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Provision of Smoking Cessation by Ontario Dental Health Professionals

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EXECUTIVE SUMMARY

In April 2011, the Ontario government announced a renewed commitment to building a Smoke-Free Ontario including a strong emphasis on providing smoking cessation services to Ontarians willing to quit smoking. Currently, the government is exploring alternative avenues to deliver smoking cessation services to smokers. One such avenue is through dental health professionals.

This study, conducted by the Ontario Tobacco Research Unit on behalf of the Ministry of Health and Long-Term Care, explores the experience of three dental health professional groups (dentists, dental hygienists, dental assistants) in providing smoking cessation services to their patients in routine daily practice.

An online survey was conducted between November 15, 2011 and January 2, 2012. Members from five dental health professional associations were invited to participate in the online survey: Ontario Dental Assistants Association, Ontario Dental Association, Ontario Dental Hygienists' Association, Dental Hygiene Practitioners of Ontario, and the Ontario Association of Public Health Dentistry. Out of 21,922 dental health professionals invited to participate in the online survey, a total of 1966 completed the online survey resulting in a 9% response rate. Twenty-three survey respondents participated in a one-on-one telephone interview, conducted between February 9 and March 22, 2012. Both the online survey and the telephone interviews aimed to capture the extent to which dental health professionals are involved in the provision of smoking cessation services, and the barriers and facilitators that impact such services.

Results from this study should be interpreted with caution due to a number of limitations, including:

- Convenience sampling methods
- A low response rate to the online survey
- A higher proportion of dental assistants responding to the online survey
- Socio-demographic characteristics of the sample that differ slightly from the reported socio-demographic characteristics of the selected dental health professional associations
- The possibility of over-reporting or under-reporting the provision of smoking cessation services as a result of the self-report data collection methods used by both the online survey and telephone interviews.

For these reasons, the results may not reflect the true opinions and provision of smoking cessation services of all dental health professionals currently practicing in Ontario.

Key Findings

- Only one-fifth (21%) of online survey respondents had received formal training in smoking cessation. Compared to dentists, dental hygienists were more likely to report receiving formal smoking cessation training (46% vs. 29%, respectively); while dental assistants were less likely than dentists to report receiving formal smoking cessation training (12% vs. 29%, respectively). Further, respondents who worked in public health were more likely to report receiving formal smoking cessation training compared to respondents who worked in private practice (54% vs. 19%, respectively). These findings were confirmed through interviews with dental health professionals.
- Reasons for not having obtained formal training in smoking cessation included: lack of awareness of available training (54%), lack of time to obtain training (19%), lack of funding to attend training (16%), no interest or not considered a priority for clinical practice (13%), no need for training (13%), and training not available in geographic area (12%).
- A little more than half of online survey respondents (52%) reported being *somewhat confident* in their knowledge and skills to provide smoking cessation services to patients. Only 12% of online survey respondents were *very confident*, whereas 29% felt they were *not at all confident* in their knowledge and skills to provide smoking cessation services to patients.
- Responses to nine attitude statements indicated that the majority of online survey respondents were generally enthusiastic about providing smoking cessation services to patients (enthusiasm score = 3.03 out of 4) and perceived such services as being effective (perceived effectiveness score = 3.05 out of 4). Dental hygienists had a higher mean score for all nine attitude statements compared to dentists, meaning that dental hygienists reported more positive attitudes towards the provision of smoking cessation services.
- Three-quarters (76%) of online survey respondents routinely recorded the patient's smoking status in their chart. Fewer indicated that smoking cessation pamphlets were available for patients in the office (44%) or smoking-related posters were displayed in the office (25%). Only 10% routinely flagged files of patients who smoke for smoking cessation advice.

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- Less than 50% of online survey respondents reported providing any form of smoking cessation services to *all or most* of their patients who smoke. However, half of online survey respondents provided *some* of their patients who smoke with smoking cessation services, such as discussing patients' quitting history and past quit attempts (52%), advising patients to stop smoking or using tobacco (51%), informing patients about the health effects of smoking and the benefits of quitting (50%), discussing patients' concerns about quitting (48%), and assessing patients' readiness to quit smoking (47%). Interview results were consistent with online survey findings and suggest that dental health professionals do not routinely provide smoking cessation services.
- Dental hygienists were more likely than dentists to report providing a number of smoking cessation services to their patients including: assessing *all or most* of their smoking patients' readiness to quit smoking (50% vs. 30%, respectively), informing *all or most* of their patients who smoke about the health effects of smoking and the benefits of quitting (56% vs. 42%, respectively), discussing quitting history and past quit attempts with *all or most* of their patients who smoke (40% vs. 20%, respectively), discussing concerns about quitting with *all or most* of their patients who smoke (29% vs. 15%, respectively).
- The greatest facilitator to providing smoking cessation services to patients was patient interest in discussing their smoking and/or quitting (83%). Other highly reported facilitators included: training or knowledge in tobacco use cessation (58%), having patient self-help materials readily available (55%), access to external resources (38%), and collaboration among dental staff in provision of smoking cessation services (33%). Interview participants expanded upon this list of key facilitators by reporting the use of medical charts and specific clinical procedures (e.g. oral cancer screening, intra-oral camera) as important factors in facilitating the provision of smoking cessation services.
- The most common barrier to providing smoking cessation services to patients was lack of interest from patients (73%). Thus, patient interest in quitting was perceived both a key facilitator and a barrier, which suggests that it is indeed a critical factor to determine dental health professional's willingness to provide smoking cessation services.
- Other key barriers identified by online survey respondents included lack of time with patients (58%), fear of alienating patients (48%), and lack of knowledge or training on how to provide cessation support to patients (45%). Interview participants working in private practice confirmed these barriers and included billing as a challenge to providing smoking cessation services.
- The majority of online survey respondents perceived a number resources and tools as very helpful in enhancing the provision of smoking cessation services in their daily practice,

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including: self-help materials to give to patients (63%), in-person training with continuing education credits (55%), referral forms to Smokers' Helpline or similar community cessation resources (55%), conference sessions with continuing education credits (53%), online learning modules (51%), and a flowchart or introductory scripts on how to do brief smoking cessation counselling (48%). Interview participants also emphasized the importance of further training as well as the need for additional smoking cessation resources for patients, particularly self-help materials and free NRT.

- Study findings demonstrate that dental hygienists appear to be the main dental health professionals highly involved in the provision of smoking cessation services. Many hygienists had received formal smoking cessation training; they were also more likely to report positive attitudes towards providing smoking cessation advice and were more likely to engage their patients in smoking cessation services.

INTRODUCTION

The effectiveness of smoking cessation services provided by dental health professionals is well established in the literature. Randomized control trials indicate that routine smoking cessation counseling by dental health professionals has led to double the proportion of patients who successfully quit smoking cigarettes compared to control groups (16.9% vs. 7.7% as reported by Cohen et al¹ and, 13.3% vs. 5.3% as reported by MacGregor²). Dental health professionals have also been successful in increasing the successful quit rates among smokeless tobacco users by 50% compared to control groups (32% vs. 21%, as reported by Little et al³ and, 18.5% vs. 12.5% as reported by Stevens et al⁴). Most trials in dental settings report a quit rate comparable to what has been achieved by physicians.⁵ Currently, there is limited information available about the provision of smoking cessation services by Ontario dental health professionals.

This study, conducted by the Ontario Tobacco Research Unit on behalf of the Ministry of Health and Long-Term Care, explores the experience of Ontario dental health professionals in providing smoking cessation services to their patients in routine daily practice.

Various professionals are involved in providing oral health care. This study focused on three dental health professions: dentists, dental hygienists and dental assistants. Briefly, the roles of each will be described. The dentist examines and diagnoses a patient's oral health care, and subsequently recommends and carries out treatment (e.g., fillings, crowns and extractions).⁶ The dental hygienist takes X-rays, cleans and polishes teeth, and provides oral care education to the patient.⁷ Finally, the role of a dental assistant ranges from administrative support to cleaning and sterilizing instruments to passing instruments to the dentist or hygienist.⁸

METHODS

Data was collected through an online survey and telephone interviews. The online survey provided a quick avenue to capture a wide response related to smoking cessation service provision by dental health professionals. Responses from the telephone interviews were used to validate online survey responses as well as enhance understanding of dental health professionals' experience in smoking cessation and provide greater context for understanding attitudes, barriers and facilitators to the provision of smoking cessation services.

Online Survey

Survey Instrument

A 24-item online survey was created using the online survey software, KeySurvey. Survey questions were drafted in partnership with the Ministry of Health and Long-Term Care. Questions focused on dental health practice characteristics; smoking cessation training; smoking cessation practices and services; and, attitudes, barriers and facilitators for the provision of smoking cessation services to their patients (see Appendix A for full questionnaire). Respondents were offered the choice to complete the survey in either French or English. The survey was designed to take no more than 10 minutes to complete.

Data Collection

A generic survey link (URL) to the online survey was sent to five dental health professional associations: Ontario Dental Assistants Association, Ontario Dental Association, Ontario Dental Hygienists' Association, Dental Hygiene Practitioners of Ontario, and the Ontario Association of Public Health Dentistry. Each dental health professional association forwarded the generic URL link to its members. This method of recruitment allowed for a wide distribution of the online survey, while protecting the confidentiality of each dental health professional association's membership list.

Sample

Approximately 21,922 dental health professionals were sent the generic URL link to the online survey on November 15, 2011. The online survey remained open until January 2, 2012. Two reminder e-mails were sent out by the dental health professional associations during the survey period. The generic URL link to the online survey was clicked on and opened in a web browser

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3188 times. In just over one-third of those clicks (1159), the individual exited the online survey without answering any survey questions (see Table 1 for summary of responses). Only 2029 dental health professionals answered at least the survey consent question or more. Fourteen respondents did not consent to participate in the online survey and were subsequently directed to the end of the survey. This left 2015 respondents who completed the majority of the online survey questions. Fifteen of these respondents completed the online survey in French (<1%).

Table 1: Summary of Online Survey Response

Indicator	N
Dental health professionals invited to participate in online survey	21,922
Respondents who opened the generic URL link	3188
Respondents who failed to answer any online survey questions	1159
Respondents who did not consent to participate in online survey	14
Respondents who were not currently working with patients	45
Respondents who were not currently practicing in Ontario	1
Duplicate responses	3
Respondents included in the online survey analysis, n	1966
Response rate	9%

Upon further examination of the online survey responses, 45 respondents were excluded from the analysis since they indicated that they were not currently working directly with patients (e.g., retired, on maternity leave, unemployed, consultant, instructors or students). One more respondent reported currently practicing overseas and therefore was excluded from the analysis. Last, three duplicate responses, identified through the contact information provided for the follow-up interview, were deleted from the dataset. Therefore, the final number of respondents included in the online survey data analysis was 1966. This represents a 9% response rate.

A comparison of respondent and non-respondent demographic characteristics could not be conducted due to the anonymous nature in which the survey was sent out and completed. Instead, key demographic characteristics (sex and age) of online survey respondents were compared with member characteristics of three of the dental health professional associations (Ontario Dental Association, Ontario Dental Hygienists' Association, Ontario Dental Assistants Associationⁱ) invited to complete the online survey. Table 2 indicates that the online survey

ⁱ Membership information was not available from the Dental Hygiene Practitioners of Ontario and the Ontario Association of Public Health Dentistry

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sample closely matched the Ontario Dental Association and Ontario Dental Hygienists' Association membership by sex; however, the online survey appears to have oversampled female dental assistants compared to the Ontario Dental Assistants Association membership. By age group, the online survey sample best matched the Ontario Dental Assistants Association membership. The online survey captured a lower frequency of dentists in the 30–39 year age group and a higher frequency of dentists and dental hygienists in the 50–59 year age group compared to each individual dental health professional association. Thus, our online survey sample is somewhat skewed.

Table 2: Summary of Online Survey and Dental Health Professional Association Demographic Characteristics

	Ontario Dental Association		Ontario Dental Hygienists' Association		Ontario Dental Assistants Association	
	Online Survey (n=217)	Membership (n=6949) %	Online Survey (n=432)	Membership (n=6500) %	Online Survey (n=1317)	Membership (n=8449) %
Sex	Female	40	31	98	98	100
	Male	60	69	2	2	0
Age	19–29 years	7	5	18	21	21
	30–39 years	13	21	25	29	30
	40–49 years	29	25	29	30	32
	50–59 years	34	24	26	18	14
	60+ years	17	19	3	3	1

^a Sources: Ontario Dental Association, Ontario Dental Hygienists' Association, Ontario Dental Assistants Association. We estimate that approximately 90% of our sample comes from one of the three professional associations listed in the above table.

Sample Limitations

Given the low response rate and the skewed sample, the results from the online survey should be interpreted with caution since they may not represent the opinions of all dental health professionals currently practicing in Ontario. In addition, dental health professionals interested in providing smoking cessation services to their patients may have been more likely to respond to the online survey resulting in a possible over-representation of smoking cessation services provided by dental health professionals in Ontario.

Analysis

A few modifications were made to the online survey question responses prior to completing the analysis. They include:

- Responses to questions that contained numerical text-only responses were re-coded. In this case, the midpoint value was entered if the respondent provided a range of values in their response (e.g., 20-60 minutes was re-coded as 40). This type of re-coding was applied to three online survey questions (Q8 “On average, how many patients do you see per week?”, Q9 “On average, how much time do you spend per patient to provide clinical services?”, and Q10 “What do you estimate is the percentage of your patients who smoke?”).
- Responses to questions that included an “other” response option where the respondent was asked to specify their answer were also re-coded. In this case, responses were carefully re-coded into one of the existing question response options or a new response option was created. This type of re-coding was applied to eight online survey questions (Q3 “You are a:”, Q5 “Primary practice setting:”, Q6 “Primary location of practice:”, Q12 “Please indicate the smoking cessation training you have attended”, Q13 “You have mentioned Regulatory College. Could you please specify the smoking cessation training program?”, Q21 “You have mentioned Professional Association. Could you please specify the smoking cessation training program?”, Q22 “With approximately how many of your patients who smoke do you take the following actions...”, and Q23 “What helps/enables you to provide cessation support to your patients?”).
- Responses to the question that asked the respondent’s dental health profession (Q3 “You are a:”) were collapsed into three response options: dentist, dental hygienist, and dental assistant. Specialist dentist was combined with dentist due to a small number ($n=32$) of respondents selecting specialist dentist as their profession. Also, text responses for 74 respondents were re-coded as a dental assistant based on the membership description of the Ontario Dental Assistants Association website. These responses included: treatment coordinator, dental receptionist, dental clinic manager, admin, hygiene coordinator and dental support staff.

