

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

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ABSTRACT

Aim: To assess and compare the effectiveness of two interactive educational methods in teaching tobacco cessation counseling (TCC) in dental practice among the clinical dental students of a dental school in Virajpet, Karnataka.

Materials and methods: An interventional single-blind study was conducted among all the third- and final-year Bachelor of Dental Surgery (BDS) students of a dental school. A total of 74 students participated. There were two groups—in one group, problem-based learning (PBL) method, and in the other group, roleplay (RP) method was used for TCC training. Questionnaire was used to assess the knowledge and attitude on TCC before and after training. There were six knowledge-based and 10 attitude-based questions. Descriptive statistics included mean, standard deviation, frequency, and percentage. Inferential statistics included the Chi-squared test. Statistical Package for the Social Sciences (SPSS) was used for the analysis.

Results: In both the groups before training, the majority of the students reported a lack of knowledge and confidence in conducting the TCC. There were no statistically significant differences in knowledge- and attitude-based questions between RP and PBL groups in pre- and posttest results. Pretraining results showed a lack of knowledge, confidence, and time among the students in conducting TCC. Knowledge and attitude both had shown a statistically significant difference between pre- and post-training in TCC in both groups.

Conclusion: The study reveals there is a need to develop innovative and educational initiatives. It is very important for the students to know how to overcome the gap between the theoretical knowledge and the practical aspect of TCC.

Clinical significance: Dentists play an important role in promoting a healthy lifestyle by incorporating tobacco cessation programs into their practice. Using different methods in training will develop skills that will lead to lifelong learning and better preparation of students for their professional careers.

Keywords: Dental students, Interactive educational methods, Interventional study, Problem-based learning, Roleplay, Tobacco cessation counseling.

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INTRODUCTION

India has one of the highest age-adjusted incidence rates of oral cancer in the world. More than 1 million adults die each year in India due to tobacco use, accounting for 9.5% of overall deaths. It has huge physical, mental, social, and economic implications for our country. Around 28.6% of all adults in India consume tobacco, either in smoked or smokeless form, including 42.4% of men and 14.2% of women. Even among adolescents, tobacco use prevalence is 19% for males and 8% for females. Use of tobacco has been associated with impoverishment. Despite the existence of practiced laws for many years, the burden of tobacco use continues to remain high in India. Preventive strategies can play a pivotal role in reducing these implications.^{1,2}

Tobacco has been the most dangerous preventable risk factor for oral cancer over the decades, and dentists are the first ones to see the effects of tobacco in the mouth, and they are one of the health professionals who are frequently in contact with the general population.³ Therefore, dentists play an important role in promoting healthy lifestyle by incorporating tobacco cessation programs into their practice.⁴⁻⁶

Tobacco cessation counseling (TCC) has a five-step protocol known as 5A's, which is a framework to the dentists to provide an effective counseling. Studies have shown that 5A's protocol provides promotion in tobacco cessation. However, there is self-reported incompetency by health professionals due to lack of

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confidence, training practice, time and resistance, and knowledge on integrating TCC.^{4,5,7}

An important factor that plays an important role in proper training and increasing knowledge is the method of education.⁷ In India, the curriculum barely mentions the TCC and therapy. It is not yet a part of routine dental practice, and lecturing is the most common teaching method used in the dental schools. Other active learning approaches are there for education, which are not commonly used in daily practice.⁴ Problem-based learning (PBL) is an active learning approach that develops adult learning skills through its self-direction and problem-solving nature, as well as clinical reasoning, teamwork, and interpersonal communication characteristics. On the other side, roleplay (RP) is also an active learning approach method that promotes students' learning by doing the skills they need to apply in clinical practice.⁷ Studies have shown that dental students generally report feeling unprepared to counsel tobacco-using patients to quit because of a lack of knowledge and confidence in the effectiveness of such measures. Culture of dentistry should change, and it is clear that TCC must be a part of the standard treatment plan for all patients.⁸ Students need to understand their role as counselors and what is expected out of them.⁴ So, using different methods in training will develop skills that will lead to lifelong learning and better preparation of students for their professional careers.^{7,8}

Although this aspect of dentist's responsibility is important, there are limited studies conducted in India concerning different methods used for effective TCC. Therefore, the aim and objective of the research is to compare the effectiveness of two educational methods to teach TCC in dental practice for clinical dental students of a dental school in Coorg, India.

