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Attitudes, Practices, and Perceived Barriers to Providing Smoking Cessation Advice to Patients Among Dentists in Dar es Salaam, Tanzania: A Cross-Sectional Study

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ABSTRACT

Objectives: To assess dentists' attitudes, practices, and perceived barriers to delivering smoking cessation advice in public dental clinics in Dar es Salaam, Tanzania.

Methods: This cross-sectional study was conducted in October 2018 among 63 dentists working in four public dental clinics selected using convenience sampling. Data were collected through a self-administered questionnaire. Statistical analyses were performed using SPSS version 27. Continuous variables were summarized as means and standard deviations (mean ± SD), while categorical variables were presented as frequencies and percentages. Associations between independent variables (sociodemographic characteristics, attitude, and barriers) and the dependent variable (practice of smoking cessation advice) were examined using the chi-square test. Statistical significance was set at a p-value < 0.05.

Results: Most dentists (95.3%) believed that they should advise patients on smoking cessation, and 84.1% agreed that such advice increases patients' chances of quitting. Furthermore, 93.7% regarded motivating patients to stop smoking as part of their professional responsibility. While more than half of the dentists (55.5%) routinely inquired about patients' smoking status, fewer than half (42.9%) reported actively advising patients to quit smoking. The most frequently reported barriers to providing smoking cessation advice were lack of patient motivation (73.0%), time constraints (69.8%), and insufficient knowledge (52.2%). Dentists with higher attitude scores tended to demonstrate more desirable practices; however, this association did not reach statistical significance (χ^2 test, $p = 0.053$).

Conclusions: Although dentists demonstrated positive attitudes towards providing smoking cessation advice, the level of implementation in clinical practice remained suboptimal. The principal barriers identified were lack of patient motivation, time constraints, and insufficient knowledge. Continued professional education programs focusing on smoking cessation counseling for dentists are recommended.

Keywords: Dentists; attitude; barriers; smoking cessation advice; Tanzania

INTRODUCTION

Tobacco smoking is the leading cause of premature death worldwide, accounting for more than seven million deaths annually, with an additional 1.6 million deaths attributable to exposure to second-hand smoke.[1] The majority of these deaths occur in low- and middle-income countries, which together account for approximately 80% of the world's tobacco users.[1] Smoking is a major risk factor for numerous chronic diseases, including lung cancer, respiratory diseases, and cardiovascular disease.[2] It is also strongly associated with oral health conditions, such as oral cancer, severe periodontal disease, dental implant failure, impaired wound healing, and oral pain.[3-5]

Smoking cessation refers to the process of discontinuing tobacco use, either with or without assistance.6 Smoking cessation confers substantial oral health benefits, including reduced risk of tooth loss, slower progression of periodontitis,[7,8] regression of oral mucosal lesions such as leukoplakia and other premalignant lesions,[9] and a decreased risk of head and neck cancer.[10] Healthcare providers play a crucial role in the early identification of tobacco use and are responsible for advising users to quit smoking.[11]

Dentists are advantageously positioned to provide smoking cessation counseling because of their regular and sustained contact with patients,[12] enabling them to initiate, reinforce, and support cessation efforts.[12] They are often able to identify patients' smoking status early, even before overt oral disease develops, and can use visible tobacco-related oral effects as motivational tools.[12] Evidence supports the effectiveness of smoking cessation advice delivered by dentists.[13]

Within dental settings, the 5 A's framework (Ask, Advise, Assess, Assist, Arrange) is widely used to guide tobacco cessation interventions.[5] This approach allows dentists to tailor interventions to an individual's readiness to quit, while considering their personal beliefs, attitudes, and motivational factors. The model involves identifying tobacco use, providing advice to quit, assessing readiness, providing support, and arranging follow-up. To optimize their role in tobacco cessation, it is essential to understand dentists' attitudes, practices, and perceived barriers to providing smoking cessation services. Research has demonstrated that most dentists have positive attitudes towards delivering smoking cessation services, with 70% to 96% recognizing its importance in dental practice.[14-17] Dentists have also expressed willingness to provide these services and support the integration of smoking cessation into routine dental care.[14,16] Nevertheless, evidence suggests that relatively few dentists

routinely address tobacco use with their patients who smoke.[16,17] Even when patients' smoking status is assessed, discussions often focus on the harmful effects of smoking, rather than the provision of comprehensive smoking cessation advice.[18]

