Original Article

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

F Sayar*[1], B Hatami[2], N Akhondi[3], E Amini[4], Sh Pourkarimkhani[4]

1- Associate Professor, Periodontology Dept, Dental Faculty, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
2- PhD in Community Oral Health, Dental Faculty, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
3- Associate Professor, Department of Mathematics, South Tehran Branch, Islamic Azad University, Department of Mathematics
4- private practice

ARTICLE INFO

Article History
Received: Apr2020
Accepted: May 2020
ePublished:Jun 2020

Corresponding author:
F Sayar,Associate Professor, Periodontology Dept, Dental Faculty, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
Email:sayar_f@yahoo.com

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.

J Res Dent Maxillofac Sci 2020;5(3):26-32

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[1,2].

Several models and strategies have been proposed for instruction and behavioral change such as health belief, social behavior and self-efficacy models [3,4]. Peer mentoring is a recent approach that has gained popularity in health and hygiene education [5,6]. 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[5-8]. 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 [9,10]. 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 [11-13]. Several studies have confirmed the positive efficacy of peer mentoring for oral hygiene instructions [14,15].

Twelve-year old children (6th graders) have fully erupted permanent teeth except for third molars and therefore, comprise a reliable study population [16]. 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 brushing 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[17]. 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[18-20].

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[18-20], and participated in peer mentor training workshop for two sessions [9,10]. 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 [21].

The test scores were analyzed using SPSS version 20 and compared between the two groups by two-way ANOVA and repeated measures 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=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**				

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.[22]

Vangipuram et al [13], Sushanth et al [23], and Biesbrock et al [23], 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 [12,24] 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 [12,24]. 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 [14] 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 [9,25-28]. 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 [21,29]. 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 [5,30].

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 [31-35].

However, Carnerio et al [36] 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[37] reported that a higher percentage of boys had good level of knowledge about dental caries compared with girls; whereas, Joshi et al[38], 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 [6,7,39].

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 [39]. Last but not least, peer mentoring is cost-effective since this group of instructors do

the instruction voluntarily [26,40].

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 [21], 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.

ACKNOWLEDGMENT:

The authors would like to thank Dr. Gholamreza Noorabadi for his educational papers. The authors report no conflicts of interest related to this study.

Please cite this paper as: Sayar F, Hatami B, Akhondi N, Amini E, Pourkarimkhani S. Efficacy of peer mentoring versus dentist-led instruction for knowledge enhancement about oral health: A Clinical Trial. J Res Dentomaxillofac Sci.2020;5(3) :26-32

References

1. Parker EJ, Jamieson LM. Associations between indigenous Australian oral health literacy and self-reported oral health outcomes. BMC Oral Health. 2010 Mar 26;10:3.
2. Lee JY, Divaris K, Baker AD, Rozier RG, Vann WF Jr. The relationship of oral health literacy and self-efficacy with oral health status and dental neglect. Am J Public Health. 2012
3. Elder JP, Ayala GX, Harris S. Theories and intervention approaches to health-behavior change in primary care. Am J Prev Med. 1999 Nov;17(4):275-84.
4. Strecher VJ, DeVellis BM, Becker MH, Rosenstock IM. The role of self-efficacy in achieving health behavior change. Health Educ Q. 1986 Spring;13(1):73-92.
5. Mellanby AR, Rees JB, Tripp JH. Peer-led and adult-led school health education: a critical review of available comparative research. Health Educ Res. 2000 Oct;15(5):533-45.
6. Turner G, Shepherd J. A method in search of a theory: peer education and health promotion. Health Educ Res. 1999 Apr;14(2):235-47.
7. Tomé G, Matos M, Simões C, Diniz JA, Camacho I. How can peer group influence the behavior of adolescents: Explanatory model. Glob J Health Sci. 2012Mar;4(2):26-35.
8. Milburn K. A critical review of peer education with young people with special reference to sexual health. Health Educ Res. 1995 Dec;10(4):407-20.
9. Mirzaii K, Nessari Ashkezari S, Khadivzadeh T, Shakeri MT. Evaluation of the effects of breast cancer screening training based on the systematic comprehensive health education and promotion model on the attitudes and breast self-examination skills of women. Evidence Based Care. 2016,6:7-18.
10. Mirzaii K, Ashkezari SN, Khadivzadeh T. Comparing the effect of breast cancer screening education based on "systematic comprehensive health education and promotion" model to health volunteers on women's practice. BMJ open. 2017, 7:bmjopen-2016- 015415.33.
11. Yazdani R, Vehkalahti MM, Nouri M, Murtomaa H. School-based education to improve oral cleanliness and gingival health in adolescents in Tehran, Iran. Int J Paediatr Dent. 2009 Jul;19(4):274-81.
12. Haleem A, Siddiqui MI, Khan AA. School-based strategies for oral health education of adolescents-a cluster randomized controlled trial. BMC oral health. 2012Dec;12:54.
13. Vangipuram S, Jha A, Raju R, Bashyam M. Effectiveness of peer group and conventional method (dentist) of oral health education programme among 12-15 year old school children-

