

Original article

To evaluate how a tobacco cessation curriculum affects the professional competency of dental students in delivering effective counseling for tobacco cessation

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ABSTRACT

Objective To assess the impact of tobacco cessation curriculum on the professional competency of dental students in providing effective TCC, ii) To determine the intention of dental students in providing TCC and whether this intention can be explained by TPB. To identify barriers in providing effective TCC **Methods** An Analytical cross-sectional study was conducted from March 2023 to August 2023. Using a consecutive sampling technique data of 300 was gathered. Students

from clinical years of BDS i.e. (third year and fourth year), dental interns, and postgraduate students from all Public and Private dental colleges in Karachi who had tobacco cessation curricula in formal dental teaching. A structured, self-administered questionnaire was used as a data collection tool which served the purpose of studying intentions and perceived barriers in tobacco cessation counseling (TCC) using constructs of the theory of Planned Behaviour **Results** The majority of participants demonstrated high intention to deliver Tobacco cessation counseling and certainly reported that it is their responsibility as dental health care providers to educate and aid the consumers in quitting. There was no significant difference observed in the intention of dental students and dentists to provide effective TCC. Statistically significant differences were observed between the barriers faced by dental students and dentists in terms that the students were more concerned that they lack skills of TCC in comparison to dentists; they were also hesitant as they thought it might impact the dentist-patient relationship. **Conclusion:** This study provides useful insights into the importance of TCC in oral healthcare and the willingness of dental professionals to incorporate it into clinical practice. It also highlights the positive impact of the tobacco cessation curriculum in effective TCC.

Keywords: Tobacco cessation counseling, tobacco cessation curriculum, dentists, dental students

INTRODUCTION

Over the last few years, extensive research has focused on understanding the repercussions of tobacco use on both overall and oral health. The adverse effects of consuming tobacco have been thoroughly documented.¹ Recent publications from the World Health Organization concerning the global tobacco epidemic emphasize that tobacco stands as a primary contributor to preventable illness and death worldwide. Reports suggest that close to six million deaths annually are attributed to tobacco use.²

Tobacco exerts a direct or indirect influence on virtually every system within the human body, including the respiratory, reproductive, and cardiovascular systems. Extensive literature underscores tobacco's pivotal role in the development of various oral conditions such as halitosis, periodontal diseases, impaired wound healing, oral cancer, and detrimental changes in salivary glands. Additionally, it contributes to nicotinic addiction and dependence in users, leading to

complications such as the failure of implants and other operative procedures.³ Active smokers have been found to harbor elevated levels of Streptococcus mutants in their oral cavities, increasing the susceptibility to dental caries.⁴ Clinical practice guidelines advocate for the responsibility of clinicians and dental professionals to provide brief tobacco cessation counseling. The World Health Organization underscores the importance of strict adherence to tobacco consumption restrictions and prioritizing tobacco cessation counseling in the field of dentistry.⁵

Numerous studies have consistently demonstrated that counseling, whether delivered by dental students, dentists, or healthcare providers, plays a significant role in motivating tobacco users to quit. Given their unique position, dental students and dentists are particularly well-placed to actively contribute to tobacco cessation initiatives. Consequently, there has been a notable emphasis on highlighting the pivotal role of dentists and dental students in providing effective tobacco cessation counseling.⁶

A clinical practice guideline aimed at managing tobacco dependence recommends employing the "5 As" approach: Ask, Advise, Assess, Assist, and Arrange.⁷ Numerous countries have prioritized integrating tobacco cessation curricula into the education of medical and dental students, with a majority successfully implementing such programs.⁸ Health professionals, particularly dental surgeons, who are often the first to observe the impact of smoking on oral health, play a crucial role in motivating patients to quit. Patients are more likely to quit smoking when health professionals provide encouragement and assistance, including connecting them with pharmacological support.⁹ Dental professionals, being at the forefront of assessing the oral effects of smoking, are well-positioned to reinforce anti-smoking counseling and support for smoking cessation. Recent evidence indicates that the incorporation of a tobacco cessation curriculum, along with the application of behavioral interventions by dental students and dentists, may contribute to an increase in tobacco abstinence rates.⁷ With recent curriculum updates, most dental students now recognize tobacco cessation counseling (TCC) as part of the dentist's domain. Research conducted by Virtue S highlights the importance of optimal timing for training dental students in providing effective TCC before entering the workforce. It emphasizes the need to integrate appropriate TCC training during the education and training period for dental students.¹⁰

