

# Efficacy of peer mentoring versus dentist-led instruction for knowledge enhancement about oral health: A Clinical Trial

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## ABSTRACT

**Background and Aim:** Oral hygiene instructions are routinely provided at schools by health mentors and dentists. Recently, oral hygiene instruction by peers has gained popularity. This study aimed to compare the effect of oral hygiene instruction by dentists and peers on the level of knowledge of twelve-year old children.

**Materials and Methods:** In this interventional randomized clinical trial, four schools were randomly selected. The level of oral health knowledge of students was assessed by a pretest. Oral hygiene instructions were then provided by dentists in control schools and by peer mentors in test schools. Knowledge of students about oral health was evaluated in the two groups immediately and after 1 month post instruction. The mean test scores were analyzed using SPSS version 20 and compared between the groups using two-way and repeated measures ANOVA.

**Result:** Oral hygiene instruction enhanced the overall knowledge of students about oral health immediately and at one month after the instruction compared with baseline in both groups ( $P < 0.05$ ). The overall knowledge score of students in the test group was higher than that of the control group immediately and at 1 month after the instruction ( $P < 0.05$ ).

**Conclusion:** It appears that oral hygiene instruction by peer mentors can effectively increase knowledge acquisition with regard to oral health-related topics. Thus, peer mentoring in health-related topics is recommended as a practical and cost-effective approach. Considering the different pattern of learning in boys, repetition and reinforcement of instruction can promote their knowledge level in long-term.

**Keywords:** Health Promotion; Knowledge; Oral Health Education; Peer Group; Students.

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## Introduction:

Oral health promotion, particularly in children, is an important priority for health authorities worldwide. Enhanced knowledge of the public regarding the adverse consequences of poor oral hygiene improves their adherence to oral hygiene instructions. Thus, it is believed that knowledge enhancement in this respect by provision of oral hygiene instructions can play a pivotal role in oral health promotion<sup>(1,2)</sup>.

Several models and strategies have been proposed for instruction and behavioral change such as health belief, social behavior and self-efficacy models<sup>(3,4)</sup>. Peer mentoring is a recent approach that has gained popularity in health and hygiene education<sup>(5,6)</sup>. This approach is based on social theories claiming that people better take advice from their friends and peers and are more influenced by the expectations, attitudes and behaviors of the groups they belong to.

In this approach, information and behavior are transferred to target groups by mentors of the same age and gender and those having the same experiences, culture and status as the target group<sup>(5-8)</sup>. The systematic comprehensive health education and promotion model is an educational model by the peer groups aiming to promote public health literacy by emphasizing on teamwork principles. This model aims to enhance the quality and quantity of knowledge sharing by systematic, comprehensive and community-based promotion of health instructions in different steps of evaluation, design, implementation and monitoring<sup>(9,10)</sup>. Schools are a suitable place for implementation of health-related and hygienic programs, and use of peer mentors in schools has yielded positive results with regard to health promotion<sup>(11-13)</sup>. Several studies have confirmed the positive efficacy of peer mentoring for oral hygiene instructions<sup>(14,15)</sup>.

Twelve-year old children (6th graders) have fully erupted permanent teeth except for third molars and therefore, comprise a reliable study population<sup>(16)</sup>. Thus, this study aimed to assess and compare the efficacy of oral hygiene instruction provided by dentists and peer mentors to 12-year-old children.

## Materials and Methods:

### 2-1 Study design

This clinical trial was approved by the ethics committee of Islamic Azad University (ethical approval code: IR.IAU.DENTAL.REC.1395,44) and was conducted in accordance with the Declaration of Helsinki (Version 2013). A consent form was signed by the parents of students who participated in this study. This study was also registered in the Iranian Registry of Clinical Trials (identifier: 2017081517053N7). Four municipal districts were randomly chosen among the 22 municipal districts of Tehran. After evaluation of schools present in the four selected municipal districts, four schools that had adequate number of students and were close to each other (in order to standardize the students in terms of socioeconomic status) were selected.

