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Effects of lecturing on selfcare oral health behaviors of elementary students

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Abstract

Background: Despite the efforts, the level of dental caries remains prevalent in developed countries; It has increased in developing countries due to dietary changes. The aim of this study was to assess the effect of an educational intervention on the oral health of students in Chabahar city.

Methods: This quasi-experimental study carried out on 200 students selected with systematic cluster sampling from schools located in Chabahar city, (100 students in each case and control groups). The data was collected using a questionnaire before the intervention, that was lecturing on oral health, and immediately and 3 months later. Data were analyzed using the SPSS software version 11.

Results: The mean age of participants was 11.3 ± 1.3 years. The findings indicated that rate of oral self-care behaviors were significantly increased in the case group compared to the control group after the intervention (tooth brushing for twice a day 69%, Flossing tooth 34%, mouthwash 69%, and regular visiting a dentist 6% in case group versus 47% ($p< 0.002$), 14% ($p< 0.001$), 57% ($p< 0.03$) and 5% ($p< 0.007$) in the control group (, , , respectively.

Conclusion: Lecturing is an effective and cheap method on the promotion of oral health preventive behaviors particularly in deprived areas like Chabahar city.

Keywords: Education, Lectures, Oral health.

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Introduction

Oral health is an integral part of general health so that the mouth and face are considered as a mirror of health. Poor oral health may have a profound effect on general health, and several oral diseases are related to chronic diseases. Oral health plays a key role in general health (1). Good oral health enables individuals to communicate effectively, enjoy food, speak well, enjoy a higher quality of life, and have high self-esteem and social confidence, and lower school absenteeism (2). Moreover, oral health includes the entire oral-facial complex and is more far ranging than just the health of the teeth. Having a good oral health enables individuals to communicate effectively, to enjoy food, to speak well, to enjoy a higher quality of life, and to have both a higher self-esteem and social confidence (3). On the other hand, oral diseases cause serious long-term problems regarding both social (e.g. social confidence), and physical (e.g. heart disease) aspects (4).

Despite the considerable efforts in the developing countries, the levels of the dental decay remains prevalent and in some de-

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veloping countries, the levels of the dental decay have increased due to the dietary changes (5). Approximately 60–90% of school-age children suffer from dental caries in developed countries (6). In the eastern Mediterranean region, which also includes Iran, the mean number of decay missing filling teeth (DMFT) for 15-year olds is the highest in the Mediterranean region (7-9). Iranian, public and private sectors provide dental health services; in 1977, the dental health care delivery system (DHDS) was established. Indeed some studies have shown that the level of oral health in Iran is low and Oral health care is integrated within the DHDS through trained professionals, oral hygienists, dentists, and specialists (10).

Dental caries and periodontal disease can be viewed as behavioral diseases preventable by simple oral hygiene practices. Oral health self-care methods (the use of dental floss, brushing and fluoride therapy) are effective techniques for preventing the dental decay and periodontal diseases (11).

The adolescent period is a critical time to establish attitudes and beliefs and shape an individual's health behavior. During the stage of childhood to adolescence, health behaviours consolidate and probably will not change beyond adolescence (12). Stability and early consolidation have particularly been evident for tooth brushing behaviour (13). During their school years children are receptive to accepting and maintaining positive health behaviours (12). The earlier the habits are established, the longer their impacts last (14). To adopt good oral health behaviour early in life is easier than to change detrimental oral health behaviours later in a child's development(11).

It seems necessary to intervene by the educational oral health in order to change the unhealthy habits and to prevent oral diseases and reduce the people who may not brush and floss; these are parts of the health habits. The health education is one of the important measures to prevent the oral health diseases and is considered as an improvement for the health level (15).

There is a lot of empirical research that address advantages of the lecture over other methods. Behaviors are classified in three domains of cognitive, emotional and mental- motion that can be experienced simultaneously. Cognitive domain is also known as thinking domain. Learning in this domain includes: information acquisition, abilities of Conscience, mental capacities and learning thinking processes (16). There are a variety of educational methods and tools with aim the cognitive development. The most important methods that are often used to motivate learning in cognitive domain include lecture and face to face education that are comprehensive and exclusive (17). It is not secret that lecture is one of the education methods the despite of its long history has an important role in efficiency of the education system (18). Advantage of lecture method is easy applicability and accessibility and it is very cheap and over populous crowded classes. This method can be adapted to a large extent with the specifically teacher plan, time, place and equipment circumstances and it is very flexible (16).

