



Original Article



Impact of Tobacco Cessation Curriculum on Professional Competency of Dental Students: A Survey

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ABSTRACT

Tobacco cessation counseling (TCC) has become a crucial component in comprehensive patient care. Dentists are in a unique position to identify tobacco users due to regular patient contact and are pivotal in delivering TCC as part of comprehensive oral healthcare. **Objectives:** To assess the impact of the tobacco cessation curriculum on the professional competency and intention of dental students to provide TCC. **Methods:** An analytical cross-sectional study was conducted from January 2025 to March 2025. It involved students from clinical years, dental interns, and postgraduate students from all Public and Private Dental Colleges in Karachi who had a tobacco cessation curriculum in formal dental teaching. A structured, self-administered questionnaire was used to assess intentions and perceived barriers in TCC using constructs of the Theory of Planned Behaviour. Data were entered and analyzed using SPSS version 22.0. Frequencies and percentages were obtained for variables. The chi-square test was applied to evaluate associations. **Results:** The majority of participants, 239 (79.7%), demonstrated a high intention to deliver tobacco cessation counseling. No significant difference was observed in the intention of dental students and dentists to provide effective TCC (p -value>0.05). Statistically significant differences were observed between the barriers faced by dental students and dentists in that the students were more concerned that they lacked skills of TCC in comparison to dentists (p -value=0.04). **Conclusions:** The tobacco cessation curriculum effectively boosts dental students' intention to provide counseling, although skill deficits and concern over patient relationships remain notable barriers.

INTRODUCTION

In the past few years, there has been massive research on the impact of tobacco use on general and oral health [1]. Reports by the World Health Organization have revealed nearly six million tobacco-related deaths every year [2]. Literature has demonstrated that tobacco has an integral role in the etiology of oral conditions like halitosis, periodontal diseases, oral cancer, and changes in salivary glands [3]. The oral cavity of active smokers shows a higher prevalence of *Streptococcus* mutants, increasing the risk

of dental caries [4]. Clinical practice guidelines have recommended that brief tobacco cessation counseling is the responsibility of dental professionals [5]. Dental students or dentists are incredibly positioned to contribute to cessation activities [6, 7]. Many countries have focused on the addition of tobacco cessation curriculum in the course [8, 9]. Therefore, dental surgeons can take the lead in helping patients quit smoking [7, 10]. Intention to provide effective TCC is explained by the Theory of Planned



Behavior (TPB). It states that a specific behavior is predicted by the intention to engage in this behavior, which is based on attitude and perceived control [11, 12]. Limited studies have been done to investigate the intention of dentists to provide TCC. The rationale of this study is grounded in the critical public health challenge posed by tobacco use, which significantly impacts both general and oral health. Tobacco use is a leading cause of severe oral diseases such as periodontal disease, oral cancer, halitosis, and dental caries, as well as systemic health problems, leading to millions of deaths annually worldwide. Given this, dental professionals are uniquely positioned and have an ethical responsibility to provide tobacco cessation counseling (TCC) due to their frequent contact with patients' oral health and tobacco-related oral conditions. However, despite the recognized need, tobacco cessation curricula are not universally integrated into dental education, and limited research has focused on the intention and competency of dental students to provide TCC, particularly through the lens of behavioral theories like the Theory of Planned Behavior (TPB). This study has addressed this research gap; the present study aims to assess the impact of the tobacco cessation curriculum on the professional competency of dental students towards TCC.

This study aimed to assess the impact of a tobacco cessation curriculum on the professional competency and intention of dental students in providing effective TCC and whether this intention can be explained by TPB. Also, to identify barriers in providing effective TCC.

METHODS

An analytical cross-sectional study was carried out from January 2025 to March 2025 for 3 months in all Public and Private Dental Colleges in Karachi. The study sample included dental students in clinical years, house officers, and postgraduate trainees who had a tobacco cessation curriculum as a part of their dental teaching. Exclusion criteria included participants who were not in clinical years, house officers, or postgraduate trainees. Additionally, those unwilling to participate or who provided incomplete or missing data in the survey were excluded to maintain the integrity of the analysis. Sample size was calculated as 323, considering the population size as 2000, at 5% margin of error, at a 95% Confidence Interval using Raosoft calculator. The 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, so the final sample achieved was 300. Ethical approval was taken from the Institutional Review Board of Hamdard University Dental Hospital, approval no: 13152-01-25, and ref no: KCM&D/HUDH/13152-25. Before participation, informed