MATERIALS AND METHODS

An interventional, single-blind study was conducted by two investigators among the clinical dental students of a dental school in Coorg, Karnataka. The effectiveness of two educational methods to teach TCC in dental practice among students was evaluated and compared. Samples included all the participants of all the third- and final-year Bachelor of Dental Surgery (BDS) students. There were 46 final-year students and 28 third-year students in the institute, and all of them participated in the study. A total of 74 students participated. Ethical approval was obtained from the Institutional Review Board. Prior to the study, informed written consent was taken from all the participants willing to participate. The study period was 2 months and was conducted from December 2018 to January 2019.

All the participants were given a lecture of 2 hours (using a Microsoft PowerPoint presentation) about the effects of tobacco on oral health and TCC process. At the end of this, all the students were randomly divided into two groups—RP and PBL by simple random sampling technique using the lottery method. Both groups had 37 participants in each. Three scenarios were distributed among members of each group, and each group formed smaller groups of three to six students to work on the scenarios. In each scenario, the patient would be in different stages of quitting the tobacco habit (ready to quit, thinking about quitting, and resistant to quitting). Once the scenarios were distributed to all the participants of each group, they were told to design and present the play. Two sessions were conducted for each group for this training, and both sessions were 1 week apart.

In the RP, in the first session, the students were asked to design a play representing a conversation between a dentist and a patient based on the patient's quitting stage. In the second session, students were asked to perform this play in 10–15 minutes. At the

end of the play, the strengths and weaknesses were discussed by the students and the investigator.

In the PBL group, the students were asked to discuss, search, and study the questions in every scenario in the first session. The students were asked to present their work in the next session after 1 week. Discussions on their presentation were done by students and investigator.

Data was collected using pretested, predesigned, and structured close-ended questionnaire.⁷ Before the first session and at the end of second session, students were asked to fill out a questionnaire. In addition to this, age and gender were asked. Totally, there were 19 questions. Questions included six items on knowledge of stages of TCC with responses yes, no, and don't know. Ten questions assessed the attitude of the students toward barriers against TCC in dental practice through a 5-point Likert scale from strongly agree to strongly disagree. In the skill part, three patient paper cases will be presented to each student. Each of the cases will represent a patient in a certain stage of tobacco cessation. The cases will be similar to what they worked on earlier during the training. The students were asked to write a unique code at the top of both their pre- and posttest questionnaires. Each participant took approximately 15 minutes to complete the questionnaire.

Data was collected, coded, and fed in the Statistical Package for the Social Sciences (SPSS) (IBM version 23) for analysis. The statistician was blinded. Interpretation of collected data was done by using appropriate statistical methods. Descriptive statistics included mean, standard deviation, frequency, and percentage. Inferential statistics included the Chi-squared test. The level of significance was set at 0.05 at a 95% confidence interval.

RESULTS

There was a total of 74 students who completed pretest and posttest questionnaire. Of these 74, 37 were trained through the RP method and 37 through the PBL method. There were 46 and 28 students of third- and final-year BDS, respectively. There were a total of 14 males and 60 females. Out of the total, in the RP group, there were five males and 32 females, and in the PBL group, there were 28 females and nine males. Mean age of the participants was 20.932 (0.689) years (Table 1).

Table 2 shows the comparison of the responses to knowledge-based questions between the RP and PBL groups in the pre- and posttest results. There was no statistically significant difference found between the groups. However, post-training results did show an improvement in the knowledge between the groups.

Table 3 shows the comparison of the responses to knowledge-based questions between pretest and posttest among RP and PBL groups. All the responses showed a difference between pre- and posttest in each group, and this was highly statistically significant. Only 16.2 and 10.8% of participants in the RP and PBL groups, respectively, knew if "ask" is the first stage of 5A's prior to the training. However, after the training, 91.9 and 75.7% of the participants knew both RP and PBL, respectively. The knowledge about 5A's had increased significantly after the training.

