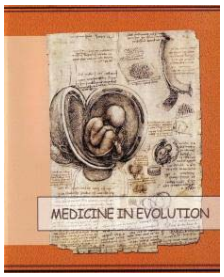
A model of experiential learning for teenagers' oral hygiene habits



Cărămidă M.[1], Sfeatcu R.[1], Dumitrache M.A.[1], Funieru C.[2], Ilici RR.[3], Oancea R.[4]

[1]*Oral Health and Community Dentistry Department, Faculty of Dental Medicine, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania*
[2]*Preventive Dentistry Department, Faculty of Dental Medicine, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania 3*
[3]*Technology and Dental Materials Department, Faculty of Dental Medicine, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania*
[4]*Preventive, Community Dentistry and Oral Health Department, Faculty of Dental Medicine, "Victor Babeş" University of Medicine and Pharmacy, Timişoara, Romania*

Correspondence to:
Name: Funieru Cristian
Address: Department of Preventive Dentistry, Faculty of Dental Medicine, "Carol Davila" University of Medicine and Pharmacy, Bucuresti, Romania, Eforie Street no. 4-6, district 5, 50037
Phone: +40 723 268 929
E-mail address: thycristi@yahoo.com

Abstract

While regarding oral hygiene remain the most important habit in preventing carious disease, teenagers might represent a vulnerable group because of tendency to adopt risky behaviors and neglect their health. On the other hand, teenagers represent a challenging group for educators involved in oral health educational program because of the difficulties for adolescence to respond to traditional learning methods. Aiming to educate adolescents through interactive and active participation regarding not only the basic tooth brushing but also the secondary means for oral hygiene, Com4You oral health educational program designed and applied activities using experiential learning. Accordingly, to this concept developed by David Kolb, participants learn by doing using the cycle: concrete experience ("Do"), observation and reflection ("Observe"), forming abstract concepts ("Think"), testing in new situation ("Plan"). The Department of Oral Heath and Community Dentistry from Faculty of Dentistry, UMF "Carol Davila", Bucharest, started applying the oral health lessons using experiential learning in a pilot longitudinal study between 2014 and 2017, in 3 public schools in Bucharest, with small working groups of 5-10 teenagers and a working time of 10-15 minutes per activity. The results of the research showed a proper feedback from participants and a significant improvement regarding oral hygiene-related knowledge and behavior.

Keywords: oral health promotion, oral hygiene, adolescents' oral health

INTRODUCTION

Proper oral health depends on proper oral health-related behavior and habits regarding the oral hygiene should be developed, adopted and maintained early in life. In community dentistry, the main oral promotion programs are targeted to priority and vulnerable population groups [1]. And while children are the priority group most frequently involved in oral health promotion and preventive programs [2], teenagers represent a vulnerable group because of their tendency to adopt risky behaviors [3], including those related to oral health such as smoking and increased consumption of sweets and beverages, or neglect their heath, including oral health - such as tooth-brushing and use of interdental cleaning products [4].

Traditional learning used in oral health education implies verbal presentations and/or video materials and this could only increase oral health-related knowledge and unfortunately it has a low impact on behavioral improvement. On the other hand, experiential learning is a didactic method which offers the opportunity to learn from own experience, so called "learning by doing" [5]. David Kolb developed the concept in 1984 and proposed a learning cycle formed by 4 phases: "Do", "Observe", "Think" and "Plan" which aims for the participant to first get involved in a concrete experience, then to reflect back on that experience and to identify weaknesses of flaws, then next to figure out solutions for improvement and last to design a plan to apply the solutions. The plan is tested and the cycled is resumed.

When experiential learning was applied in an oral health promotion for teenagers in a 2-years longitudinal pilot study in Bucharest, Romania, results showed that not only the level of knowledge regarding the oral hygiene was raised but also behavior was improved. Moreover, compared to the control group that was educated using traditional learning, the test group in which experiential learning was applied, the improvement was clearer and reflected in the dental plaque level revealed through clinical examinations. After the experiential learning educational lessons planed in the Com4You program, the frequency of adolescents brushing twice daily increased from 72,1% to 80% (compared to traditional learning group: from 71,4% to 74,3%), while for flossing the increase in frequency of subjects who use it daily was from 47,5% to 62,3% (compared to control group: from 40% to 45,7%). Moreover, at the end of the program the awareness on the role of fluoride in toothpaste raised, so that the frequency of subjects who know it raised from 32,8% to 83,6% (compared to control group: from 31,4% to 51,4%). And while in the test group there was observed in a decreased in mean plaque index from 1,32 to 1,12, in the control group there was an increase, from 1,15 to 1,79 [6].