Also, mutual nature of communication, acquire habits leading to behavior change and bearing skills along with information acquisition and development of communication skills, the possibility of questions answers and feedback are another benefits of teaching method lecture (18-19).

Given the high prevalence of dental caries and low self-care behaviors to prevent oral diseases in primary school students, the present study performed with the aim to evaluate the effect of the traditional educational lectures on the oral health behavior promotion of primary school students of Chabahar city.

Methods

Subjects

This school based study used cross sectional data obtained from face-to-face surveys with students studying in elementary schools of Chahbahar, Iran. The study was conducted from April 2012 to Novamber

2012. To obtain samples from the 3230 elementary students studying in this city sector, a two stage random cluster sampling method was used. In the first stage, 2 schools were randomly selected. In the second stage 200 students who studied in grade Four and Five and aged between 10 and 12 from each school were randomly selected.

In this quasi-experimental study of a student population, attending the Chahbahar schools, confidential sample size of 95% and attest power of 80% using the formula for sample size of 100 was calculated for comparison of the two groups.

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 \left(P_1(1-P_1) + P_2(1-P_2)\right)}{\Delta^2}$$

Eligible students included individuals aged 10-12 years, fluent in understanding and speaking Farsi, and willing to participate as well as being present in the school at the time of the survey. For those who were not available at the time of study, a subsequent survey was arranged. Thus, from all eligible subjects who were available at school at the time of the study or at the time of subsequent survey, 200 subjects' parents signed the consent forms and allowed their children to answer all the survey questions. The first author, who was trained, did the surveying. Face-to-face interviews were conducted through a structured survey questionnaire. Which included three sections: demographic characteristics, views regarding oral healthy behaviors, and the source of self-care information?

Study procedures were explained to prospective subjects aged between 10-12 years. Subjects' parents who were willing their children to participate provided informed consent. After sampling the random selection of the 2 groups a pre-test was conducted. Then intervention was completed in the case group and no interference occurred in the control group. Immediately and 3 months after the intervention, the impact of the educational oral health program were measured on the aspects of the health knowledge, attitude and practice.

Measures

A self-designed questionnaire derived from the literature was developed to collect data. The questionnaire is composed of five sections as fallow:

Demographic data: This section includes the questions about age, birth orders, family size, parental literacy level, occupation and living area of the parents. Knowledge: Knowledge toward oral health consisted of 7 items derived from the available literature (11, 14, 19-20). The mean of 7 items was calculated to determine the knowledge score. Higher scores indicate higher level of awareness about oral health. Attitude: Attitude toward oral health was measured consisted of six items using three-point semantic differential scales, ranging from 1 (agree) to 3 (disagree) taken from the available literature (10, 12, 20). Practice: this section of the questionnaire was derived from the available literature (1, 14, 16). Four items were included to assess the students' practise to oral health. For example, the question "How often do you usually brush your teeth?" offered five alternatives: "irregularly or never", "once a week", "a few times a week", "once daily", or "twice daily or more". The final section includes a question about the source of the information about the oral health behavior.

The survey questionnaire was developed by the researchers and validated through content validity through which 10 specialists viewed the questions and put their comments about them. To establish content validity of the questions, the questions were reviewed by ten specialists including five physicians, three nurses and two health care providers who were experienced in tooth self-care (CVI = 0.82 and CVR = 0.78).

Their considerations were then applied to the questionnaire. To test reliability, internal consistency was assessed using Cronbach's alpha coefficient (r= 0.78). An alpha equal to or greater than (0.70) was considered satisfactory; the alpha coefficient for this questionnaire was as 0.80.

SPSS version 11 was used to analyze data.

