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Liviu GAVRILĂ-ARDELEAN, Mihaela GAVRILĂ-ARDELEAN

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Health Education in Special High Schools for the Improvement of Dental Hygiene of Students in Arad County

Liviu GAVRILĂ-ARDELEAN¹,
Mihaela GAVRILĂ-ARDELEAN^{2*}

Abstract

This research aims to highlight the importance of health education for dental hygiene of special high school students in Arad County. It was considered that health education for dental hygiene in special high schools would determine a decrease in medical consultation, which represents an improvement in the dental hygiene of students. The study sample comprises students of school age, from Arad County special high schools. The children have been dentally examined, and the following items were analyzed: cavity index on certain teeth and oral hygiene education level. Based on the analysis, the educational needs for dental hygiene in special high school students of Arad County, in the year 2016-2017, were assessed. Health education was taught to students during the school program. The health class lasted 30 minutes per classroom, distributed as follows: 10 minute explanation, 10 minute practical demonstration on plaster mold, and a 10 minute distribution of sanitary materials (toothpaste, toothbrushes, and dental floss). Research data was processed with SPSS 17.0 and showed the statistically significant threshold of $p < .01$. The courses have had a beneficial effect on young people with special needs, causing them to be more careful about maintaining oral care and hygiene. Conclusions: It has been found that after oral hygiene education, the dental health of special school population was improved.

Keywords: *dental hygiene; health education; students; special high schools; prevention.*

¹ West University Vasile Goldiș, Arad, Romania, livingar@yahoo.com.

² Aurel Vlaicu University, Arad, Romania, miba.gavrila@yahoo.com.

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Corresponding Author: Mihaela GAVRILĂ-ARDELEAN

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1. Introduction

Dental affections have an integrative impact on human health, and a social and economic impact on public health [3].

Dental diseases among the young population determine the increase of school absenteeism through the suffering it produces. Among adolescents, when the personality is forming and the image of self and self-esteem is being structured, dental affections, through unsightliness, also determine a strong psychological and social impact [3, 8].

It is known from specialty literature that oral hygiene education has a positive effect on dental health [3, 6].

Multiple studies have been conducted in this area, mainly for schoolchildren's education [4].

The novelty of the present research is given by the characteristics of the group included in the study and the fact that, at national level, there is no found study on this subject for the West of Romania. From the characteristics of the study sample, we take as distinctive element the fact that it consists of a population of teenagers deprived of the interest and involvement of their family for their oral health. The high school students come from a permanent (placement centre) or temporary (special school) institutional environment, and are enrolled in a special school with internment regime. These adolescents have multiple health problems in the form of deficiencies (visual, mental, associated).

At international level, studies on this issue are relatively few. Testing the research hypothesis brings as scientific novelty the necessity and importance of introducing oral health education especially in special schools, by acquiring and applying dental hygiene notions to school populations institutionalized in special schools, where there are multiple diagnosis, and where the children are devoid of parental interest and care (social cases).

Dental hygiene education is a part of health education, and both of them are part of Public Health education [3]. Prophylaxis through health education in schools is essential for the health of children and it addresses the young generation [10].

In order to educate, the message must transmit an appropriate experience, and effective techniques to the learners [9, 11].

The information is precursory. It consists of communicating verified objective facts that the patient is free to dispose of. If the patient is receptive, he will apply the learned methods [7].

The education consists of emphasizing these facts and their consequences, so as to influence judgment and modify the behavior positively. Pain is usually the main reason for the patient to address the

doctor. By insisting on the painful aspects of oral and dental diseases, the patient can be persuaded to take into account the advice and guidance that is given to him [9].

The doctor and the dentist, while occupying the position of teacher, must act according to psychological principles. A first principle is to initiate education using personal diagnosis, which encourages the patient to be more receptive [12].

2. Problem Statement

Public health education aims, after Podariu and all, 2002 [20]:

- to ensure better information about health and disease;
- to form community teachers to actively deal with this objective;
- to ensure their cooperation with some teachers (sociologists, psychologists) unspecialized in health;
- to achieve effective local infrastructure;
- to strengthen the role of each individual in his own health care.

The basic principles of health education are the following [13, 21]:

- the most important principle: the earlier the intervention, the more effective is the education;
- pedagogical authority: the opinion of those with legitimate authority (doctor, nurse, teacher) is more reliable;
- integration of health education in the objectives of the national health program.