Survey data analysis was conducted in SAS v.9.2. Frequencies were calculated for all online survey questions that contained multiple response options (i.e., categorical variables). Cross-tabulations were conducted where there was an interest in assessing a relationship between a

particular online survey question and the following questions of interest: dental health profession, practice setting, location of practice, respondent's smoking status, and smoking cessation training attendance. Where cross-tabulations were conducted by dental health profession, estimates were produced within each dental health profession (e.g., 60% of dental assistants agreed, while 40% of dental assistants disagreed) to control for the over-sampling of dental assistants in the online survey. Simple logistic regression analyses were conducted in place of χ^2 tests to assess significant associations between two survey questions since many of the survey questions contained more than two categories.

Median values (i.e., midpoint) were calculated for the three online survey questions where numerical data was captured (i.e., continuous variables; Q8 "On average, how many patients do you see per week?", Q9 "On average, how much time do you spend per patient to provide clinical services?", and Q10 "What do you estimate is the percentage of your patients who smoke?") after it was determined that the range of values for these questions was not normally distributed. Kruskal-Wallis test was applied to assess significant differences in these three online survey questions by dental health profession, practice setting and respondent smoking status.

Analyses for the series of nine statements that assessed dental health professionals' attitudes towards the provision of smoking cessation services (Q17 "Using the scale below, please indicate your level of agreement/disagreement with the following statements:") were based on the study conducted by Coleman & Wilson.⁹ Each question had five response options, ranging in value from 1 (strongly agree) to 5 (don't know). The "don't know" category (neutral category) was excluded from the analysis to be consistent with the published study, leaving the maximum score for each statement equal 4 (strongly disagree). Mean scores were calculated for each of the nine attitude statements. Higher mean scores indicated a more positive attitude towards the provision of smoking cessation services among dental health professionals. One-way ANOVA's were conducted to assess significant differences by dental health profession.

P-values are noted in the text where significant tests were conducted. We applied a cut-point of $p < 0.05$ to determine significant differences between online survey question categories.

Telephone Interviews

Sample

Among the 1966 respondents that were included in the online survey analysis, 141 (or 7%) consented to be contacted for a follow-up telephone interview and provided contact information. A convenience sample strategy was used with the aim to randomly recruit at least 10 respondents from each of the three dental health professionals (30 in total). However, it proved very difficult to recruit dentists, apparently due to their busy schedules. As a result, the recruitment fell short of the original aim in case of dentists.

Sample Limitations

Similar to the online survey, the convenience sample method of recruiting dental health professionals to participate in the telephone interviews may have resulted in a biased sample. Participants were self-selected, which likely over-represented those who are more engaged in the delivery of smoking cessation services and/or who possess more knowledge or training in smoking cessation. Additionally, fewer dentists were recruited for interviews than originally planned (three practitioners instead of 10). Thus, there are limitations on the generalizability of the interview findings. Nevertheless, the interviews with dental health professionals provided an opportunity to validate findings from the online survey and enrich our understanding of the dental health professionals' experience in smoking cessation.

Data Collection

Telephone interviews were conducted between February 9 and March 22, 2012. A total of 23 dental health professionals were interviewed, including three dentists, 10 dental assistants, and 10 dental hygienists. The latter included four independent dental hygienists (i.e. licensed dental professionals who perform the same functions as a dental hygienist, but work independently from a dentist). Interview participants were mostly female, between the ages of 40 and 59 years, had approximately 25 years of experience practicing in the dental health field, were never smokers, and worked in a private practice setting. Table 3 summarizes the characteristics of interview participants.

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Table 3: Descriptive Characteristics of Interview Participants, n=23

Characteristic		n
Sex	Female	21
	Male	2
Age	19–29 years	1
	30–39 years	2
	40–49 years	7
	50–59 years	12
	60+ years	1
Number of years practiced ^a		24.8 years
Smoking status	Current smoker	1
	Former Smoker	4
	Never Smoker	18
Primary practice setting	Private Practice	4
	Public Health	19

^a Median number of years practiced in dental health profession.

The interviews were generally 15 to 20 minutes in duration. Written and/or oral consent was obtained from each interview participant prior to commencing the interview. The telephone interview guide included questions about dental health professionals' attitudes toward smoking cessation, experience in provision of smoking cessation in their daily practice, facilitators and barriers to providing smoking cessation services, and suggestions for improving the provision of smoking cessation services within dental practice (see Appendix B for the interview guide).

Analysis

Telephone interviews were digitally recorded, transcribed, and then analyzed using the qualitative data analysis software NVIVO 9. The data was organized into categories based on responses to questions and emerging themes across the interviews. Broader categories or themes were assigned a “node” and sub-themes were identified and coded under these heading nodes. A series of attributes was created for each respondent to allow for analysis according to key characteristics: practice setting (private practice/public health) and occupation (dentist, dental hygienist, and dental assistant).

RESULTS

Respondent Characteristics

Overall, online survey respondents were predominately female (93%) and between the ages of 30–39 years (27%) and 40–49 years (32%; see Table 4). Two-thirds (67%) of the online survey respondents were dental assistants; in comparison, fewer dental hygienists, general dentists and specialist dentists responded to the online survey (22%, 9% and 2%, respectively).

Table 4: Descriptive Characteristics of Online Survey Respondents, n=1966

		<i>n</i>	%
Sex	Female	1826	92.9
	Male	140	7.1
Age	19–29 years	364	18.5
	30–39 years	532	27.1
	40–49 years	636	32.4
	50–59 years	368	18.7
	60+ years	66	3.4
Dental profession ^a	Dental Assistant	1317	67.0
	Dental Hygienist	432	22.0
	General Dentist	185	9.4
	Specialist Dentist	32	1.6

^a General Dentist and Specialist Dentist is collapsed into one Dentist category for the remainder of the report (n=217; 11.0% of respondents).

The majority of respondents reported working primarily in a private practice setting (89%; see Table 5). Other respondents reported working in public health (5%), at a university or college (3%), or in another practice setting (e.g., hospital, Community Health Centre, insurance/benefits company, etc.; 3%). Urban practice locations were the most commonly reported practice locations (56%); suburban locations (23%) and rural, remote or isolated locations (14%) were less commonly reported. A small proportion of respondents (7%) reported working in multiple practice locations. The median number of years practiced in the dental health profession among survey respondents was 13.8 years (range: less than one year to 47 years).

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Table 5: Practice Characteristics of Online Survey Respondents, n=1966

		<i>n</i>	<i>%</i>
Primary practice setting	Private Practice	1751	89.1
	Public Health	103	5.2
	University/College	57	2.9
	Other ^a	55	2.8
Primary location of practice	Urban	1098	55.9
	Suburban	458	23.3
	Rural, Remote or Isolated	266	13.5
	Multiple practice locations	133	6.8
Number of years practiced ^b		1966	13.8 years

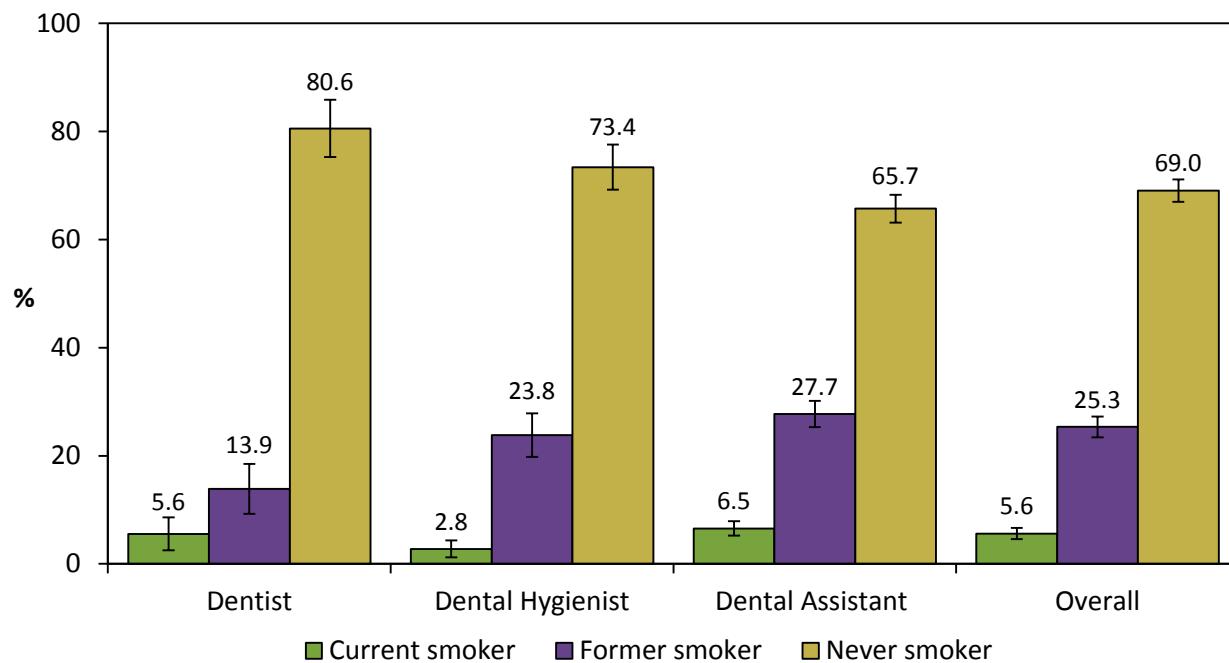
^a Other practice setting includes: hospital, Community Health Centre, Department of National Defense, insurance or benefits company, regulatory college, long-term care facility, professional association, dental supply company, financial company, First Nation's remote community, and unspecified.

^b Median number of years practiced in dental health profession

Very few of the respondents were current smokers at the time of survey (6%; see Figure 1). About one-quarter of respondents (25%) were former smokers, while the majority (69%) of respondents had never smoked. The proportion of current smokers did not differ by dental health profession. Dental assistants (28%) and dental hygienists (24%) were more likely to report being a former smoker compared to dentists (14%; dental assistants vs. dentists $p < .0001$; dental hygienists vs. dentists $p < .01$). In contrast, dental assistants (66%) and dental hygienists (73%) were less likely to report being a never smoker compared to dentists (81%; dental assistants vs. dentists $p < .0001$; dental hygienists vs. dentists $p < .05$).

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Figure 1: Self-reported Respondent Smoking Status, by Profession, n=1961



The median number of patients seen by respondents per week was 44.6 and the median time spent per patient was 43.2 minutes (see Table 6). The number of patients seen per week and the time spent per patient were significantly associated with both dental health profession and practice setting. Dental hygienists reported seeing the fewest number of patients per week and spending the most time with each patient compared to dentists ($p < .0001$). Respondents who worked in a private practice reported seeing more patients per week and spending more time per patient compared to respondents working in public health ($p < .05$).

Table 6: Median Number of Patients Seen per Week and Time Spent per Patient, by Profession and Practice Setting

	Profession	Number of patients seen per week		Time spent per patient (minutes)	
		n	Median value	n	Median value
Overall		1457	44.6	1519	43.2
Practice Setting	Dentist	193	49.8	185	43.0
	Dental Hygienist	364	29.8	399	47.6
	Dental Assistant	900	48.6	935	39.6
Private Practice	Private Practice	1355	44.7	1396	43.4
	Public Health	52	18.0	65	29.7

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Survey respondents estimated that 28.5% of their patients smoked (median value; see Table 7). The estimation of patient smoking status was significantly associated with profession and practice setting. Dental assistants reported a higher estimation of patients smoking status compared to dentists (29.6% vs. 20.0%, respectively; $p < .0001$). Respondents working in a public health setting reported a lower estimation of patients smoking status compared to those working in a private practice setting (4.9% vs. 28.6%; $p < .0001$).

Table 7: Median Estimated Percentage of Patients Who Smoke, by Profession and Primary Practice Setting, n=1228

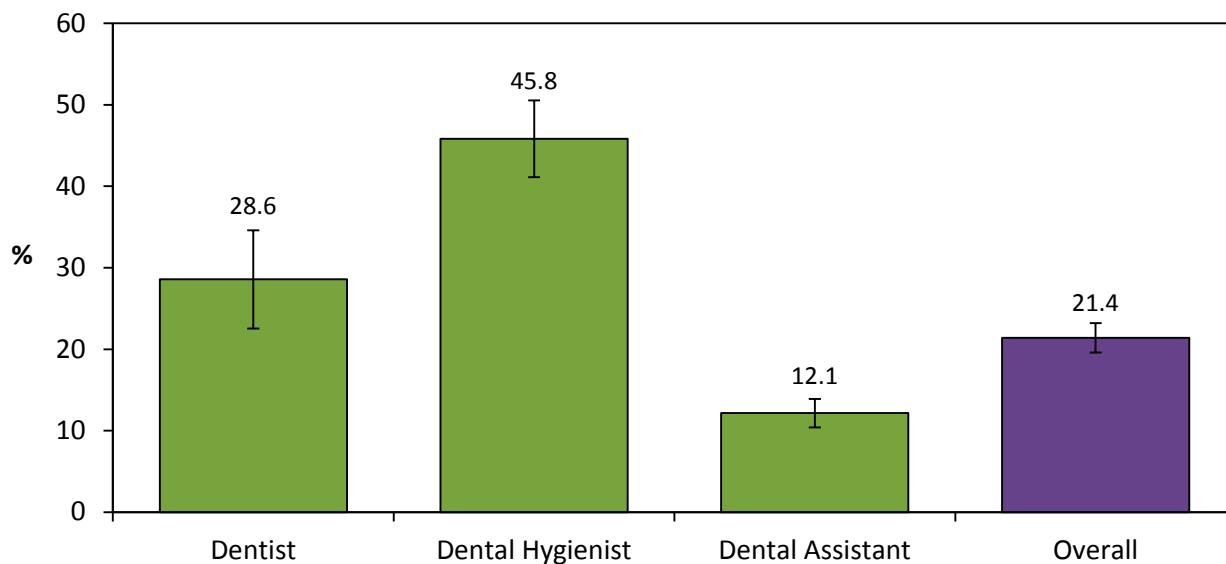
		Estimated percentage of patients who smoke	
		n	Median %
Overall		1228	28.5
Profession	Dentist	154	20.0
	Dental Hygienist	341	21.3
	Dental Assistant	733	29.6
Practice Setting	Private Practice	1110	28.6
	Public Health	59	4.9

Smoking Cessation Training

Overall, only 21% (n=420) of online survey respondents reported receiving formal training in smoking cessation (see Figure 2). Compared to dentists, dental hygienists were more likely to report receiving formal smoking cessation training (46% vs. 29%, respectively; $p < .0001$), while dental assistants were less likely to report receiving formal smoking cessation training (12% vs. 29%, respectively; $p < .0001$). Respondents who worked in public health were more likely to report receiving formal smoking cessation training compared to respondents who worked in private practice (54% vs. 19%, respectively; $p < .0001$). Formal smoking cessation training was not significantly associated with the respondents' smoking status or location of practice.