Educational program

The intervention was a group – based self-care oral health behaviors educational program that involved four 45 - minute sessions. The intervention classes were delivered to the participants in group sessions. Thus, the program consisted of four initial classes administered by principal researchers. All initial four classes were administered and finished during one week. The initial classes were as follows: one 45 - minute class in which the researcher explained firstly regarding about oral health , familiarizing of the dental health self-care behaviors, the importance of brushing, flossing and using mouthwash and visiting a dentist, widespread decay problems and appropriate oral health program in the aged 10-12. The main teaching style of this class was lecture.

The three other class were another 45 - minute sessions, in which the researcher and a health education specialist tried to change attitudes of the subjects regarding oral health self-care behaviors in this period. These classes were hold in small group sessions and face to face education was the main structural method. The participants' skills regarding correct brushing, flossing, mouth washing and the importance of visiting a dentist was practiced in another 45-minute class in which the participants were educated how they can behave regarding oral health.

In all classes a health education specialist focused on cognitive behavioral interventions for oral health practicing. Therefore, she aimed to re - conceptualize the beliefs of subjects, replace maladaptive thinking patterns with adaptive patterns and replace maladaptive behavior patterns with functional alternatives. Furthermore, the health education specialist played an active role in motivational counseling by continued contacts with the subjects.

Outcome variable

Outcome variables were the improved knowledge, attitude and practice of participants regarding oral health self-care behaviors.

Statistical analysis

Data were analyzed using the statistical package for the social sciences (SPSS V.11.0.). Statistical significance was determined at the $p< 0.05$ level throughout. Descriptive variables are expressed as frequency, mean, standard deviation (SD) and overall range (minimum and maximum). The results were analyzed with using the statistical tests of independent sample T-test, paired sample T-test and Chi-Square.

Ethics

This project has been approved by the ethics committee of Tarbiat Modares University. Students gave verbal informed consent.

Results

The mean age of the students at case group and control was 11.4 ± 1.1 and 11.2±1.6 years respectively. Students were in the 5th, 6th and 7th grades with an age range of 10 to 12 years. Both groups were the same regarding personal characteristics, demographic variables such as age, education, Family size, parent education, occupation of parent and familial income. The information of the demographic variables of the study population is in Table 1. There was no significant difference between the case and control groups ($p> 0.05$).

Befire the educational intervention, around less than half of the participations (42% of case group, 46% of control group) reported that they brushed their teeth at least twice a day ($p= 0.569$); moreover 86% of the case group, 88% of the control group reported their theeth brushing habit only once a day ($p= 0.674$), with no significantly difference between case and control groups. Prevalence of flossing tooth, mouthwash, and regular visiting a dentist was 13%, 52% and 4% respectively in the case group. These rates were 15%, 55% and 5.0%, respectively in control group, with no significant-

Table 1. The Demographic Variables of the Study Population

Variable	Group	Case Group N (Percent)	Control Group N (Percent)	p-value*
Students' age	10 year old	42	39	0.392
	11 year old	58	61	
Birth order of the students	1	17	22	0.169
	2	30	20	
	3	21	19	
	4	12	9	
	5	7	11	
	6 Or more	13	19	
The family number	3 or less	20	19	0.740
	4	21	11	
	5	14	17	
	6	12	18	
	7	10	10	
	8 or more	23	25	
The level of fathers' education	Illiterate	24	14	0.852
	Primary	26	21	
	Guidance	20	23	
	Diploma and above	30	42	
The level of mothers' education	Illiterate	46	28	0.193
	Primary	33	39	
	Guidance	11	17	
	Diploma and above	10	16	
Fathers' job	Unemployed	25	20	0.495
	Worker	17	26	
	Employee	22	30	
	Free	36	24	
Mothers' Job	Housewives	85	74	0.399
	Non- Housewives	15	26	
Housing	Private housing	56	44	0.217
	Rent	17	16	
	Other	27	40	

ly difference between case and control groups (p= 0.405, p= 0.671 and p= 0.732). Also, almost one-third (case group 28.2 %, control group 29%) of the parents reported flossing tooth at a day, and 89% of them reported that they brushed their teeth at least once a day. There was no significant difference between the case and control groups in oral self-care behaviors (tooth brushing, flossing tooth, mouthwash, and regular visiting a dentist) before the educational intervention, although the findings of educational intervention indicated that rate of oral self-care behaviors (tooth brushing for twice a day 69%, Flossing tooth 34%, mouthwash 69%, and regular visiting a dentist 6% in case group versus 47%, 14%, 57% and 5% respectively in control group) were significantly increased in the case group compared to the control group after the intervention (p< 0.002, p< 0.001, p< 0.003 and p< 0.007) (Table1).

