Promoting Oral health in Elementary students: Implementing Presentation and Practical Methods

Malihe Noori Sistani[1], Somayeh Karami[2], * Maryam Delavari Heravi[3]

[1] MSc, Department of Public Health, Neyshabur University of Medical Sciences, Neyshabur, Iran.

[2] MSc, Department of Health Education and Health Promotion, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran.

[3] Assistant professor, Department of public health. Neyshabur University of Medical Sciences, Neyshabur, Iran.

Abstract

Background: Recent studies show that the prevalence of oral diseases, as one of the non-communicable diseases, is rapidly increasing in Iran and its improvement necessitates an efficient educational program. Thus, the present study aims at investigating the effect of peer education using poster and presentation methods on perceived benefits of oral health based on the Health Belief Model (HBM).

Method: This study is a quasi-experimental study which examines 118 elementary students, categorized into control and experimental groups, in Neyshabur, 2018. The data was collected using a researcher-made questionnaire that examined the participants' performance as well as the perceived benefits concerning oral health based on HBM before and after the study. In addition, the data was analyzed using SPSS 20 through paired samples t-tests, independent t-tests and Chi Square analysis.

Results: The results show that the perceived benefits mean score for the experimental group increased after the implementation of the treatment (Pretest M=10.83, SD=2.6 & Post Test M=21.69, SD=1.77). Therefore, it could be stated that the peer education approach along with using presentation methods to increase the average score of perceived benefits of the students in oral hygiene is highly effective and statistically significant (P <0.001).

Conclusion: The results revealed that the implementation of active educational methods that are done with the participation and focus of students, can lead to the improvement of oral health indicators in them.

Key Words: Elementary Students, Oral health, Presentation Methods.

* Corresponding Author:

Maryam Delavari Heravi, Assistant professor, Department of public health. Neyshabur University of Medical Sciences, Neyshabur, Iran. Email: delavari27@yahoo.com

1- INTRODUCTION

Tooth decay is considered as one of the most common human diseases that threatens people of all age groups and genders. It is believed that oral hygiene during childhood and adolescence has a great impact on the reduction and prevention of this disease (1). The World Health Organization (WHO) in 2012 announced that there is evidence of dental caries in about 60 to 90 percent of students and almost 100% of adults worldwide (2). Research studies have accentuated the fact that oral health is directly linked to children's social relationships, and students suffering from poor oral health are 72 times more likely to be restricted in daily activities. More than 54 million school-hours are lost annually at schools due to oral health problems (3). Therefore, oral health can affect children's performance at school and their future success (4).

Educational centers and Schools can provide an effective platform to promote the health status of the students and community and due the large number of students they are accommodating their trial would be highly effective. Through accurate and comprehensive education, students can acquire skills enabling them to make decisions and adopt a healthy lifestyle making them capable of dealing with conflicts and inconsistencies. Schools as well as the educational centers can emphasize the importance of oral health messages which could be reinforced during the school year in which beliefs, attitudes and skills will emerge and develop (2).

Despite the oral health training programs that have been presented widely, the index of decayed, extracted, filled (DMFt) teeth is still high (5-8). It seems that the traditional educational programs were not of high impact and the awareness of dental caries and gum diseases does not provide much motivation and sustainability for oral hygiene (8).

Peer group approach is considered one of the most effective behavior change strategies that enhances people's thinking and creativity and results in their full participation in all stages of planning, implementing and evaluating educational programs. Studies on pubertal physical health suggest that using peer-based education results in individuals' knowledge, positive attitude and better performance of students (1-9). In health programs, one of the most important steps is to choose a model or theory based on the circumstances to identify the problem and to match the performance or purpose of the model or theory with the goal of the training program. Thus, using effective models is highly suggestive; the Health Belief Model (HBM) is an optimized model which is used for the purpose of this study due to the prevalence of the disease in the region. The HBM was developed and suggested by a group of social psychologists who attempted to identify and determine the failures and weaknesses of disease prevention or diagnosis programs (2-9). This model was also used for determining the predictors of oral health status. The model includes elements such as perceived susceptibility and severity, perceived barriers and benefits, action guides, and self-efficacy (10, 11).