Perceived barriers are the specific obstacles dentists believe hinder their ability to provide smoking cessation counseling. Previous studies have identified several such barriers, including lack of confidence, limited patient motivation, insufficient knowledge and skills, inadequate educational resources, time constraints, fear of losing patients, and inadequate remuneration.[14,15,19,20]

Tobacco use remains a significant public health challenge in Tanzania. According to the 2018 Tanzania Global Adult Tobacco Survey, the prevalence of tobacco use was 8.7%, corresponding to approximately 2.6 million adults, with higher use among men (14.6%) than among women (3.2%).[21] Tobacco use is responsible for more than 17,200 deaths annually in the country.[21] Furthermore, 32.9% of indoor workers (approximately 1 million individuals) and 13.8% of adults (approximately 4.1 million individuals) are exposed to second-hand smoke in workplaces and homes, respectively.[21]

To the best of our knowledge, there is no published evidence on dentists' attitudes and practices regarding smoking cessation advice in Tanzania. Given the well-established benefits of smoking cessation on general and oral health and the strategic role of dentists in tobacco control, this study aimed to assess the attitudes, practices, and perceived barriers to providing smoking cessation advice among dentists in Tanzania.

METHODS

Ethical Considerations: Ethical clearance for this cross-sectional survey was obtained from the Institutional Review Board of Muhimbili University of Health and Allied Sciences (MUHAS) (Ref. No. DA.282/298/01.D/24) prior to commencement of the study. Permission to conduct the study was obtained from the administrative authorities of all participating hospitals. Written informed consent was obtained from all participants enrolled in the study. The study was conducted in accordance with the Declaration of Helsinki and reported in adherence to Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

Study Design and Setting: A cross-sectional survey was conducted in October 2018 among dentists and dental specialists working in the dental clinics of four public hospitals in Dar es Salaam, Tanzania. These included two regional hospitals (Mwananyamala Regional Referral Hospital and Amana Regional Referral Hospital), as well as Muhimbili National Hospital (MNH) and the MUHAS dental clinics. These facilities were selected using convenience sampling.

Study Participants

Inclusion criteria: All dental professionals holding a Doctor of Dental Surgery (DDS) degree or higher who consented to participate were eligible for inclusion. All eligible dentists present during the study period were invited to participate.

Exclusion criteria: Dentists who were absent on the day of data collection were excluded.

Bias: To minimize selection bias, all eligible dentists working in the selected hospitals were invited to participate in the study. Information bias was reduced by using a pre-tested, self-administered questionnaire and anonymized data collection to encourage honest responses.

Sample Size Determination and Sampling Technique: The study size was determined by the total number of dentists available in the selected facilities, as the study aimed to include the entire accessible population. Therefore, no a priori sample size calculation was performed. Of the 84 eligible dentists invited, 63 completed the questionnaire, resulting in a response rate of 75%.

Data Collection Tool and Reliability Testing: Data were collected using a self-administered questionnaire adapted from a previous study[22] and modified to reflect the local dental practice context. Modifications included the removal of irrelevant items and rewording of certain statements to improve contextual relevance. The questionnaire was pre-tested for face validity among three dentists to ensure clarity and comprehensiveness, and necessary revisions were made based on feedback. Internal consistency of the questionnaire was evaluated using Cronbach's alpha, which demonstrated acceptable reliability, with values of 0.78 for the attitude domain, 0.87 for the practice domain, and 0.56 for the perceived barrier items.

