



The Effect of School Dental Education Program on the Gingival Health Condition in a Group of 8 Years Boys in Diyala City, Iraq

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ABSTRACT

Objective: Gingivitis is the inflammation of the gingival tissues, which usually precedes periodontitis. Periodontal health depends mainly on the regular removal of dental plaque. One of the effective means of prevention is the oral self-care practice for maintaining good individual oral health; in addition, schools are thought to be the most suitable aid to provide health information to children in order to achieve the maintenance of oral health. So the aim was to see the effect of a school education program on the gingival health for a group of boys. **Materials and methods:** Total 60 pupils of primary school aged 8 years old from Diyala city/Iraq were randomly selected. All of them were boys. The sample was collected from February 2017 to March 2017 from one primary school (Al-Falah School). The subjects were examined for the gingival health condition according to Loe and Silness, 1963 and plaque accumulation was recorded according to Silness and Loe, 1964. The program consisted of phases for motivation and instruction. **Results:** The instruction and motivation program showed a change in behavior and attitude of children after program and increase in the percentage of answers (yes) about cleaning teeth with brush and toothpaste, the use of fluoridated toothpaste, times of brushing, replacement of toothbrush and if there is a relation between brushing and dental caries. Conversely, there was less change in answers about the time of brushing and visit the dentist. **Conclusion:** There was a change or increase in knowledge and behavior of children about the care of oral health, promoting preventive care after the educational program.

Keywords: School dental education program, Gingival health, Diyala city, Children

INTRODUCTION

Gingivitis and its related periodontitis are considered as prevalent oral diseases. As a universal health concern, it affects both children and adolescents [1]. At its initial stages, as gingivitis is considered as a reversible disease by controlling and maintaining good oral hygiene, if not treated, it will progress to periodontitis which includes the destruction of tissues and resorption of bone around the teeth which may result in tooth loss [2].

Dental education usually elaborates helping individuals to change their behavior which is thought to be the reason for poor oral hygiene [3-5]. That means if the dental health personnel provide people with a good basis of dental knowledge, there will be alteration towards good oral hygiene and a behavior change will be noticed [3,4]. It was proved that there was limitations ineffectiveness of traditional methods of education programs to accomplish good oral hygiene because of various interaction between the education program with other factors, such as diet, the frequency of dental visits, level of education, economic status, politics and community provision [3,5-7]. Furthermore, Watt stated that "future improvements in oral health and a reduction in inequalities in oral health are dependent upon the implementation of public health strategies focusing on the underlying determinants of oral diseases [3]".

The benefits of the planned dental education program, in addition, to achieving behavioral changes, leads to the improvement of individuals, groups, or community health by supporting and upholding healthy behavior [8]. One of the upmost and appropriate environments for dental health education programs is the school because it enrolled a large group of children easily available for dental personnel and they are already in a learning environment, so there will be an effective dental health education programs in such environment [9-11].

Aim of the Study

To study the effect of school dental education program on the gingival health condition represented by GI and PII for a group of 8 years old boys.

PATIENTS AND METHODS

This oral health survey was conducted among 60 pupils of primary school aged 8 years old in Diyala city/Iraq. The sample consisted of boys only and was collected from February 2017 to March 2017 in a primary school (Al-Falah School) with the required consent from higher authorities. Every pupil was asked (by direct interview) about his name, age, and dental behavior and knowledge including:

1. Do you clean your teeth using toothbrush and paste? Yes, No
2. Do you use fluoridated toothpaste? Yes, No, I do not know
3. How many times do you brush your teeth a day? 1,2,3
4. Do you replace your toothbrush? Yes, No, I don't know
5. Is there a relation between brushing and dental caries? Yes, No
6. When do you brush your teeth? After meals, in the morning or before going to bed
7. Do you visit the dentist? No, routinely/at emergency

Oral examination was performed according to the basic methods of oral health surveys of the World Health Organization (1987) [12]. Each child was seated in a straight chair and daylight was used for illumination. Clinical examination was performed using a dental mirror and probe. Systemic approach of examination for gingival index (GI) and plaque index (PI) was performed starting from upper right primary second molar or permanent first molar, upper right primary or permanent lateral incisor, upper left primary first molar or permanent first premolar, lower left primary second molar or permanent first molar, lower left primary or permanent lateral incisor, lower right primary first molar or permanent first premolar (Ramfjord teeth).

