• Sample I - interactive discussion, lasting 10 minutes and activities in small groups, with the practical demonstration of the correct brushing technique and the involvement of students through the subsequent practice of the technique on the didactic model. This method of education included information on the morphology, structure and functions of teeth, the role of microbial dental plaque and nutrition in the etiology of tooth decay, prevention of tooth decay by brushing and using adjuvants brushing and non-carious diet, increasing addressability to dental offices. The methods of health education, applied to this study group, will be hereinafter referred to as unitary, generic, method 1.

• Sample II - watching an animated educational film "Journey to the Tooth Kingdom" ("Dr. Rabbit and the Legend of the Tooth Kingdom"), and activities in small groups, with a practical demonstration of the method of correct brushing and student involvement by practicing the brushing technique on the didactic model. The methods of health education, applied to this group of students, will be hereinafter referred to as unitary, generic, method 2.

• Sample III - watching the educational animation film, interactive discussion and later activities in small groups, with the practical demonstration of the correct brushing method and the involvement of students by practicing the brushing technique on the didactic

model. The methods of health education, applied to this study group, will be hereinafter referred to as unitary, generic, method 3.

• Sample IV - constitutes the control group (control). For ethical reasons, this group benefited from the practical demonstration of the correct brushing method and the involvement of students by practicing the brushing technique, on the didactic macro-model. Given the fact that only the toothbrushing technique was implemented in this group of students, I will refer to method 4 during the study.

Stage III - conducted at an interval of 3 weeks from the previous stage, found in the reassessment of knowledge, attitudes and behavior towards oral health using the simplified initial questionnaire, consisting of 16 questions and assertions.

RESULTS

The oral hygiene status at the initial evaluation of the first stage of the educational program didn't differ significantly across the 4 groups. This criterion was partially met, but not for the microbial dental plaque index (hereinafter referred to as IP-initial) The distribution of the brushing frequency does not differ significantly in the 4 batches ($x^2 = 4,368$, DF = 6, $p = 0.627$).

When evaluating the phrase "Dental caries affects my physical appearance", the correct, expected answer is "yes". Typically, students who answered "yes" to the initial assessment before implementing each method of health education will also respond correctly to the reassessment. This can be verified, but not 100%. Thus, only 94.6% of the students in "Groups I, II, III" and 98.5% of the students in "Group IV" maintained the correct answer. The difference between these percentages is not significant ($x^2 = 3.784$, DF = 2, $p = 0.151$).

Also, regarding the students who had a different opinion and chose a different answer than the expected one, given that the method of health education was effective, some of the students from "Groups I, II , III "and to a lesser extent" Sample IV, should re-evaluate their opinion and give the correct answer in the re-evaluation. Indeed, analyzing the percentages corresponding to the students who initially answered "no", it is found that on reassessment 46.6% of the students in "Groups I, II, III" and 11.1% of the students in sample IV" and they corrected the answer. The difference between these percentages is significant ($x^2 = 13,132$, DF = 2, $p = 0.001$).

A similar finding is obtained in the case of students who initially answered, "I don't know". The reassessment shows that 77.8% of the students in "Groups I, II, III" and 43.5% of the students in "Group IV" corrected their opinion and gave the correct answer. The difference between these percentages is significant ($x^2 = 13,360$, DF = 2, $p = 0.001$).

When evaluating the phrase "Tooth brushing prevents tooth decay", the expected, correct answer is "yes". Among the students who answered "yes" to the initial assessment, 95.09% of the students from samples I, II, III " and 96.79% of the students Sample IV maintained their opinion during the re-evaluation. the difference between these percentages is not significant ($x^2 = 1.622$, DF = 2, $p = 0.444$).

Analyzing the percentages corresponding to the students who initially answered with "no", it is found that at the reassessment 63.92% of the students from samples I, II, III " and 22.22% of the students from sample IV corrected their opinion, highlighting the fact that the health education methods applied to the study groups were effective. The difference between these percentages is significant ($x^2 = 18.919$, DF = 2, $p<0.01$).

The most interesting aspect is that, in the case of students who answered "knowing" at the initial assessment, 60% of the students from samples I, II, III and 20% of the students from sample IV answered the opinion, choosing the correct answer, that is, the answer "yes". The difference between these percentages is significant ($p = 0.038$, linear association test).

