**Effectiveness of Two Interactive Educational Methods to Teach Tobacco Cessation Counseling to Senior Dental Students**

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**ABSTRACT**

**Background and Aim:** Nowadays, one of the major health problems in many countries is tobacco use. Dental professionals are in a unique position to promote smoking cessation due to the opportunity for regular interaction with their patients. The purpose of the present study was to compare the effectiveness of two educational methods to teach tobacco cessation counseling (TCC) in dental practice for senior dental students. **Materials and Methods:** In this interventional study, sixty six senior dental students from Tehran and Shahid Beheshti Dental Schools participated. The students were randomly divided into two groups. Two educational programs, role play and problem-based learning, with the same aim about TCC in dental practice were developed and implemented for the two groups. The score of knowledge, attitude and skill were determined in both groups before and after participation in the course by means of a questionnaire. The changes in the scores from pre-test to post-test were statistically analyzed by repeated measure ANOVA test. **Results:** Total scores of knowledge, attitude and skill of the participants showed improvements when compared to scores before training (P< 0.001, P=0.003 & P< 0.001, respectively). However, the differences between the two study methods were statistically insignificant (P> 0.05). **Conclusion:** The results suggested that TCC training through role playing and problem-based learning method leads to improvement in knowledge, attitude and skills of dental students in short-term evaluation. **Key words:** Training method, Tobacco cessation counseling, Dental students, Role play, Problem-based learning.

**INTRODUCTION**

Nowadays, one of the major health problems in many countries is tobacco use.1 Dependence on tobacco, is considered as a chronic disease and one of the known risk factors for more than 40 diseases including heart and cardiovascular disease, 2, 3 respiratory disease, diabetes, and even death.4, 5 The leading cause of death by the year 2030 is expected to be tobacco use.6

In addition to its detrimental effects on general health, smoking leads to some undesirable effects on oral health. These effects includes: staining the teeth and fillings, halitosis, loss of taste sensation or salivary changes, root caries, soft tissue changes, acute necrotizing ulcerative gingivitis, increasing the risk of bone loss, and eventually tooth loss. More importantly, smoking is a risk factor for oral leukoplakia, and oral and pharyngeal cancer. Moreover, failure of osteointegration in dental implant, impaired oral wound healing, increased gingival recession, and failure of periodontal therapy are the negative effects of smoking on dental treatments.7

Based on current estimates, over 10 million smokers exist in Iran, and mortality due to smoking in these individuals is estimated to be about 70000 people per year. The overall prevalence of tobacco use in men in 1994 was 12.6%, increased to 16.3% in 1998.8 The overall prevalence of tobacco consumption (current and daily) among Iranians aged15-64 years was recently estimated at 12.5%; the rate among male was 23.4% and only 1.4% among females.2

The increasing trend of smoking in Iran calls for comprehensive tobacco cessation programs designed and implemented by health professionals. Dental professionals are in a unique position to promote smoking cessation due to the opportunity for regular interaction with their patients.9, 10
Interventions in enhancing smoking cessation counseling with supportive medical treatments such as nicotine replacement and bupropion therapy may increase rates of smoking cessation.11-13 Based on information available, from 5 to 10% of successful cessation cases can be resulted from cessation activities in dental centers.14

The Five A`s protocol provides a useful framework for general practitioners to provide their patients with effective cessation counseling. The protocol comprised five steps: Asking about tobacco use, Advising cessation, Assessing willingness to quit, Assisting the patient in making a quit attempt, and Arranging follow up to prevent relapse.10

 Dental practitioners in Iran seem not to receive sufficient training in smoking cessation since no comprehensive educational program exists in undergraduate national dental curriculum. To address this shortcoming, recently some studies have been done to investigate efficacy of such programs.15 An important factor in successfulness of a training program is the method of education.

The purpose of the present study was to compare the effectiveness of two educational methods to teach tobacco cessation counseling (TCC) in dental practice for senior dental students in Tehran and Shahid Beheshti Dental Schools, Tehran, Iran.