The questionnaire used in this study included 10 multiple-choice questions related to factors causing dental caries, technique of tooth brush-

ing and dental flossing, necessity of periodic examinations and measures that need to be taken in case of dental trauma, fluoride therapy, fissure sealant therapy, diet and frequency of food intake. The questionnaires were filled out by students at baseline prior to instruction, immediately after instruction and 1 month after instruction. The questionnaires were collected 10 minutes after distribution. Each question had only one correct answer, and each correct answer was allocated one score while zero score was allocated to incorrect or "I do not know" answers. The total score of each individual was calculated by summing up the scores of all questions (maximum score was 10 and minimum score was 0). The content validity and face validity of this questionnaire had been previously confirmed by oral health experts and pediatric dentists using the Lawshe's method<sup>(17)</sup>. The coefficient of validity of this questionnaire was found to be 0.65. This questionnaire was administered among 21 twelve-year-old students and collected. The questionnaire was administered again among the same students after 2 weeks and the reliability coefficient of the questionnaire was calculated to be 0.73.

### 2-2 Selection of mentors:

An expert panel comprising of two teachers, one dentist, one health education expert, one psychologist and one oral health specialist assessed the vocal and non-vocal skills and concept transfer ability of the instructors using a checklist. The items in the mentor checklist such as eye contact, communication skills, body language, speech speed and proficiency were scored 1 to 5<sup>(18-20)</sup>.

In the control group, one dentist that acquired a higher score in the expert panel mentor checklist was selected as dentist-led mentor.

In the test group, five students who attained high scores in the pretest and were volunteered to be peer mentors were selected and assessed by an expert panel using the checklist.

Eventually, in each test school, one student that acquired a higher score was chosen<sup>(18-20)</sup>, and participated in peer mentor training workshop for two sessions<sup>(9,10)</sup>. In the first session of the workshop, necessary arrangements were made with school authorities and one classroom equipped with multimedia devices was used for instruction.

According to the contents of a PowerPoint presentation, the selected student was provided with oral hygiene instructions using a dental model and educational contents on papers and CD such that he/she could review and exercise the topics at home for 1 week. In the second session of the workshop held 1 week later, he/she rehearsed teaching of the contents of a few PowerPoint slides to find his/her strengths and weaknesses, and necessary corrections were made. These students then provided oral hygiene instruction to their peers (peer-led mentors).

2-3 Knowledge assessment at different time points:

The study population in each school was divided into six groups and received oral hygiene instructions provided by dentists in the control and by peers in the test schools using a dental model, toothbrush and educational slides in the form of a story with popular cartoon characters within 1 day. After completion of instruction, the questionnaires were filled out again on the same day and collected after 10 minutes. One month after instruction, the same questionnaire was filled out by the test and control groups and collected after 10 minutes<sup>(21)</sup>.

The test scores were analyzed using SPSS version 20 and compared between the two groups by

ANOVA.  $P < 0.05$  was considered statistically significant.

### Results:

A total of 246 children participated in this study in the test and control groups. Of all, 51.2% were females and 48.8% were males. Table 1 shows the mean knowledge score of students in the two groups before and after instruction.

According to two-way ANOVA, knowledge score of students about oral health at baseline (before the instruction) was the same in the two groups ( $P=0.562$ ). According to the results of repeated measures ANOVA, the knowledge score of students in this respect was not the same immediately and at 1 month after the instruction in the two groups ( $P=0.0001$ ). As shown in Table 1, the knowledge score of females in the test group was higher than that of the control group at both time points (immediately after instruction and 1 month after instruction).

According to the results of repeated measures ANOVA, oral health instruction significantly increased the knowledge of students about oral health in both groups ( $P=0.0001$ ) such that the knowledge score immediately and at 1 month after the instruction was significantly higher than the baseline knowledge score.

**Table 1. Mean knowledge score of male and female students about oral health in the two groups at different time points**

		Instruction by dentist		Instruction by peers		P- value
		Gender		Gender		
		Female	Male	Female	Male	
Before instruction	Mean±SD	4.24±1.24	4.00±1.53	4.62±1.05	3.95±1.36	0.562*
Immediately after instruction	Mean±SD	8.46±1.10	6.75±1.88	8.97±1.03	7.47±1.36	0.0001*
1 month after instruction	Mean±SD	7.10±1.28	5.23±2.48	7.95±1.30	5.90±2.03	0.0001*
p-value			0.0001**			

two-way ANOVA and repeated measures

## Discussion:

The current results indicated that oral hygiene instruction enhanced the level of knowledge of 6th graders about oral hygiene in both groups but knowledge retention was significantly greater in the peer mentor group. Twelve-year-old students comprised our study population because students better perceive the necessity of oral hygiene at this age and retain the acquired knowledge in this respect for a long period of time.<sup>(22)</sup>

Vangipuram et al<sup>(13)</sup>, Sushanth et al<sup>(23)</sup>, and Biesbrock et al<sup>(23)</sup>, evaluated the long-term efficacy of peer mentoring and reported results similar to our findings. However, in addition to the efficacy of peer mentoring for knowledge enhancement, they assessed its effect on performance as well.