Dental plaque was recorded by PI according to the criteria reported by Silness and Loe, and for the assessment of gingival health condition, the GI was used according to Loe and Silness [13,14]. Statistical analysis was performed by using SPSS version 13.

Motivation Program

The program was continued as phases for motivation and instruction about dental health care:

First phase: Motivation of children about healthy teeth, gingiva, and mouth and which food and drinks that helps to enhance the oral health and which diet causes poor oral health by giving each child a dental education manual made by the researchers with a complete and detailed demonstration about it.

Second phase: Instruct the children about the importance of brushing their teeth by showing them the right way to brush their teeth on manikin represented the teeth on their arches with tongue.

Third phase: Read and discuss with the children about some questions that increased their dental education, and then encourage the children to answer it.

Fourth phase: The boys were showed a dental educational video which demonstrated the oral health care, how to brush the right way and what will happen if they didn't look after their teeth.

Fifth phase: Some pictures were displayed to the boys about healthy teeth, how to floss and explain the subject of gingivitis.

Re-examination

After two weeks after the initial examination, with the completion of the motivational program, the children were reinterviewed to reexamine and remeasure the GI and PI for each child.

RESULTS

Descriptive statistics was represented by the mean and standard deviation for PI, GI, the minimum and maximum of each for the total sample (Table 1).

Table 1 Descriptive statistics of PI and GI

Variables	N	Minimum	Maximum	Mean	Std. Deviation
PI	60	0.7	2.1	1.195333	0.274538
GI	60	0.5	1.1	0.849000	0.108030

Paired sample t-test before and after the motivational program revealed that plaque index was lower after motivation; however with non- significant difference at level $p=0.05$. At the same time, the gingival index was a non-significantly different (Table 2).

Table 2 Paired sample t-test statistics for PI and GI

Variables	Mean	Std. Deviation	p-value	Sig.
Pair 1	PI	0.849	0.110	0.404
	PI2	0.957		
Pair 2	GI	0.849	0.228	0.079
	GI2	0.885		

Concerning question 1 (Q1): (Do you clean your teeth using toothbrush and paste?), the answers (yes) were increased from 81.7% before motivation to 91.7% after motivation program (Table 3).

Table 3 Do you clean your teeth using toothbrush and past? Before and after the motivation program

Variables	Before		After		Z-score	p-value
	No.	%	No.	%		
Yes	49	81.7%	55	91.7%	-1.6113	0.1074
No	11	18.3%	5	8.3%	1.6113	0.1074
Total	60	100.0%	60	100.0%	-	-

Similarly, regarding Q2 (Do you use fluoridated toothpaste?), the answers (yes) was increased from 70% before motivation to 90% after motivation program (Table 4).

Table 4 Do you use fluoridated toothpaste? before and after the motivation program

Variables	Before		After		Z-score	p-value
	No.	%	No.	%		
Yes	42	70.0%	54	90.0%	-2.7386	0.00614
No	4	6.7%	5	8.3%	-0.3466	0.72634
I do not know	14	23.3%	1	1.7%	3.5883	0.00034
Total	60	100.0%	60	100.0%	-	-

Also, about Q3 (How many times do you brush your teeth a day?), the answers (once) was increased from 16.7% before motivation to 36.7% after motivation program (Table 5).

Table 5 How many times do you brush your teeth a day? before and after the motivation program

Variables	Before		After		Z-score	p-value
	No.	%	No.	%		
once	10	16.7%	22	36.7%	-2.4772	0.01314
twice	33	55.0%	23	38.3%	1.8298	0.06724
3 times	17	28.3%	15	25.0%	0.4129	0.6818
total	60	100.0%	60	100.0%	-	-

In addition, concerning Q4 (Do you replace your toothbrush?), the answers (yes) was increased from 81.7% before motivation to 83.3% after motivation program (Table 6).