**METHODS**

**Study Subjects and Interventions**

The research project was approved by the Istitutional Review Board at Tehran University of Medical Sciences. In this interventional study, the study population comprised senior dental students from Tehran and Shahid Beheshti Dental Schools, the two foremost dental schools of the country. All the senior dental students of the two schools were asked to participate in the study if they want. The same programs with same instructors were conducted in the two schools separately.

First, all of the participants in each school participated in the first session that was a 2-3 hour lecture about the effects of tobacco on oral health and tobacco cessation counseling process. At the end of the first session, the students in each school were randomly divided into two groups: role play (Role play: RP) and problem-based learning (Problem-based Learning: PBL). Three scenarios were distributed between members of each group. Each group then formed three small groups (3-6 students) to work on the scenarios. In each scenario the patient was in a different stage of quit (ready to quit, thinking about quit & resistance to quit).

In RP group the students were asked to design a play representing conversation between dentist and patient according to existent scenarios for the next session. In the second session after one week, every scenario was performed in 10-15 minutes by two students and at the end of each play the performance and its strengths and weakness were discussed by the students and instructor.

In PBL group the students were asked to discuss, search and study about the questions in every scenario. The students presented their work in the next session after one week and discussion on their presentation was done by students and facilitated by the instructor.

**Questionnaire**

Before the first session lecture, and at the end of the second session, the students were asked to fill in an anonymous questionnaire. In addition to age, gender, and marital status the questionnaire requested information on the following items:

*Knowledge:* The students were asked to react to six statements on the stages of tobacco cessation counseling in a five-point Likert scale from strongly disagree to strongly agree. The students’ answers were scored from 1 to 5. By summing up the scores for 6 questions the knowledge score for each student (possible range from 6 to 30) was calculated.

*Attitude:* Nine questions assessed students’ attitude toward barriers against TCC in dental practice through a five-point Likert scale from strongly disagrees to strongly agree. Scoring the answers and calculating attitude score (possible range from 9 to 45) was don as described above.

*Skill:* In this part, three patient paper cases were presented to the students. Each case represented a patient in a certain stage of tobacco cessation. The cases were almost similar to the ones the students worked on during their training, with some extra questions. Based on the student`s answers, skill scores of the students (possible range from 0 to 27) was calculated.

The students were asked to write a code at top of their questionnaires. For better recall they were advised to write the last four digits of their cell phone numbers. This code was used to assess individual changes throughout the study.

Validity and reliability of knowledge questions were evaluated and approved by performing a test-retest procedure on 15 students. Kappa coefficient calculated to be from 75% to 95 % in different questions. Attitude and skill questions were extracted from previous studies15, 16 with approved validity and reliability.

**Statistical Analysis**

The data was entered to SPSS software. *Repeated measure ANOVA* test served for statistical analysis. In the test knowledge, attitude and skill before and after training were considered as*repeated factors* and the training method as a *between subject factor.*

**RESULTS**

Fifty students from Tehran Dental School and forty three students from Shahid Beheshti Dental School participated in pre-test. Sixty three students participated in post-test (27 students from Tehran Dental School and 39 students from Shahid Beheshti Dental School). The response rate was 73%.

Thirty students were trained through RP method, (60% female, mean age 24.6± 1.6) and 36 students were trained through PBL method (61% female, mean age 24.9± 5.7).

In RP group twenty six (87%) students were single and in PBL group twenty seven students (75%) were single.

Percentages of favorable answers to knowledge questions before and after the training program on tobacco cessation counseling in both groups (RP & PBL) is demonstrated in **Table 1**. Before and after training in both RP and PBL group the most correct answers was observed for question 1 (related to first stage of 5 A`s protocol).

**Table 2** shows percentages of favorable answers to attitude questions before and after the training program in both groups. Before the training, in both RP and PBL group the majority of students indicated that lack of knowledge and confidence in conducting tobacco cessation counseling is the most important barrier to tobacco cessation counseling. After the training in both RP and PBL groups the most alterations in responding to the desirable answer was in third question that was about lack of dentist’s time (**Table 2**).