The final questionnaire consisted of four sections. The first section captured participants' sociodemographic attributes, including age, sex, professional rank, years of practice, and smoking status. The second section assessed attitudes towards smoking cessation using six items measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), yielding total scores

ranging from 6 to 30. Individual items were classified as indicating a good attitude if the score was > 3 and a poor attitude if the score was ≤ 3. Overall attitude scores ≥ 24 were categorized as positive, whereas scores < 24 were categorized as negative.
The third section assessed smoking cessation practices using six items rated on a 4-point frequency scale (1 = Rarely to 4 = Always), with total scores ranging from 6 to 24. Individual items were classified as good practice if the score was > 2 and poor practice if ≤ 2; total practice scores ≥ 18 were considered desirable, while scores < 18 were considered undesirable.

The fourth section evaluated perceived barriers to providing smoking cessation advice using four statements measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), yielding total scores from 4 to 20. Items scored > 2 were classified as barriers and not barriers if the score was ≤ 2. Total scores > 8 indicated high perceived barriers, whereas scores ≤ 8 indicated low perceived barriers.
The Likert-scale responses across the three domains were dichotomized to distinguish endorsement or consistent behavior from neutrality or absence, consistent with the approach used in previous research.[16]

Data Collection Procedures: Participants were informed about the purpose and procedures of the study before enrolling. Questionnaires were distributed to dentists early in the morning, during breaks, or after working hours to minimize disruption to clinical duties and were collected approximately 20 minutes later. All data were anonymized and de-identified prior to analysis.

Variables
Independent variables: The independent variables included sociodemographic and professional characteristics (sex, age, years in practice, professional rank, and smoking status), as well as attitudes and perceived barriers to providing smoking cessation advice. For analysis, variables were categorized as follows: sex (male, female), age (≤ 40 years and > 40 years), professional rank (interns, registrars, and specialists), number of years in practice (≤ 10 years and > 10 years), and smoking status (ever smoked, never smoked). Cut-offs (age 40; practice 10 years) were based on prior evidence linking older age and greater experience with smoking cessation engagement.[15,16]

Dependent variable: The dependent variable was dentists' practice of smoking cessation advice, categorized as desirable or undesirable based on predefined cut-off scores.

Missing Data: All 63 returned questionnaires were fully completed, and there were no missing data for any variable. Incomplete questionnaires were excluded from the analysis, which accounted for the 21 non-respondents.

Statistical Analysis: Data were cleaned, coded, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 27 (IBM Corp., Chicago, IL, USA). Continuous variables were summarized as means ± standard deviations, while categorical variables were presented as frequencies and percentages. Associations between independent variables and smoking cessation practices were examined using the chi-square test or Fisher's exact test, as appropriate. Statistical significance was set at a p-value < 0.05. Sensitivity and subgroup analyses were not performed, as they were not within the scope of the study objectives.

RESULTS
Sociodemographic Characteristics of the Participants: A total of 63 dentists participated in the study. More than half of the respondents were male (55.6%). Interns constituted 44.4% of the sample, and the majority of participants (77.8%) were aged 40 years or younger. Most respondents (71.4%) had 10 years or fewer of professional experience. With respect to smoking status, 19.0% of participants reported a history of smoking, with only 6.3% identifying as current smokers (Table 1).

Table 1: Sociodemographic Characteristics of the Participating Dentists (N = 63)

Variable		n	%
Age group	≤ 40 years	49	77.8
	> 40 years	14	22.2
Sex	Male	35	55.6
	Female	28	44.4
Professional rank	Interns	28	44.4
	Registrars	11	17.5
	Specialists	24	38.1
Years in practice	≤ 10 years	45	71.4
	> 10 years	18	28.6
Smoking status	Ever smoked	12	19.0
	Never smoked	51	81.0

Dentists' Attitudes and Practices in Providing Smoking Cessation Advice: Table 2 presents item-level proportions for the attitude and practice domains. The vast majority of participants (95.3%) agreed or strongly agreed that dentists should advise patients on quitting smoking. Similarly, 84.1% believed that smoking cessation advice provided by dentists increases patients' likelihood of quitting, and 93.7% perceived motivating patients to stop smoking as part of their professional responsibility. In addition, 74.6% considered advising on smoking cessation a professional priority. It is worth mentioning that 28.6% agreed that smoking cessation advice is not necessary as patients know they should quit, as highlighted in Table 2.