Table 1: Mean age of the participants

Age (in years)	Mean	Standard deviation
Total	20.932	0.689
RP	20.973	0.686
PBL	20.891	0.698

Table 2: Comparison of the responses to knowledge-based questions between RP and PBL groups among the pretest and posttest

Knowledge			Responses (%)			Chi-squared value	Significance
			Yes	No	Don't know		
Ask is the first stage of 5A's	Pre	RP	6 (16.2)	17 (45.9)	14 (37.8)	2.682	0.262 (nonsignificant)
		PBL	4 (10.8)	24 (64.9)	9 (24.3)		
	Post	RP	34 (91.9)	2 (5.4)	1 (2.7)	3.666	0.160 (nonsignificant)
		PBL	28 (75.7)	5 (13.5)	4 (10.8)		
We prescribe nicotine replacement therapy if it is necessary in the advice stage	Pre	RP	21 (56.8)	6 (16.2)	10 (27)	0.363	0.834 (nonsignificant)
		PBL	20 (54.1)	8 (21.6)	9 (24.3)		
	Post	RP	5 (13.5)	28 (75.7)	4 (10.8)	1.960	0.375 (nonsignificant)
		PBL	6 (16.2)	30 (81.1)	1 (2.7)		
We realize in the assessment stage that the patient is unwilling to quit, so we advise him/her to quit again	Pre	RP	10 (27)	13 (35.1)	14 (37.8)	4.011	0.135 (nonsignificant)
		PBL	4 (10.8)	12 (32.4)	21 (56.8)		
	Post	RP	19 (51.4)	17 (45.9)	1 (2.7)	4.206	0.122 (nonsignificant)
		PBL	27 (73)	10 (27)	0 (0)		
Advice is the third stage of 5A's	Pre	RP	10 (27)	5 (13.5)	22 (59.5)	1.490	0.475 (nonsignificant)
		PBL	12 (32.4)	2 (5.4)	23 (62.2)		
	Post	RP	8 (21.6)	23 (62.2)	6 (16.2)	3.056	0.217 (nonsignificant)
		PBL	3 (8.1)	29 (78.4)	5 (13.5)		
We set a quit date to assist	Pre	RP	1 (2.7)	17 (45.9)	19 (51.4)	2.669	0.263 (nonsignificant)
		PBL	4 (10.8)	19 (51.4)	14 (37.8)		
	Post	RP	29 (78.4)	7 (18.9)	1 (2.7)	4.340	0.114 (nonsignificant)
		PBL	35 (94.6)	2 (5.4)	0 (0)		
We don't arrange to quit for patients unwilling to quit	Pre	RP	19 (51.4)	8 (21.6)	10 (27)	0.293	0.864 (nonsignificant)
		PBL	17 (45.9)	8 (21.6)	12 (32.4)		
	Post	RP	5 (13.5)	32 (86.5)	0 (0)	2.902	0.199 (nonsignificant)
		PBL	1 (2.7)	36 (97.3)	0 (0)		

Table 4 shows the comparison of the responses of attitude-based questions between RP and PBL groups in pre- and posttest results. The attitude among the participants pre and posttraining was similar between the groups, and there was no statistically significant difference noted.

Table 5 shows the comparison of the responses of attitude-based questions between pretest and posttest among the RP and PBL groups. The attitude among the participants within both the groups, pre- and post-training, was highly statistically significant. Before training, in both 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, the attitude of some of the participants had improved.

No significant difference exists between the groups regarding the knowledge and attitude of the participants. After the training, the average knowledge score of students significantly improved in both RP and PBL groups. However, the differences between groups in posttest remained insignificant. The results indicated that both methods improved knowledge and attitude at a short-term follow-up with no significant difference between the two methods.

DISCUSSION

This interventional study compared the effectiveness of two educational methods for training dental students in TCC. Not many studies have been conducted about TCC using RP and PBL methods.