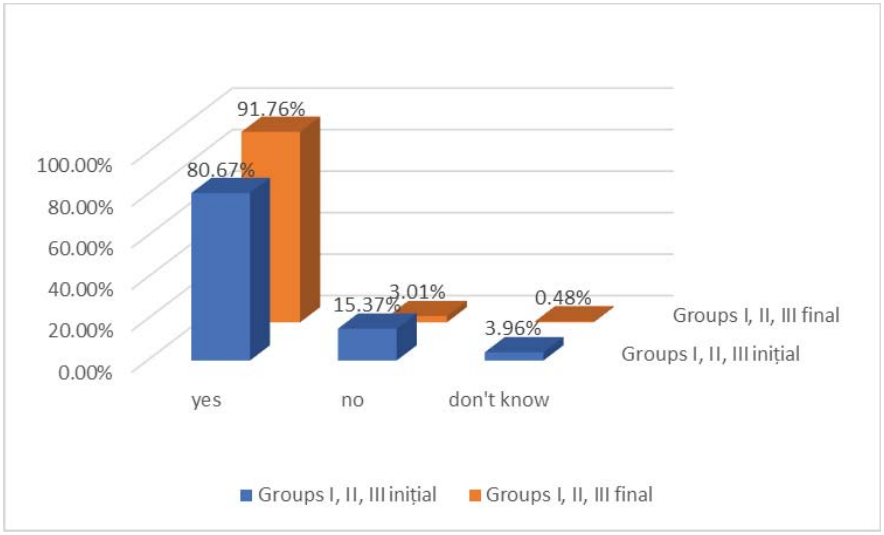


Figure 1. The evolution of the knowledge regarding the role of toothbrushing in the prevention of dental caries, at the evaluations within the educational program

When evaluating the phrase "Brushing your teeth prevents gum problems", the expected, correct answer is "yes". Among the students who answered ”yes” to the initial assessment, 91.95 % of the students from samples I, II, III and 96.95 %% of the students from sample IV maintained their opinion. The difference between these percentages is not significant ($x^2 = 3.352$, DF = 2, p = 0.187).

Analyzing the percentages corresponding to the students who initially answered ”no”, it is found that at the reassessment 57.37 % students from Samples I, II, III and 30% of the students from Sample IV corrected their opinion, highlighting that the methods of education for health applied to the study groups were effective. The difference between these percentages is significant ($x^2 = 9,294$, DF = 2, p = 0.010).

The most interesting aspect is found in the case of the students who answered ”I don't know” at the initial assessment, 63.77% of the students from Samples I, II, III and 23.53% of the students from Sample IV clarified their opinion, choosing the correct answer, meaning "yes". The difference between these percentages is significant ($x^2 = 12.724$, DF = 2, p = 0.002).

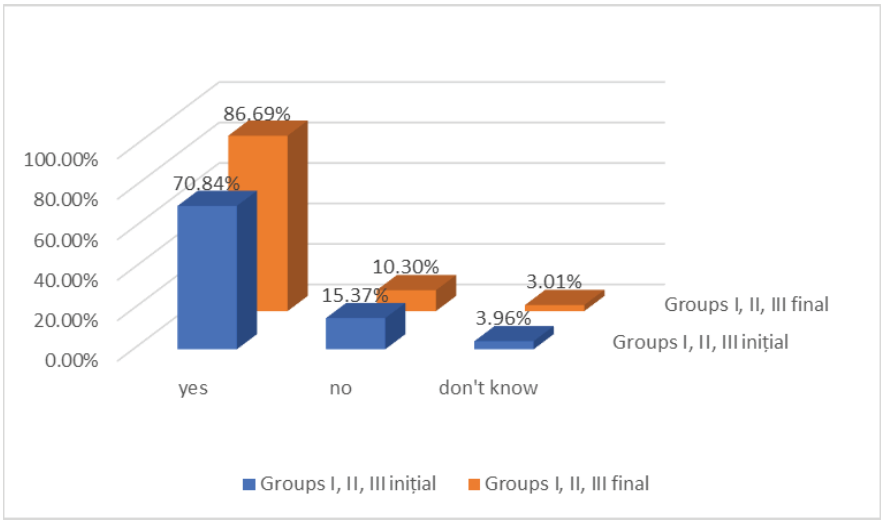


Figure 2. The evolution of the knowledge regarding the role of toothbrushing in the prophylaxis of periodontal diseases, at the evaluations within the educational program

When evaluating the phrase "I'm afraid to go to the dentist, due to possible pain", the expected, correct answer is "no". Of the students who answered "no" to the initial assessment, 95.44% of the students in "Groups I, II, III" maintained their opinion during the re-assessment and 96.53% of the students in sample IV" corrected their opinion.

In contrast, 85.71% of students in groups I, II, III and 78.95% of students in group IV maintained their initial answers, highlighting that the health education methods applied to the study groups did not reach the purpose of reducing the degree of anxiety about dental treatment. However, the difference between these percentages is not significant (x^2 = 2,583, DF = 2, p = 0.275).

In the case of students who answered "I don't know" at the initial assessment, the re-assessment shows that the answers were similar for both categories of groups.