Regarding smoking cessation practices, more than half of the dentists (55.5%) reported routinely inquiring about patients' smoking status. However, fewer than half (42.9%) reported actively advising patients to quit smoking, and 52.4% informed patients about the benefits of cessation. Although a greater proportion discussed the adverse effects of smoking on oral health (58.7%) and general health (49.2%), most dentists (77.8%) did not routinely document patients' smoking status.

Table 2: Dentists' Attitude and Practice Towards Providing Smoking Cessation Advice

Attitude Statement*	**n (%) Agree/Strongly Agree**
Dentists should advise their patients on smoking cessation	60 (95.3)
Smoking cessation advice given by a dentist increases a patient's chances of quitting	53 (84.1)
As a dentist, it is my responsibility to motivate patients to quit smoking	59 (93.7)
It is not worth discussing the benefits of smoking cessation with patients, as patients already know they should quit	18 (28.6)
Counseling patients on smoking cessation can increase their chances of quitting	58 (92.1)
Advising patients to quit smoking is a priority for me	47 (74.6)
Practice Statement**	**n (%) Often/Always**
Do you inquire about your patient's smoking status?	35 (55.5)
Do you keep a record of the patient's smoking status?	14 (22.2)
Do you provide advice to motivate patients to quit smoking?	27 (42.9)
Do you explain to patients the impact of smoking tobacco on oral health?	37 (58.7)
Do you explain to patients the impact of smoking tobacco on general health?	31 (49.2)
Do you inform patients about the benefits of quitting smoking?	33 (52.4)
Values are item-level proportions (%).	
* Attitude items were scored on a 5-point Likert scale (1 = "Strongly Disagree" to 5 = "Strongly Agree").	
** Practice items were scored on a 4-point frequency scale (1 = "Rarely" to 4 = "Always").	

Perceived Barriers to Providing Smoking Cessation Advice: With respect to perceived barriers to delivering smoking cessation advice, the majority of participants (73.0%) identified lack of patient motivation as a major obstacle (Figure 1). Furthermore, time constraints were reported as a barrier by 69.8% of dentists, while more than half (52.2%) cited insufficient knowledge of smoking cessation counseling. Fear of losing patients was reported by approximately one-third of respondents (33.3%).

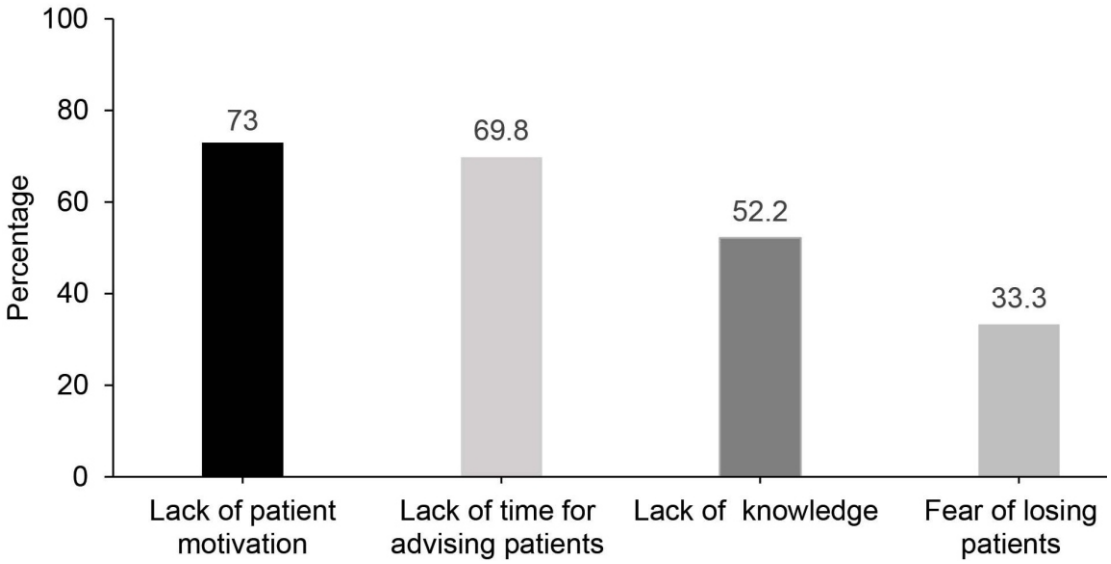

Figure 1: Percentage of Respondents Who Agree or Strongly Agree with Perceived Barriers to Providing Smoking Cessation Advice