One of the methods depending on observation is the presentation method or the practical activity. In this method, people learn certain skills through observation, in which the trainer shows the howness of device use. Through using this approach, the instructor can present skills to a large number of learners over a short period of time (12). In a study of the effect of practical-activity-method on students' learning and attitude of green chemistry education, it was found that the implementation of practical activity-based curriculum in addition to learning had a positive effect on people's attitude (13). Also, a study was conducted to compare

different methods in oral health education from the perspective of 127 adolescents in Sao Paulo, Brazil. This study was conducted in 3 stages: 1- Students' assessment of oral health using a self-study questionnaire. 2- Application of educational methods including lectures, practical demonstrations and participatory activities, and 3- Assessing people's awareness. The results indicated that the knowledge of students in all groups was significantly different. Their preferred method was the practical demonstration method due to contact they could have with the educational materials followed by participatory activities because it encouraged learning in a more dynamic way (14).

Therefore, due to the high rate of tooth decay among students and the availability of a suitable school environment for active learning, the main strategy in this area is to implement health promotion interventions and implement educational strategies and activities based on health education models. Strategies that are consistent with new ways of learning and using the most effective and shortest way to achieve the goal of promoting oral health in children (15). Therefore, in this study, the effect of an education using posters and demonstration methods was investigated on the perceived benefits for oral health based on the health belief model in primary school students in Neishabour, Iran.

2- MATERIALS AND METHODS

2-1. Design and sampling

The present study is a pretest-posttest quasi-experimental study. The study population consisted of 118 primary school students in Neishabour in the academic year of 2018-2019. According to the study of Emami Moghadam et al. (16) and using the following formula (p=.05, effect size=.8) the sample size for each group was estimated to be 43 people; and

considering the drop, finally 59 people in each group were examined.

$$n = \frac{(z_{1-\frac{\alpha}{2}} + z_{1-\beta})^2 (S_1{}^2 + S_2{}^2)}{(\mu_1 - \mu_2)^2}$$

To determine the samples, two schools were randomly selected from the schools of region two in Neishabour; and based on the attendance list, 118 students from each school were selected as the research samples. After selection, the samples were divided equally into experimental and control groups of 59 people each.

2-2. Inclusion and Exclusion criteria

Inclusion criteria were the ability to read and answer the questionnaire and having informed consent to participate in the study. Exclusion criteria included not completing the questionnaires completely or the students' unwillingness to continue cooperating in the research, as well as students dropping out before completing the interventions and not participating in the curriculum.

2-3. Instruments

The data collection tool was a researcher-made questionnaire on structural performance of the health belief model in three parts: the first part included demographic information, the second part included the participants' perceived benefits and the third part included a list. Demographic questions of the questionnaire included age, birth rank, parents' education, parents' occupation. The second part focused on obtaining some of the students' beliefs and presumptions about the benefits of oral health. The structure of perceived benefits consisted of 5 questions (questions about the benefits of oral care including high economic costs, etc.). The questions in this section were scored in a Likert scale and ranged from strongly agree to strongly disagree. In the performance checklist, 12 questions in various fields such as toothbrush, flossing, proper nutrition and

use of fluoride mouthwash were compiled by observing the students' direct performance on oral modeling and self-reporting. The scores ranged from 1 to 5, attributed to the following options: completely disagree, 1 point; I am against, 2 points; I have no opinion, 3 points; I agree with, 4 points; and I completely agree, 5 points. In total, the total score of this section was between 5 (lowest score) and 25 (highest score). In the performance checklist, each correct behavior was given a score of one and the wrong behavior was given a score of zero.