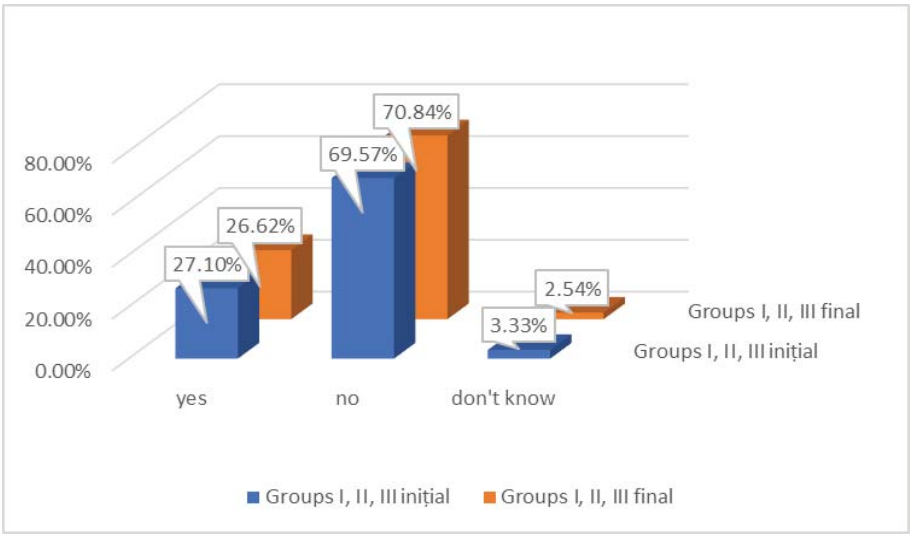


Figure 3. The evolution of the degree of anxiety of the students towards the dental treatment, at the evaluations within the educational program

Research aimed at evaluating the effectiveness of oral health education methods on knowledge, behavior and anxiety has reached the same conclusion: maintaining the degree of anxiety of patients at the same level, at the end of the educational process.

The impact of health education methods on students' eating behavior, in the evaluations within the educational program shows the following results.

In the case of the question ”At what time intervals do you consume one of the following foods? ”, the answer options allow the assessment of health on a numerical scale with 5 steps, as follows: 1 = several times a day; 2 = every day; 3 = 2-3 times a week, 4 = once a week and 5 = never. In order to analyze the results obtained by self-administering the questionnaire containing this question, before and after the implementation of health education methods, we calculated the averages of these scores, both for students in samples I, II, III and for those in sample IV. It should be noted that, on reassessment, the increase in the average score highlights the consequent reduction in the consumption of carbohydrate-rich foods.

In the case of students in group IV, the re-assessment found a significant evolution, from a statistical point of view, of the consumption of chewing gum (p = 0.002, milk sweetened with sugar (p <0.001) and at the limit, tea sweetened with sugar (p = 0.0532), as an expression of the obvious increase in food consumption. These differences can be attributed to random, unsystematic causes.

In contrast, in the case of students in "Groups I, II, III", the revaluation found an increase in the average score for all foods, except milk and fruit, which shows a reduction in the consumption of foods rich in sugars. The application of the Wilcoxon test shows the statistically significant evolution in the consumption of all foods ($p < 0.001$), except fruits.

At the initial assessment, for each study group, the following average value of the toothbrush frequency score was found: 1.54 for students in group I, 1.59 for students in group II, 1.59 for students in group III and 1, 50 for students in group IV, control. The mean value of the initial toothbrush frequency score did not show statistically significant differences in the four study groups ($p = 0.615$ for the ANOVA test).

On reassessment, the average value of the toothbrush frequency score was as follows: 1.66 for students in group I, 1.65 for students in group II, 1.76 for students in group II and 1.55 for students in group IV, Control. The average value of the final score of the toothbrushing frequency has a significant upward trend ($p = 0.001$, ANOVA test for linearity) as follows: the minimum value for group IV, the maximum value for group III; there is no significant difference between groups I and II.