Barrier	% Agree/Strongly Agree
Lack of patient motivation	73.0
Time constraints	69.8
Insufficient knowledge	52.2
Fear of losing patients	33.3

Overall Attitude, Practice, and Perceived Barrier Scores in Delivering Smoking Cessation Advice: The mean ± SD and ranges of overall attitude, practice, and perceived barrier scores are presented in Table 3. The mean attitude score was 25.4 ± 3.3 (range: 17–30), the mean practice score was 14.4 ± 4.8 (range: 6–24), and the mean perceived barrier score was 13.5 ± 2.7 (range: 8–19).

Based on predefined cut-off criteria, most participants (73.0%) demonstrated a positive attitude towards smoking cessation advice. In contrast, only 30.2% of dentists exhibited desirable practices related to smoking cessation counseling. It is worth noting that almost all participants (98.4%) had high perceived barrier scores.

Table 3: Association Between Sociodemographic Characteristics, Attitudes, and Smoking Cessation Practices

Parameter	Practice	Total		p-value
	Desirable n (%)	Undesirable n (%)	n (%)	
	(n=19, 30.2%)	(n = 44, 69.8%)	(N = 63)	
Sex				0.76
Female	9 (32.1)	19 (67.9)	28 (44.4)	
Male	10 (28.6)	25 (71.4)	35 (55.6)	
Age group				0.58*
> 40 years	4 (28.6)	10 (71.4)	14 (22.2)	
≤ 40 years	15 (30.6)	34 (69.4)	49 (77.8)	
Professional rank				0.67
Specialist	8 (33.3)	16 (66.7)	24 (38.1)	
Intern/Registrar	11 (28.2)	28 (71.8)	39 (61.9)	
Years in practice				0.73
> 10 years	6 (33.3)	12 (66.7)	18 (28.6)	
≤ 10 years	13 (28.9)	32 (71.1)	45 (71.4)	
Smoking status				0.48*
Ever smoked	3 (25.0)	9 (75.0)	12 (19.0)	
Never smoked	16 (31.4)	35 (68.6)	51 (81.0)	

Total attitude score				0.053
Positive	17 (37.0)	29 (63.0)	46 (73.0)	
Negative	2 (11.8)	15 (88.2)	17 (27.0)	
Values are reported as n (%); percentages may not sum to 100 due to rounding.				
Chi-square test used unless otherwise indicated. Fisher's exact test (*) applied when >20% of cells had expected frequency < 5.				

DISCUSSION

Findings: This study examined dentists' attitudes, practices, and perceived barriers to providing smoking cessation advice in public dental clinics in Dar es Salaam, Tanzania. Although most dentists demonstrated positive attitudes towards providing smoking cessation advice, the actual delivery of such advice in clinical practice was relatively low. Only 42.9% of participants routinely advised patients to quit smoking. This disconnect between favorable attitudes and suboptimal practice highlights missed opportunities for tobacco control within dental settings.[23]

In the present study, most participants recognized smoking cessation advice as an important professional responsibility and priority. The majority also believed that advice provided by dentists increases patients' chances of quitting. Overall, a vast majority of participants (73.0%) demonstrated positive attitude scores, consistent with findings from studies conducted in other settings.[14,20]

Previous studies have suggested that dentists who smoke may be reluctant to engage in smoking cessation advice due to discomfort or perceived hypocrisy.[19,28] In the current study, however, the proportion of smokers was small, limiting the ability to statistically examine the relationship between dentists' smoking status and their attitudes or practices towards smoking cessation advice.

