

# Effectiveness of two interactive educational methods to teach tobacco cessation counseling for senior dental students

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## ABSTRACT

**Objective:** Nowadays, one of the major health problems in many countries is tobacco use. Dental professionals are in a unique position to promote smoking cessation since they have 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, 93 eligible senior dental students from two dental schools in Tehran, Iran were randomly divided into two groups. Two educational programs, role play (RP) and problem-based learning (PBL), 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 using a questionnaire. The changes in the scores from pre- to post-test were statistically analyzed using repeated measure ANOVA test. **Results:** Total scores of knowledge, attitude, and skill of the participants showed improvements when compared to scores before training ( $P < 0.001$ ,  $P = 0.003$ , and  $P < 0.001$ , respectively). However, the differences between the two study methods were statistically insignificant ( $P > 0.05$ ). **Conclusion:** The results suggested that TCC training through RP and PBL methods leads to improvement in knowledge, attitude, and skills of dental students in the short-term evaluation.

**Key words:** Counseling, dental, problem-based learning, role play, teaching, tobacco use cessation

## INTRODUCTION

Tobacco use is one of the major health problems in many countries.<sup>[1]</sup> Dependence on tobacco is considered a chronic disease and one of the known risk

factors for more than 40 diseases including heart and cardiovascular disease, respiratory disease, diabetes,

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and even death.<sup>[2-5]</sup> If current trends continue, the leading cause of death by the year 2030 is expected to be tobacco use that would exceed 8 million/year.<sup>[1,6]</sup>

In addition to its detrimental effects on general health, smoking leads to such undesirable effects on oral health as increasing the prevalence and severity of periodontitis, increasing the risk for oral cancer and edentulism, and failure of osteointegration in a dental implant.<sup>[1,3,4,7]</sup>

Based on current estimates, over 10 million smokers exist in Iran, and mortality due to smoking in these individuals is estimated to be about 70,000 people/year. The overall prevalence of tobacco uses in the country among men in 2010 was 19.8%, decreasing to 18.7% in 2015.<sup>[8]</sup> Moreover, according to the WHO (2010), the overall prevalence of tobacco consumption (current and daily) among 15–64 years old Iranians has been 12%: 22% among males and only 1% among females.<sup>[8]</sup>

The prevalence of smoking in Iran calls for comprehensive tobacco cessation programs designed and implemented by health professionals. During a routine care, health professionals can effectively promote quit rate.<sup>[7,9]</sup> Dental professionals are in a unique position to promote smoking cessation since they have the opportunity for regular interaction with their patients.<sup>[1,4,6,10,11]</sup> Based on information available, from 5% to 10% of successful cessation cases can be resulted from cessation activities in dental centers.<sup>[12]</sup>

The five-step protocol known as “5 As” provides a useful framework for general practitioners to provide their patients with effective cessation counseling. The protocol comprised five steps of 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.<sup>[10,11,13]</sup> Evidence indicates that implementing the “5 As” protocol provides promotion in tobacco cessation.<sup>[11]</sup> However, lack of training and knowledge on integrating tobacco cessation counseling (TCC) in practice has led to self-reported incompetency by health professionals.<sup>[7,13,14]</sup>

Many studies have revealed gaps in health professionals’ education regarding TCC.<sup>[11,13-15]</sup> Similarly, dental practitioners in Iran seem not to receive sufficient training on TCC since no comprehensive course on the subject exists in the undergraduate national dental curriculum. To address this shortcoming, recently some studies have been done to investigate the efficacy of such

programs.<sup>[16]</sup> An important factor in successfulness of a training program is the method of education. Problem-based learning (PBL) as an active learning approach would develop adult learning skills through its self-direction and problem-solving nature as well as clinical reasoning, teamwork, and interpersonal communication characteristics; as all of these skills lead to lifelong learning and better preparation of students for their professional careers.<sup>[17]</sup> On the other hand, role play (RP) is another active learning method that promotes students learning by doing the skills they need to apply in clinical practice.<sup>[18]</sup>

The purpose of this study was to compare the effectiveness of two educational methods to teach TCC in dental practice for senior dental students in two dental schools in Tehran, Iran.

## MATERIALS AND METHODS

### Study subjects and interventions

The research project was approved by the Research Ethics Committee at Tehran University of Medical Sciences. In this interventional study conducted in 2013, the study population comprised senior dental students of the two oldest governmental dental schools of Iran, located in Tehran, the capital of the country. Of these students ( $n = 116$ ), those students attending community dentistry course at the time of the study ( $n = 93$ ) were asked to participate in the study if they want. As an extra activity in community dentistry course, a program on TCC with the same structure and instructors (three faculty members from the two schools) was designed to be delivered through two educational methods of RP and PBL.