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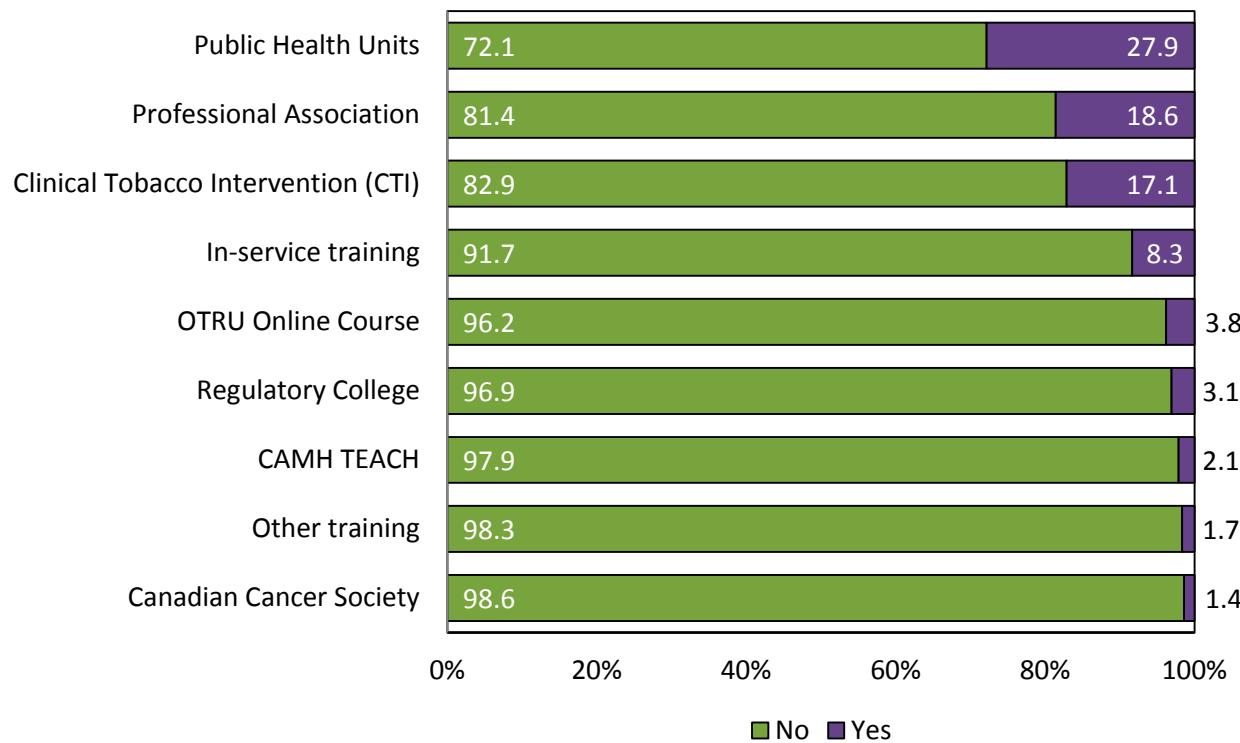
Figure 2: Smoking Cessation Training, by Profession, n=1966



University or college curriculum was the most commonly reported source of formal smoking cessation training (38%; see Figure 3). Public health unit training (28%), professional dental associations (19%), Clinical Tobacco Intervention (CTI; 17%), and in-service training (8%) were also reported as sources of formal smoking cessation training. Less common sources of formal smoking cessation training included the OTRU Online Course (4%), dental regulatory college (3%), CAMH Training Enhancement in Applied Cessation Counseling and Health (TEACH; 2%), other training (e.g., hospital cessation training; 2%), and Canadian Cancer Society (1%).

Provision of Smoking Cessation by Ontario Dental Health Professionals

Figure 3: Source of Smoking Cessation Training, n=420



Note: Percentages do not add up to 100% as the survey participants could check more than one answer.

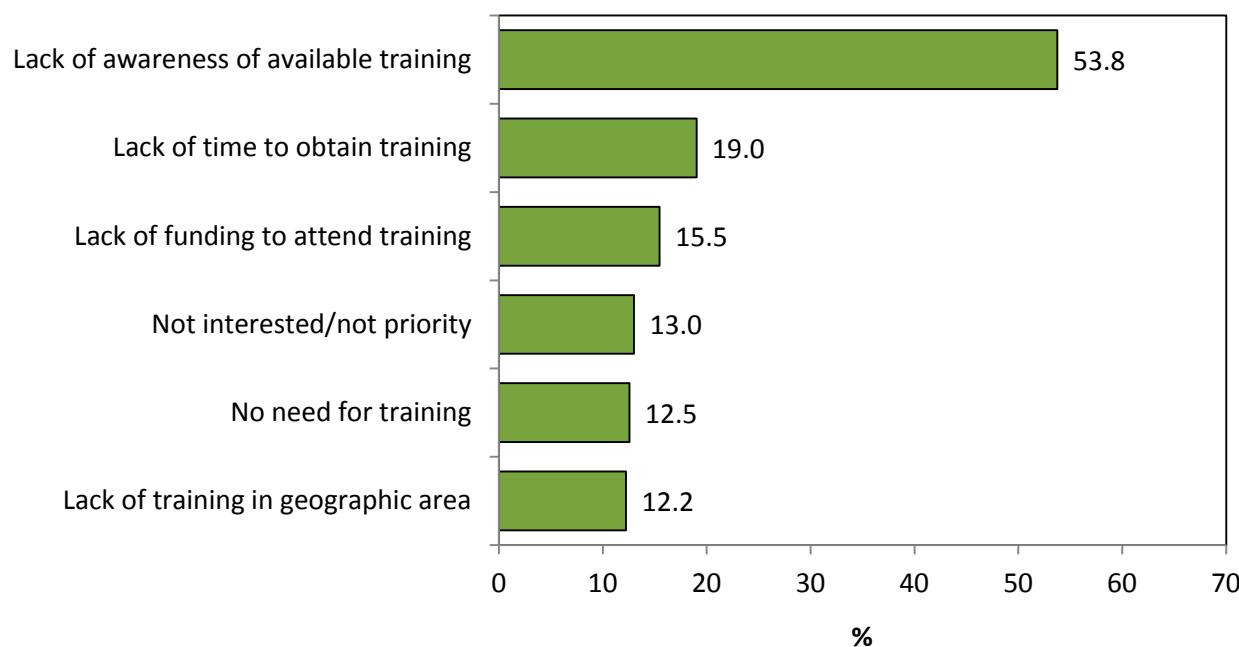
A small number of formal smoking cessation training sources were significantly associated with dental health profession. Dental hygienists were more likely to report university and college curriculum as a source for formal smoking cessation training compared to dentists (42% vs. 24%, respectively; $p < .05$). Dental assistants were more likely than dentists to report obtaining their smoking cessation training through public health units (36% vs. 18%, respectively; $p < .01$). Similarly, respondents working in rural or remote practice location were more likely to report receiving training through public health units compared to those practicing in urban areas (41% vs. 22%, respectively; $p < .01$). Dental hygienists were more likely to report professional dental associations as a source of formal smoking cessation training compared to dentists (27% vs. 11%, respectively; $p < .05$). Last, dental hygienists and dental assistants were less likely to report CTI as a source of formal smoking cessation training compared to dentists (10% and 9% vs. 61%, respectively; $p < .0001$).

The majority of dental health professionals (79%, n=1546) reported not having received formal training in smoking cessation. Lack of awareness of available training was the most frequently reported reason for not having received training (54%; see Figure 4). Other reasons included:

Provision of Smoking Cessation by Ontario Dental Health Professionals

lack of time to obtain training (19%), lack of funding to attend training (16%), no interest or not considered a priority for clinical practice (13%), no need for training (13%), and lack of availability of training in the geographic area (12%).

Figure 4: Reasons for not Receiving Training in Smoking Cessation, n=1546



Note: Percentages do not add up to 100% as the survey participants could check more than one answer.

Reasons for lack of any training in smoking cessation differed by dental health profession. Dental assistants (59%) and dental hygienists (44%) were more likely to cite lack of awareness of available training as a reason for not having smoking cessation training than dentists (34%; dental assistant vs. dentist $p < .0001$, dental hygienist vs. dentist $p < .05$). Dental hygienists were more likely to report lack of time as a reason for absence of any smoking cessation training compared to dental assistants (31% vs. 15%, respectively; $p < .0001$). Dental hygienists were also more likely to note lack of funding to attend training as a reason for not having smoking cessation training compared to dentists (25% vs. 10%, respectively; $p < .001$). Further, dentists (31%) were more likely to cite that they were not interested in obtaining smoking cessation training than dental hygienists (11%) and dental assistants (11%; both $p < .0001$). Finally, dentists were also more likely than dental hygienist to state that there was no need for training as a reason for not having smoking cessation training (12% vs. 3%, respectively; $p < .01$). As expected, respondents who worked in rural, remote or isolated practice locations were more likely to cite lack of training in the surrounding geographic area as a reason for not having

Provision of Smoking Cessation by Ontario Dental Health Professionals

smoking cessation training compared to respondents working in urban practice locations (17% vs. 10%, respectively; $p <.01$).

Compared to private practice, dental health professionals working in a public health setting were less likely to cite lack of awareness as a reason for not having received smoking cessation training (36.2% vs. 54.3%, respectively; $p <.05$).

Interviews with dental health professionals support the online survey findings. A few interview participants ($n=5$) reported receiving formal training in smoking cessation. Most of them were dental health professionals working in public health units (PHUs) with reported access to internal resources, such as pamphlets, posters, and training from a public health nurse. Dental hygienists who had training in smoking cessation and worked independently felt a strong responsibility to obtain training to be able to assist their patients. One independent dental hygienist commented:

...[I want to have] more information, if it's available...I'm interested in my client.../ I want my client to be healthy. (Dental Hygienist)

Among interview participants who had not obtained any formal training in smoking cessation ($n=18$), the majority were interested in attending a training course or program. Two dentists felt that training would be unnecessary. They were unsure whether their intervention was necessary or would provide further action:

Yeah ...trained psychologists and medical physicians have trouble getting people to stop smoking, but the orthodontist is not going to take over that role...our primary goal isn't smoking cessation, our primary goal is straight teeth. (Dentist)

The majority of dental professionals stated that they would consider further training if points or certificates could apply to their point system or portfolio for continuing education purposes.

...Yeah, something like that...you know can be downloaded and printed off and almost like a, like a, a course – right that we do online and then you know we do a test at the end and then we get some you know I guess like a certificate at the end because as dental hygienists we have to maintain a professional portfolio.
(Dental Hygienist)

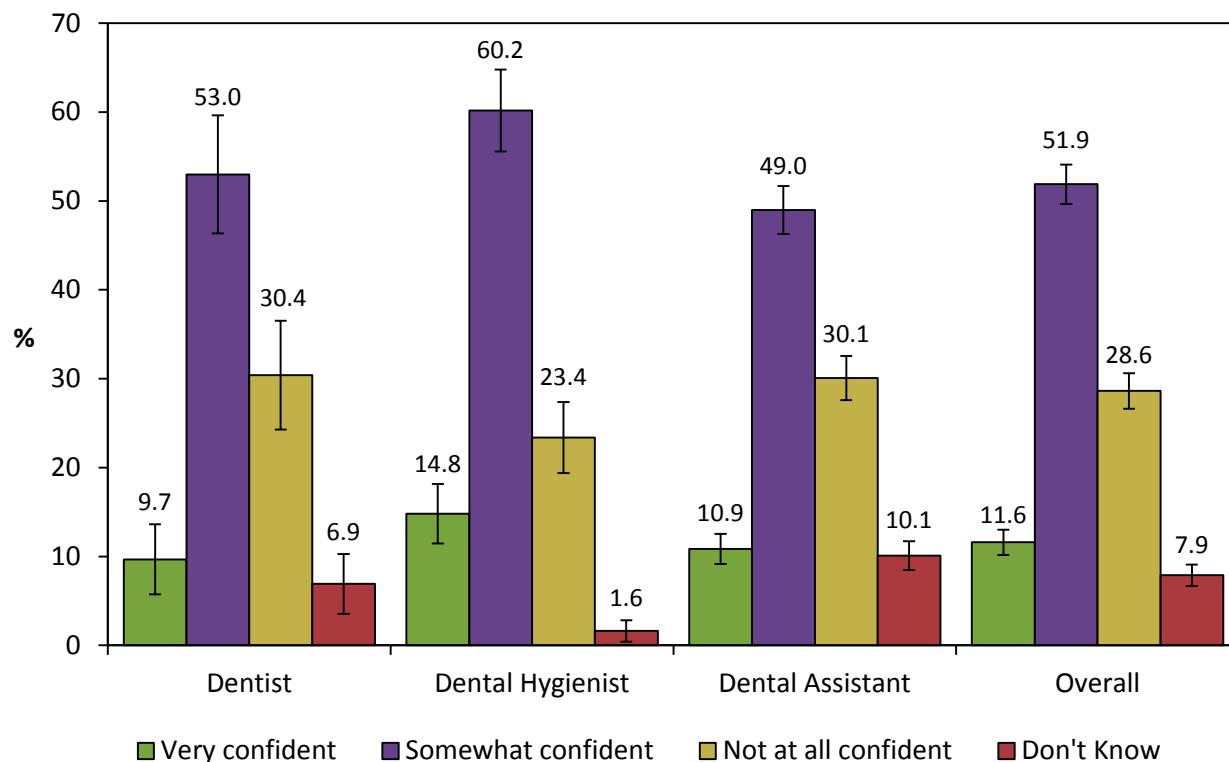
Provision of Smoking Cessation by Ontario Dental Health Professionals

Due to their typically busy schedule, one dentist suggested providing training through a DVD, booklet, or webinar. This dentist was particularly interested in learning more about cessation medications and their effects in order to feel more confident in prescribing or recommending them to patients.