The content validity of the data collection tools was evaluated by a panel of experts in the field of HBM and the items were revised based on the received comments. The content validity ratio (CVR) was found to be 0.77 and the content Validity Index (CVI) was 0.86. In addition, the questionnaire was piloted among 20 students and all ambiguities were eliminated. The reliability of the questionnaire was, then, assessed by calculating Cronbach's alpha coefficient which was 0.84 for the performance section and .83 for the perceived benefits section.

2-4. Procedure

After selecting the samples and obtaining their consent to participate in the program, all students were pre-tested. The pre-test included answers to the questionnaire questions. The training was conducted in the control group by lecture method and in the experimental group by the peer group approach. 10 students of the fourth and fifth grades who were used as peer educators were among those who scored the highest score in the pretest were selected. Necessary training was given to these 10 people in two 90-minute sessions. After learning, the peer group transferred the educational and health content to the other students through the demonstration-based teaching method, using the teaching aids such as posters, oral and dental

modeling and dental floss. The educational content and the materials were the same in the two groups; only the way they were presented was different. Finally, after one month of the intervention, the posttest data were collected from both experimental and control groups.

The educational content was based on three main axes identified according to the educational needs specified in the pre-test stage: At first, while introducing the students to dental caries and oral health, it was important for them to know the importance of the method. In the second part, the ways to promote oral health (brushing and flossing) were taught and the consequences of not observing oral hygiene were introduced. In the third part, the students were taught how to brush effectively and efficiently, as well as how to use dental floss as the most important method of promoting oral health.

2-5. Ethical considerations

In addition to obtaining the approval of the esteemed deputy of health of Neyshabur city and the permission of the educational office and schools in question, the students and their parents were informed about the purpose and procedure of the research and their consent was obtained.

2-6. Data analysis

After data collection, the data were entered into SPSS software version 20 and analyzed using independent t-test and paired t-test to determine the mean difference before and after training in the structure of perceived benefits of the health belief model. P values less than 0.05 were considered significant.

3- RESULTS

The total number of the participants was 118 whose mean age was 10.58 (SD=1.6). The majority of students were the third children of the family (30.5%). The majority of the mothers (72.4%) and fathers (44.6%) had primary education.

Most of the mothers were housewives (81.4%) and fathers were freelancers (62.7%). There was no significant difference between the experimental and control groups (P> 0.05) in terms of performance scores and perceived benefits of the health belief model prior to the study (P> 0.05). After the intervention, the results of paired t-tests showed a significant difference between the two groups in terms of the performance scores and perceived benefits (P <0.001). The mean score of perceived benefits in the experimental group after intervention increased from 10.83 to 21.69, while in the control group it increased from 11.11 to 11.28 after intervention. The mean performance score in the experimental group was 5.23 before training that increased to 8.08, while in the control group it was 5.32 and increased to 5.74 (**Table 1**).

Before the intervention, 66.1 % of the students in the experimental group were in the medium level of the perceived benefit structure, whereas after the educational intervention their mean scores in the upper level were improved by 89.8%.

In this study, 20.3% of the experimental group used toothbrushes before the intervention, which increased to 71.2% after the intervention. In addition, 3.4% of the students in the experimental group used tooth floss before each meal. However, it increased to 66.1% after the intervention. No significant changes were observed in the control group (**Table 2**). Chi-square test showed a significant difference between mean performance scores and perceived benefits in the experimental group after the educational intervention (P <0.001). There was a significant relationship (p = 0.02) between the variables of mother's education and performance scores and perceived benefits structure, so that the students with mothers with higher educational levels had higher scores of performance and perceived

benefits than had the other students. The other demographic variables were not significantly correlated to the performance scores and perceived benefit structures (P> 0.05).

Concerning the findings of the present study, it can be stated that the comparison between the two groups showed that the DMFT index in the experimental group was 4.61, while in the control group it was 4.63. The following figures illustrate the analytical comparisons (**Fig. 1-4**).