a randomized controlled trial. J Clin Diagn Res. 2016May;10(5):ZC125-9.
14. Keikhaee R, Rakhshani F, Fijan S, Keikhaee M. The effectiveness of oral health education by peers on knowledge and performance of students in Zabol, Iran. Int J Res Med Sc. 2014;2(1):222-27.
15. Laiho M, Honkala E, Nyyssönen V, Milen A. Three methods of oral health education in secondary schools. Eur J Oral Sci. 1993Dec;101(6):422-7.
16. Pancholi S, Patil S, Shivakumar K M, Malik N, Pawar R,Suresh KV,et al. Utility of pediatric cariogenicity index among preschoolers of the western part of Maharashtra: A cross-sectional study. J Indian Assoc Public Health Dent. 2015Mar;13(1):30-2
17. Lawshe CH. A quantitative approach to content validity 1. Pers Psychol. 1975 Dec;28(4):563-75.
18.Jönsson B, Ohrn K, Oscarson N, Lindberg P. The effectiveness of an individually tailored oral health educational programme on oral hygiene behaviour in patients with periodontal disease: a blinded randomized-controlled clinical trial (one-year follow-up). J Clin Periodontol. 2009 Dec;36(12):1025-34.
19. Stice E, Rohde P, Shaw H, Gau JM. Clinician-led, peer-led, and internet-delivered dissonance-based eating disorder prevention programs: Acute effectiveness of these delivery modalities. J Consult Clin Psychol. 2017 Sep;85(9):883-895.
20. Strange V, Forrest S, Oakley A; RIPPLE Study Team. Randomized Intervention of PuPil-Led sex Education. What influences peer-led sex education in the classroom? A view from the peer educators. Health Educ Res. 2002 Jun;17(3):339-49.
21. Biesbrock AR, Walters PA, Bartizek RD. Initial impact of a national dental education program on the oral health and dental knowledge of children. J Contemp Dent Pract. 2003 May 15;4(2):1-10.
22. Albandar JM, Buischi YA, Mayer MP, Axelsson P. Long-term effect of two preventive programs on the incidence of plaque and gingivitis in adolescents. J Periodontol. 1994 Jun;65(6):605-10.
23. Sushanth VH, Krishna M, Babu AM,Prashant GM, Chandu GN. A peer group approach model of oral health promotion among orphans at Puduchery, South India. J Int Soc Prev Community Dent. 2011Jul-Dec;1(2):71-5.
24. Haleem A, Khan MK, Sufia S, Chaudhry S, Siddiqui MI, Khan AA. The role of repetition and reinforcement in school-based oral health education-a cluster randomized controlled trial. BMC Public Health. 2016 Jan 4;16:2.
25. Kim CR, Free C. Recent evaluations of the peer-led approach in adolescent sexual health education: a systematic review. Perspect Sex Reprod Health. 2008 Sep;40(3):144-51.
26. Mainbolagh BL, Rakhshani F, Zareban I, et al. The effect of peer education based on health belief model on nutrition behaviors in primary school boys. J Research Health. 2012Fall-Win;2(2):214-25.
27. Stock S, Miranda C, Evans S, Plessis S, Ridley J, Yeh S, Chanoine JP. Healthy Buddies: a novel, peer-led health promotion program for the prevention of obesity and eating disorders in children in elementary school. Pediatrics. 2007 Oct;120(4):e1059-68.
28. White S, Park YS, Israel T, Cordero ED. Longitudinal evaluation of peer health education on a college campus: impact on health behaviors. J Am Coll Health. 2009 Mar-Apr;57(5):497-505.
29. Al-Ansari JM, Honkala S. Gender differences in oral health knowledge and behavior of the health science college students in Kuwait. J Allied Health. 2007 Spring;36(1):41-6.
30. Halpern DF, LaMay ML. The Smarter Sex: A Critical Review of Sex Differences in Intelligence. Educ Psychol Rev. 2000Jun;12:229-46.
31. Al Subait AA, Alousaimi M, Geeverghese A, Ali A,Metwally A. Oral health knowledge, attitude and behavior among students of age 10-18 years old attending Jenadriyah festival Riyadh; a cross-sectional study. The Saudi Journal for Dental Research. 2016Jan;7(1):45-50.
32. Al-Ansari JM, Honkala S. Gender differences in oral health knowledge and behavior of the health science college students in Kuwait. J Allied Health. 2007 Spring;36(1):41-6.
33. Amin TT, Al-Abad BM. Oral hygiene practices, dental knowledge, dietary habits and their relation to caries among male primary school children in Al Hassa, Saudi Arabia. Int J Dent Hyg. 2008 Nov;6(4):361-70.
34. Hamilton ME, Coulby WM. Oral health

knowledge and habits of senior elementary school students. J Public Health Dent. 1991 Fall;51(4):212-9.
35. D'Cruz AM, Aradhya S. Impact of oral health education on oral hygiene knowledge, practices, plaque control and gingival health of 13- to 15-year-old school children in Bangalore city. Int J Dent Hyg. 2013 May;11(2):126-33.
36. Carneiro L, Kabulwa M, Makyao M, Mrosso G, Choum R. Oral health knowledge and practices of secondary school students, tanga, Tanzania. Int J Dent. 2011;2011:806258.
37. Lian CW, Phing TS, Chat CS, Shin BC, Baharuddin LH, Jalil ZB. Oral health knowledge, attitude and practice among secondary school students in Kuching, Sarawak. Arch orofac Sci. 2010;5(1):9-16.
38. Joshi N, Rajesh R, Sunitha M. Prevalence of dental caries among school children in Kulasekharam village: a correlated prevalence survey. J Indian Soc Pedod Prev Dent. 2005 Sep;23(3):138-40.
39. Abdi F, Simbar M. The Peer Education Approach in Adolescents- Narrative Review Article. Iran J Public Health. 2013 Nov;42(11):1200-6.
40. Powers AR, Struempler BJ, Guarino A, Parmer SM. Effects of a nutrition education program on the dietary behavior and nutrition knowledge of second-grade and third-grade students. J Sch Health. 2005 Apr;75(4):129-33.