First, all the participants in each school participated in the first session that was a 2–3-h lecture about the effects of tobacco on oral health and TCC process. At the end of the first session, the students in each school were randomly divided into two groups: RP and PBL. Three scenarios were distributed among 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 and resistance to quit).

In RP group the students were asked to design a play representing a conversation between dentist and patient according to existent scenarios for the next session. In the second session after 1 week, each scenario was performed in 10–15 min 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 the questions in every scenario. The students presented their work in the next session after 1 week. Discussion on their presentation was done by students and facilitated by the instructor.

### Questionnaire

Before the first session, 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 TCC in a five-points Likert scale from strongly disagree to agree strongly. The students' answers were scored from 1 to 5. By summing up the scores for six questions, the knowledge score for each student (possible range from 6 to 30) was calculated.

#### Attitude

Ten questions assessed students' attitude toward barriers against TCC in dental practice through a five-point Likert scale from least important to most important. Scoring the answers and calculating attitude score (possible range from 10 to 50) was done 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 as described above.

The students were asked to write a unique code at the top of their both pre- and post-test questionnaires. This code was used to assess individual changes throughout the study.

Two experts in community oral health and one expert in TCC assessed the validity of knowledge part of the questionnaire. Reliability of knowledge questions was 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 studies<sup>[16,19]</sup> with approved validity and reliability.

### Statistical analysis

The data were entered into SPSS software, version 22 for windows (SPSS Inc., Chicago, IL, USA). Repeated measure ANOVA test served for statistical analysis. The significance level was set at  $P < 0.05$ . In the test, knowledge, attitude, and skill before and after training were considered repeated factors and the training method as a between subject factor.

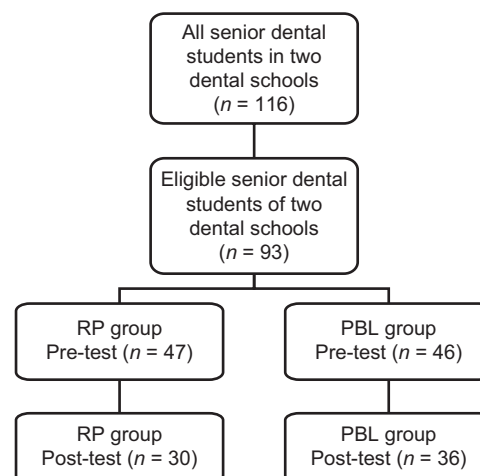
## RESULTS

From the total 93 students, completing pretest questionnaire and attending the program (47 in RP and 46 in PBL groups), 66 students completed also posttest questionnaire (response rate = 71%) [Figure 1].

Of these 66 students, thirty students were trained through RP method, (60% female, mean age  $24.6 \pm 1.6$ ) and 36 students were trained through PBL method (61% female mean age  $24.9 \pm 5.7$ ). In RP group 23 students (87%) and in PBL group 27 students (75%) were single.

Percentages of favorable answers to knowledge questions before and after the training program on TCC in both groups (RP and PBL) are demonstrated in Table 1. Before and after training in both RP and PBL group, the most correct answers were observed for question 1 (related to the first stage of 5A'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



**Figure 1:** Flow chart of the interventional study on senior dental students

RP and PBL groups the majority of students reported that lack of knowledge and lack of confidence in conducting TCC were the most important barriers. After the training in both RP and PBL groups, the most alterations in responding to the desirable answer was in the third question that was about the lack of dentist's time [Table 2].

As it can be seen in Table 3, no significant difference exists between the two groups regarding the knowledge, attitude, and skill of the participants. After the training the average knowledge score of students significantly improved in both RP and PBL group ( $P < 0.001$ ). However, the differences between two groups in posttest occasion remained insignificant ( $P > 0.05$ ).

**Table 1: 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**

	Role play group (n=30)		Problem-based learning group (n=36)	
	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)
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	50.0
3. If we realize in assess stage that the patient is unwilling to quit, we advise him/her to quit again	23.4	40.0	19.4	44.5
4. Advice is the third stage of 5'A	36.7	76.6	30.5	94.4
5. We set a quit date in assist stage	60.0	76.6	16.7	80.5
6. We don't arrange to quit for patients unwilling to quit	13.3	26.7	16.7	52.7

\*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". NRT: Nicotine replacement therapy