The theory of planned behavior (TPB) serves as a framework for understanding the intention to deliver effective Tobacco Cessation Counseling (TCC). According to TPB, specific behaviors are predicted by the intention to engage in them, which, in turn, is influenced by attitudes and perceived control over the behavior.¹¹ This theory has previously been employed to explain dentists' intentions related to various behaviors, such as managing drug users, adopting preventive measures against COVID-19, and handling HIV-positive patients.¹² Despite the utility of TPB in explaining various dental behaviors, there is a dearth of studies investigating dentists' intentions to provide TCC. The present study addresses this research gap and, building on existing literature, aims to evaluate the impact of a tobacco cessation curriculum on the professional competency of dental students in delivering effective TCC. The objectives include assessing the impact of the curriculum on dental students' professional competency in providing TCC, determining the

intention of dental students to offer TCC, and exploring whether this intention can be elucidated by TPB. Additionally, the study seeks to identify barriers hindering the provision of effective TCC.

MATERIALS AND METHODS

An analytical cross-sectional study was carried out from March 2023 to August 2023 for 6 months in all Public and Private Dental Colleges in Riyadh. The present study followed STROBE guidelines. Out of these 10 Colleges, 4 belonged to the public sector whereas, 6 belonged to the private sector. The study sample comprised all dental students in clinical years of BDS i.e. 3rd year BDS and 4th year BDS as well as house officers and postgraduate trainees who had tobacco cessation curriculum as a part of their dental teaching. Those studying in non-clinical years were excluded from this study. Consecutive sampling technique was used for the selection of study participants, approximately 750 participants were approached out of which 376 consented to take part, 76 were excluded due to missing data or failure to respond in the given time frame so the final sample achieved was 300. A self-administered structured questionnaire was used as a data collection tool, and a validated questionnaire was obtained from a previous study with certain modifications to fit the study's purpose.^{10,11} The research team of statisticians along with the authors reviewed the content of each question to make sure that the survey reflected appropriate phrasing understanding and validation.

The questionnaire was designed using Google Forms a link of which was sent to the coordinators of the dental institutes within the city. The completion of the survey was marked as anonymous and non-obligatory and the students were asked to respond in one week. The questionnaire was divided into three sections: i) Attributes of study participants and ii) Intention of dental students to provide TCC. iii) Perceived barriers in TCC. Attributes of participants were recorded in terms of gender, program level, and smoking status, whereas intention to provide TCC was assessed in terms of attitude, perceived confidence, and support to provide TCC. These items corresponded to the constructs of the Theory of Planned Behavior: attitude towards particular behavior, perceived control, and subjective norms. Questions in each of the above sections had options and participants were instructed to respond with either 'yes' or 'no'. The face and content validity of the questionnaire were assessed to ensure clarity and comprehensiveness of wordings.

Data was entered and analyzed using SPSS v.22. Frequencies and percentages were obtained for all categorical variables like gender, program level, tobacco consumption status, variables related to TCC counseling intention, and perceived barriers. The chi-square test was applied to look into associations. Results were considered statistically significant when the p-value was less than 0.05.

RESULTS

A total number of 750 participants were approached for this study out of which 376 consented to take part, 76 were excluded due to missing data or failure to respond in the given time frame so the final sample achieved was 300(response rate= 79.7%). Amongst all participants there were

67(22.3%) males and 233(77.7%) females with the age range of 19-34 years, mean age 23 ± 2.6 . Table 1 demonstrates the attributes of participants. It was seen that the majority of participants were from 3rd year BDS 103(34.3%), followed by the greatest number of 4th year BDS students 82(27.3%), whereas, dental interns/House officers were approximately 80(26.7%) and least frequency was attained for postgraduate students 35(11.7%). The majority of the participants themselves were non-users of tobacco products 252(84.3%).

Since all the participants had tobacco cessation counseling as a part of their course in BDS, therefore, their intention to take part in TCC was assessed by asking certain questions so that their attitude can be analyzed. Over 239(79.7%) participants believed that giving tobacco cessation advice is the role of dental students/dentists. When the participants were inquired about their willingness to incorporate tobacco cessation counseling in dental practice shortly, it was seen that the majority agreed to it 283(94%). Approximately 284(95%) participants were in agreement with the fact that counseling by dentists could aid patients in quitting smoking and 271(90.3%) students/dentists agreed that NRT) is beneficial for patients to give up tobacco use. Almost all 291(97.0%) of the students/dentists were confident in providing verbal information to tobacco users to encourage quitting, some other means were also reported (Table 2). Nearly, 268(89.3%) students/dentists believed that they were confident enough to explain the hazardous impact of tobacco products. Almost all participants 278(92.7%) reported that they had sufficient knowledge regarding the etiology of oral cancer whereas, 199(66.3%) were well aware of tobacco cessation counseling protocol very well. However, only 147(49%) of students/dentists knew the proper mechanism of NRT.