Dental Health Professionals' Confidence in Providing Smoking Cessation Services

Overall, a little more than half of survey respondents (52%) reported being *somewhat confident* in their knowledge and skills to provide smoking cessation support to patients (see Figure 5). Only 12% of respondents reported being *very confident*, whereas 29% felt they were *not at all confident* in addressing smoking cessation within their daily practice. The reported level of confidence in the provision of smoking cessation services to patients was similar across all three dental health professions.

Figure 5: Confidence in Knowledge and Skills to Provide Smoking Cessation Services to Patients, n=1966



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Through interviews with dental health professionals, it became evident that those with training in smoking cessation felt more confident in addressing smoking with patients; particularly, discussing the health effects of smoking and informing patients about external cessation services, programs, and materials. One dental hygienist explained that because of the training obtained through the TEACH program, she felt more confident and was able to assist patients with further smoking cessation support.

Interviews revealed that dental health professionals working in the public health sector felt more confident about providing smoking cessation advice and information to their patients in comparison to those working in a private practice. This may be explained by the fact that many dental professionals from PHUs mentioned that it was mandatory to participate in continuing education courses, particularly smoking cessation courses. One dental hygienist mentioned benefiting largely from a team of nurses within the PHU who were a constant source of information on smoking cessation. This helped to strengthen her confidence.

...Working in conjunction with our nurses who are on the smoking cessation team... we're very fortunate here we have a strong team of nurses that we refer to constantly...I feel that we have here, we have all the resources we need. Our nurses are involved in the [Tobacco Control Area Network] and they, they work closely with [Centre for Addiction and Mental Health], so I feel that we are well equipped here...they touch base with us every, usually every six months they'll come to our team meetings and update us on any new current changes, any new strategies that they have with the four A's or anything in cessation...that's probably where my confidence comes in because I know they can pick up and take over very proficiently. (Dental Hygienist)

Dental assistants who were interviewed noted particularly low confidence in providing cessation support. When asked if they felt confident enough to provide cessation advice to patients, one dental assistant responded by explaining, *"Probably not very because I mean I only see what they would see on the TV. I do not feel I know more than they do"*(Dental Assistant).

Although a substantial number of interview participants had not received formal training in smoking cessation, many still felt confident providing cessation advice to their patients because of personal experiences and accounts. One dentist explained that patients listen to her advice

regarding smoking cessation because of her confidence and credibility through describing her sister's experience with lung cancer at the age of 35.

Well ... , I, and I, tend to be, my role is often shock-related ... I have a, my sister died of lung cancer when she was thirty-five and she was a casual smoker, and my brother-in-law just died of oral cancer, and so I, I feel that sometimes it's the shock value that's critical and you have to have credibility to have like if you don't have that personal experience in your life, then you don't have the credibility. (Dentist)

Attitudes towards Smoking Cessation Services

Dental health professionals' attitudes towards addressing smoking during routine visits were explored by rating nine attitude statements adapted from the Attitudes to Smoking Advice Questionnaire.⁹ Seven negatively worded statements were intended to measure dental professionals' enthusiasm for discussing smoking with patients (enthusiasm sub-scale), while the other two statements were positively worded and aimed to explore the extent to which health professionals believed that they could be effective in promoting smoking cessation (perceived effectiveness sub-scale). Online survey respondents' means scores and the proportion of negative attitudes for each of the nine attitude statements are presented below.

Enthusiasm towards Smoking Cessation Advice

Table 8 summarizes respondents' mean score for each statement assessing enthusiasm towards smoking cessation advice (maximum score = 4 for each statement). A higher score indicates disagreement, therefore more positive attitudes. Overall, dental health professionals held positive attitudes towards giving smoking cessation advice as indicated by the high mean scores for six of the seven statements (mean score range: 2.88 to 3.41; overall enthusiasm score = 3.03/4). However, there were still a substantial proportion of dental health professionals who held a number of negative attitudes towards providing smoking cessation advice. In particular, 23% of dental professionals thought that giving anti-smoking advice should not be a part of their job; 32% did not believe that discussing smoking with all patients was an appropriate use of their time; and, 33% did not like discussing smoking in routine visits. More than a third of respondents preferred not to discuss smoking unless the patient was in poor oral health with a smoking related problem (35%) or patients raise the subject (37%). Finally, half of dental professionals (51%) preferred to target smokers they felt would respond to their advice.

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Table 8: Enthusiasm towards Smoking Cessation Advice

	<i>n</i>	Mean score (SD) ^a	% Negative attitudes
To discuss smoking with patients is likely to do more harm than good	1877	3.41 (0.8)	14
Giving smoking cessation advice during routine visits should not be part of my job	1890	3.17 (0.9)	23
Discussing smoking with all patients is not an appropriate use of time	1892	2.98 (1.0)	32
I dislike discussing smoking in routine visits	1871	2.93 (0.9)	33
I prefer not to discuss smoking unless the patient is in poor oral health with a smoking related problem	1927	2.96 (1.0)	35
I prefer not to discuss smoking with patients unless they raise the subject	1926	2.88 (1.0)	37
I do not discuss smoking with all patients, but prefer to select those I feel will respond to my advice	1883	2.63 (1.0)	51
<i>Overall enthusiasm score</i>	1726	3.03 (0.7)	--

Note: Response options ranged from 1 (strongly agree) to 5 (don't know). However the "don't know" response was not included in the mean score calculations, making the highest score equal to 4 (strongly disagree).

^a Higher scores indicate disagreement, therefore more positive attitudes

All seven statements were significantly associated with dental health profession (data not shown; see Table A1, Appendix C). Dental hygienists had higher mean scores compared to dentists for all seven statements, meaning that dental hygienists displayed more positive attitudes towards smoking cessation advice compared to dentists. Dental assistants had a lower score than dentists for all statements except "Discussing smoking with all patients is not an appropriate use of time", meaning that dental assistants showed more negative attitudes towards smoking cessation advice compared to dentists.

Two studies have published findings using the same enthusiasm sub-scale: one study sampled doctors⁹ and the other study sampled nurses.¹⁰ Dental health professionals in this study generally held a greater proportion of negative attitudes towards statements in the enthusiasm sub-scale compared to published attitudes among doctors and nurses for all but two statements. Fewer dental health professionals agreed that discussing smoking with patients would do more harm than good compared to nurses; whereas doctors held the same level of agreement as dental health professionals for this statement. Also, fewer dental health professionals agreed that discussing smoking with all patients is not an appropriate use of time compared to doctors. These comparisons should be interpreted with caution due to the low response rate observed in our study (9%), while the other two studies observed a response rate between 70-76%.

Perceived Effectiveness

Respondents' mean score for each statement assessing perceived effectiveness of smoking cessation services is summarized in Table 9 (maximum score = 4 for each statement). A higher score indicates agreement, therefore more positive attitudes. Respondents tended to have positive attitudes about the effectiveness of smoking cessation advice (overall perceived effectiveness score = 3.05/4). Again, some dental health professionals held negative attitudes towards the perceived effectiveness of smoking cessation services. Specifically, 14% did not believe that discussing smoking with patients could be rewarding, and 24% did not agree that their smoking cessation advice could be effective in persuading some patients to stop smoking. Dental hygienists and dental assistants had higher mean scores than dentists for the statement "Discussing smoking with patients can be rewarding" (3.29 and 3.17 vs. 2.98, respectively; $p < .01$; see Table A2 in Appendix C). While only dental hygienists had a higher mean score compared to dentists for the statement "My smoking cessation advice can be effective in persuading some patients to stop smoking" (2.99 vs. 2.93, respectively; $p < .01$).

Table 9: Perceived Effectiveness of Smoking Cessation Advice

	<i>n</i>	Mean score (SD) ^a	% Negative attitudes
Discussing smoking with patients can be rewarding	1740	3.18 (0.8)	14
My smoking cessation advice can be effective in persuading some patients to stop smoking	1845	2.90 (0.8)	24
<i>Overall perceived effectiveness score</i>	1706	3.05 (0.7)	--

Note: Response options ranged from 1 (strongly agree) to 5 (don't know). However the "don't know" response was not included in the mean score calculations making the highest score equal to 4 (strongly disagree).

^a Original scores reversed so that higher scores reflect more positive attitudes.

Mean scores reported by dental health professionals for both measures in the perceived effectiveness sub-scale were similar to mean scores reported by nurses.¹⁰ However, compared to the doctors' mean scores reported in Coleman and Wilson,⁹ dental health professionals in our study reported fewer negative attitudes for the statement "Discussing smoking with patients can be rewarding." Dental health professionals in our study reported higher negative attitudes towards the perception that their smoking cessation advice could be effective in persuading some patients to stop smoking. These comparisons should be interpreted with caution due to

the low response rate observed in our study (9%), while the other two studies observed a response rate between 70-76%.

When discussing their perceived role in providing smoking cessation support, interview participants in general were supportive and positive, and felt that promoting health was part of their job. Most individuals felt that raising the topic of smoking themselves was more conducive to patient discussion. Four individuals stated that a probe for discussing smoking involved charting patient history, whereby questioning smoking habits allowed for cessation discussion naturally. Few interview participants (n=3) felt more comfortable raising the topic of smoking cessation when patient interest was present. One dental hygienist elaborated that although the College of Dental Hygienists recommends discussion on smoking cessation, she did not feel discussion was warranted until the patient raised the topic:

My personal role – or what I think the college wants us to say? Well okay the college, it's my opinion that the college says we should talk to everybody who smokes about smoking cessation. My personal opinion is if they're interested in quitting smoking that's when I will talk to them about it. (Dental Hygienist)

Dental health professionals who worked in the PHUs had a more persistent attitude. These individuals did not experience any uneasiness about the patient's outlook on smoking, nor did they worry about time. They felt it was their responsibility to provide information to every tobacco user, regardless of their interest level. One dental hygienist stated:

Okay, so no interest, I don't care if they're not interested [Laugh]. They will tell you I am not interested and I say okay that's fine you don't have to be interested you know but we do have programs here when you do get interested so I don't care if they're not interested or not, I do have you know I do say my little something. Okay time I'm good with time because we're Public Health. Time is not an issue. Time is not money here – like it is in private practice. (Dental Hygienist)

Several dental assistants and hygienists (n=5) commented that the attitude and atmosphere regarding smoking cessation was dependent on the dentist in a private practice. In some situations, the dentist was adamant about providing smoking cessation advice, and in others, there were several organizational restrictions. One dental hygienist shared a story explaining

that sometimes dental hygienists or assistants were forced to skip processes, including discussions about smoking cessation, because the dentist did not want time wasted.

...There's a high percentage of dental professionals that just go in... I say dental hygienists, scale the teeth, polish them up and get them out the door in half an hour and charge an hour's worth of work. Okay time is money to a dentist [in private practice]. Do you know I know a dental hygienist that's not allowed to do probing, periodontal probings on her client because it takes too much time but legally she's supposed to have a periodontal charting in the chart – and she's stuck...and the dentist won't let the dental hygienist do it [smoking cessation discussion] because it takes time. (Dental Hygienist)

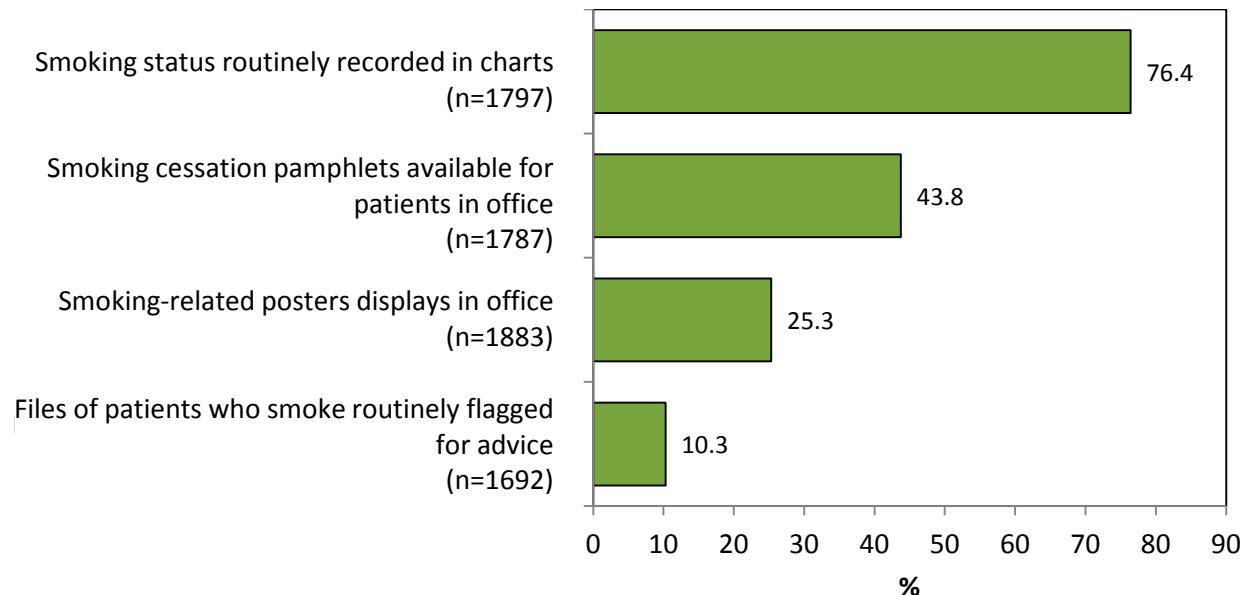
Smoking Cessation Practices and Materials

The majority of respondents (76%) reported that they routinely record the patient's smoking status in their chart (see Figure 6). Fewer respondents indicated that smoking cessation pamphlets were available for patients in the office (44%) or smoking-related posters were displayed in the office (25%). Only 10% of respondents reported that files of patients who smoke were routinely flagged for advice.