Abdul-Haleem et al<sup>(12,24)</sup> found no significant difference in knowledge score of students in peer-led and dentist-led instructions. Their results were different from our findings, which may be due to the long-term communication of mentors (peer mentors and dentists) with students and repetition of educational topics in their study, because instruction was provided over a long period of time with reinforcement and repetition<sup>(12,24)</sup>. On the other hand, the communication between mentors and students improves over time and promotes educational goals. Their findings highlight the necessity of repetition of instruction and the positive role of peer mentors in this respect. One major advantage of peer-led instruction is the close relationship of students and their continuous contact with the mentor, which may explain absence of a significant difference between the test and control groups in their study. Keikhaee et al<sup>(14)</sup> reported the positive effect of peer mentoring on knowledge acquisition of female students about oral health after 1 month, which was in agreement with our findings.

Aside from the topic of oral hygiene, many studies have confirmed the positive efficacy of peer mentoring for knowledge enhancement about other health-related topics such as sexual health, nutrition, AIDS and breast cancer screening<sup>(9,25-28)</sup>. In our study, knowledge acquisition was greater among female students in peer mentor group compared with male students. This finding has been reported by some other studies

as well and can be attributed to the fact that girls generally pay more attention to their oral and dental health and often have a superior performance with regard to oral hygiene compared with boys<sup>(21,29)</sup>. Also, the mean score of knowledge in females was higher than that in males at 1 month after the instruction, which may be attributed to superior knowledge retention and long-term memory of females<sup>(5,30)</sup>.

The mean knowledge score about oral health was generally low in our study population at baseline. Many studies have pointed to the low level of public knowledge about oral and dental health and prevention of caries and periodontal disease, particularly in males. In the majority of previous studies, females were more aware of the oral health-related topics than males and had greater motivation for healthy behaviors<sup>(31-35)</sup>.

However, Carnerio et al<sup>(36)</sup> demonstrated that the majority of students in their study had adequate knowledge about oral and dental health but their adherence to oral hygiene was low. Both males and females had similar level of knowledge in this respect but males showed superior performance with regard to oral hygiene practice. Lian et al<sup>(37)</sup> reported that a higher percentage of boys had good level of knowledge about dental caries compared with girls; whereas, Joshi et al<sup>(38)</sup>, found no significant difference in the level of knowledge of male and female students regarding oral health.

Enhancing the knowledge of children about oral health-related topics can be the first step to improve oral hygiene practice in older ages. Evidence shows that peer mentoring is an effective approach for knowledge transfer in schools. Adolescents and the youth spend most of their time with their peers. Thus, education provided by their peers can efficiently change or reinforce some certain behaviors. The efficacy of this method is much higher than teacher-led or parent-led instructions<sup>(6,7,39)</sup>.

Adolescents and the youth often have some sort of resentment against instructions given by their parents and prefer to spend most of their time with their peers rather than with their family. Thus, their behavior and beliefs with regard to oral hygiene can be more easily changed by their peers<sup>(39)</sup>. Last but not least, peer mentoring is cost-effective since this group of instructors do



the instruction voluntarily <sup>(26,40)</sup>.

Boys instructed by dentists showed higher knowledge score immediately after instruction of oral hygiene while girls showed higher knowledge score at 1 month. Girls have a superior performance with regard to oral hygiene, which explains their greater knowledge retention in this respect. On the other hand, superior immediate learning ability of boys in dentist-led instruction may be due to the presence of fewer obstacles against their learning (such as fear) compared with girls, or their superior communication with dentists, which led to better learning. However, since boys have a poorer long-term memory than girls <sup>(21)</sup>, they almost forgot what they had learned after 1 month and showed poorer knowledge retention in our study.

### Conclusion:

In general, the results of this study suggest that peer mentoring can yield superior results with regard to oral health knowledge enhancement compared with traditional instruction and is therefore recommended. Long-term success of health instructions can be achieved by emphasizing on reinforcement and repetition of educational programs.

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