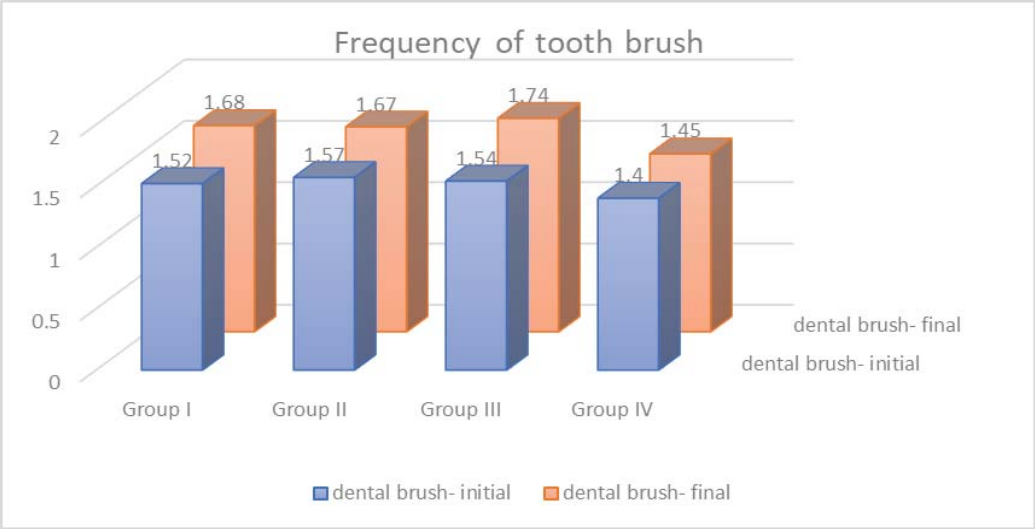


Figure 4. Evolution of the average value of the toothbrush frequency score

DISCUSSIONS

Given the conclusion regarding the reduction of the microbial plaque index, it can be stated that the main benefit of the educational program is not the frequency of brushing, but the quality of brushing.

A. The ascending order of the efficiency of the educational methods applied within the educational program is the following: method IV (tooth brushing technique), method 2 (animated educational film + tooth brushing technique), method 1 (interactive discussion + tooth brushing technique), method 3 (educational animation film + interactive discussion + toothbrushing technique).

B. The efficiency of the interactive discussion (method 1) is higher compared to that of the animated educational film (method 2) on the dental health and oral health behavior of students in the study groups, but the difference in favor of the interactive discussion is not is high: about 7% for IP. In the case of using another type of educational film and another structure of interactive discussion in an educational program, it is possible to reverse the order of effectiveness of these types of health education methods. What must be remembered is that the interactive discussion and the animated educational film had a comparable

efficiency on the state of dental health and behavior towards the oral health of students in the study groups, of over 30%.

C. The significant efficiency (12%) of the exclusive application of the toothbrushing technique (method 4) on the dental health condition and the behavior towards the oral health of the students, highlights the low level of health education in the students aged between 11 and 12 years and emphasizes the need for immediate implementation of oral health programs.

D. The highest efficiency on the dental health status and behavior towards the oral health of the students in the study groups was found in the case of the implementation, in the same session, of the educational animation film and the interactive discussion (method 3). This fact is not surprising from the point of view of psycho-pedagogical principles, but it should be noted the very high percentage of reduction in the average microbial dental plaque index, over 50%.

CONCLUSIONS

Organize conclusions which emerge from the study. In the end state: a) contributions to be acknowledged but which do not justify paternity right; b) thanks for technical support; c) thanks for financial or material support.

REFERENCES

1. Watt RG, Marinho VC: Does oral health promotion improve oral hygiene and gingival health?. Periodontol. 2005, 37: 35-47. 10.1111/j.1600-0757.2004.03796.x.
2. Craft M, Croucher R, Dickinson J, James M, Clements M, Rodgers AI: Natural Nashers: a programme of dental health education for adolescents in schools. Int Dent J. 1984, 34: 204-213.
3. Petersen PE, Peng B, Tai B: Fan Ml: Effect of a school-based oral health education programme in Wuhan City, Peoples Republic of China. Int Dent J. 2004, 54: 33-41. 10.1111/j.1875-595X.2004.tb00250.x.
4. Nyandindi U, Palin-Palokas T, Milen A, Robison V, Kombe N, Mwakasagule S: Participation, willingness and abilities of school-teachers in oral health education in Tanzania. Community Dent Health. 1994, 11: 101-104.
5. Mellanby AR, Rees JB, Tripp JH: Peer-led and adult-led school health education: a critical review of available comparative research. Health Educ Res. 2000, 15: 533-545. 10.1093/her/15.5.533.
6. Cuijpers P: Peer-led and adult-led school drug prevention: a meta-analytic comparison. J Drug Educ. 2003, 32: 107-119.
7. Nowak AJ. Paradigm shift: Infant oral health care – Primary prevention. J Dent. 2011;39(Suppl 2): S49–55
8. Brukiene V, Aleksejuniene J. Theory-based oral health education in adolescents. Stomatologija. 2010; 12:3–9
9. Axelsson P, Buischi YA, Barbosa MF, Karlsson R, Prado MC. The effect of a new oral hygiene training program on approximal caries in 12-15-year-old Brazilian children: Results after three years. Adv Dent Res. 1994; 8:278–84.