In the current study, knowledge scores significantly increased in RP and PBL after the training. This was similar to a study conducted by Ahmadian et al.,⁷ which also compared the effectiveness of two

educational methods, including RP and PBL, for TCC among senior dental students in Iran. In a study conducted in the United States by Ahmadian et al., a lecture method in continuing dental education course improved knowledge, attitude, and skills of dentists in TCC at 6-month follow-up.⁷ Studies have also shown that dentists with a good attitude toward the domains (5A's) "ask," "advise," "assess," "assist," and "arrange" were significantly more likely to have good practice in all the domains toward the provision of tobacco cessation interventions.⁹

Regarding attitude, the pretest results showed lack of knowledge, confidence, and time among the students in conducting TCC. A few studies have also shown that virtual training through CD-ROM and using standardized patient's method in training TCC on dental students improved their knowledge, attitude, skills, and self-confidence. This was similar to the study conducted by Ahmadian et al., where the RP and PBL method was used.⁷ In a study conducted by Ahmadian et al., patient resistance and lack of supportive organizations in developing tobacco cessation were the barriers to TCC from the student's point of view, and this was similar to the present study.⁷ In a systematic review by Virtue et al.,¹⁰ the most perceived barrier was patient resistance and lack of motivation among the students who were interested in being trained in tobacco cessation. In a study conducted by Duparea et al. among dental surgeons in Maharashtra, almost half of the participants agreed that they had poor knowledge on the subject of tobacco cessation, and 32% of them complained of lack of time.¹¹ In a study conducted by Razavi et al., some of the participants felt that giving advice on tobacco cessation might have a negative effect on their relationship with patients. Other perceived barriers were mostly about the lack

Table 3: Comparison of the responses to knowledge-based questions between pretest and posttest among RP and PBL group

Knowledge			Responses (%)			Chi-squared value	Significance
			Yes	No	Don't know		
Ask is the first stage of 5A's	RP	Pre	6 (16.2)	17 (45.9)	14 (37.8)	42.709	0.000 (highly significant)
		Post	34 (91.9)	2 (5.4)	1 (2.7)		
	PBL	Pre	4 (10.8)	24 (64.9)	9 (24.3)	32.371	0.000 (highly significant)
		Post	28 (75.7)	5 (13.5)	4 (10.8)		
We prescribe nicotine replacement therapy if it is necessary in the advice stage	RP	Pre	21 (56.8)	6 (16.2)	10 (27)	26.653	0.000 (highly significant)
		Post	5 (13.5)	28 (75.7)	4 (10.8)		
	PBL	Pre	20 (54.1)	8 (21.6)	9 (24.3)	26.675	0.000 (highly significant)
		Post	6 (16.2)	30 (81.1)	1 (2.7)		
We realize in the assessment stage that the patient is unwilling to quit, so we advise him/her to quit again	RP	Pre	10 (27)	13 (35.1)	14 (37.8)	14.593	0.001 (highly significant)
		Post	19 (51.4)	17 (45.9)	1 (2.7)		
	PBL	Pre	4 (10.8)	12 (32.4)	21 (56.8)	38.246	0.000 (highly significant)
		Post	27 (73)	10 (27)	0 (0)		
Advice is the third stage of 5A's	RP	Pre	10 (27)	5 (13.5)	22 (59.5)	20.937	0.000 (highly significant)
		Post	8 (21.6)	23 (62.2)	6 (16.2)		
	PBL	Pre	12 (32.4)	2 (5.4)	23 (62.2)	40.488	0.000 (highly significant)
		Post	3 (8.1)	29 (78.4)	5 (13.5)		
We set a quit date in assist	RP	Pre	1 (2.7)	17 (45.9)	19 (51.4)	46.500	0.000 (highly significant)
		Post	29 (78.4)	7 (18.9)	1 (2.7)		
	PBL	Pre	4 (10.8)	19 (51.4)	14 (37.8)	52.403	0.000 (highly significant)
		Post	35 (94.6)	2 (5.4)	0 (0)		
We don't arrange to quit for patients unwilling to quit	RP	Pre	19 (51.4)	8 (21.6)	10 (27)	32.567	0.000 (highly significant)
		Post	5 (13.5)	32 (86.5)	0 (0)		
	PBL	Pre	17 (45.9)	8 (21.6)	12 (32.4)	44.040	0.000 (highly significant)
		Post	1 (2.7)	36 (97.3)	0 (0)		