consent was obtained from all participants. They were provided with detailed information about the study's purpose, procedures, risks, and benefits, and assured that participation was voluntary with the option to withdraw at any time without penalty. All participants signed a consent form indicating their voluntary agreement to take part in the study, ensuring ethical compliance with research standards. A self-administered structured questionnaire designed on Google Forms was used. It was divided into three sections: Attributes of study participants, intention of dental students to provide TCC, and perceived barriers. Attributes of participants were recorded in terms of gender, program level, whereas intention 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. Participants were instructed to respond with either 'yes' or 'no'. The questionnaire was developed based on a thorough review of existing literature, validated instruments in tobacco cessation research, and guidelines from recognized health organizations to ensure relevance and comprehensiveness for assessing dental students' competency and intention regarding tobacco cessation counseling. The questionnaire was pre-tested on a small group of participants to ensure clarity, validity, and reliability before the main study, allowing for necessary revisions based on feedback. Data were entered and analyzed using SPSS version 22.0. 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 examine associations. Results were considered statistically significant when the p-value was less than 0.05.

RESULTS

Amongst all participants, there were 67 (22.3%) male and 233 (77.7%) female with the age range of 19-34 years, mean age 23 ± 2.6 (Table 1).

Table 1: Attributes of Study Participants

Variables	Frequency (%)
Gender	
Male	67 (22.3%)
Female	233 (77.7%)
Program Level	
3 rd Year BDS	103 (34.3%)
4 th Year BDS	82 (27.3%)
Dental Interns	80 (26.7%)
Postgraduate Students	35 (11.7%)

Over 239 (79.7%) participants believed that giving tobacco cessation advice is the role of dental students/dentists (Figure 1).

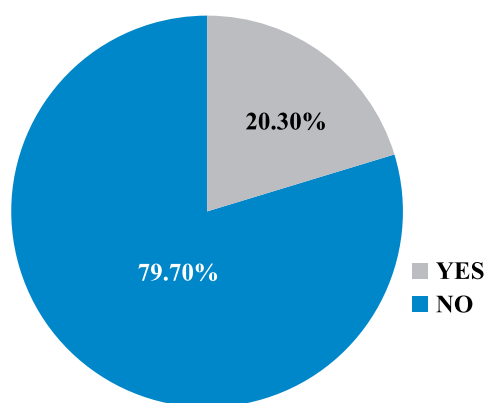


Figure 1: I Believe TCC Is Part of My Role as A Dental Student

Willingness towards tobacco cessation counseling was seen in 283 (94%). Whereas, 291 (97.0%) confidently provided verbal information to encourage quitting. From clinical practices, almost all 282 (94%) were interested in enquiring about the history of tobacco, and 201(67%) kept a proper record of tobacco consumption. Surprisingly, 240 (80%) persuaded patients to quit tobacco, out of which 164 (54.7%) were successful in motivating patients towards cessation. The result of the Chi-square test showed statistically insignificant differences 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. The p -values of variables like giving TCC were our responsibility, and willingness to pursue TCC was statistically insignificant, suggesting no difference in opinion between groups (p -value 0.65 and 0.98, respectively), but overall responses were highly positive between groups. 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%)(Table 2).

Table 2: Intention of Dental Students/Dentists to Provide TCC

Variables	Frequency (%)	p-value
Giving TCC is Our Responsibility	239 (79.7%)	0.65
3rd Year BDS	75 (72.8%)	
4-Year BDS	66 (80.5%)	
Dental Interns/H.OS	71 (88.8%)	
Postgraduate Students	27 (77.1%)	
Willingness to Pursue TCC	283 (94.3%)	0.98
3rd Year BDS	97 (94.2%)	
4-Year BDS	75 (93.8%)	
Dental Interns/H.OS	33 (94.3%)	
Postgraduate Students	29 (90%)	
Tobacco Cessation Advice Could Help to Quit Tobacco	284 (94.7%)	0.14
3rd Year BDS	98 (95.1%)	
4-Year BDS	81 (98.8%)	

Dental Interns/H.OS	73 (91%)	0.66
Postgraduate Students	32 (71.4%)	
NRTs Is Helpful in Tobacco Cessation	271 (90.3%)	
3rd Year BDS	100 (97.1%)	
4-Year BDS	76 (87.7%)	
Dental Interns/H.OS	73 (91.2%)	
Postgraduate Students	30 (85.7%)	

Dental students and dentists are generally confident and intend to provide verbal tobacco cessation counseling, with clinical practice improving skills(Figure 2).