MATERIALS AND METHODS

The following proposed activities using experiential learning were first applied between 2014 and 2017 in a pilot study as part of Com4you program, and were designed by the Oral Health and Community Dentistry Department ("Carol Davila" Medicine and Pharmacy University in Bucharest, Romania) and TES Association and were applied to a test group of 61 students enrolled in 3 public schools in Bucharest. Working groups were formed by no more of 10-15 students and with a duration of around 15 minutes per activity. All the 4 activities described in the present article were part of the lesson that had as a main theme oral hygiene and aimed both to raise awareness about the frequency and characteristics of products used in oral hygiene and to improve teenagers' skills in using the correct techniques of tooth brushing and dental floss. Moreover, one of the activities focused on the etiology of cavities, in order for teenagers to understand the contribution of their own oral hygiene habits on the development of dental caries.

Activity 1. Formation of dental caries - decisional tree

Aim: To be aware of the causes of dental caries

Method of education: decisional tree and facilitated discussion

Description of the educational process:

Teenagers are mentioned that they are going to be given a question at which together, both students and coordinators (educators) have to work to find the answer. And the coordinator writes on the white board the question "What happens with our teeth after we eat?" (Figure 1). All answers offered by the students are noted on the table but the coordinator has to facilitate, through the guidance of the discussion, the answer "dental plaque" and also has to offer clear and simple description of its mean. Then, students are invited to offer possible decisions that could be made by a person regarding the dental plaque on the teeth. The discussion is facilitated so that the answers obtain from the students to be the main two decisions: to maintain or to remove the dental plaque from the tooth surfaces. Then students are asked to make future decision for each of the two scenarios chose. On the scenario with the removal the dental plaque the coordinator should guide the discussion so that the answer be the methods used for cleaning the tooth, both at home and professional. For the daily oral hygiene, the discussion, based on the answers from the participants, should stress out that brushing twice daily is mandatory but not enough to clean properly so that products for interdental cleaning are helpful to complete the oral hygiene. Mouthwash, as well, are to be noted as another important answer for additional products, accordingly to individual risk and need. For the professional cleaning, the discussion should be conducted so that students recognize the preventive role of regular cleaning in the dental office in order to complete what is performed with the home-care regime. And so the destination of this path is healthy teeth. On the scenario with the maintained dental plaque in the tooth surface, the discussion should be facilitated so that the students be aware that the level of bacteria in the biofilm increase and produce acids. Then the coordinator should invite students to think about the chemical process, that they learn in theory from the chemistry, that happens between a product that contains minerals (that being the tooth) and an acid solution (the acids produced by the biofilm). And thus once the enamel loses minerals and the process continues, cavities are formed, which is the destination at the final of the path if this scenario is chosen. Once all the answers are noted on the table and remain written for both scenarios, the coordinator should summarize the how a student could get healthy teeth or cavities depending on his/her habits and own decisions (Figure 1).

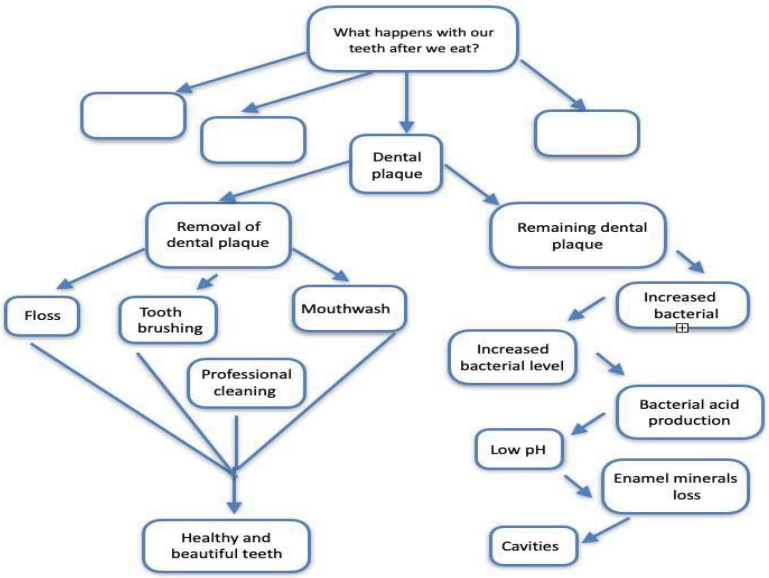


Figure 1. Formation of dental caries - decisional tree

Activity 2: Oral hygiene risk factors vs. protective factors

Aim: Getting to know the correct and incorrect habits related to oral hygiene

Method of education: Brainstorming, debate

Description of the educational process:

Teenagers are divided in small working groups formed of not more than 5 participants. Each group are offered a set of 26 cards with different products or habits related to oral hygiene (Table 1). Participants are offered a working time of 5 minutes to collaborate and separate the cards in two categories: correct habits/proper products and improper habits/risky products. After 5 minutes, the coordinators invite two students to represent the group and revel their decisions their team made regarding the classification of the cards. Also, they are asked not only to mention in which category considered each card but also to offer the reasons behind the decisions. If there are two parallel working groups, one participant from one group presents the protective factors while the participant from the other group presents risky factors. In case of divergent opinions between groups are mentioned regarding one factor, participants are encouraged to debate with pertinent pros and cons. The coordinator monitors the discussion and facilitates the debate and at the end validates the right answers, opinions and reasons, enforces the correct decisions made by the teams and corrects the improper arguments heard, if any. At the end of the activity participants should remain with the take-home message that proper oral hygiene is represented by the rigorous home-care regime with both tooth brushing and interdental cleaning, plus regular dental check-ups and professional cleaning in the office and that the frequency and the timing of the oral hygiene should be also accordingly to the eating habits. As a final summary, the coordinator should note on the whiteboard, the two columns with the two categories: oral hygiene protective and risk factors.

Table 1. Activity No.2 cards

Oral hygiene risk factors	Oral hygiene protective factors
DENTAL PLAQUE	REGULAR DENTAL CHECK-UP
UNCLEAN TEETH	TWICE A DAY TOOTHBRUSHING
SWEETS	FLUORIDE TOOTHPASTE USE
STARCHY FOOD	SCALING
BEVERAGES	RISK AWARENESS
SWEETENED DRINKS	DAILY FLOSSING
FREQUENT SNACKS	FLUORIDE MOUTHWASH USE
WORN-OUT TOOTHBRUSH	CHEWING GUM
ONCE A DAY TOOTHBRUSHING	PROFESSIONAL POLISHING
LACK OF INFORMATION	CHEESE
VISITS TO THE DENTAL OFFICE FOR DENTAL EMERGENCIES	HARD FOOD (WALNUTS / CARROTS)
SWEETENED TEA	NO FOOD/DRINKS CONSUMPTION AFTER THE LAST TOOTHBRUSHING OF THE DAY
SWEET FRUITS	TOOTHBRUSHING AFTER SWEETS CONSUMPTION

Activity 3: Steps of a proper tooth brushing

Aim: Getting to know proper technique of tooth brushing (Modified Bass technique)

Method of education: Brainstorming, demonstration

Description of the educational process:

To a group of 13 participants are offered a set of 13 separate and mixed cards with steps during the tooth brushing, a model of dentate arches, toothbrush and toothpaste (Table 2). The cards are distributed to participants so that each student have a randomly chosen card. They are given a working time of 5 minutes in which they should collaborate and put the steps in the correct order. After they set out their order, they are asked to sit in a row in the order accordingly to the card they hold. Also, each of them are asked to read and demonstrate on the model, if it applies, the step written on his/her card. The coordinator assists at their demonstration and if he/she detects a mistake in their order, the children are asked to rearrange themselves until the coordinators approves the order set. Moreover, if the coordinator observes an improper move during a step on the model, another participant is asked to do the correct move and invite the participants to give their opinion on how the move should be performed. At the end, participants are asked again to set the order and demonstrate properly without coordinator's intervention.