Bold term indicate *p* value i.e. statistically significant

of appropriate knowledge.¹² In a study conducted by Shaheen et al., the first reported barrier for dentists was insufficient reimbursement for tobacco cessation. Studies from other countries have identified reimbursement as one of the major barriers to TCC in dental care. The European Workshop on Tobacco Use Prevention and Cessation also recommended a four-stage compensation care model to overcome the reimbursement barrier, depending on the level of intervention. A report by Shaheen et al. reported that monitoring of effective planning and execution of community-based programs by appropriate authorities at regular intervals is vital for the successful achievement of the goal of a tobacco-free society.¹³

The results of the present study agree with a study conducted by George et al.³ with an objective to assess the awareness of smoking cessation counseling among dental practitioners in Kerala, where lack of patient's motivation, lack of time, and lack of financial incentives were the barriers to TCC. The present study also showed that if TCC was provided to the patients, there might be loss of patients, and this was similar to the study conducted by George et al.,³ where the majority of the dentists believed that there would be damage in dentist-patient relationship if TCC was provided to their patients. In a study conducted by Razavi et al., most of the students believed that TCC should be a part of the dentist's responsibility, and the students also showed willingness to participate in the training.¹²

A general study was conducted by Awan et al. among Saudi Arabian general dental practitioners (GDP) and dental students regarding tobacco use and cessation. Here, 62% of GDP and 67% of the dental students rated both smoking cessation and prevention

together as a very important preventive measure, whereas others perceived either smoking cessation or prevention as important.⁵ In the present study, when asked if smoking is a private matter before the training, the majority of the students from both groups agreed to the statement. However, after the training, the majority of them changed their view and disagreed with the statement. In a study conducted by Razavi et al. among dentists and senior dental students of Iran toward TCC, 28% of dentists and 36% of the students believe that tobacco use by patients is a personal decision.¹²

It is very important for the students to know how to overcome the gap between the theoretical knowledge and the practical aspect of TCC. For this, proper education enables teaching and learning to be self-motivated and directed both to the resolution of specific problems and to acquire skills. Few studies have reported that some students face difficulty in learning, and these are related to motivation, prior knowledge, student age, role of teaching, use of teaching strategies, learning conditions, etc. Students prefer methods that encourage discussion or interaction in groups, which help in understanding the content and confidence in their ability to cope.¹⁴ Multiple studies have indicated that tobacco cessation training is associated with higher intervention rates and increased self-efficacy.¹⁵

Skills training and organizational change are needed for effective educational programs and improving patient outcomes. RPs and practice with standardized patients are some of the active methods that enable the students to learn "by doing" the skills they need to apply in clinical practice.¹⁶ If the dentist provides cessation assistance routinely to their patients, they can expect a steady success rate, and this would have an enormous impact on public health.¹⁵

Table 4: Comparison of the responses to attitude-based questions between RP and PBL groups in pretest and posttest