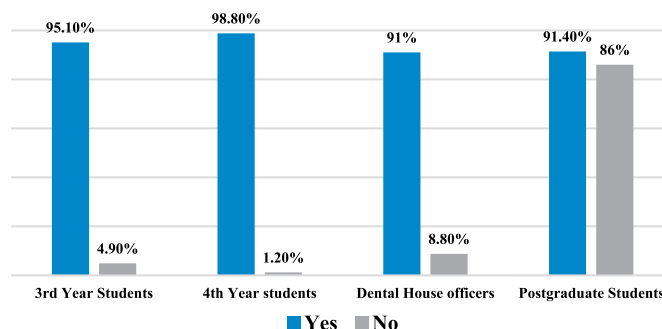


Figure 2: TCC by Dentists Could Assist Patients to Quit Smoking

Among participants, verbal counseling emerged as the overwhelmingly preferred method, selected by 291 (97.0%) respondents across all educational levels with no significant differences observed (p -value=0.97). Leaflets or pamphlets were favored by 78 (54%) participants, showing statistically significant variation between groups (p -value<0.05). Dental students, particularly those studying in 3rd year of BDS, were actively involved in TCC as compared to others through making brochures. While nicotine replacement therapy preference differed notably across 3rd year BDS, 4th year BDS, house officers, and postgraduates (p -value=0.02). These findings highlight verbal methods' universal appeal in dental settings due to their direct, patient-centered approach, whereas adjuncts like printed materials and pharmacotherapy exhibit group-specific preferences influenced by training stage and experience. Statistically significant differences were observed between the barriers faced by dental students and dentists in that the students were more concerned that they lacked skills of TCC in comparison to dentists (p -value=0.04); they were also hesitant in involved in TCC as they thought it might impact the dentist-patient relationship (p -value=0.01). Whereas, dentists faced time issues in dental practice to provide TCC (p -value=0.04) (Table 3).

Table 3: Perceived Barriers

Variables	Dental Students	Dentists	Total
Lack of Motivation	150 (57%)	113 (43%)	263 (87.7%)
Lack of Skills	130 (67.4%)	63 (32.6%)	193 (64.3%)

Impact on the Dentist-Patient Relationship	140 (66.7%)	70 (33.3%)	210 (70.0%)
Time Restriction	80 (34.8%)	150 (65.2)	230 (76.7%)
Insufficient Information	100 (52.15)	92 (47.9%)	192 (64.0%)
Lack of Awareness of Referral Pathways	104 (51.5%)	98 (48.5%)	202 (67.3%)

DISCUSSION

Throughout the world use of tobacco has profound health consequences [13]. Considering the magnitude of the problem, dental organizations have devised certain policies, like the implementation of tobacco cessation curriculum into dental institutes in Pakistan [14, 15]. In the present study, it was hypothesized that tobacco cessation as a part of Community Dentistry in dental education has an encouraging role in tobacco cessation counseling; this study accepts this hypothesis. The findings of the present study revealed that a significant proportion of participants, nearly 79.7% showed a strong inclination to offer TCC. The Majority had the true intention; these findings are in agreement with another study in which nearly 69.2% have incorporated TCC in their regular practice [16]. In contrast, some studies have identified disparities in the intention of dental professionals to provide TCC and in real practice [17, 18]. The high intention for TCC among participants, that is 79.7% aligns with findings from Pakistani dental students, where 97.9% recognized dentists' role in cessation, but only 11% actively counseled due to inadequate 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 [19]. Confidence of students has been positively correlated with TCC delivery [20]. In the current study greater proportion of participants, nearly 89.3% believed that they are confident enough in their capability. Conversely, limited health literacy among patients was identified as the primary hurdle in performing TCC [21]. Barriers like lack of skills were prevalent in 64.3% participants, and fear of impacting dentist-patient relationships was seen in 70%. This mirrors Saudi dental professionals, whereas 51.7% cited time/literacy issues, and global reviews noted patient resistance [21]. Lack of time was the second most common barrier identified, i.e., 76.7%. These findings are congruent with another study, which revealed that 51.7% dentists tend to neglect TCC as they are more in favor of addressing immediate dental issues [16]. Approximately 70.0% of participants were afraid of the fact that taking part in TCC might affect the doctor-patient relationship. Numerous researchers have provided insight on this topic and have concluded that involving patients in planning their quitting strategies cements the doctor-patient relationship [22, 15]. The low response rate in this study may have introduced potential nonresponse bias, which could affect

the generalizability of the findings. Factors such lack of perceived importance of the survey among participants may have contributed to the lower participation. Despite this limitation, the responses obtained still provide valuable insights, but results should be interpreted with caution. Future studies could consider strategies such as follow-up reminders or incentives to improve response rates and enhance representativeness.

CONCLUSIONS

In conclusion, the majority of participants show willingness to engage in TCC. Students in their 3rd year were just as prepared and aware as postgraduates. This finding may indeed be intriguing and suggests that foundational TCC education in early dental curriculum aids efficient counseling.

Authors Contribution

Conceptualization: WA

Methodology: WA, SHA, TBT

Formal analysis: TBT

Writing review and editing: MBB, SA, SJAZ

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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