The frequency of correct responses to the skill questions in both RP and PBL group is demonstrated in **Table 3**. Before the training in both RP and PBL group the most correct answer was to third question. After the training in RP group the most correct answers were to third, fifth and eighth questions, and in PBL group to third, fourth and ninth questions (appendix1)

As it can be seen in **Table 4** after the training the average knowledge score of students significantly improved in both RP and PBL group (p< 0.001). But the differences between two groups (study methods) was insignificant before and after training (p= 0.13). Similar improvement occurred in attitude scores of the students (p=0.003). But the differences between two groups (study methods) was insignificant in both before and after training (p>0.05). The average score of students in skill section was significantly increased in both RP and PBL group (p< 0.001). But the differences between two groups (study methods) was insignificant in both before and after training (p>0.05).

**DISCUSSION**

In this interventional study, we compared the effectiveness of two educational methods for training senior dental students in tobacco cessation counseling. The results indicated that both methods improved knowledge, attitude and skill of the students at short term follow up with no significant difference.

Data collection tool in the present study was a questionnaire benefiting from a previously designed valid and reliable questionnaire and being tested for validity and reliability of its new part. A Likert scale was used to measure the result of knowledge and attitude section, which provided a wider range of responses. The specific code of each participant made assessment of individual change possible. On the other hand, using self-administered questionnaires might lead to imprecise measurements of students’ performance, and it is possible that students complete the questionnaires based on social desirability. In this case, results would be an optimistic estimate of the real situation.17, 18 Additionally, this study did not explore the long-term impact of training on knowledge, attitude and skill of students.

Similar studies that were carried out about training TCC with Role Play method, indicated that this method is effective in improving knowledge, attitude and skill`s scores. We couldn`t find any similar studies about TCC using PBL method.15, 19, 20, 21, 22, 23

Mean knowledge scores were significantly increased after training in both RP and PBL group.

In a similar study by Walsh et al. (2007) with standardized patients, a significant increase in objective knowledge about tobacco cessation counseling was reported.21In the mentioned pilot study, knowledge and skill score of participants increased after training, these results are consistent with those of our study. Walsh et al study was conducted on a groups of dentists and residents and the lectures on general health hazards of smoking were given by cancer specialists; whereas, the present study was conducted on dental students and lectures were given by oral health specialists who, compared to cancer specialists, had a more comprehensive knowledge about the periodontal tissues and smoking-related oral lesions as well as precancerous and cancerous lesions. Thus they could provide students with greater knowledge in this respect. In another study, a lecture method improved knowledge and skills of students in tobacco cessation counseling.24  In another study on dental hygienists using standardized patients statistically significant improvement also was detected in the knowledge of subjects.13

Regarding attitude toward tobacco cessation in dentistry, the students reported lack of knowledge and confidence in conducting TCC as the most important barriers to tobacco cessation counseling. In a similar study, Ebn Ahmady et al, reported patient`s resistance and lack of supportive organizations in developing tobacco cessation as the most important barriers to tobacco cessation counseling from the students’ point of view.16

In a UK study, dentists indicated that lack of time and training facilities for tobacco cessation counseling were the most important barriers.25

The average score of students in attitude section was significantly increased after training in both RP and PBL group. In similar study that was carried out on dental students, using training and practice opportunities, results showed improvement in student`s attitude after training.26 Another study on dental and dental hygienist students reported that virtual training though CD-ROM was able to improve students’ knowledge and attitude.27

The average score of students in skill section was significantly increased after training in both RP and PBL group.

Cornuz et al, in 2002 evaluated the efficacy and the outcome of smoking cessation counseling training program for internal medicine residents using standardized patients.19 The training program on smoking cessation could significantly improve the quality of physicians' counseling and increase smokers' motivation to quit and rates of abstinence from smoking among patients during the one year follow up. Also, Ebn Ahmady et al. using standardized patients in training tobacco cessation counseling on dental students reported improvement in skills and self-confidence of students.15

Standard patient method also was used by Foley et al. in 2006 on medical students. They reported positive educational results and emphasized on the important role of standardized patients in improving the quality of smoking cessation counseling offered by students.23

**CONCLUSION**

The results suggested that tobacco cessation counseling training through role playing and problem-based learning method leads to improvement in knowledge, attitude and skills of dental students in short-term evaluation However, the differences between the two study methods remained statistically insignificant. It is suggested that in further studies these two methods are compared to standardized patient method which has been used widely for training dental professionals in tobacco cessation counseling.