An essential component of health education is to inform the general public [8, 11, 17, 21].

Some patients do not consider the hygiene measures as "necessary and natural human desires", as shown in another study by Grivu and collaborators, in 1995 [13].

Another element in the process of dental health education consists of commercials for toothpastes and cavity-preventive chewing gum: on the small screen appears a dentist showing, for example, that sweets are broken down into acids that attack the tooth enamel. To have a big impact on the public, advertising should be based on aesthetic considerations, because beauty is a human requirement. If the commercials would say 'by not washing your teeth, they start to hurt and look bad', results would be completely different.

In terms of dental medicine, health is threatened by four types of conditions [9, 11, 19]:

- dental cavities;
- gum diseases;
- malformations, dental and maxillary abnormalities;
- cancer.

In prophylaxis (primary prevention) role play can be effective [7]. Or, to inform the general public, health education should be realized on a wide scale. This education is complex because it has to start early and to be continued permanently, with support from public education and dentistry [14, 15, 16, 17, 18]. Unfortunately, we cannot accomplish many educational actions because of the lack of money [2, 22].

The information materials should be published in the form of a pamphlet that addresses various age groups on various topics: teeth brushing, risks of excessive sugar consumption, the role of fluoride, periodic inspections [21]. The American Academy of Pediatric Dentistry regularly broadcasts such brochures throughout the United States [1, 11, 23]. Some brochures are addressed to parents with reference to oral and dental health of the infant, other brochures are addressed to teenagers, and others present techniques and new materials, such as those for sealing cracks.

Public information can be assured by two means [5]:

- actions of hygiene equipment manufacturers;
- media.

Manufacturers of toothbrushes, toothpastes, mouthwashes, etc., are striving to secure informative commercial advertising [5].

Mass-media [21]:

- newspapers;
- display;
- radio;
- cinema;
- television.

The regional daily newspapers could publish information materials focused on dental pathology specific to that area.

Unfortunately, newspapers are read more by men than by women, and the interest in reading is decreasing.

Periodic newspapers can provide a better audience to people to whom they are addressed. Some periodicals publish health education materials.

The local radio could present a short program every morning for 1-2 minutes that would have large public audience. Some stations do, but unfortunately, the disinterest of authorities manifests itself too [11].

Television might be the most powerful transmission mean in health education, as long as the audiovisual message is appropriate.

Educational materials are another crucial component of health education. The main materials are [20, 25]:

- slides;
- movies;
- videotapes and DVDs;
- brochures and picture books.

All of these can be used in dental offices, and brochures and books can be disseminated in schools and at home.

The existence of health education laboratories, equipped with appliances for filming and recording, is ideal for prophylaxis [20, 25].

The importance of health education emerges from a series of recent studies conducted in different countries [14, 15, 16, 18, 22]. Examples:

- Bøge Christensen and collaborators (2003), in a study conducted in Denmark, concluded that intensive oral health education is necessary to be implemented in the entire population [24]. The same writers, after some research conducted in India, have concluded that the implementation of community programs is needed so as to increase the level of knowledge and to change the attitudes and practices related to promoting oral health in children [24].
- Egri and Gunay (2004), based on a study conducted in Turkey, have concluded that providing primary education level is a good indicator for DMFT in the developing countries [4].
- The value of health education is also demonstrated by the research of Pieper and Schulte (2004) which showed that oral health in Germany improved considerably between 1994 and 2000, due to increased use of fluoridated toothpastes, fluoride salt pans, and administration of fluoride supplements, increased use of dental services and adoption of a precautionary program by practitioners [19].

Oral and dental disease prevention is based on health education, a field in which our country is very poor.

3. Hypothesis

It was supposed that health education for dental hygiene in special schools would determine a decrease in medical consultation, which represents an improvement in the dental hygiene of institutionalized high school students, who come from a special school with internment regime.

Prevention in dental health through oral hygiene education is useful, regardless of the children's background, especially in special schools.