It could also be stated that 90 percent of the participants in the experimental group, i.e., 59 students had at least one decayed tooth. 75 percent had two decayed teeth. 67 percent of them had at least 3 decayed teeth. The mean number of the missing teeth for each student was 3.2. 64 percent of the experimental group had at least one missing tooth. 58 percent of them had at least two missing teeth. 49 percent of the participants in the experimental group had 3 missing teeth. In the experimental group, the mean number of the filled teeth for each student was 2.6 58 percent had at least one filled tooth. 36 percent had at least two filled teeth. 22 percent had at least three filled teeth.

As for the control group, the mean number of the decayed teeth was 3.9 for each student. 87 of the participants in the control group, i.e., 59 students, had at least one decayed tooth 76 percent of them had two decayed teeth. 76 had at least 3 decayed teeth. The mean number of the missing teeth for each student was 2.9. in the control group, 60 percent had at least one missing tooth. 59 percent of the controls had two missing teeth. 50 percent of the controls had three missing teeth. In the control group the mean number of the filled teeth was 2.3 for each student. 55 percent of the participants had at least one filled tooth. 37 percent of the participants had two filled teeth. 20 percent had three filled teeth.

Table-1: Mean scores of perceived benefits and Oral Health Performance of HBM in the experimental and control groups

Variable	Group	Mean and SD before intervention	Mean and SD after intervention
Perceived benefits	Intervention Group	10.83± 2.6	21.69 ± 1.77
	Control Group	11.13 ± 2.35	11.28 ± 2.76
	t-test	P = 0.603	P < 0.001
Oral Health Performance	Intervention Group	5.23 ± 1.98	8.08 ± 2.25
	Control Group	5.32 ± 1.78	5.74 ± 1.72
	t-test	P= 0.793	P < 0.001

Table-2: Comparing the performance scores between the two groups before and after the intervention

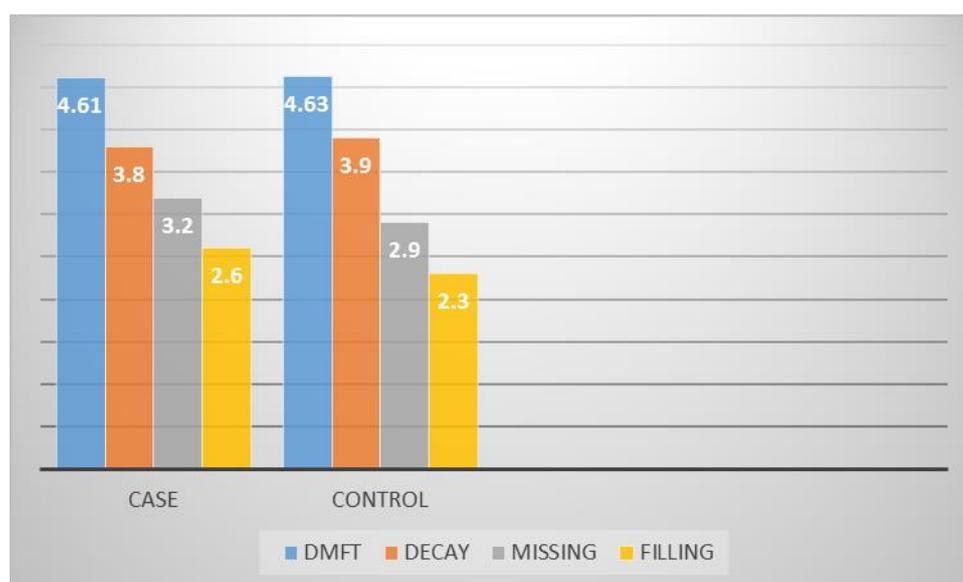| Performance Variable	control group		Test group	
	Before	After	Before	After
I brush once a day.	46.3	44.1	45.8	40.7
After each meal, I brush.	23.7	25.4	20/3	71.2
I brush three times a day.	20.3	20.3	16.9	71.2
I don't brush at all.	16.9	16.9	11.9	16.4
I floss once a day.	28.8	35.6	25.4	23.7
After each meal, I use toothpaste.	4.8	3.4	3.4	66.1
I do not know how to use tooth floss.	39.8	69.5	40.7	23.7
I don't use toothpaste at all.	58.6	44.1	59.3	30.5
I use fluoride mouthwash.	15.4	27.1	16.9	78
I don't know how to use fluoride mouthwash.	60.6	54.2	62.7	47.5
I use yogurt (dairy) daily.	80.7	76.3	83.1	79.7
I consume fruits and vegetables daily.	84.9	88.1	86.4	93.2