Dental hygienists were more likely to report routinely recording a patient's smoking status in their chart compared to dentists (85% vs. 75%, respectively; $p < .01$). Compared to dentists, dental assistants were more likely to report that files of patients who smoke were flagged for advice (12% vs. 7%, respectively; $p < .05$). Respondents who never smoked were more likely to report having smoking cessation pamphlets or materials for patients available in their office compared to current smokers (45% vs. 33%, respectively; $p < .05$). Dental professionals from public health settings were more likely to report having smoking cessation pamphlets available for patients in the office compared to respondents who worked in a private practice setting (87% vs. 40%, respectively; $p < .0001$). Similarly, respondents who worked in a public health setting were more likely to report displaying smoking-related posters in their office (72% vs. 22%, respectively; $p < .0001$).

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Figure 6: Smoking Cessation Practices and Materials



Some dental hygienists and assistants noted in interviews that patient health-related notations in dental charts have changed over the last decade; currently dentists tend to record more information relevant to patient health compared to previous years. This is particularly the case with charting patients' smoking status and their progress in quitting smoking. For instance, one dental assistant explained that the dentist preferred her to document any changes in patient's attitudes or smoking behaviour:

Yeah and we would [chart the information]...if they're thinking about it we would say or if we discussed it – like discussed smoking with the patient, we would write that in their chart as well – so even like pre-contemplation...a lot of times when this comes up is when patients usually are complaining because their teeth are yellow.
(Dental Assistant)

One dental assistant mentioned referring patients to smoking cessation nurses within the PHU for more information:

...If we felt like that there was a need for that like we've got lots and lots of avenues here at the Health Unit like definitely we would go and see the smoking cessation nurse and she's wonderful like there would be no problem with getting what we needed. (Dental Assistant)

In contrast, very few dental health professionals in private practice mentioned having smoking cessation materials in the office. Some interviewees reported that cessation materials in their offices were severely outdated. When asked if there are any smoking cessation materials at their office, one dental assistant responded: *"We, I think we do. Now honestly, they're probably ten years old – and before that they were probably like thirty years old"* (Dental Assistant). Independent dental hygienists were more likely to have updated information regarding smoking and smoking cessation. One independent dental hygienist reported providing patients with materials from her lending library, which included in-depth information regarding smoking cessation:

...Because when you get them in the chair and you're seeing things...you know [you ask] oh well have you tried this? Well what about this? You know if you're interested, you know I always say...my lending library I have this and then if they show an interest then I give them some handouts to go home with.

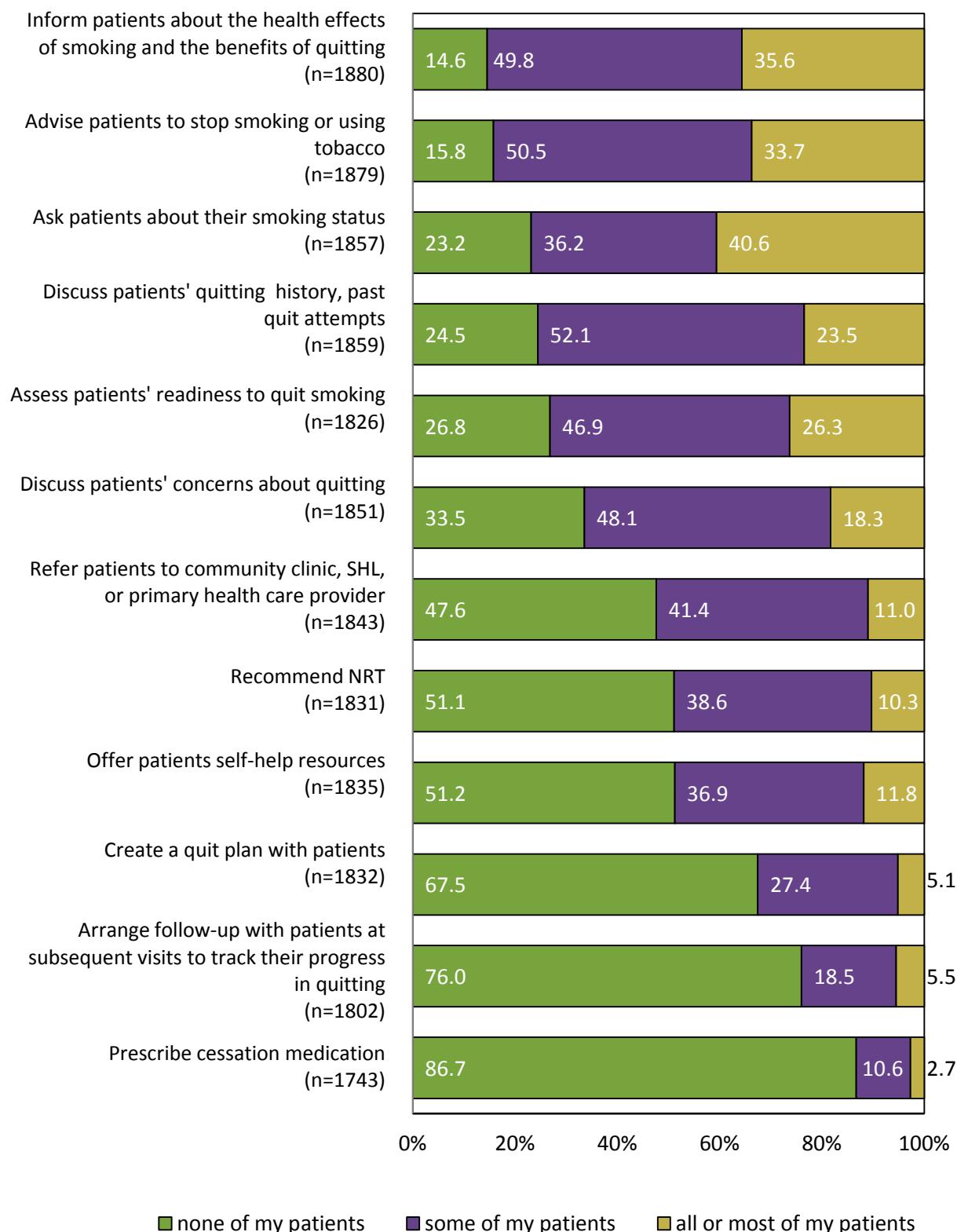
(Dental Hygienist)

Smoking Cessation Services Provided to Patients

Less than 50% of online survey respondents reported providing any form of smoking cessation services to *all or most* of their patients who smoke (see Figure 7). The highest frequency reported for any smoking cessation service provided to *all or most* patients who smoke was asking patients about their smoking status (41%). Approximately half of survey respondents indicated that they provided *some* of their patients who smoke with smoking cessation services, such as discussing patients' quitting history and past quit attempts (52%), advising patients to stop smoking or using tobacco (51%), informing patients about the health effects of smoking and the benefits of quitting (50%), discussing patients' concerns about quitting (48%), and assessing patients' readiness to quit smoking (47%). Other smoking cessation services were primarily reported as being offered to *none* of their patients who smoke including: prescribing cessation medication (87%), arranging follow-ups with patients at subsequent visits to track their progress in quitting (76%), creating a quit plan with patients (68%), recommending NRT (51%); offering patients self-help resources (51%), referring patients to community clinics, Smokers' Helpline, or a primary health care provider (48%).

Provision of Smoking Cessation by Ontario Dental Health Professionals

Figure 7: Smoking Cessation Services Provided to Patients Who Smoke



Provision of Smoking Cessation by Ontario Dental Health Professionals

A number of the smoking cessation services provided to patients were significantly associated with type of dental health profession. Dental assistants were less likely than dentists to report:

- asking *all or most* patients who smoke about their smoking status (33% vs. 52%, respectively; $p < .0001$)
- advising *all or most* of their patients who smoke to stop smoking (26% vs. 48%, respectively; $p < .0001$)
- assessing *all or most* of their smoking patients' readiness to quit smoking (17% vs. 30%, respectively; $p < .0001$)
- informing *all or most* of their patients who smoke about the health effects of smoking and the benefits of quitting (26% vs. 42%, respectively; $p < .0001$)
- referring *all or most* of their patients who smoke to community clinics, Smokers' Helpline, or a primary health care provider (8% vs. 13%, respectively; $p < .05$)
- creating a quit plan with *some* of their patients who smoke (22% vs. 30%, respectively; $p < .05$)
- offering *some* of their patients who smoke self-help materials (32% vs. 42%, respectively; $p < .01$)
- recommending the use of NRT to *some* of their patients who smoke (34% vs. 46%, respectively; $p < .01$).

In contrast, dental hygienists were more likely than dentists to report:

- assessing *all or most* of their smoking patients' readiness to quit smoking (50% vs. 30%, respectively; $p < .0001$)
- informing *all or most* of their patients who smoke about the health effects of smoking and the benefits of quitting (56% vs. 42%, respectively; $p < .0001$)
- discussing quitting history and past quit attempts with *all or most* of their patients who smoke (40% vs. 20%, respectively; $p < .0001$)
- discussing concerns about quitting with *all or most* of their patients who smoke (29% vs. 15%, respectively; $p < .0001$)
- offering *all or most* of their patients who smoke self-help resources (18% vs. 9%, respectively; $p < .01$)
- recommending to *all or most* of their patients who smoke the use of NRT (16% vs. 7%, respectively; $p < .01$)
- arranging follow-up with *all or most* of their patients who smoke (9% vs. 2%, respectively; $p < .01$)
- creating a quit plan with *some* of their patients who smoke (41% vs. 30%, respectively; $p < .01$).

Provision of Smoking Cessation by Ontario Dental Health Professionals

Respondents' smoking status was significantly associated with five smoking cessation services provided to patients who smoke. Former smokers and never smokers were more likely than current smokers to report advising *all or most* patients who smoke to stop smoking or using tobacco (27% of former smokers and 27% of never smokers vs. 17% of current smokers, respectively; both $p < .05$) and informing *all or most* of their patients who smoke about the health effects of smoking and the benefits of quitting (35% and 37% vs. 20%, respectively; both $p < .01$). Never smokers were also more likely than current smokers to assess *all or most* of their smoking patients' readiness to quit smoking (27% vs. 18%, respectively; $p < .05$), discussing quitting history and past quit attempts with *all or most* of their patients who smoke (25% vs. 14%, respectively; $p < .05$), and discussing concerns about quitting with *all or most* of their patients who smoke (20% vs. 11%, respectively; $p < .05$).

Dental health professionals working in a public health setting were more likely than dental health professionals working in a private practice to report offering *all or some* of their patients who smoke self-help resources (24% vs. 11%, respectively; $p < .01$) and referring *all or some* of their patients who smoke to community clinics, Smokers' Helpline or a primarily health care provider (23% vs. 10%, respectively; $p < .01$). However, dental health professionals working in a public health setting were less likely to report discussing quitting history and past quit attempts with *some* of their patients who smoke compared to dental health professionals working in a private practice (41% vs. 53%, respectively; $p < .05$).

Respondents who received formal smoking cessation training were more likely to report providing *all or most* patients who smoke all smoking cessation services ($p < .0001$) except prescribing NRT.

Interview findings provide insight into the level of involvement of various types of dental health professionals in smoking cessation. The majority of dental health professionals who participated in the interviews inquired about patient smoking status through medical history questionnaires. This information was updated in the dental chart with each subsequent visit. When asked at what time they provided cessation advice to their patient, the majority of dental assistants preferred to provide advice prior to clinical services; whereas dental hygienists and dentists preferred during or after clinical services. These differences in the provision of smoking cessation advice to the patient can be attributed to the timing in which each dental health professional is actively involved with the patient during the clinical appointment.

Provision of Smoking Cessation by Ontario Dental Health Professionals

Most dental hygienists who were interviewed tend to use the time allocated for an appointment as a teachable moment in order to provide a quick lesson of the health effects of smoking. One dental hygienist explained that alluding to the negative effects of smoking came easy while conducting an oral screening for cancer, a mandatory service for each cleaning.

I mean nine times out of ten when they open their mouth I can tell that they're, they are a smoker...they may be in for a toothache but I'm taking a look at the general mouth and saying in seeing maybe some early periodontal disease or advanced periodontal disease as a result of a combination of things including smoking so that time I think it's a teachable moment for me to say by the way as your healthcare professional I see that you're a smoker and you know you're at an increased risk for oral cancer and periodontal disease as well as other cancers...I say [this] as your healthcare professional, it's my responsibility. (Dental Hygienist)

Interviewees noted that provision of cessation supports is dependent on the patient's interest in receiving smoking cessation advice, with the exception of the dental health professionals working in PHUs who appeared to be less concerned with patient's lack of interest. When asked how they would proceed with the discussion on smoking cessation if patient interest was low, one dental hygienist from a PHU commented, "*Okay so no interest?...but I do explain that we do have programs here – when you do get interested*"(Dental Hygienist).

Some dental health professionals (n=5) were successful in assisting their patients to quit smoking simply by providing them with information about the health effects of tobacco. One dentist noted that she provided two patients with information about chewing tobacco, which made them realize it was not healthier than smoking cigarettes:

...I have one young woman who was on chewing tobacco and she thought it was natural in quotation marks because it was imported from Sweden, therefore it was healthier...I showed her the tissue and what it was doing...and actually this is the second patient and this guy was from Sweden and he'd used it for twenty-two years – and I got both of them to quit...[I asked them] is it because you want to get cancer that you use this like what is it about this material, this stuff that you're putting in there?(Dentist)

Dental health professionals working in PHUs, mainly dental hygienists and assistants, referred their patients to external programs or other health professionals for further smoking cessation advice. They appeared to have knowledge, training, and further resources at their disposal through the PHU, and were confident in referring their patients to other cessation resources if necessary. In contrast, interviewees who were in private practice did not indicate that they were able to provide their patients with similar supports. Many of these dental professionals admitted to not having enough knowledge and resources, and expressed interest in further training.