74.2% of the students who did not brush their teeth mentioned that brushing is not necessary. 79.6% of the students announced that the reason they didn't use floss because didn't have dental floss and only 5.5% said that brushing is enough. 79% of them announced that they didn't use mouth wash because didn't have it and only 6.45% said that brushing is enough; 87.2% of them did not visit a dentist regu-

Table 2. The variales of oral self care befor and after (3 month) in the study population

Variable	Case Group (n=100)		Control Group (n=100)		p-value*
Twice-daily tooth brushing	Yes (%)	No (%)	Yes (%)	No (%)	
Before	42	58	46	54	0.569
After	69	31	47	53	0.002
p.value**	0.001		0.245		
Once-daily tooth brushing					
Before	86	14	88	12	0.674
After	96	4	89	11	0.051
p.value**	0.02		1		
Dental floss					
Before	13	87	15	85	0.405
After	34	66	14	86	0.001
p.value**	0.001		0.415		
Mouthwash					
Before	52	48	55	45	0.671
After	69	31	57	43	0.03
p.value**	0.04		0.754		
Regular visiting a dentist					
Before	4	96	5	95	0.732
After	6	94	5	95	0.007
p.value**	0.225		0.995		

*Chi-square, **Mc Nemar

larly because they could not afforded it and the rest have no time to do this.

Based on results of obtained from independent T tests, there was no significant difference between mean score of knowledge, attitude and practice (KAP) of oral self-care behaviors before educational program in the case and control groups ($p> 0.05$). According to the paired sample T-test, there was a significant difference between mean score of KAP of oral self-care behaviors before and after educational intervention in the case group ($p< 0.05$). However, there was no significant difference ($p> 0.05$) in KAP of regular visiting by dentist (Table 2). Moreover, the present study showed no significant difference in KAP of oral self-care behaviors before and after the educational intervention in the control group ($p> 0.05$).

Discussion

The present study showed that a lecture intervention approach is effective in improving the self-care oral health behaviors of adolescents. This is in line with earlier findings, for instance, in a study by Hartono et al in Indonesia, a weekly supervised tooth-brushing and a monthly oral health-education programmed by teachers among children in second grade showed, after 1.5 years, a moderate positive effect on oral health knowledge, on plaque level, and on the effectiveness of tooth brushing (21). Similarly, A multi-week oral health education among 6- to 15-year-olds in Chicago enhanced children's oral health knowledge and reduced their plaque and gingival bleeding scores over a 4-week period (22). Similar findings also were reported in study of Pakpur et.al in Iran; Their results show the students' knowledge of the oral health such as brushing and flossing has been significantly and considerably increased in the time immediately and 3 month after lecture, the mean score of the students' attitude of the oral health such as brushing has been significantly increased as well. The mean score of the students' practice of the oral health such as brushing, using mouthwash and regular visit, has been significantly increased as well (1).

The findings indicated that the mean scores of attitude and practice toward oral health increased significantly after intervention. This is consistent with the study

Table 3. Distribution of the mean and SD of the knowledge, attitude and practice of Brushing, Flossing, using mouth-wash and Regular visit for the case and control groups