The independent variables are: price of medical consultation and dental curative intervention, teenager fear of dentist, family disinterest. These independent variables of the research were eliminated through the next elements:

- The medical dental packet offered by Romanian National House of Health Assurance, include the following services from years 2016-2017: free consultations and curative medical acts for children (0-18 years old); some 100% free curative medical acts for youth (over 18 years old) who do not have income sources. For the beneficiaries of special laws (blind people, people with other health problems), the consultations and curative dental acts are free [24];

- The description of the medical act during oral hygiene education has been demonstrated in another study to reduce the fear of dentist. Operational medical acts have been explained in the medical education class. Thus, the fear level of teenagers became predictable. For example: the explanation of the cavity curative act that involves the bur reduces the medium level of pain [6];

- Regarding the independent variable of family involvement, a coherent collaboration between the family and the school does not exist, because most of these families have social problems, and the majority of them live outside of Arad County.

4. Research Methods

Sample

The study sample comprised a number of 60 students from Arad County special high schools with internment regime, aged between 14 and 19 years old. These teenagers come either from families that have social problems, or institutions (placement centers, residential centers) and they go to a special school with internment regime. They have health problems such as: visual impairment and/or mental disorders, but without affecting the capacity of discernment.

The criteria for inclusion in the study were:

- respondents had to be adolescents and young people of school age, enrolled in a special school in Arad, under internment regime;
- respondents had to want to participate in this research.

Exclusion criteria were the disagreement with participation in the study, by not wanting to undergo a dental examination.

Student informed consent was obtained for inclusion in the study.

Because families do not cooperate with the school, we have asked for the agreement of the ethics committee, consisting of the school social assistant, school physician and school psychologist, that has agreed to run the study in the special school, and has validated the use of research tools standardized by World Health Organization (WHO), [24, 26].

This study does not concern intimate data from the pupils' private lives. The name of the subjects and the school were anonymized for confidentiality. Subjects understand the consequences of their acts and their deeds and of the others.

Methodology

The research is based on the quantification of medical dentistry aspects in relation with knowledge of oral hygiene, observed on the study sample that comprises teenagers from the special school of Arad County.

An analysis of educational dental hygiene needs of students in Arad County special school was conducted. High school students were consulted by the dentist. They have been dentally examined, and the following items were analyzed: cavity index on certain teeth (standardized dental special consultation), and oral hygiene education level (How many times do they brush their teeth? What kind of oral hygiene methods do they use?). A number of 60 high school students with health problems (visual impairment and/or mental disorders) was examined, some of which needed 2 to 3 dental curative interventions, with a total number of 85 consultations. Based on these examinations, there have been evaluated the educational needs for dental hygiene of the high school population of Arad County, in the year 2016-2017.

In the school timetable of the students, there was included half an hour of health education for dental hygiene during the entire first semester (from 20 September until 20 December). Health education was taught to students during the school program. This health class lasted 30 minutes per classroom, distributed as follows: 10 minute explanation, 10 minute practical demonstration on plaster mold, and a 10 minute distribution of sanitary materials (toothpaste, toothbrushes, and dental floss), [26].

In this educational program, there were presented the causes of dental problems, the care methods for teeth through practical demonstration and distribution of sanitary materials (toothpaste, toothbrushes and dental floss).

5. Results

Table 1 shows the distribution of students from the studied sample, taking into account their age.

Table 1. Distribution by age of the sample subjects

Age	14	15	16	17	18	19	Total
Number	10	9	8	15	10	8	60

In order to have a record of the total medical interventions, the number of consultations was counted in the first semester, when the students had not received any information about oral hygiene, and in the second semester, after the students have benefited from health education courses.

In the first semester (September to December) there was recorded a number of 85 consultations, with an average of 21.25 consultations/month (see Table 2).

Table 2. The number of consultations in the first semester

Month	Sep.	Oct.	Nov.	Dec.	Total	Average
Number of consultations	33	17	19	16	85	21.25

It can be seen that the largest number of consultations are at the beginning of the research (in September) and in November. Beginning with the first semester, in September, the students received half an hour of health education every week, during the hours taught by the class master. During this time, they could also ask any questions and receive answers from the staff that was educating them for health behavioral, and were allowed to practice different oral hygiene procedures.

Education for dental hygiene was supported through the following lessons, adapted after Dumitrache and collaborators [3]:

Lesson 1. Oral hygiene rules

Dental brushing - Minimum twice a day for 3 minutes;

Dental floss - Once a day;

Mouthwash - Removes bacteria from tongue and cheeks.

Inter-dental brush is used:

- after brushing;
- before brushing;
- to clean the spaces between the teeth.