**Table 2: 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 (n=30)		Problem-based learning group (n=36)	
	Pretest (%)	Posttest (%)	Pretest (%)	Posttest (%)
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	44.4	72.2
4. Lack of supportive organization in developing TCC	6.7	10.0	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	100.0
7. Lack of knowledge about TCC method	80.0	80.0	86.1	97.2
8. Dentist's preference to provide dental treatments instead of counseling	46.7	60.0	61.1	58.4
9. No reimbursement system for TCC in dental settings	40.0	50.0	27.8	52.7
10. Risk of losing the patients	60.0	76.7	44.4	55.6

\*The acceptable answer in Questions 5, 6 and 7 was considered as scores "4" and "5" showing these barriers as most important and in Questions 1, 2, 3, 4, 8, 9 and 10 was considered "1" and "2". TCC: Teach tobacco cessation counseling

**Table 3: 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	
	Pretest (n=30)	Posttest (n=30)	Pretest (n=36)	Posttest (n=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

SD: Standard deviation

A similar improvement occurred in attitude and skill scores of the students ( $P = 0.003$  and  $P < 0.001$ , respectively) without significant difference between the two groups in posttest occasion ( $P > 0.05$ ).

## DISCUSSION

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

Data collection tool in the present study was a questionnaire benefiting from a previously designed valid and reliable questionnaire<sup>[16,19]</sup> 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 an 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.<sup>[20,21]</sup> In addition, our study did not explore the long-term impact of training on knowledge, attitude, and skill of students. Moreover, this study focused on the self-reported practice of the students, which might be different from their performance in real life situation. We had a 30% attrition rate from pre- to post-test occasion due to unknown reasons. However, almost similar attrition rate between the two study groups can show that the attrition has not been related to the interventions.

Similar studies that were carried out about training TCC with RP method indicated that this method is effective in improving knowledge, attitude, and skill's scores.<sup>[15,16,22-24]</sup> We could not find any similar studies about TCC using PBL method.

In this study, mean knowledge scores of participants significantly increased after training in both RP and PBL group. In a similar study by Walsh *et al.* with standardized patients, a significant increase in objective knowledge about TCC was reported,<sup>[15]</sup> which is consistent with our findings. 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 in the US by Vendrell Rankin *et al.*, a lecture method in a continuing dental education course improved knowledge, attitude, and skills of dentists in TCC at 6-month follow-up.<sup>[25]</sup>

Regarding attitude toward tobacco cessation in dentistry, the students reported a lack of knowledge and confidence in conducting TCC as the most important barrier to TCC. In a similar study, Ebne *et al.*, reported patient's resistance and lack of supportive organizations in developing tobacco cessation as the most important barriers to TCC from the students' point of view.<sup>[19]</sup> In a UK study, dentists indicated that lack of time and training facilities for TCC was the most important barriers.<sup>[26]</sup>

The average score of students in attitude section significantly increased after training in both RP and PBL group. In a similar study on dental students, training on the subject along with providing practice opportunities, improved student's attitude.<sup>[27]</sup> Another study on dental and dental hygienist students reported that virtual training through CD-ROM was able to improve students' knowledge and attitude.<sup>[14]</sup>

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.<sup>[22]</sup> The training program on smoking cessation could significantly improve the quality of physicians' counseling. It also increased smokers' motivation to quit and rates of abstinence from smoking among patients during the 1-year follow-up.<sup>[22]</sup> Furthermore, Ebne *et al.* using standardized patients in training TCC on dental students reported improvement in skills and self-confidence of students.<sup>[19]</sup>