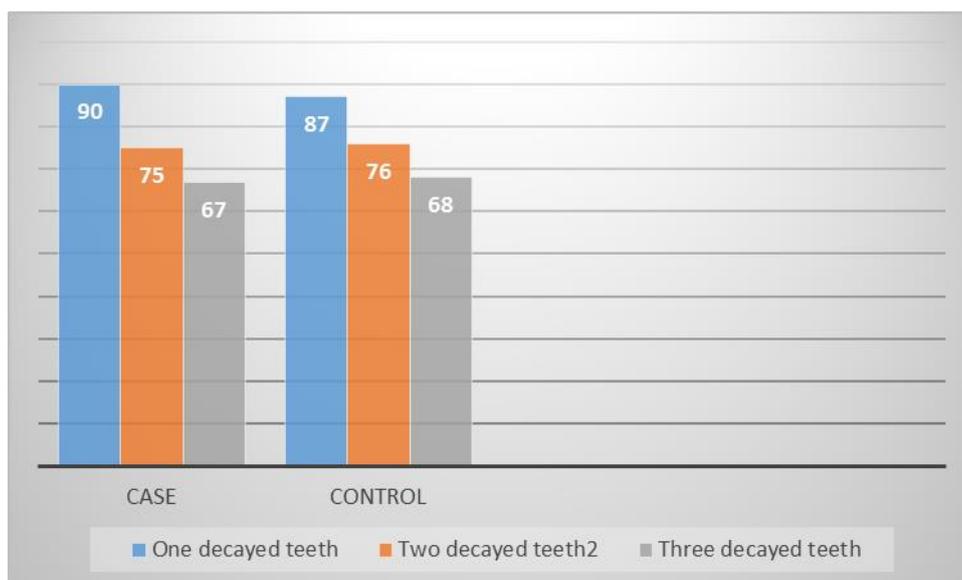**Fig. 1:** DMFT Index for the Control and Experimental Groups

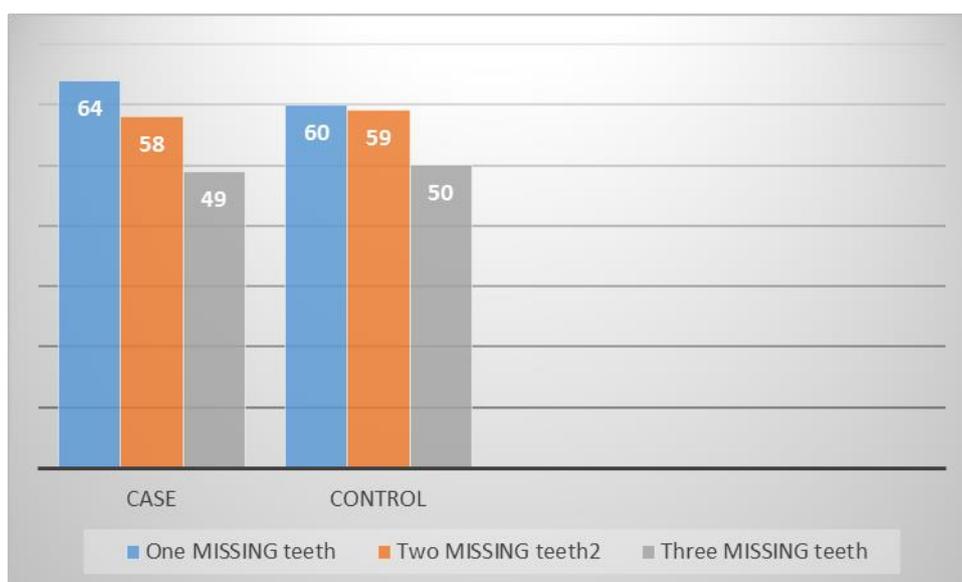**Fig. 2:** A Comparison of Teeth Decay between the Control and Experimental Group