Most interview participants reported not having enough knowledge about NRT and other medications. However, many dental health professionals expressed a great interest in participating in training regarding various forms of NRT. In particular, one dentist mentioned:

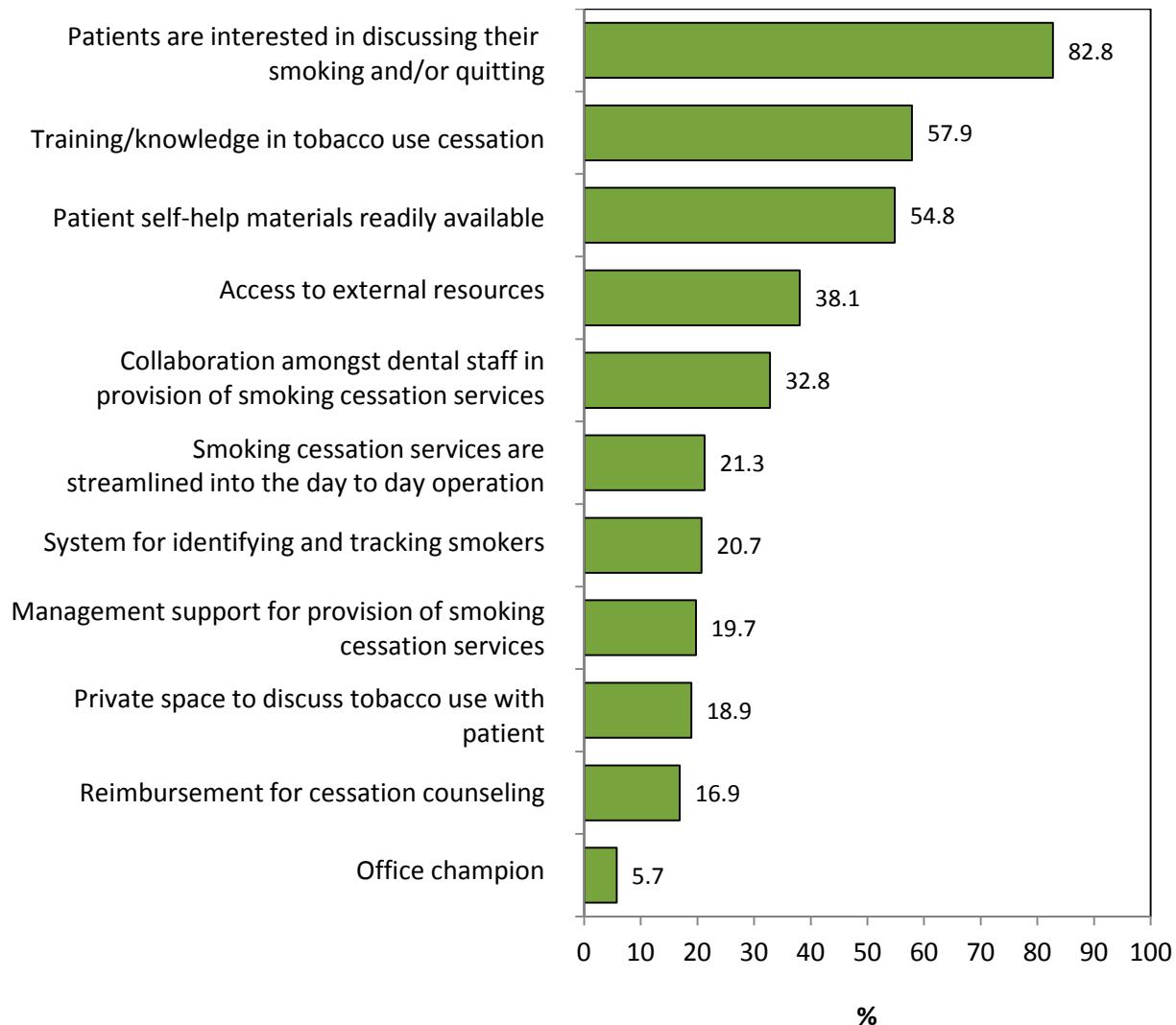
...I just read an article recently and it helped to encourage me to speak to them (patients) about various drugs that might help them – whereas in the past I pretty much saw that only as the physician's responsibility and now I'm beginning to feel that perhaps that I could play a role in prescribing these drugs as well which I didn't really think about before so I need to educate myself enough about these drugs so that I can feel more confident. (Dentist)

Facilitators to Providing Smoking Cessation Services to Patients

The greatest facilitator to providing smoking cessation services to patients, as identified by survey respondents, was patient interest in discussing their smoking and/or quitting (83%; see Figure 8). Other frequently mentioned facilitators included training or knowledge in tobacco use cessation (58%), having patient self-help materials readily available (55%), access to external resources (38%), and collaboration among dental staff in provision of smoking cessation services (33%). Approximately one-fifth of dental health professionals considered the following as facilitators in providing smoking cessation services to patients: smoking cessation services are streamlined into the day to day operation (21%), system for identifying and tracking smokers (21%), management support for provision of smoking cessation services (20%), private space to discuss tobacco use with patient (19%), and reimbursement for cessation counselling (17%). Having an office champion was cited the least as a facilitator to the provision of smoking cessation services among respondents (6%).

Provision of Smoking Cessation by Ontario Dental Health Professionals

Figure 8: Facilitators to Providing Smoking Cessation Services to Patients, n=1966



Note: Percentages do not add up to 100% as the survey participants could check more than one answer.

Significant differences were noted by dental health profession among the 11 facilitators to providing smoking cessation services. Dental hygienists were more likely than dentists to identify patient interest in discussing their smoking and/or quitting as a facilitator (92% vs. 77%, respectively; $p < .0001$). Similarly, dental hygienists were more likely than dentists to state that training or knowledge in tobacco use cessation (69% vs. 53%, respectively $p < .0001$), having management support (22% vs. 15%, respectively; $p < .05$), having patient self-help material readily available (62% vs. 50%, respectively; $p < .01$), and having access to external resources (51% vs. 42%, respectively; $p < .05$) were facilitators in providing smoking cessation to patients.

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Dental assistants and dental hygienists were less likely to cite reimbursement for cessation counselling as a facilitator compared to dentists (16% and 13% vs. 29%, respectively; $p < .0001$). Dental assistants were less likely to indicate that access to external resources was a facilitator to providing smoking cessation services compared to dentists (33% vs. 42%, respectively; $p < .05$). Last, dental assistants were more likely to state that having a private space to discuss tobacco use with patients was a facilitator compared to dentists (15% vs. 2%, respectively; $p < .05$).

Dental health professionals working in public health settings were more likely than their counterparts working in private practice settings to indicate the following facilitators: training and knowledge in tobacco use cessation (72% vs. 57%, respectively; $p < .01$), smoking cessation services are streamlined into the day to day operation (38% vs. 20%, respectively; $p < .0001$), collaboration among dental staff in provision of smoking cessation services (42% vs. 32%, respectively; $p < .05$), management support for provision of smoking cessation services (44% vs. 18%, respectively; $p < .0001$), patient self-help materials readily available (68% vs. 54%, respectively; $p < .01$), private space to discuss tobacco use with patient (32% vs. 18%, respectively; $p < .001$), and access to external resources (70% vs. 36%, respectively; $p < .0001$).

Interview participants, specifically dental health professionals at PHUs and independent dental hygienists, identified a number of key factors facilitating the provision of smoking cessation services, including: previous training, use of the charting and medical histories as a probe to discussion, clinical service related procedures, such as completing an oral cancer screening and utilizing an intra-oral camera, and the lack of a time restriction.

Nine dental health professionals cited charting and discussing medical histories as the most prominent facilitator to discussing smoking cessation support. They felt that probing about smoking through the medical history brought about cessation discussion more naturally. During the interviews many dental hygienists and assistants brought up a tool called an intra-oral camera, which they considered an important educational tool to spark discussion around smoking cessation. The intra-oral camera assists in the early detection of inflammation, infection, cancerous and precancerous tissue. The pictures from the assessment are immediate and it is easy to detect whether there are signs of abnormalities. Many dental professionals are using an intra-oral camera to assist in discussion of smoking cessation with patients by allowing them to visualize the damage that is occurring due to their smoking.

What a Velscope is, is it's a machine that is used clinically by hygienists or dentists and it's basically an intra-oral. It looks almost like a camera device...you snap a picture basically as the inside of the mouth...cheek, one of the tongue and one underneath the tongue...both can use it right and you're educating the patient [about smoking cessation]. It will show you spots in your mouth...and it shows you areas, they're basically screening your mouth for cancers. (Dental Assistant)

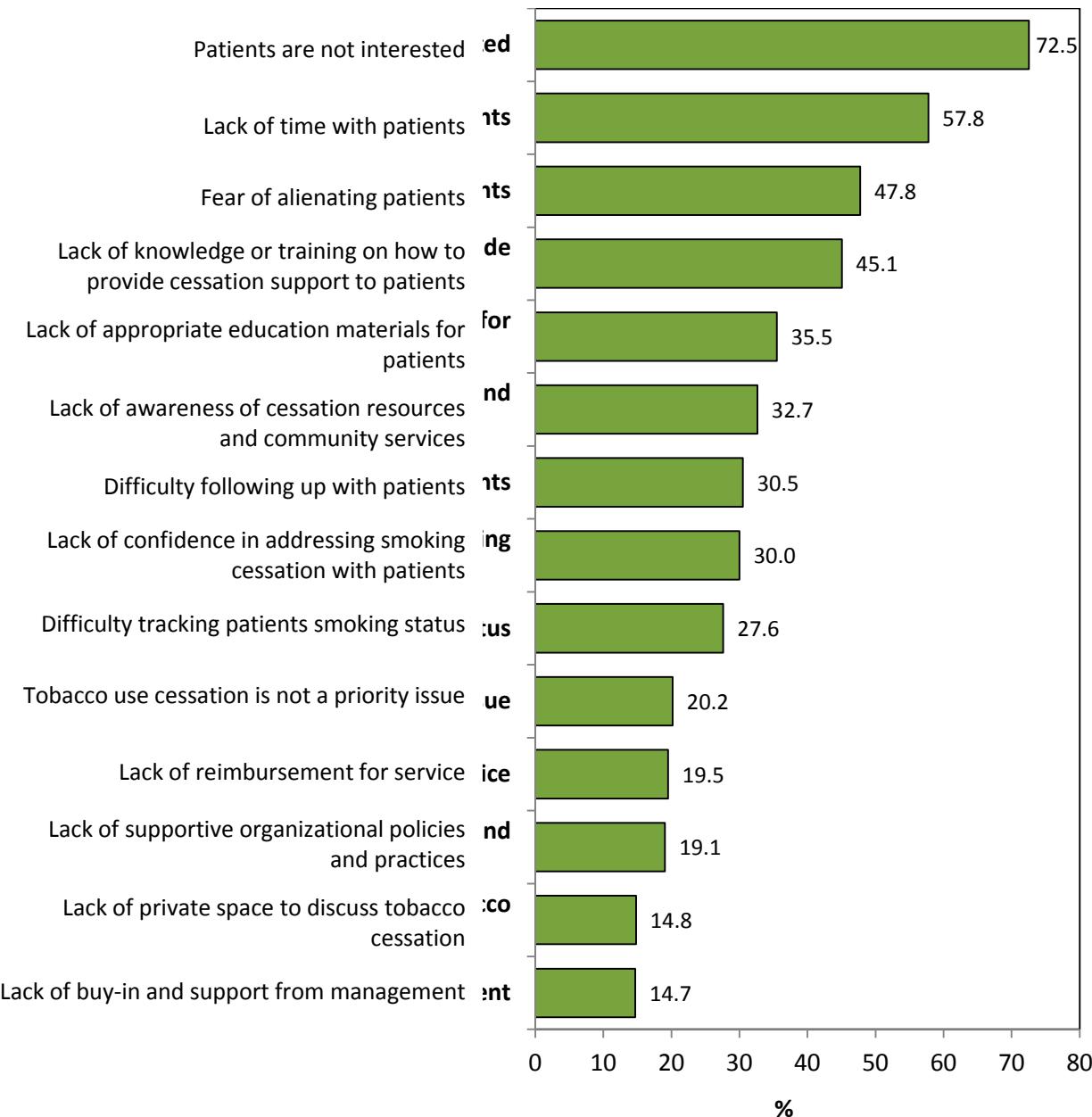
In contrast to those working in private practice, dental health professionals working in PHUs and independent dental hygienists had the added bonus of not having to worry as much about time as a factor. These individuals reported booking more time for an appointment with patients who smoke, and were able to provide them with the advice and support they required.

Barriers to Providing Smoking Cessation Services to Patients

Lack of interest from patients was the most common barrier to providing smoking cessation services reported by online survey respondents (73%; see Figure 9). The fact that patient interest in quitting was perceived both a key facilitator and a barrier suggests that patient interest is indeed a critical factor to determine the dental professional's willingness to address smoking in routine practice. Data analysis also showed that about half of the respondents identified lack of time with patients (58%), fear of alienating patients (48%), and lack of knowledge or training on how to provide cessation support to patients (45%) as barriers to providing smoking cessation services to patients. Lack of appropriate education materials for patients, lack of awareness of cessation resources and community services, and difficulty following up with patients were also cited as barriers to providing smoking cessation services by approximately one-third of respondents (36%, 33% and 31%, respectively). Other barriers include lack of confidence in addressing smoking cessation with patients (30%), difficulty tracking patients smoking status (28%), lack of reimbursement for service (20%), and smoking cessation being not a priority issue (20%). The least commonly reported barriers were office-specific ones, such as lack of supportive organizational policies and practices (19%), lack of private space to discuss smoking (15%), and lack of buy-in and support from management (15%).

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Figure 9: Barriers to Providing Smoking Cessation Services to Patients, n=1966



Note: Percentages do not add up to 100% as the survey participants could check more than one answer.