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**TABLES**

|  |  |  |
| --- | --- | --- |
|  | Role play group | Problem based learning group |
| Pre-testn=30% | Post-testn=30% | Pre-testn=36% | Post-testn=36% |
| 1. Ask is the first stage of 5`A | 63.3 | 86.7 | 55.6 | 97.2 |
| 2. We prescribe NRT if it is necessary in Advice stage  | 16.6 | 43.3 | 13.9 | 50 |
| 3. If we realize in Assess stage that the patient is unwilling to quit, we advice him/her to quit again  | 23.4 | 40 | 19.4 | 44.5 |
| 4. Advice is the third stage of 5A | 36.7 | 76.6 | 30.5 | 94.4 |
| 5. We set a quit date in Assist stage | 60 | 86.6 | 16.7 | 80.5 |
| 6. We don’t arrange to quit for patients unwilling to quit | 13.3 | 26.7 | 16.7 | 52.7 |

**Table1. Percentages of favorable answers to knowledge questions before and after conducting a training program on tobacco cessation counseling through role play (n=30) and problem-based Learning (n=36) methods for a group of senior dental students.**

The correct answer in questions 1, 5 and 6 was considered “totally agree” and “agree” and in questions 2, 3 and 4 was considered “totally disagree” and “disagree

**Table2**. **Percentages of favorable answers to attitude questions (barriers against tobacco cessation counseling in dental practice) before and after conducting a training program on tobacco cessation counseling through role play (n=30) and problem-based Learning (n=36) methods for a group of senior dental students.**

|  |  |  |
| --- | --- | --- |
|  | Role play group | Problem based learning group |
| Pre-testn=30% | Post-testn=30% | Pre-testn=36% | Post-testn=36% |
| 1. Patient’s resistance to advice | 13.4 | 23.3 | 2.8 | 13.9 |
| 2. Smoking is a private matter | 66.7 | 66.6 | 72.3 | 69.4 |
| 3. Lack of sufficient time  | 33.4 | 66.7 | 24.4 | 72.2 |
| 4. Lack of supportive organization in developing TCC | 6.7 | 10 | 8.4 | 5.6 |
| 5. Lack of training facilities for TCC in dental settings | 63.3 | 66.7 | 77.7 | 80.5 |
| 6. Lack of confidence in conducting TCC | 73.4 | 73.3 | 88.9 | 100 |
| 7. Lack of knowledge about TCC method | 80 | 80 | 86.1 | 97.2 |
| 8. Dentist’s preference to provide dental treatments instead of counseling | 46.7 | 60 | 61.1 | 58.4 |
| 9. No reimbursement system for TCC in dental settings | 40 | 50 | 27.8 | 52.7 |
| 10. Risk of losing the patients | 60 | 76.7 | 44.4 | 55.6 |

**Table3.** **Percentages of correct answers to skill questions before and after conducting a training program on tobacco cessation counseling through role play (n=30) and problem-based Learning (n=36) methods for a group of senior dental students.**

|  |  |  |
| --- | --- | --- |
|  | Role play group | Problem based learning group |
| Pre-testn=30% | Post-testn=30% | Pre-testn=36% | Post-testn=36% |
| Question 1 | 60.7 | 60 | 66.7 | 83.3 |
| Question 2 | 53.3 | 63.3 | 36.1 | 13.9 |
| Question 3 | 90 | 90 | 83.3 | 97.2 |
| Question 4 | 43.3 | 86.7 | 33.3 | 97.2 |
| Question 5 | 70 | 90 | 58.3 | 88.9 |
| Question 6 | 76.7 | 70 | 77.8 | 72.2 |
| Question 7 | 46.7 | 50 | 50 | 44.4 |
| Question 8 | 30 | 90 | 36.1 | 91.7 |
| Question 9 | 63.3 | 80 | 66.7 | 97.2 |