From clinical practices, almost all 282(94%) students/dentists were interested in enquiring about the history of tobacco use. Almost 272(90.7%) participants had come across patients who were tobacco consumers. Among this group 201(67%) reported that they keep a proper record of the quantity of tobacco consumption of their patients and 217(72.3%) recorded the types of tobacco used by their patients. It was seen that approximately 240(80%) persuaded patients to quit tobacco, but only 155(51.7%) regularly counseled the patients coming to them for treatment. Nearly 164(54.7%) successfully motivated patients towards smoking cessation, and 117(39%) successfully aided patients to quit tobacco.

There was no significant difference observed in the intention of dental students and dentists to provide effective TCC (p -value < 0.05) Hence, we can say that both have equal intentions of providing counseling. However, a significant difference was found in preferred methods for tobacco cessation counseling, it was seen that almost all of them were more into verbal counseling (97%) but 3rd year and 4th year students preferred demonstrations by leaflets and pamphlets(58%). It was also seen that only 66.3% of the respondents had awareness of the tobacco cessation protocol. Whereas, 80.0% of participants agreed that they genuinely made efforts for smoking cessation activities nearly, 39% have made patients quit tobacco successfully.

Some barriers in proving TCC were also identified by the participants which are elaborated in Table 3. Mostly, reported that despite having good knowledge and confidence they lacked motivation 263(87.7%). Nearly 230(76.7%) reported that they did not have enough clinical time to guide patients about TCC. Around 210(70%) believed that their relationship might be impacted if they insisted. 202(67.3%) still lacked awareness about referral pathways for patients. Whereas, 193(64.3%) reported insufficiency of skills to provide TCC. In addition, 192(64%) recommended that that should be updated tobacco cessation information in the dental hospital.

It was also seen dental students particularly those studying in 3rd year BDS were actively involved in TCC as compared to others and were assisting people in quitting tobacco use through advising NRT, providing verbal advice to people, and making brochures for increasing awareness among the public. We can also see that students had more skills and were more confident and knowledgeable about TCC when compared to dentists.

Statistically significant differences were observed between the barriers faced by dental students and dentists in terms that the students were more concerned that they lack skills of TCC in comparison to dentists (p-value = 0.04); they were also hesitant in involved at TCC as they thought it might impact the dentist-patient relationship–value 0.01). Whereas, dentists faced time issues in dental practice to provide TCC (p-value = 0.04) (Figure 1)

DISCUSSION

The worldwide impact of tobacco extends beyond smokers to include those exposed to second and third-hand smoke, emphasizing the urgent need for comprehensive measures. Recognizing the gravity of this issue, dental organizations in Pakistan have implemented policies, such as integrating tobacco cessation curricula into dental institutes.¹³ Globally, the crucial role of dental professionals in tobacco cessation is widely acknowledged. The World Health Organization's Global Oral Health Programme emphasizes that dental professionals can play a pivotal role by incorporating effective Tobacco Cessation Counseling (TCC) into routine dental screenings and treatments. Moreover, staying abreast of current evidence and emerging trends in smoking habits is essential for dental professionals.¹⁴ In alignment with this global perspective, the present study hypothesized that integrating tobacco cessation into Community Dentistry within dental education would positively impact tobacco cessation counseling. The study's findings support this hypothesis, reinforcing the encouraging role of incorporating tobacco cessation education within the broader context of dental education and practice.¹⁵

This study revealed a connection between dental students' inclination to offer effective Tobacco Cessation Counseling (TCC) and their more favorable responses. The comprehension of the role that dentists and dental students play in delivering TCC, along with their intentions to provide such counseling, can be elucidated through the constructs of the Theory of Planned Behavior.