Dental hygienists were more likely than dentists to indicate lack of time with patients (65% vs. 54%, respectively; $p <.05$) and fear of alienating patients (52% vs. 42%, respectively $p <.05$) as barriers. Both dental hygienists and dental assistants were more likely than dentists to cite lack of buy-in and support from management (19% and 14% vs. 8%, respectively; $p <.05$), lack of supportive organizational policies and practices (19% and 20% vs. 12%, respectively; $p <.05$),

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lack of knowledge or training on how to provide cessation support to patients (42% and 48% vs. 32%, respectively; $p < .05$) , and lack of confidence in addressing smoking cessation with patients (34% and 30% vs. 23%, respectively; $p < .05$) as barriers to providing smoking cessation services. Dental assistants were more likely than dentists to state such barriers as lack of awareness of cessation resources and community services (33% vs. 26%, respectively; $p < .05$) and lack of private space to discuss smoking cessation (16% vs. 8%, respectively; $p < .01$). Last, dental hygienists and dental assistants were less likely to report that lack of reimbursement for service was a barrier to providing smoking cessation services compared to dentists (21% and 15% vs. 42%, respectively; $p < .0001$).

Dental health professionals working in public health settings were more likely to cite difficulty following-up with patients as a barrier to providing smoking cessation services than dental health professionals working in a private practice setting (44% vs. 30%, respectively; $p < .01$). Otherwise, dental health professionals working in public health settings were less likely than dental health professionals working in private practice to indicate that fear of alienating patients (36% vs. 49%, respectively; $p < .05$), patients are not interested (59% vs. 73%, respectively; $p < .01$), lack of knowledge or training on how to provide cessation support to patients (29% vs. 47%, respectively; $p < .001$), lack of supportive organizational policies and practices (11% vs. 20%, respectively; $p < .05$), and lack of awareness of cessation resources and community services (16% vs. 37%, respectively; $p < .001$).

Interviews with dental health professionals confirmed and further expanded a list of barriers or challenges to the provision of smoking cessation services. Through interviews it became evident that public health and private practitioners have concerns that are specific to the nature of their work.

In general, dental professionals from PHUs split their time between clinical services and oral health promotion. Depending on their region, tobacco-use varied significantly. However, all four participants from PHUs wished to combine efforts and be able to provide clinical services, cessation services, and oral health promotion to an older high school youth population, when tobacco use begins. They discussed that although the negative effects of tobacco are taught in health classes, cessation services were not provided to current youth tobacco-users. The dental assistants and hygienists perceived a lack of human resources to be able to provide clinical and oral advice at the high school level. One dental assistant mentioned that with the Ministry of Health and Long-Term Care mandate, her time was allocated to explaining oral hygiene to the elementary school population, but she did not have enough time and resources to be able to discuss oral cancer with youth and/or adolescents in high schools. Another dental hygienist explained that although the PHU encompasses care for youth up until the age of 17, the dental

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staff concentrates mostly on the younger population because of the Ministry of Health and Long-Term Care mandate.

I think we should be providing screening for every grade in, in high school. We don't have the manpower right now to even do one grade – it sounds like we're cutting back on that cause it's not mandated in our, in our protocols to do so, so if the Ministry made it mandatory that we screen this population...we would stop them dead in their tracks...they don't know, nobody's telling them oh it's not right to smoke it's not healthy to smoke and if at least we're influencing them at grade nine, then by grade eleven they're not chronic smokers. (Dental Hygienist)

Another related challenge stems from the need for confidentiality of youth patients' personal information, including their smoking status in health care practice. Most PHU dental professionals felt that their inability to share information with parents regarding a youth's smoking status sometimes prevents them from providing adequate smoking cessation support. This is particularly evident when a dental health professional considers recommending the use of NRT, in which case parents might need to be informed in order to cover the cost of medication.

The majority of dental health professionals in private practice confirmed the lack of patient interest, lack of time, fear of alienating patients, and a lack of knowledge or training as the major barriers to providing smoking cessation advice to their patients. Dentists' limited opportunities to bill for smoking cessation to insurance companies (and hence the need to charge patients extra for service that is not covered by patients' health benefit plan) also emerged as a challenge. Although interview participants recognized the importance of discussing smoking, the ability to bill for smoking cessation was an incentive to discuss the topic with patients further.

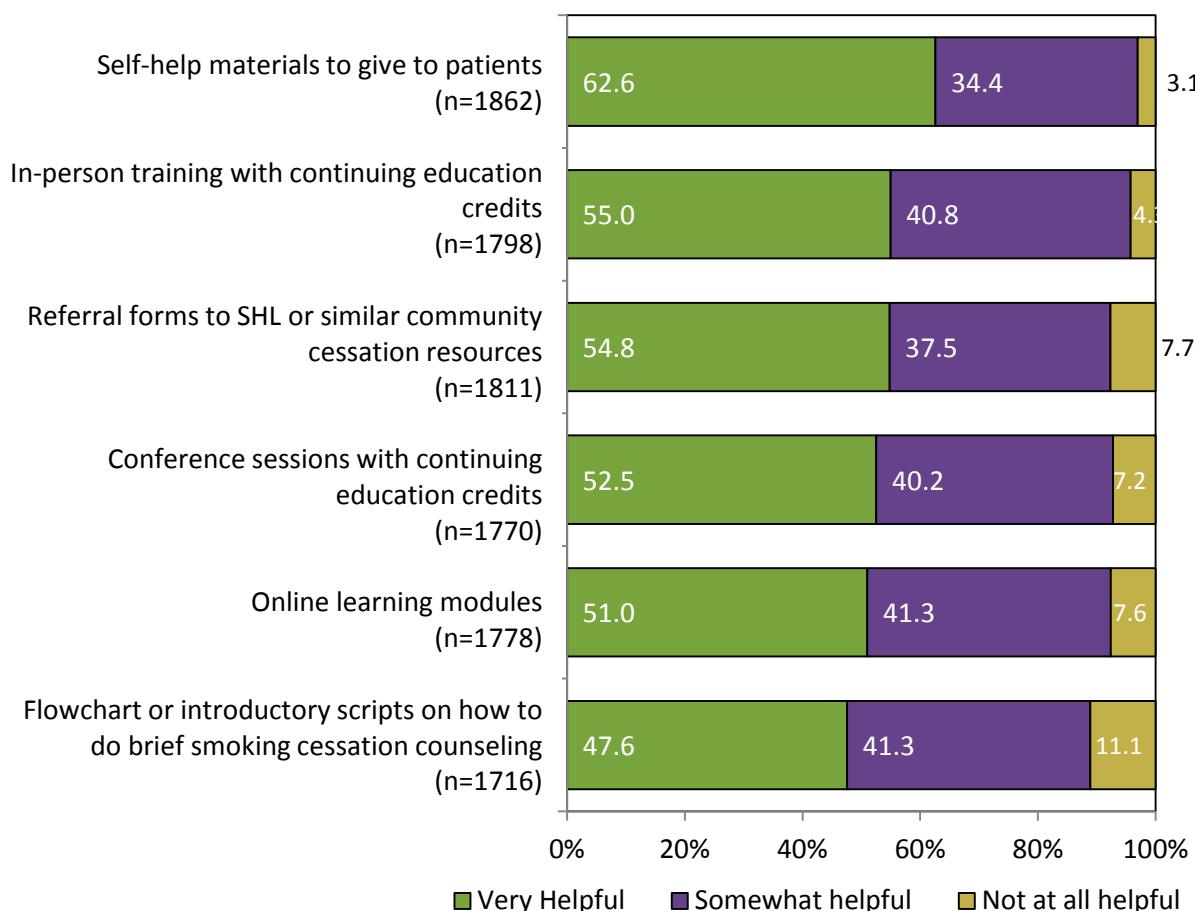
Many of these individuals cited the nature of private practice as a significant contributor to these obstacles. One dental hygienist explained that a lack of patient interest makes it difficult to discuss smoking cessation with a patient without the conversation feeling forced. She commented that discussing smoking cessation in situations when patients are not willing to do so could cause alienation of a patient and the loss of customers. A dental assistant explained that although the dentist prefers the patient to quit, the discussion cannot occur to the point where the patient becomes frustrated. This could sometimes put the dental assistant in a situation where they become worried about their position at the private practice:

I mean obviously you don't want to piss off the patient because you, you know then your boss hears about that and then as much as you know they're trying to get them to quit as well – it's not a good thing. (Dental Assistant)

Resources to Facilitate Delivery of Smoking Cessation Services

Survey respondents were asked to assess how helpful various resources or tools would be in enhancing the provision of smoking cessation services in their daily practice. Survey data shows that approximately 50% or more of the respondents perceived the six resources listed in Figure 10 as very helpful. These resources included: self-help materials to give to patients (63%), in-person training with continuing education credits (55%), referral forms to Smokers' Helpline or similar community cessation resources (55%), conference sessions with continuing education credits (53%), online learning modules (51%), and a flowchart or introductory scripts on how to do brief smoking cessation counselling (48%).

Figure 10: Helpfulness of Smoking Cessation Resources or Tools in Enhancing the Provision of Smoking Cessation Services



Interviewees added to the resources that could improve the provision of smoking cessation services. The most prominent responses concerned a desire for training and additional smoking

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cessation resources for patients. Many felt that dental clinics were significantly lacking in smoking cessation materials/resources, such as pamphlets, posters, brochures, and links to external local smoking cessation programs. One dentist explained that access to these resources in the offices, especially tailored to each region, would guide and facilitate discussion with the patient:

Well, if you provide a package of specific information, referral cards with the address of the clinic, so we don't have to be vague in, in terms of how they would go about it, we'd be more than glad to yeah hand it to patients and say here's another approach to trying to stop smoking and you're not alone. (Dentist)

Many dental health professionals felt that the provision of free NRT would be an excellent incentive for patients to attempt to quit smoking. Some individuals felt that with more knowledge and understanding of cessation medications, they would be able to assist the patient in finding the option that would work best, and assist with the quitting. Three individuals suggested that mandatory smoking cessation training through the Ministry of Health and Long-Term Care would be an opportune way to explain NRT to all individuals, and the ability to assist in providing informational advice and follow-up.

Interview participants also discussed a need to develop a national smoking cessation guideline that would be applicable to all dental professionals groups.

From an organizational perspective, many dental hygienists and assistants felt a need for team training to apply a more holistic approach to smoking cessation. This would ensure that all members of the dental team would be able to address questions relating to tobacco use, as well as be able to refer patients to external programs/services and cessation medication. A holistic approach would also alter the attitude on smoking cessation within dental clinics, and facilitate further discussion with patients about the possibilities of smoking cessation interventions and treatments.

CONCLUSION

This study utilized a mixed method approach (survey and interviews) to examine the experience of dental health professionals (i.e. dentists, dental hygienists, dental assistants) in providing smoking cessation services in routine daily practice.

Our findings demonstrate that very few (21%) Ontario dental health professionals (mainly from public health settings) have received formal smoking cessation training. Yet, the majority of dental health professionals was enthusiastic about providing smoking cessation services to patients and perceived such services as being effective.

Recording patient's smoking status in the chart appears to be a common practice across dental clinics. Other cessation practices, such as having posters and pamphlets in the office, and routinely flagging the files of patients for cessation advice are not widely adopted. The latter was reported only by 10% of survey respondents.

The study results, consistent with studies in other jurisdictions,^{11,12,13,14,15} suggest that dental professionals in Ontario do not routinely provide smoking cessation services. The results further demonstrate a low level of cessation activities in a number of areas, including: prescribing cessation medication, arranging follow-ups with patients at subsequent visits, creating a quit plan, and recommending NRT. This may be explained by the reported lack of knowledge/training in smoking cessation, time constraints and lack of patient interest, the key barriers consistently identified in many studies.^{5,16,17,18,19} Interestingly, our study found the patient's interest in quitting to be both a major facilitator and a barrier to provision of smoking cessation services. This finding indicates that currently the patient indeed drives the provision of smoking cessation services by dental health professionals.

Dental hygienists appear to be more highly involved than dentists and dental assistants in the provision of smoking cessation services. Compared to dentists and dental assistants, more dental hygienists received formal smoking cessation training. They were more likely to report positive attitudes towards giving smoking cessation advice and were more likely to engage all or most of their patients in most of the smoking cessation services examined in the study. Patients also spend more time with dental hygienists than with dentists and dental assistants.

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There are some limitations to this study that should be considered when interpreting the results presented in this report. First, all online survey data and telephone interview data was collected via a convenience sample. Second, a small percentage of selected Ontario dental health professional association membership (9%) took the time to complete our online survey. Third, the online survey sample is skewed because it comprises mostly dental assistants and the demographic characteristics differ slightly from the reported demographic characteristics of the selected Ontario dental health professional associations. Last, all data included in this report is self-reported and cannot be verified to assure that the respondents were not over or under-reporting the provision of smoking cessation services. For these reasons, the results may not reflect the true opinions and provision of smoking cessation services of all dental health professionals currently practicing in Ontario.

Overall, this study suggests that dental health professionals in Ontario are currently providing some form of smoking cessation services to patients and that they largely hold positive attitudes towards providing such services. However, more training and cessation resources are necessary if dental health professionals are to routinely provide smoking cessation services to patients.

APPENDIX A: ONLINE SURVEY QUESTIONNAIRE

Survey Language

Please select the language for the survey:

Veuillez choisir la langue dans laquelle vous voulez répondre à ce sondage:

English

French

Consent

Welcome to the online survey.

First, we would like to inform you about the purpose, procedures, benefits, discomforts, risks and precautions associated with this survey. In order to decide whether you wish to participate, you should understand enough about its risks and benefits to be able to make an informed decision. This is known as the informed consent process.

Background & Purpose of Study

The Ontario Tobacco Research Unit (OTRU) is an academic research institution with offices at the University of Toronto, the University of Waterloo, and the Center for Addiction and Mental Health. OTRU conducts tobacco control research, monitoring and evaluation, teaching and training and is a respected source of science based information on tobacco control. In partnership with the Ministry of Health Promotion and Sport, OTRU is conducting a survey to explore the experience of dental professionals (e.g., dentists, dental hygienists, dental assistants) in providing smoking cessation support to their patients in routine daily practice. OTRU is inviting you to participate in this survey because you are a dental professional and your opinion is important to OTRU. You are being asked to participate voluntarily in an online survey. The results of the survey will facilitate the development of strategies and resources to further enhance the delivery of smoking cessation services in dental practice.

Procedures

You are being asked to participate in an online survey, which will ask you about your current experience delivering cessation services to patients; barriers and challenges to providing these services; enablers and motivators such as cessation training, tools and/or resources. The survey should take no more than 10 minutes.

Voluntary Participation & Early Withdrawal

Your participation in this survey is voluntary. You can choose not to participate or you may withdraw at any time without penalty. If you decide to participate, you may choose not to answer specific questions and may end the survey at any time. We will use and analyze any data we have from all participants, including those who withdraw early.