Table 2. Activity No.3 cards

Apply toothpaste on the toothbrush
Hold the toothbrush in your hand with support on the thumb
Open your mouth
Place the toothbrush on the molar area with the bristles parallel to tooth surface
Redirect the tip of the bristles toward the gingival margin on 45 degree angle
Rotate the toothbrush from gingiva to the tooth margin
Brush all the tooth surfaces
Place the bristles perpendicular to the inner surface of the frontal teeth and move the toothbrush from gingiva to the tooth margin
Move the toothbrush with circular horizontal moves on the biting surfaces of teeth in the posterior area
Do 8-10 moves of the same type on each surface of all teeth
Brush the tongue surface from the back to the tip with 3-4 moves
Rinse your mouth with water with vigorous moves and spit the water
Clean your toothbrush under the water flow

Activity 4: Steps of proper use of dental floss

Aim: Getting to know proper technique of flossing

Method of education: Brainstorming, demonstration

Description of the educational process:

To a group of 9 participants are offered a set of 9 separate and mixed cards with steps necessary when flossing, a model of dentate arches dental floss. The cards are distributed to participants so that each student has a randomly chosen card. They are given a working time of 5 minutes in which they should collaborate and put the steps in the correct order. After they set out their order, they are asked to sit in a row in the order accordingly to the card they hold. Also, each of them are asked to read and demonstrate on the model, if it applies, the step written on his/her card. The coordinator assists at their demonstration and if he/she detects a mistake in their order, the children are asked to rearrange themselves until the coordinators approves the order set. Moreover, if the coordinator observes an improper move

during a step on the model, another participant is asked to do the correct move and invite the participants to give their opinion on how the move should be performed. At the end, participants are asked again to set the order and demonstrate properly without coordinator's intervention.

Table 3. Activity No. 4 cards

Take 45 cm of floss
Roll the floss around the middle fingers of both hands and keep a 2 cm long free part of floss between the two fingers
Handle the free segment of floss with pointer fingers for lower teeth
Handle the free segment of floss with pointer finger for internal end and thumb for the external end when placed between upper teeth
Place the free segment of floss in tension between the two adjacent teeth and push carefully to pass the contact between teeth
Adapt the floss on the contour of each of the two adjacent teeth and move the floss on vertical direction , up and down repeatedly
Repeat on each lateral surface of teeth
Use a clean free segment for each inter-dental space
Dispense the floss in the bin after all the spaces have been cleaned

DISCUSSIONS

The experiential learning approach showed an increased interest from teenagers and the results at the end of the 2-years program the results confirmed that this activity had greater impact on behavioral change compare to traditional learning, that most of the participants adopted proper oral hygiene habits, reflected in the lowered plaque index. Thus, based on promising results obtained the research team encourage oral health educators to use this learning method and offer as models the activities applied and described in this article. A possible limitation of the study is that the proper techniques for tooth brushing and flossing were performed on the model and not directly on student's oral cavity, when working conditions differ. Thus, the recommendation for future research is to apply a part of these activities in the dental office of the schools where there are proper conditions for such an intervention.

CONCLUSIONS

Applied in oral health promotion programs in general and targeted to teenagers in particular, experiential learning approach show good results in oral hygiene related behavioral change. The activities described in the present article represent a model recommended for use in oral health education initiatives.

Acknowledgement

The Erasmus+ project ''Youth Community-based Oral Health Learning Model" was cofunded by European Union. The authors also thank Oral-B Romania for support.

REFERENCES

1. The Challenge of Oral Disease – A call for global action. The Oral Health Atlas. 2nd ed. Geneva: FDI World Dental Federation; 2015

Available from:
https://www.fdiworlddental.org/sites/default/files/media/documents/complete_oh_atlas.pdf
2. Best practices in oral health promotion and prevention from across Europe – An overview prepared by the Platform for a better Oral Health in Europe. Platform for a better Oral Health in Europe; 2015 Available from: http://www.oralhealthplatform.eu/our-best-practices/
3. Sawyer, S. M., Afifi, R. A., Bearinger, L. H., Blakemore, S.-J., Dick, B., Ezeh, A. C., & Paton, G. C. (2012). Adolescence: A foundation for future health. The Lancet, 379, 1630–1640.
4. Cărămidă M., Sfeatcu R.I., Dumitrache M.A., Oancea R., Funieru C., Totan A. Periodontal risk factors among a group of teenagers in Romania. Med in Evol. 2019; 25(4): 380-4.
5. Kolb DA. Experiential Learning: Experience as the Source of Learning and Development. 2nd ed. Englewood Cliffs, NJ: Prentice-Hall; 1984.
6. Sfeatcu R, Dumitrache MA, Cărămidă M, Johannsen A, Perlea P. A pilot study on the effectiveness of a 2-year school-based oral health educational programme using experiential learning among adolescents. Int J Dent Hyg. 2019; 17(3): 221-228.