The results of the current study unveiled a notable trend, with approximately 79.7% of participants demonstrating a strong inclination to engage in Tobacco Cessation Counseling (TCC). A significant majority expressed genuine intentions to deliver effective TCC, affirming their belief in the dentist's responsibility in this regard. These findings align with a related study, where dental providers reported incorporating TCC into their regular practice, accounting for nearly 69.2%.¹⁶ However, it's worth noting that some studies have identified discrepancies between the intention of dental professionals to provide Tobacco Cessation Counseling (TCC) and their actual practice.¹⁷ These variations in perspectives may be influenced by diverse factors such as past experiences with counseling, personal interest, and the level of professional training.

Moreover, during clinical practice, 67% reported that they documented the amount of tobacco consumption which highlights an interesting aspect of TCC in the studied group, as they presume it is an integral part of a patient's health profile. In addition to it, 72.3% of participants regularly recorded the type of tobacco patients are consuming. This shows formal training related to TCC plays a crucial role in clinical practice. These findings are in agreement with another study which also reported that recording of tobacco consumption was done by the participants regularly.¹⁸

The positive correlation between students' confidence and the delivery of Tobacco Cessation Counseling (TCC), as identified in a previous study by Martel et al.¹⁹, is echoed in the current research. A substantial majority of participants, approximately 89.3%, expressed a belief in their confidence levels, feeling capable of conducting TCC and seamlessly integrating it into their professional practice. However, it is essential to acknowledge the identified challenge of limited health literacy among patients.²⁰ This obstacle underscores the importance of implementing a structured approach to further enhance students' confidence and their capacity to effectively assist patients. Such an approach becomes crucial in ensuring superior outcomes in the realm of Tobacco Cessation Counseling.

In this research, the second most prevalent barrier identified was a shortage of time, acknowledged by 76.7% of the participants. These findings align with another study indicating that 51.7% of dentists tend to overlook Tobacco Cessation Counseling (TCC) as they prioritize immediate dental concerns and may lack the necessary information.¹² The identified challenges may be attributed to insufficient support staff or a high patient turnover rate, issues that could potentially be mitigated by integrating counseling centers within dental facilities.

About 70.0% of participants expressed concern that participating in Tobacco Cessation Counseling (TCC) might impact the doctor-patient relationship. Several researchers have delved into this topic and reached a consensus that involving patients in planning their quitting strategies solidifies the doctor-patient relationship, increasing the likelihood of successful smoking cessation.^{21,20} Implementing these strategies provides dentists with an opportunity to not only assist patients in quitting smoking but also to establish more meaningful and collaborative relationships with them.

Previously, it has been observed that dentists who received proper training were 14 times more familiar with smoking cessation channels and agencies.²² This current study also underscores the obstacle of a lack of awareness, pathways, and skills in providing Tobacco Cessation Counseling (TCC). This suggests that merely incorporating tobacco cessation counseling into the curriculum is insufficient. Instead, there is a need for the addition of a dedicated subject that involves comprehensive education, regular updates, and practical training to equip dental professionals with the necessary knowledge and skills for effective TCC.

The findings of our study revealed that students in their 3rd year exhibited comparable preparedness and awareness in counseling patients as postgraduates. Notably, there was no significant difference in knowledge between 3rd-year students and postgraduate students. This intriguing result suggests that foundational Tobacco Cessation Counseling (TCC) education in the early stages of the dental curriculum contributes to effective counseling skills. This discovery holds potential significance for the review and redesign of dental curricula. It implies an opportunity to incorporate advanced topics related to TCC and provide more practical training throughout the early years of dental education. Such adjustments could further enhance the proficiency of dental students in delivering effective TCC, aligning education with practical application.

To address the substantial challenge at hand, it is imperative not only to include Tobacco Cessation Counseling (TCC) in the curriculum but also to equip students with the necessary knowledge and skills through supplementary means. Certification courses, workshops, role-plays, and simulation scenarios can serve as effective tools in this regard. These practical training methods contribute to the development of competencies that are crucial for delivering impactful TCC. Furthermore, expanding the dental workforce by training dental hygienists and assistants can help alleviate time management issues and enhance the efficiency of TCC delivery. Additionally, community-oriented health promotion and education initiatives focused on TCC can prove instrumental in reducing the burden on individual dentists and fostering collaborative efforts.

The organization of more workshops is strongly recommended to empower dentists, enabling them to make a more significant impact and play a pivotal role in actively performing Tobacco Cessation Counseling. These efforts collectively contribute to a more comprehensive and effective approach to addressing tobacco cessation in dental practice.

The study's primary strength lies in its comprehensive inclusion of both public and private sector universities. However, the cross-sectional design poses a limitation by hindering the establishment of temporal relationships. Additionally, certain institutions exhibited a low response rate, indicating potential underrepresentation. To address these limitations, further research is advisable to identify and promote greater participation.