Despite favorable attitudes, dentists' practices were suboptimal. Although more than half of the respondents reported routinely assessing patients' smoking status, fewer than half (42.9%) actively encouraged cessation. Similar patterns have been reported in previous research, where dentists focused more on discussing the harmful effects of smoking rather than delivering structured cessation counseling.[12,18] Time constraints and insufficient knowledge or counseling skills likely contributed to this gap, as reflected by more than half of respondents (52.2%) identifying inadequate knowledge of smoking cessation advice as a potential barrier. This finding is consistent with previous studies that reported similar challenges.[12,24]

It is noteworthy that while the majority of dentists discussed the adverse effects of smoking on oral and general health, these discussions rarely extended to encouraging cessation. This finding mirrors reports from Turkey, where dentists frequently informed patients about smoking-related risks with less emphasis on comprehensive cessation.[18] Lack of patient motivation was the most frequently reported barrier, cited by 73.0% of participants, consistent with findings from India, which reported that 82% of dentists viewed lack of patient motivation as a barrier.²5 However, this contrasts with reports from other settings, such as Kenya, where fewer healthcare workers, including dentists (26.9%), identified lack of patient motivation as a major barrier.[26] Time constraints were also commonly reported, aligning with studies from India, Saudi Arabia, and Kuwait.[14,15] The procedural demands of dental practice may limit opportunities for preventive counseling during clinical encounters.[27]

In line with previous studies, insufficient knowledge of smoking cessation counseling was identified as a key barrier.[19,28] These findings might explain the low proportion of dentists in the current study who advise patients to quit smoking, despite the majority possessing a positive attitude. Although beyond the scope of this study, evidence suggests that formal training in smoking cessation improves healthcare providers' confidence and reduces perceived barriers.[29] Fear of losing patients was the least frequently reported barrier to the provision of smoking cessation advice among dentists in this study, cited by only one-third (33.3%) of participants. This finding contrasts with reports from Malaysia (52.4%)³0 and India (81.4%),[20] where concerns about damaging the patient-dentist relationship were more commonly reported. The tendency for higher attitude scores to be associated with more desirable practice is consistent with findings from a previous study, which reported that dentists with positive attitudes were more likely to engage in smoking cessation activities.[16] However, this association did not achieve statistical significance ($p = 0.053$). Furthermore, the near-universal presence of high perceived barriers (98.4%) limited assessment of their relationship with practice behaviors.

Implications: The observed gap between dentists' positive attitudes towards smoking cessation and their limited clinical involvement highlights the importance of addressing modifiable barriers, particularly time constraints and inadequate training. Targeted continuing professional education programs may enhance dentists' engagement in smoking cessation counseling. Mitigating these barriers through targeted continuing education and practice-level strategies may facilitate the integration of smoking cessation counseling into routine dental care.

Trade-Offs (Limitations): This study was limited by its cross-sectional design, lack of a priori statistical power calculation, and relatively small sample size, which may have reduced the statistical power of the study. In addition, restriction to dentists practicing in public hospitals within a single urban setting (Dar es Salaam) may limit the generalizability of the findings, particularly to private-sector or rural settings. Consequently, the results are most applicable to dentists working in public hospital environments in urban Tanzania and should be interpreted with caution when extrapolated to other contexts. In addition, the reliance on self-reported data introduces the possibility of social desirability bias. Data collection was conducted during working hours, which may have influenced participation; however, efforts were made to minimize disruption by collecting data early in the morning, during breaks, and after working hours.

Take-Home (Conclusion): Dentists in Dar es Salaam demonstrated positive attitudes towards providing smoking cessation advice to their patients. However, the actual provision of such advice was relatively low. The key barriers included lack of patient motivation, time constraints, and inadequate knowledge of cessation counseling. Strengthening undergraduate curricula and implementing continuing professional development programs focused on smoking cessation may improve dentists' confidence and integration of cessation advice into routine dental care.

Recommendations and Future Research: Continuing education programs focusing on smoking cessation counseling are recommended to empower dentists in patient counseling. Future studies with larger sample sizes including dentists from private clinics and other regions are needed to assess whether attitudes, practices, and perceived barriers differ across practice settings.

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