Variable			Control Group Mean(SD)	Case Group Mean(SD)	p. value*
Tooth brushing	knowledge	Pretest	5.44(0.88)	5.46(0.85)	0.82
		Post test	5.49(0.94)	5.68(0.97)	0.02
		p. value**	p=0.07	p<0.001	
	Attitude	Pretest	5.36(0.91)	5.40(1)	0.57
		Post test	5.55 (0.66)	5.75(0.96)	0.003
		p. value	p=0.38	p<0.001	
	Practice	Pretest	5.44(0.94)	5.46(0.97)	0.82
		Post test	5.46(0.55)	5.64(0.62)	0.002
		P .value	p=0.10	p<0.001	
Tooth Flossing	knowledge	Pretest	5.79(0.51)	5.75(1.02)	0.78
		Post test	5.34(0.70)	5.82(0.92)	0.001
		p. value	P=0.09	p<0.001	
	Attitude	Pretest	5.78(0.72)	5.68(1)	0.55
		Post test	5.40(1.09)	5.83(0.49)	0.001
		p. value	p=0.10	p<0.004	
	Practice	Pretest	2.12(0.39)	2.40(0.66)	0.16
		Post test	2.19(0.66)	2.87(0.68)	0.001
		p. value	p=0.13	p<0.001	
Mouthwash	knowledge	Pretest	2.84(0.29)	2.76(0.62)	0.30
		Post test	2.59(0.37)	2.89(0.71)	0.001
		P .value	p=0.28	p=0.05	
Mouthwash	Attitude	Pretest	2.80(0.26)	2.74(0.69)	0.78
		Post test	2.63(0.59)	2.95(0.47)	0.001
		p. value	p=0.68	p<0.001	
	Practice	Pretest	2.14(0.59)	2.34(0.65)	0.40
		Post test	2.34(0.72)	2.65(0.73)	0.004
		p .value	p=0.14	p<0.001	
Regular visit	knowledge	Pretest	2.78(0.56)	2.80(0.54)	0.76
		Post test	2.80(0.36)	2.87(0.53)	0.002
		p. value	p=0.43	p<0.001	
	Attitude	Pretest	2.90(0.57)	2.79(0.66)	0.67
		Post test	2.66(0.47)	2.90(0.65)	0.001
		p. value	p=0.46	p<0.03	
	Practice	Pretest	2.32(1.06)	2.18(0.94)	0.22
		Post test	2.03(1.09)	2.60(0.91)	0.001
		p. value	p=0.07	p<0.001	

Independent Sample t-test*, Paired Sample t-test**

done by Tai et al in Chinese first-grade school children. They showed that a 6-year period of a school-based oral health promotion program has improved attitudes to dental care and oral health behavior (23).

Similarly, among Irish school children aged 7 to 12, positive changes occurred in the dental health knowledge, beliefs and behavior of these children after the dental nurse's intervention

(24). Results of studies by Chen (25), Elemek (26) and Gonzalez (27) shown that the effect of an educational lecture was more than the effect of the self-teaching.

In a study conducted by Mehta et al, in 2010, titled "the effect of two methods of e-learning and educational lecture" it has been determined that the rate of learning was similar in both methods. The students suggestions on learning methods of the two educational methods showed that using the educational lecture was more effective on "the learning " and " the motivation" (20). Again, the study conducted by Newton et al, in 2012, it has been determined that using the educational lecture was effective on the promotion of the knowledge of the military personals (28). In 2010, in the Vichayanrat study the mean score of the preschool children practice for oral health has been increased after the education (29).

However, these results are inconsistent

with some other studies. For instance, In Tanzania, weekly supervised tooth brushing and monthly lessons on aspects of oral health during one school year in grade 4, carried out by their teachers did not result in significant reduction in plaque score, gingival bleeding, or DMFT value (30). In Zimbabwe, a one-time training of teachers in aspects of oral health was ineffective in lowering plaque levels among grade 2 and grade 4 children over a period of 3.5 years (31). However, it is difficult to directly compare this results with those in other studies, due to between-study differences in the age and geographic location of the participants.

The present study had several limitations: The results of oral health behavior are based on students' self-reports. Secondly, the study participants were recruited from schools. Interpretation of the results to the general adolescent population in Chabahar must be made with caution as school going adolescents may not represent the overall adolescent population.

Conclusions

Because of the importance of hygiene and the prevention, the best, easiest and cheapest solutions in the field of education are changing behavior and attention to preventive care and health education. Verbal expression in speech and question and answer method can eliminate ambiguity, and the dynamic approach is considered. Thus, oral health education lecture method is effective in improving the knowledge, attitude and behavior of students. But it is not enough in some cases and we need to provide the facilities of oral health to them because they have no access to them.

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