The 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.<sup>[24]</sup>

## CONCLUSION

The results suggested that TCC training through both RP and PBL method leads to improvement in knowledge, attitude, and skills of dental students in the 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 thorough standardized patient method which has been used widely for training dental professionals in TCC.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Warren CW, Sinha DN, Lee J, Lea V, Jones N, Asma S. Tobacco use, exposure to secondhand smoke, and cessation counseling training of dental students around the world. *J Dent Educ* 2011;75:385-405.
- Meysamie A, Ghaletaki R, Haghazali M, Asgari F, Rashidi A, Khalilzadeh O, *et al.* Pattern of tobacco use among the Iranian adult population: Results of the National Survey of Risk Factors of Non-Communicable Diseases (SuRFNCD-2007). *Tob Control* 2010;19:125-8.
- Nazir MA, Almas K. Awareness about the effects of tobacco consumption on oral health and the possibility of smoking behavior among male Saudi schoolchildren. *Eur J Dent* 2017;11:29-35.
- Sood P, Narang R, Swathi V, Mittal L, Jha K, Gupta A. Dental patient's knowledge and perceptions about the effects of smoking and role of dentists in smoking cessation activities. *Eur J Dent* 2014;8:216-23.
- Doll R. Fifty years of research on tobacco. *J Epidemiol Biostat* 2000;5:321-9.
- Mecklenburg RE. Tobacco Effects in the Mouth: A National Cancer Institute and National Institute of Dental Research Guide for Health Professionals: U.S. Department of Health and Human Services, Public Health Service: National Institute of Health; 1994.
- Gelskey SC. Tobacco-use cessation programs and policies at the University of Manitoba's faculty of dentistry. *J Can Dent Assoc* 2001;67:145-8.
- World Health Organization. WHO Global Report on Trends in Tobacco Smoking 2000-2025. Available from: <http://www.who.int/tobacco/publications/surveillance/reportontrendstobaccosmoking/en/>. [Last cited on 2017 Jun 18].
- Carson KV, Verbiest ME, Crone MR, Brinn MP, Esterman AJ, Assendelft WJ, *et al.* Training health professionals in smoking cessation. *Cochrane Database Syst Rev* 2012;16:CD000214.
- Watt RG, Johnson NW, Warnakulasuriya KA. Action on smoking – Opportunities for the dental team. *Br Dent J* 2000;189:357-60.
- Agaku IT, Ayo-Yusuf OA, Connolly GN. Tobacco cessation training among dental and other health professions students in eight low-and middle-income countries. *J Dent Educ* 2014;78:75-84.
- Ghasemi H, Murtomaa H, Torabzadeh H, Vehkalahti MM. Perceived barriers to the provision of preventive care among Iranian dentists. *Oral Health Prev Dent* 2009;7:339-46.
- Shibly O. Effect of tobacco counseling by dental students on patient quitting rate. *J Dent Educ* 2010;74:140-8.
- Gordon JS, Severson HH, Seeley JR, Christiansen S. Development and evaluation of an interactive tobacco cessation CD-ROM educational program for dental students. *J Dent Educ* 2004;68:361-9.
- Walsh SE, Singleton JA, Worth CT, Krugler J, Moore R, Wesley GC, *et al.* Tobacco cessation counseling training with standardized patients. *J Dent Educ* 2007;71:1171-8.
- Tabibzadeh NZ, Atapour S, Ebn AA. The effects of simulated patient training on senior dental students' confidence and skills in delivering a tobacco cessation counseling program in school of dentistry. *J Dent Sch Shahid Beheshti Univ Med Sci* 2012;29:289-97.
- Bassir SH, Sadr-Eshkevari P, Amirikhorheh S, Karimbux NY. Problem-based learning in dental education: A systematic review of the literature. *J Dent Educ* 2014;78:98-109.
- Humair JP, Cornuz J. A new curriculum using active learning methods and standardized patients to train residents in smoking cessation. *J Gen Intern Med* 2003;18:1023-7.
- Ebne AA, Ayremlou S, Gol MS, Khoshnevisan MH. Barriers limiting involvement of Iranian senior dental students in tobacco cessation program. *J Dent Sch Shahid Beheshti Univ Med Sci* 2011;29:199-206.
- Sjöström O, Holst D, Lind SO. Validity of a questionnaire survey: The role of non-response and incorrect answers. *Acta Odontol Scand* 1999;57:242-6.
- Sjöström O, Holst D. Validity of a questionnaire survey: Response patterns in different subgroups and the effect of social desirability. *Acta Odontol Scand* 2002;60:136-40.
- Cornuz J, Humair JP, Seematter L, Stoianov R, van Melle G, Stalder H, *et al.* Efficacy of resident training in smoking cessation: A randomized, controlled trial of a program based on application of behavioral theory and practice with standardized patients. *Ann Intern Med* 2002;136:429-37.
- Amemori M, Virtanen J, Korhonen T, Kinnunen TH, Murtomaa H. Impact of educational intervention on implementation of tobacco counselling among oral health professionals: A cluster-randomized community trial. *Community Dent Oral Epidemiol* 2013;41:120-9.
- Foley KL, George G, Crandall SJ, Walker KH, Marion GS, Spangler JG. Training and evaluating tobacco-specific standardized patient instructors. *Fam Med* 2006;38:28-37.
- Vendrell Rankin K, Jones DL, Crews KM. Tobacco cessation education for dentists: An evaluation of the lecture format. *J Cancer Educ* 2010;25:282-4.
- Johnson NW, Lowe JC, Warnakulasuriya KA. Tobacco cessation activities of UK dentists in primary care: Signs of improvement. *Br Dent J* 2006;200:85-9.
- O'Donnell JA, Hamilton MK, Markovic N, Close J. Overcoming barriers to tobacco cessation counselling in dental students. *Oral Health Prev Dent* 2010;8:117-24.