Risks & Benefits

There are no known risks about this online survey.

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Although, you may not receive any direct personal benefit from participating in this survey, information learned in this study could facilitate the development of strategies/resources to effectively integrate the smoking cessation support within dental professionals' daily clinical practice.

Confidentiality

All information obtained during the survey will be held in strict confidence. No personal names or identifying information will be used in any analysis, publication or presentations. Electronic data will be kept on a password protected server at OTRU at the University of Toronto. Data will only be accessible to researchers working at OTRU, including senior management, scientists, and research associates.

Publication of Research findings

Aggregate data may be presented and published. But no information that could individually identify you will be available or published.

Compensation

There is no direct compensation for completing this survey.

Questions

If you experience any discomfort during or after the survey, or if you have any general questions about the study, please contact the study coordinator, Alexey Babayan at 416-978-7096 or alexey.babayan@utoronto.ca

If you have any complaints or concerns about how you have been treated as a research participant, please contact Rachel Zand, Director, Office of Research Ethics, rachel.zand@utoronto.ca or 416-946-3389.

You Must Complete the Survey in One Session

If you exit the survey or close your internet browser before completing the entire online survey, your responses to that point will be lost.

I consent to participate in this survey

I do not consent to participate in this survey

GO TO END OF SURVEY

General

First, we would like to ask you several socio-demographic and professional practice related questions.

1. Your sex:
 - a. male
 - b. female

2. Please indicate your age range:
 - a. 19-29
 - b. 30-39
 - c. 40-49
 - d. 50-59
 - e. 60 and above

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3. You are a:
 - a. General Dentist
 - b. Specialist Dentist
 - c. Dental Hygienist
 - d. Dental Assistant
 - e. Denturist
 - f. Other. Please specify: _____
4. Number of years of practice as a dental professional: _____ years
5. Primary practice setting
 - a. Private Practice
 - b. Hospital
 - c. Community Health Centre
 - d. Public Health
 - e. Regulatory College
 - f. University/Community College
 - g. Other, please specify: _____
6. Location of practice: (Check all that apply)
 - a. Urban
 - b. Suburban
 - c. Rural
 - d. Remote/isolated
 - e. Other, please specify: _____
7. What is your smoking status?
 - a. I currently smoke
 - b. I am a former smoker
 - c. I never smoked
8. On average, how many patients do you see per week?
 - a. _____ patients/ week
 - b. Don't know
9. On average, how much time do you spend per patient to provide clinical services?
 - a. _____ minutes per patient
 - b. Don't know
10. What do you estimate is the percentage of your patients who smoke?
 - a. _____ %
 - b. Don't Know

Training in tobacco use cessation

11. Have you received any formal training in smoking cessation? (e.g., training in smoking cessation counseling, 5As, etc)

- a. Yes
- b. No **GO TO Q13**

12. Please indicate the smoking cessation training you have attended (Check all that apply):

- a. Regulatory College. Please specify program: _____
- b. Professional Association. Please specify program : _____
- c. University and college curriculum
- d. Clinical Tobacco Intervention (CTI)
- e. Public Health Units (e.g., youcanmakeithappen.ca)
- f. The Centre for Addiction and Mental Health (CAMH) – Training Enhancement in Applied Cessation Counseling and Health (TEACH)
- g. Ontario Tobacco Research Unit (OTRU) Tobacco Cessation Online Course – Tobacco and Public Health: From Theory to Practice
- h. Other, please specify: _____

GO TO Q14

13. If you have not had any training in smoking cessation, please indicate the reason(s). (Check all that apply):

- a. No need for training
- b. Not interested/not considered a priority for clinical practice
- c. Lack of awareness of available training opportunities
- d. Lack of training in my geographic area
- e. Lack of time to obtain training
- f. Lack of funding to attend training
- g. Other, please specify: _____

14. How confident are you in your knowledge and skills to provide smoking cessation support to patients who smoke?

- a. Very confident
- b. Somewhat confident
- c. Not at all confident
- d. Don't know

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Attitudes toward provision of smoking cessation support

15. Using the scale below, please indicate your level of agreement/disagreement with the following statements:

	Strongly Agree	Agree	Disagree	Strongly disagree	Don't know
I dislike discussing smoking in routine visits	1	2	3	4	5
To discuss smoking with patients is likely to do more harm than good	1	2	3	4	5
Giving smoking cessation advice during routine visits should not be a part of my job	1	2	3	4	5
I prefer not to discuss smoking with patients unless they raise the subject	1	2	3	4	5
I prefer not to discuss smoking unless the patient is in poor health with a smoking related problem	1	2	3	4	5
I do not discuss smoking with all patients, but prefer to select those I feel will respond to my advice	1	2	3	4	5
Discussing smoking with all patients is not an appropriate use of time	1	2	3	4	5
My smoking cessation advice can be effective in persuading some patients to stop smoking	1	2	3	4	5
Discussing smoking with patients can be rewarding	1	2	3	4	5

Current smoking cessation practice

16. Is patient smoking status routinely recorded in your charts?

- a. Yes
- b. No
- c. Don't know

17. Are files of patients who use tobacco routinely flagged for advice?

- a. Yes
- b. No
- c. Don't know

18. Are there smoking-related posters displayed at your practice?

- a. Yes
- b. No
- c. Don't know

19. Are there smoking cessation pamphlets or materials for patients at your practice?

- a. Yes
- b. No
- c. Don't know

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20. With approximately how many of your **PATIENTS WHO SMOKE** do you take the following actions:

Cessation activity	All or most of my patients	Some of my patients	None of my patients	Don't know
Ask patients about their smoking status (e.g., "Have you smoked tobacco in the past 6 months?")	1	2	3	4
Advise patients to stop smoking or using tobacco	1	2	3	4
Assess patients' readiness to quit smoking	1	2	3	4
Inform patients about the health effects of smoking and the benefits of quitting	1	2	3	4
Discuss patients' quitting history, past quit attempts	1	2	3	4
Discuss patients' concerns about quitting (e.g., withdrawal symptoms)	1	2	3	4
Create a quit plan with patients	1	2	3	4
Offer patients self-help resources (e.g., quit plans, pamphlets)	1	2	3	4
Recommend nicotine replacement therapy (NRT) such as gum or the patch	1	2	3	4
Prescribe cessation medication (if applicable)	1	2	3	4
Refer patients to a community clinic/service/program	1	2	3	4
Refer patients to Smoker's Helpline	1	2	3	4
Refer patients to primary health care provider (e.g., physician, nurse, etc.)	1	2	3	4
Arrange follow-up with patients at subsequent visits to track their progress in quitting	1	2	3	4

Facilitators and challenges

21. What helps/enables you to provide cessation support to your patients? (Check all that apply)

- a. Patients are interested in discussing their smoking and/or quitting
- b. Training/knowledge in tobacco use cessation
- c. Smoking cessation services are streamlined into the day to day operation
- d. Reimbursement for cessation counseling
- e. Collaboration amongst dental staff in provision of smoking cessation services
- f. Management support for provision of smoking cessation services
- g. System for identifying and tracking smokers
- h. Office champion
- i. Patient self-help materials readily available
- j. Private space to discuss tobacco use with patient
- k. Access to external resources (e.g., community smoking cessation programs/services)
- l. Other. Please specify: _____

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22. What have been the barriers/challenges in providing smoking cessation support to your patients? (Check all that apply)
- a. Lack of time with patients
 - b. Lack of reimbursement for service
 - c. Fear of alienating patients
 - d. Difficulty tracking patient's smoking status
 - e. Difficulty following up with patients
 - f. Patient is not interested
 - g. Tobacco use cessation is not a priority issue
 - h. Lack of knowledge/training on how to provide cessation support to patients
 - i. Lack of confidence in addressing smoking cessation with patients
 - j. Lack of buy-in and support from management
 - k. Lack of supportive organizational policies and practices
 - l. Lack of awareness of cessation resources and community services
 - m. Lack of private space to discuss tobacco cessation
 - n. Lack of appropriate education materials for patients
 - o. Other. Please specify: _____

Future directions

23. How helpful would each of the following measures/tools be in enhancing the delivery of tobacco use cessation services in your practice?

	Very helpful	Somewhat helpful	Not at all helpful	Don't know
Referral forms to Smokers' HelpLine or other community cessation resources	1	2	3	4
Self-help materials to give to patients	1	2	3	4
In-person training with continuing education credits	1	2	3	4
Conference sessions with continuing education credits	1	2	3	4
Online learning modules	1	2	3	4
Flowchart/introductory scripts on how to do brief cessation counseling	1	2	3	4
Other, please specify: _____	1	2	3	4

24. If you have additional comments or suggestions, please include them below:

Thank you for completing the survey.

We would like to further explore the experience of dental professionals in smoking cessation in a 20-minute telephone interview. The interview will be arranged at a time and date convenient for you. All information obtained from you will be strictly confidential.

Do you provide consent to be contacted for an interview

1. Yes. Please provide your name and phone number so that we can contact you.
2. No

APPENDIX B: TELEPHONE INTERVIEW QUESTIONS

1. Please briefly describe your main responsibilities in your current position.
2. What do you perceive as your role(s) in providing smoking cessation support to patients? Please explain.

Probe: Do you think your role is (should be) to have ...

- Minimal discussion/advice to all patients
- Minimal discussion/advice to selected patients who will likely respond to a cessation advice
- Discuss smoking only when patients raise the subject
- Other, please specify

3. We would appreciate some more details about the smoking cessation support/advice provided to patients within your dental practice:

- Who is responsible for providing cessation support/discussing smoking? Everyone in your practice? Only certain dental professionals (e.g. dentist, dental assistant, dental hygienist?) Please explain.
- When do you discuss smoking/provide advice: before, during or after the provision of clinical services? On average how many minutes do you spend discussing smoking with a patient? Please explain.
- Do you follow-up with patients to track their progress in quitting/smoking? If yes, how frequently (e.g. one month, 3 months after the visit; at the next appointment, etc)? If no, why?

4. What helps/enables you to provide cessation support to your patients? Please explain.

Probe:

- patient interest in quitting
- knowledge/training in smoking cessation
- self-help materials
- access to external resources (e.g. Smokers' Helpline, primary health care provider)
- collaboration amongst dental staff in provision of smoking cessation services
- EMR system
- Other, please specify

5. Our survey shows that there are key barriers to the provision of smoking cessation support experienced by dental professionals, such as (in ascending order):

- no interest from patients to quit
- lack of dental professional's time with patient
- fear of alienating patients
- lack of knowledge/training on how to provide cessation support to patients

How relevant is each of these challenges/barriers to your own practice? Why?

Are there other key barriers that you encounter in your daily practice? Please specify.

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6. How confident are you in providing smoking cessation support/advice to your patients? Can you please explain what makes you feel confident/not confident?
7. Is there a need to improve the provision of smoking cessation support/services within your clinic/dental practice?
 - No: Please explain, why.
 - Yes: What needs to be done to further improve the provision of smoking cessation support/services within your clinic/dental practice?

Probe:

- Greater teamwork
- Follow a smoking cessation guideline
- Training
- Follow-up with patients
- Remuneration
- Links to external smoking cessation clinics/programs
- Free medication (NRT patch, gum)

APPENDIX C: ADDITIONAL TABLES

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Table A1: Enthusiasm towards Smoking Cessation Advice, by Profession

	Dentists		Dental Hygienists			Dental Assistants		
	n	Mean score (95% Confidence Intervals)	n	Mean score (95% Confidence Intervals)	p -value	n	Mean score (95% Confidence Intervals)	p -value
To discuss smoking with patients is likely to do more harm than good	208	3.57 (3.48 - 3.67)	419	3.63 (3.56 - 3.69)	<.0001	1250	3.32 (3.27 - 3.37)	<.0001
Giving smoking cessation advice during routine visits should not be a part of my job	212	3.17 (3.04 - 3.31)	428	3.58 (3.51 - 3.65)	<.0001	1250	3.03 (2.98 - 3.08)	<.05
Discussing smoking with all patients is not an appropriate use of time	213	2.90 (2.75 - 3.05)	424	3.18 (3.08 - 3.27)	<.0001	1255	2.93 (2.87 - 2.98)	0.7311
I dislike discussing smoking in routine visits	215	3.01 (2.88 - 3.15)	430	3.05 (2.96 - 3.13)	<.01	1226	2.88 (2.83 - 2.93)	<.05
I prefer not to discuss smoking unless the patient is in poor oral health with a smoking related problem	215	3.15 (3.02 - 3.29)	430	3.40 (3.32 - 3.49)	<.0001	1282	2.78 (2.72 - 2.83)	<.0001
I prefer not to discuss smoking with patients unless they raise the subject	215	3.15 (3.02 - 3.29)	431	3.29 (3.21 - 3.38)	<.0001	1280	2.69 (2.64 - 2.74)	<.0001
I do not discuss smoking with all patients, but prefer to select those I feel will respond to my advice	212	2.72 (2.58 - 2.87)	428	2.89 (2.79 - 2.99)	<.0001	1243	2.52 (2.47 - 2.58)	<.01
<i>Overall enthusiasm score</i>	200	3.15 (3.06 - 3.25)	410	3.31 (3.26 - 3.37)	<.0001	1116	2.90 (2.86 - 2.94)	<.0001

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Table A2: Perceived Effectiveness of Smoking Cessation Advice, by Profession

	Dentists		Dental Hygienists			Dental Assistants		
	n	Mean score (95% Confidence Intervals)	n	Mean score (95% Confidence Intervals)	p -value	n	Mean score (95% Confidence Intervals)	p -value
Discussing smoking with patients can be rewarding	199	2.98 (2.86 - 3.10)	414	3.29 (3.22 - 3.36)	<.01	1232	3.17 (3.13 - 3.22)	<.001
My smoking cessation advice can be effective in persuading some patients to stop smoking	191	2.93 (2.81 - 3.04)	406	2.99 (2.90 - 3.07)	<.01	1143	2.87 (2.82 - 2.91)	0.327
<i>Overall perceived effectiveness score</i>	184	2.98 (2.87 - 3.09)	397	3.15 (3.08 - 3.22)	<.01	1125	3.02 (2.98 - 3.06)	0.4104

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