**Table4.** **Mean scores and standard deviations of knowledge, attitude and skill before and after conducting a training program on tobacco cessation counseling through role play (n=30) and problem-based Learning (n=36) methods for a group of senior dental students.**

|  |  |  |
| --- | --- | --- |
| Mean(SD) | Role play group | Problem based learning group |
| Pre-testn=30 | Post-testn=30 | Pre-testn=36 | Post-testn=36 |
| knowledge | 18.2(2.4) | 21.3(3.0) | 18.6(1.9) | 23.2(3.7) |
| attitude | 35.4(5.8) | 36.9(5.4) | 35.8(5.1) | 38.5(5.6) |
| skill | 16.6(5.8) | 20.7(6.8) | 15.4(7.1) | 20.6(3.1) |

**APPENDIX1**

**Skill Questions**

**scenario1:**

Mr Rezaei, a 38 years old patient with advanced localized periodontitis , leukoplakia and pigmentations due to tobacco use, comes to you. You tell him about disadvantages of tobacco use, but he stands up and tells you “I like to smoke, why everyone tells me to quit? I do not want to quit. My grandfather has been smoking for 40 years and he is still alive”.

1. What should you do according to the stage of change that Mr Rezaei is in it?

a. Not to try to talk to the patient about tobacco cessation

b. Talk to him about his opinion about tobacco cessation

c. Assisting the patient to decide on a correction program

d. I do not know

Mr Rezaei visits you for another examination after 6 months. He states that his grandfather hospitalized due to heart arrest and his death is expected. He looks so upset and tells you maybe it is the time that he should contemplate about quitting, but he is not ready now. He is under lots of pressure, but when he achieves his calmness he is willing to talk about cessation with you.

2. Which option describe the stage of change that Mr Rezaei is in it?

a. Assess

b. Assist

c. Ask

d. I do not know

3. How can you help him the best in this condition?

a. Listen to what he says and give him training information and brochures to read when he is ready (this information contains telephone numbers, web sites and enough informations about cessation)

b. Not to talk because you prefer not to speak nonsense

c. Approve him and tell him to continue smoking until he is out of stress

d. I do not know

**scenario2:**

Mrs Rajabi is a 47 years old patient that is willing to have dental implants. Her periodontist has told her if she wasn`t smoker she would have better results in her treatment. She had tried to quit last year but after 2 weeks a family crisis caused her to smoke again. Now her periodontist refuses to put in implants because quitting for at least 6 months is prerequisite for treatment. Mrs Rajabi has decided to quit and wants you to help her.

4. Which option describes the stage of change that the patient is in it?

a. Roadblocks

b. Assist

c. Relevance

d. I do not know

5. Which one cannot be a part of the quit planning for Mrs Rajabi?

a. Set a quit date

b. Smoke as much as she does not want to smoke any more

c. Deciding on a executive program

d. I do not know

6. Which one has a more important role in bone loss around the implant?

a. Inflammation caused by plaque accumulation

b. Occlusion forces

c. Dry mouth

d. I do not know

7. Why her periodontist refuse implant placement?

a. Tooth loss and mobility is 4.5 times more in smokers compare to non-smokers

b. Peri-implantitis

c. Dry mouth

d. I do not know

**scenario3**:

You are treating a 35 years old patient (Mrs Mohseni) in clinic, while she voluntary declared that she is willing to quit. She had tried to quit several times before and it seems that she couldn’t do it alone and she wants you to help her.

8. Which option describes the stage of change that the patient is in it?

a. Assess

b. Assist

c. Repetition

d. I do not know

9. At first we should determine if Mrs Mohseni is physically dependent to nicotine or not. Which questions can help you in definite diagnosis?

a. How many cigarettes does she smoke every day?

b. How soon after waking up does she tend to smoke?

c. Both of them

d. I do not know