Attitude	Responses (%)							Chi-squared value	Significance
	Strongly disagreed	Disagree	Neutral	Agree	Strongly agree				
Patients' resistance to advice is an important factor in TCC	Pre	RP	18 (48.6)	14 (37.8)	4 (10.8)	0 (0)	1 (2.7)	4.378	0.223 (nonsignificant)
		PBL	13 (35.1)	14 (37.8)	10 (27)	0 (0)	0 (0)		
	Post	RP	1 (2.7)	0 (0)	5 (13.5)	11 (29.7)	20 (54.1)	4.303	0.231 (nonsignificant)
		PBL	0 (0)	0 (0)	4 (10.8)	19 (51.4)	14 (37.8)		
Smoking is a private matter	Pre	RP	1 (2.7)	4 (10.8)	7 (18.9)	12 (32.4)	13 (35.1)	1.525	0.822 (nonsignificant)
		PBL	2 (5.4)	4 (10.8)	4 (10.8)	15 (40.5)	12 (32.4)		
	Post	RP	15 (40.5)	17 (45.9)	3 (8.1)	1 (2.7)	1 (2.7)	4.228	0.376 (nonsignificant)
		PBL	9 (24.3)	24 (64.9)	2 (5.4)	0 (0)	2 (5.4)		
Lack of sufficient time	Pre	RP	4 (10.8)	4 (10.8)	23 (62.2)	3 (8.1)	3 (8.1)	3.600	0.463 (nonsignificant)
		PBL	1 (2.7)	4 (10.8)	23 (62.2)	2 (5.4)	7 (18.9)		
	Post	RP	29 (78.4)	4 (10.8)	1 (2.7)	3 (8.1)	0 (0)	1.128	0.770 (nonsignificant)
		PBL	30 (81.1)	5 (13.5)	1 (2.7)	1 (2.7)	0 (0)		
Lack of supportive organization in developing TCC	Pre	RP	16 (43.2)	12 (32.4)	4 (10.8)	6 (13.5)	0 (0)	5.211	0.266 (nonsignificant)
		PBL	13 (35.1)	11 (29.7)	10 (27)	2 (5.4)	1 (2.7)		
	Post	RP	12 (32.4)	4 (10.8)	1 (2.7)	2 (5.4)	18 (48.6)	3.867	0.424 (nonsignificant)
		PBL	15 (40.5)	8 (21.6)	0 (0)	2 (5.4)	12 (32.4)		
Lack of training facilities for TCC in dental settings	Pre	RP	15 (40.5)	14 (37.8)	7 (18.9)	1 (2.7)	0 (0)	2.214	0.696 (nonsignificant)
		PBL	19 (51.4)	10 (27)	6 (16.2)	1 (2.7)	1 (2.7)		
	Post	RP	14 (37.8)	4 (10.8)	1 (2.7)	3 (8.1)	15 (40.5)	2.882	0.578 (nonsignificant)
		PBL	21 (56.8)	2 (5.4)	1 (2.7)	2 (5.4)	11 (29.7)		
Lack of confidence in conducting TCC	Pre	RP	14 (37.8)	14 (37.8)	9 (24.3)	0 (0)	0 (0)	5.669	0.225 (nonsignificant)
		PBL	12 (32.4)	9 (24.3)	12 (32.4)	3 (8.1)	1 (2.7)		
	Post	RP	24 (64.9)	11 (29.7)	0 (0)	1 (2.7)	1 (2.7)	1.197	0.754 (nonsignificant)
		PBL	28 (75.7)	7 (18.9)	0 (0)	1 (2.7)	1 (2.7)		
Lack of knowledge about the TCC method	Pre	RP	20 (54.1)	9 (24.3)	8 (21.6)	0 (0)	0 (0)	7.333	0.062 (nonsignificant)
		PBL	10 (27)	18 (48.6)	8 (21.6)	1 (2.7)	0 (0)		
	Post	RP	31 (83.8)	5 (13.5)	0 (0)	1 (0)	0 (0)	1.016	0.797 (nonsignificant)
		PBL	30 (81.1)	5 (13.5)	1 (2.7)	1 (2.7)	0 (0)		
Dentists preference to provide dental treatments instead of counseling	Pre	RP	1 (2.7)	2 (5.4)	10 (27)	10 (27)	14 (37.8)	2.413	0.660 (nonsignificant)
		PBL	4 (10.8)	3 (8.1)	9 (24.3)	10 (27)	11 (29.7)		
	Post	RP	23 (62.2)	9 (24.3)	1 (2.7)	2 (5.4)	2 (5.4)	5.773	0.217 (nonsignificant)
		PBL	13 (35.1)	17 (45.9)	2 (5.4)	2 (5.4)	3 (8.1)		
No reimbursement system of TCC in dental settings	Pre	RP	19 (51.4)	11 (29.7)	6 (16.2)	1 (2.7)	0 (0)	3.916	0.271 (nonsignificant)
		PBL	18 (48.6)	7 (18.9)	12 (32.4)	0 (0)	0 (0)		
	Post	RP	0 (0)	1 (2.7)	1 (2.7)	8 (21.6)	27 (73)	1.097	0.778 (nonsignificant)
		PBL	0 (0)	2 (5.4)	1 (2.7)	5 (13.5)	29 (78.4)		
Risk of losing the patients	Pre	RP	1 (2.7)	5 (13.5)	7 (18.9)	21 (56.8)	3 (8.1)	4.236	0.375 (nonsignificant)
		PBL	0 (0)	2 (5.4)	9 (24.3)	19 (51.4)	7 (18.9)		
	Post	RP	32 (86.5)	2 (5.4)	3 (8.1)	0 (0)	0 (0)	2.394	0.495 (nonsignificant)
		PBL	34 (91.9)	1 (2.7)	1 (2.7)	1 (2.7)	0 (0)		