CONCLUSION

The majority of participants have demonstrated a willingness to engage in the proposed activity, indicating a positive reception to the integration of an integrated formal tobacco cessation curriculum into dental programs. While this initiative has proven highly beneficial to some extent, challenges persist. Despite the incorporation of the tobacco cessation curriculum, dentists have reported difficulties in implementing tobacco cessation counseling. This challenge is attributed to the perceived lack of integration between didactic course material and clinical instruction. Recognizing the advantages gained from this initiative, it becomes imperative to emphasize ongoing efforts towards continuous learning and advancement, particularly at the postgraduate level. Addressing these challenges and fostering a seamless integration between theoretical knowledge and practical application will contribute to the sustained success of tobacco cessation efforts within dental programs in the future.

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Table 1: Attributes of study participants

Variables	Frequency (n=300)	Percentage (%)
GENDER: <ul style="list-style-type: none"> • Male • Female 	67	22.3%
	233	77.7%
PROGRAM LEVEL: <ul style="list-style-type: none"> • 3rd year BDS • 4 year BDS • Dental interns/H.OS • Postgraduate students 	103	34.3%
	82	27.3%
	80	26.7%
	35	11.7%
TOBACCO USE STATUS: <ul style="list-style-type: none"> • Non-user • Former user • Current user 	252	84.3%
	23	7.7%
	25	8.3%

Table 2: Intention of dental students/dentists to provide TCC

Variables	Frequency (%)		Chi-square (p-value)
	YES	NO	
<i>I believe giving Tobacco cessation counseling is not a responsibility of dental student</i> <ul style="list-style-type: none"> • 3rd year BDS • 4 year BDS • Dental interns/H.OS • Postgraduate students 	61(20.3%)	239(79.7%)	0.65
	28(27.2%)	75(72.8%)	
	16(19.5%)	66(80.5%)	
	9(11.2%)	71(88.8%)	
	8(22.9%)	27(77.1%)	
<i>Will you pursue tobacco cessation counseling in the future?</i> <ul style="list-style-type: none"> • 3rd year BDS • 4th year BDS • Dental interns/H.OS • Postgraduate students 	283(94.3%)	17(5.7%)	0.98
	97(94.2%)	6(5.8%)	
	75(93.8%)	5(6.2%)	
	33(94.3%)	2(5.7%)	
<i>I believe TCA by dentists could help to quit tobacco usage</i> <ul style="list-style-type: none"> • 3rdth year BDS • 4th year BDS • Dental interns/H.OS • Postgraduate students 	284(94.7%)	16(5.3%)	0.14
	98(95.1%)	5(4.9%)	
	81(98.8%)	1(1.2%)	
	73(91%)	7(8.8%)	
	32(91.4%)	3(8.6%)	
<i>I believe NRT is helpful in tobacco cessation.</i> <ul style="list-style-type: none"> • 3rd year BDS • 4th year BDS • Dental interns/H.OS • Postgraduate students 	271(90.3%)	29(9.7%)	0.66
	100(97.1%)	3(2.9%)	
	76(92.7%)	6(7.3%)	
	73(91.2%)	7(8.8%)	
	30(85.7%)	5(14.3%)	
<i>Preferred methods for tobacco cessation counseling?</i> <ul style="list-style-type: none"> • Verbally • Leaflets or pamphlets • Nicotine replacement therapy 	291(97.0%)	9(3.0%)	0.97
	74(58%)	126(42%)	< 0.05
	161(53.7%)	139(46.3%)	0.02

Table 3: Perceived barriers perspective regarding TCC

VARIABLES	FREQUENCY (%)		CHI SQUARE (p-value)
	YES	NO	
<i>Lack of motivation to provide TCC</i>	263(87.7%)	37(12.3%)	0.15
<i>Lack of skills to provide TCC</i>	193(64.3%)	107(35.7%)	0.04
<i>Impact on dentist-patient relationship due to forceful TCC</i>	210(70.0%)	90(30.0%)	0.01
<i>Limited time during clinical practice</i>	230(76.7%)	70(23.3%)	0.04
<i>Insufficiency of updated tobacco cessation information in a hospital</i>	192(64.0%)	108(36.0%)	0.21
<i>Lack of awareness of referral pathways</i>	202(67.3%)	98(32.7%)	0.79

Figure 1: Barriers related to TCC