Fig. 3: The rate of Missing teeth in the Control and experimental Groups

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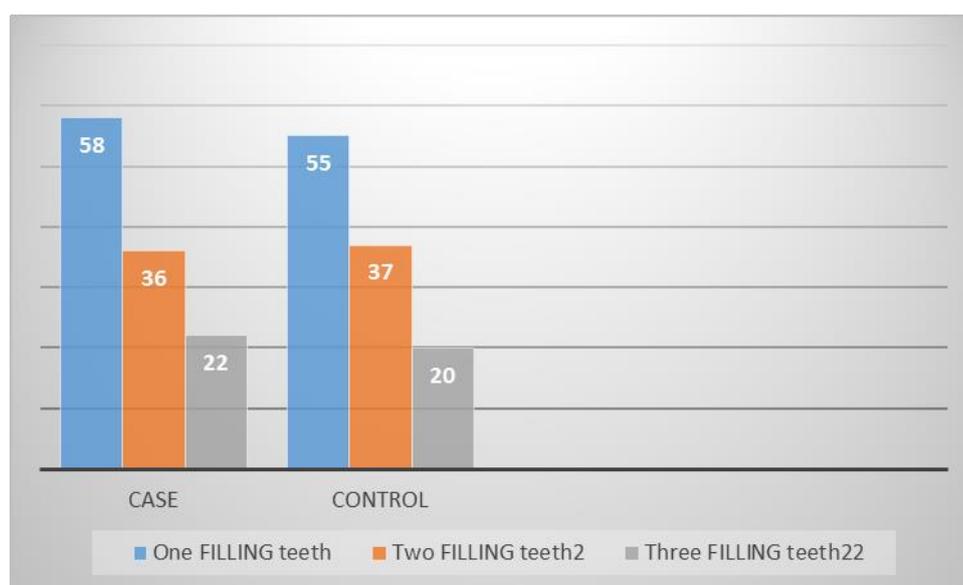

Fig. 4: A Comparison of the number of the Filled Teeth between the Control and Experimental Group

4- DISCUSSION

The present quasi-experimental intervention study aimed at promoting oral hygiene with peer group approach using presentation method through HBM in Neyshabur. Choosing the most suitable educational approaches to raise awareness and adopt appropriate behaviors in the community is considered one of the most cost-effective measures to prevent health problems. To the researchers' knowledge, no study had been previously conducted on the effects of the presentation method and health belief model on students' oral hygiene; and most of the previous studies had implemented the lecture method. Thus, this method was selected due to the relative overlook it had received. In the present study, 59.3% of students did not use dental floss and 14.4% did not brush.

In addition, prior to the intervention, 45.8% of the students used toothbrushes once a day and 27.1% of them used dental floss once. These results show that the brushing behavior is more favorable, among the students, than the flossing behavior. Flossing works by removing the plaque between the teeth and protects people from gum diseases. Therefore, people who do not floss are more prone to gum disease (17). Various studies have shown that the students' performance in the field of oral health is low (18-21).

Given the fact that most of the students do not use toothbrushes, it can be said that their understanding of the proper use of the teeth and the necessity of cleaning the teeth and interdental surfaces is low; so it seems necessary to provide them with a proper educational approach.