Despite the limitations, there was a good response rate and participation of all the students, leading to better results. Due to the smaller sample size, the generalizability of the results is limited. Since it was a self-administered questionnaire, there is a possibility of social desirability bias. The respondents might not have answered truthfully or accurately. The results might be better as all the undergraduates stay in the hostel; there is a possibility that the participants would have discussed among themselves about the training process in each group. Moreover, the present study does not explore the long-term impact of the training on the knowledge, attitude, and skill of the students. In future, longitudinal,

multi-institutional research should be conducted to measure the attitudes and skills of dental students. Tobacco cessation should be given greater emphasis in the curriculum of Indian dental schools in order to expand the use of TCC in dental practices.

CONCLUSION

The findings of the present study clearly showed the difference in the knowledge and attitude among both the groups before and after training. The study also reveals there is a need to develop innovative and educational initiatives in training on TCC. It should

Table 5: Comparison of the responses of attitude-based questions between pretest and posttest among the RP and PBL group

Attitude	Responses (%)						Chi-squared value	Significance	
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree				
Patients' resistance to advice is an important factor in TCC	RP	Pre	18 (48.6)	14 (37.8)	4 (10.8)	0 (0)	1 (2.7)	57.512	0.000 (highly significant)
		Post	1 (2.7)	0 (0)	5 (13.5)	11 (29.7)	20 (54.1)		
	PBL	Pre	13 (35.1)	14 (37.8)	10 (27)	0 (0)	0 (0)	62.571	0.000 (highly significant)
		Post	0 (0)	0 (0)	4 (10.8)	19 (51.4)	14 (37.8)		
Smoking is a private matter	RP	Pre	1 (2.7)	4 (10.8)	7 (18.9)	12 (32.4)	13 (35.1)	41.491	0.000 (highly significant)
		Post	15 (40.5)	17 (45.9)	3 (8.1)	1 (2.7)	1 (2.7)		
	PBL	Pre	2 (5.4)	4 (10.8)	4 (10.8)	15 (40.5)	12 (32.4)	41.550	0.000 (highly significant)
		Post	9 (24.3)	24 (64.9)	2 (5.4)	0 (0)	2 (5.4)		
Lack of sufficient time	RP	Pre	4 (10.8)	4 (10.8)	23 (62.2)	3 (8.1)	3 (8.1)	42.106	0.000 (highly significant)
		Post	29 (78.4)	4 (10.8)	1 (2.7)	3 (8.1)	0 (0)		
	PBL	Pre	1 (2.7)	4 (10.8)	23 (62.2)	2 (5.4)	7 (18.9)	54.740	0.000 (highly significant)
		Post	30 (81.1)	5 (13.5)	1 (2.7)	1 (2.7)	0 (0)		