Table 6 Do you replace your toothbrush? before and after the motivation program

Variables	Before		After		Z-score	p-value
	No.	%	No.	%		
Yes	49	81.7%	50	83.3%	-0.2402	0.81034
No	9	15.0%	10	16.7%	-0.2501	0.80258
I do not know	2	3.3%	0	0.0%	1.4261	0.15272
Total	60	100.0%	60	100.0%	-	-

At the same way, regarding Q5 (Is there a relation between brushing and dental caries?), the answers (yes) was increased from 73.3% before motivation to 91.7% after motivation program (Table 7).

Table 7 Is there a relation between brushing and dental caries? before and after the motivation program

Variables	Before		After		Z-score	p-value
	No.	%	No.	%		
Yes	44	73.3	55	91.7	-2.6427	0.0083
No	16	26.7	5	8.3	2.6427	0.0083
Total	60	100	60	100	-	-

In addition, with reference to Q6 (When do you brush your teeth?), the answers (after meal) were increased from 50% before motivation to 68.3% after motivation program, and the answers (before going to bed) were increased from 23.3% before motivation to 25% after motivation program (Table 8).

Table 8 When do you brush your teeth? before and after the motivation program

Variables	before		After		Z-score	p-value
	No.	%	No.	%		
After Meal	30	50	41	68.3	-2.0429	0.04136
In The Morning	16	26.7	4	6.7	2.9394	0.00328
Before Going To Bed	14	23.3	15	25	-0.2132	0.83366
total	60	100	60	100	-	-

Adding to answers for Q7 (Do you visit the dentist?), the answers (at emergency) was increased from 58.3% before motivation to 75% after the motivation program (Table 9).

Table 9 Do you visit the dentist? before and after the motivation program

Variables	before		After		Z-score	p-value
	No.	%	No.	%		
No	5	8.3	5	8.3	0	1
Routinely	20	33.3	10	16.7	2.1082	0.03486
At emergency	35	58.3	45	75	-1.9365	0.05238
Total	60	100	60	100	-	-

DISCUSSION

This oral survey was to investigate the effect of school oral hygiene instructions and motivation on the oral health of pupils aged 8 years old. In the first question (Do you clean your teeth using toothbrush and past?) the answers (Yes) was increased after instruction and motivation program. As with other studies around the world that showed the school toothbrushing program education is effective in improving oral hygiene and had a greater impact on plaque and gingivitis than on gingival bleeding. It is necessary to reinforce the oral health education component of the program [15].

About Q2 (Do you use fluoridated toothpaste?), the answers (Yes) of the question was increased after the motivation program. As in other studies the regular brushing fluoridated toothpaste might act as an adjunct to the maintenance of good oral hygiene and thus improve oral health [16].

Concerning the Q3 (How many times do you brush your teeth a day?), the answers after motivation and instruction become 36.7% while was 16.7% before program, as shown in other studies that tooth brushing is considered as a fundamental self-care behavior for maintenance of oral health, and brushing twice a day has become a social norm, but the evidence base for this frequency is weak [17].

Regarding Q4 which was about the replacement of toothbrush, the answers were increased after motivation. The practitioners recommend their patients to replace their toothbrushes usually at three-month intervals when bristles are bent or splayed. This suggested time frame was similar to the interval used by dentists and dental hygienists to discard their own brushes [18].

The answer of Q5, which was about the relation between brushing and dental caries, was increased after instruction and motivation program. A primary school toothbrush program significantly reduced caries prevalence and increases the benefit of teeth brushing to reduce the caries occurrence [19].

The answers of Q6 about time of tooth brushing, the answers (before going to bed) showed slight change in percentage, and in Q7 (Do you visit the dentist?), the answers (at emergency) showed increase in percentage, which may be resulted from low frequency of conducting the program, this motivation program need to be more frequent and instruction to concentrate the information in the children's minds and to have a change in behavior and attitude.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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