The findings of the present study showed that the mean score of perceived benefits and performance in the experimental group were higher than those in the control group, after the intervention. These changes could be indicative of the effectiveness of the presentation-based curriculum and the use of educational posters on students' perceived benefits and performance, consistent with the results of Falahi et al. (22).

The results of similar studies using theater for training the students in oral hygiene have also shown a significant difference in the mean performance score, in agreement with the results of the present study (17). However, in a study by Amidi Mazaheri and Sharifi Rad, the mean score of performance on oral health behaviors had not significantly improved after the training by the use of the posters (23). Perhaps one of the reasons for the ineffectiveness of the posters in improving the knowledge, attitude, and performance of people is the inappropriate placement of the poster.

In our study, maternal education was significantly correlated with the performance score and the perceived benefit; so that the students with mothers having high school diploma and higher education were most probable to have higher performance scores and perceived benefits than other students. Likewise, in the study by Kamsai et al. (1993), there was a statistically significant correlation between maternal education and performance (21).

Moreover, Yavari et al. showed that there was a statistically significant relationship between the father's education and the children's oral health performance, but there was no relationship between the mother's education and their children's knowledge, attitude and oral health performance (24). Therefore, this article reiterates the necessity of upgrading the education of women in the country as well as implementing comprehensive educational programs for mothers.

The Iranian National Oral Health Survey, in 2012, showed that the DMFT index for children of 7-8 years old and 12-13-year-old students in the whole country was 94/4 and 02/2, respectively (26).

Various studies have shown that the rate of decayed teeth among Iranian students is high, which is almost similar to the proportion of these teeth in countries such as India, Afghanistan and Ethiopia (26-29); and higher than the proportion in countries such as Israel, Spain and Brazil (30-32).

The main reasons for the high incidence of tooth decay among the students is the few number of the free national prevention and education programs, the pediatric dentists providing the required knowledge for preventing tooth decay at younger ages, as well as the poor eating habits such as frequent consumption of the sweet snacks (33-37) Furthermore, due to High costs of dental services, lack of proper dental insurance and unavailability of these services in all parts of the country, access to such services may be limited to certain group (28, 38, 39). People with higher socioeconomic backgrounds may receive more remedies than people with low socioeconomic status, and this may increase the incidence of tooth decay in this group of people, while in many countries such as Finland, Portugal, France, the dental services such as oral health education, periodic pediatric examination, necessary treatments and preventive services are available free of charge (40).

One of the positive points of this study is the implementation of the educational intervention in schools as one of the best places to reach a large number of students. Positive messages and practical interventions can also be reinforced during the consecutive years that the children

study at school. Also, the support of teachers and the peer network has a greater impact on students than the family. And, it can also be helpful if the students who have good behavior and practice in the field of oral health be introduced as a model for other students.

Since primary school students have little knowledge and weak will to maintain and promote their oral health, it is recommended that oral health education and interventions be done continuously in schools. It is also suggested that in addition to implementing oral health education programs for elementary school students, their parents, especially mothers, be involved in educational programs.

4-1. Limitations of the study

One of the limitations of the present study is the information gathering in the form of self-report, which could be affected by the cultural and emotional characteristics of the students. In addition, since the study population consisted of the elementary school students, there was a possibility of making errors in completing the questionnaires.

5- CONCLUSION

The results of this study showed that the oral health status of the primary school students before the intervention was not favorable. Therefore, it is necessary to formulate appropriate policies such as enriching school textbooks, setting up workshops and employing health educators in all schools to provide the students with comprehensive education on oral health. Moreover, based on the results of this study, health education models, especially the health belief model, along with active educational methods such as demonstration and poster use can be used as one of the effective health education strategies in oral health care. One of the achievements of the peer group approach will be the development of appropriate behaviors and the change of unhealthy

behaviors in the target groups. Furthermore, the results of this study revealed that the implementation of active educational methods that are done with the participation of students, can lead to the improvement of oral health indicators among them.

6- ACKNOWLEDGEMENT

7- CONFLICTS OF INTERESTS

None

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