Lack of supportive organization in developing TCC	RP	Pre	16 (43.2)	12 (32.4)	4 (10.8)	6 (13.5)	0 (0)	25.657	0.000 (highly significant)
		Post	12 (32.4)	4 (10.8)	1 (2.7)	2 (5.4)	18 (48.6)		
	PBL	Pre	13 (35.1)	11 (29.7)	10 (27)	2 (5.4)	1 (2.7)	19.924	0.001 (highly significant)
		Post	15 (40.5)	8 (21.6)	0 (0)	2 (5.4)	12 (32.4)		
Lack of training facilities for TCC in dental settings	RP	Pre	15 (40.5)	14 (37.8)	7 (18.9)	1 (2.7)	0 (0)	26.090	0.000 (highly significant)
		Post	14 (37.8)	4 (10.8)	1 (2.7)	3 (8.1)	15 (40.5)		
	PBL	Pre	19 (51.4)	10 (27)	6 (16.2)	1 (2.7)	1 (2.7)	17.671	0.001 (highly significant)
		Post	21 (56.8)	2 (5.4)	1 (2.7)	2 (5.4)	11 (29.7)		
Lack of confidence in conducting TCC	RP	Pre	14 (37.8)	14 (37.8)	9 (24.3)	0 (0)	0 (0)	13.992	0.007 (highly significant)
		Post	24 (64.9)	11 (29.7)	0 (0)	1 (2.7)	1 (2.7)		
	PBL	Pre	12 (32.4)	9 (24.3)	12 (32.4)	3 (8.1)	1 (2.7)	19.650	0.001 (highly significant)
		Post	28 (75.7)	7 (18.9)	0 (0)	1 (2.7)	1 (2.7)		
Lack of knowledge about TCC method	RP	Pre	20 (54.1)	9 (24.3)	8 (21.6)	0 (0)	0 (0)	12.515	0.006 (highly significant)
		Post	31 (83.8)	5 (13.5)	0 (0)	1 (0)	0 (0)		
	PBL	Pre	10 (27)	18 (48.6)	8 (21.6)	1 (2.7)	0 (0)	22.792	0.000 (highly significant)
		Post	30 (81.1)	5 (13.5)	1 (2.7)	1 (2.7)	0 (0)		
Dentists preference to provide dental treatments instead of counseling	RP	Pre	1 (2.7)	2 (5.4)	10 (27)	10 (27)	14 (37.8)	46.318	0.000 (highly significant)
		Post	23 (62.2)	9 (24.3)	1 (2.7)	2 (5.4)	2 (5.4)		
	PBL	Pre	4 (10.8)	3 (8.1)	9 (24.3)	10 (27)	11 (29.7)	28.924	0.000 (highly significant)
		Post	13 (35.1)	17 (45.9)	2 (5.4)	2 (5.4)	3 (8.1)		
No reimbursement system of TCC in dental settings	RP	Pre	19 (51.4)	11 (29.7)	6 (16.2)	1 (2.7)	0 (0)	63.349	0.000 (highly significant)
		Post	0 (0)	1 (2.7)	1 (2.7)	8 (21.6)	27 (73)		
	PBL	Pre	18 (48.6)	7 (18.9)	12 (32.4)	0 (0)	0 (0)	64.085	0.000 (highly significant)
		Post	0 (0)	2 (5.4)	1 (2.7)	5 (13.5)	29 (78.4)		
Risk of losing the patients	RP	Pre	1 (2.7)	5 (13.5)	7 (18.9)	21 (56.8)	3 (8.1)	56.007	0.000 (highly significant)
		Post	32 (86.5)	2 (5.4)	3 (8.1)	0 (0)	0 (0)		
	PBL	Pre	0 (0)	2 (5.4)	9 (24.3)	19 (51.4)	7 (18.9)	63.933	0.000 (highly significant)
		Post	34 (91.9)	1 (2.7)	1 (2.7)	1 (2.7)	0 (0)		

Bold term indicate *p* value i.e. statistically significant

be mandatory to learn and perform cessation counseling. If TCC is successful, it will help us create a tobacco-free world, which will reduce the financial burden of treating cancer and increase the productivity of our community.

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