Inter-dental brushing:

- takes 3-5 minutes;
- can be done manually or by using an electric brush;
- is used in large inter-dental spaces.

Lesson 2. Risk/protection factors in oral hygiene

Risk factors

Microbial plate
Lack of teeth cleaning
Sweets
Floury snacks
Sweet drinks
Fizzy drinks
Often food consumption
Worn-out toothbrush
Sweet fruits

Protective factors

Regular dental consult
Regular brushing at least two times a day
Use of fluoride toothpaste
Scaling
Knowledge of risks
Daily flossing
Use of fluorine mouthwash
Chewing gum
Brushing and rinsing after sweet consumption.

Lesson 3. Stages of proper dental brushing and use of dental floss [5, 11]

- Apply toothpaste on the dry toothbrush (1cm);
- Hold the toothbrush in the palm of the hand with support on the thumb;
- Gently open the mouth;
- Insert the toothbrush parallel to the teeth until it reaches the last molar;
- Place the toothbrush parallel to the gum at a 45-degree angle with the bristles facing the gum, the bristles must be in contact with the tooth-gum area;
- Execute rotational movements of the wrist in order to move the toothbrush from the gum to the tip of the tooth, on each group of 2-3 teeth;
- All tooth surfaces are brushed;
- For the inner surface of the front teeth, the toothbrush can also be positioned perpendicularly on the gum, executing pulling movements from the gum to the tip of the tooth;

- The surfaces of the teeth that come into contact when biting are cleaned by circular movements in horizontal plane;
- For each surface of each tooth group, 8-10 movements are performed;
- At the end, the tongue is brushed with 3-4 movements from the base to the tip of the tongue;
- Rinse mouth vigorously with water and remove water with mouth wide open, so as to remove bacterial plaque;
- Wash the toothbrush under a powerful jet of water without touching the brush bristles with the fingers;
- Place the protective cover over the toothbrush.

After the health education courses, the situation changed, and it is clear from Table 2 that the number of consultations has decreased considerably (see Table 3).

Table 3. The number of consultations in the second semester

Month	Jan.	Feb.	Mar.	Apr.	Total	Average
Number of consultations	10	6	17	6	39	9.75

In the second semester, there was registered a number of only 39 consultations, with an average of 9.75 consultations/month. This means that the courses had a great influence on the students and they were much more careful in maintaining oral hygiene and caring for teeth. February and April are mentioned as having only 6 consultations within 30 days.

In order to see if the difference between averages is statically significant, the t test (Student) was used to evaluate the difference (see Table 4).

Table 4. The averages, their difference and their significance (N=60)

Semester	Average	Difference	Significance
Sem.1	21.25	7.28	p < .01
Sem.2	9.75		

Data processing with SPSS 17.0 reveals a t of 7.28, which is statistically significant, at a significance threshold of p < .01.

It results that the courses have had a beneficial effect on young people, causing them to be more careful about the care of the teeth and the maintenance of oral hygiene.

The authors were also interested to see which age group is more receptive to these oral health education classes. The influence of the courses was also measured by the number of consultations for each age group (see Table 5).

Table 5. The number of consultations by age in both semesters

Age	14	15	16	17	18	19	Total
Semester 1	21	15	6	24	10	9	85
Semester 2	5	2	1	18	4	6	39

The most receptive age groups were the 14 and 15 age groups. This fact found in the research is in accordance with data from scientific literature, suggesting that the earlier the education for oral hygiene begins, the more significant are the results.

Another interesting finding is that a fairly large number of young people have asked for additional explanations and oral hygiene products for their smaller brothers and sisters who were not included in the study. This means that some oral hygiene skills have already been formed, which can be shared by subjects with the close people around them.

6. Discussions and conclusions

The hypothesis has been validated. The research has shown the usefulness of introducing oral hygiene classes for students in school curricula, leading to a reduction in the number of consultations, and implicitly to a better oral health of young people. Testing the research hypothesis brings as scientific novelty the necessity and importance of introducing oral health education especially in special schools, by acquiring and applying dental hygiene notions to school populations institutionalized in special schools, where there are multiple diagnosis, and where the children are devoid of parental interest and care (social cases).

The courses have awakened pupils' curiosity and helped them to form oral hygiene skills.

A second finding of the research was that, the lower the ages at which oral health education starts are, the sooner the habits will form and

the better the results will be. Younger students are more receptive to oral health education.

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