

Can Dentists Help Patients Quit Smoking? The Role of Cessation Medications

Bo Zhang, PhD; Susan J. Bondy, PhD; Lori M. Diemert, MSc; Michael Chaiton, PhD

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Abstract

Background: Clinical trials show the efficacy of dentists' counseling in smoking cessation. However, little is known about the effectiveness of such advice in the general population of smokers.

Objective: To examine the association between dentists' advice, use of cessation medications and quitting behaviours in the general population of adult smokers in Ontario, Canada.

Methods: Data were from the Ontario Tobacco Survey panel study, which followed people who were smokers in July 2005 semi-annually for up to 3 years until June 2011. Baseline smokers, who were seen by a dentist during the study, were included in the analysis ($n = 2714$ with 7549 observations). Logistic regression analysis with generalized estimating equations was used to examine associations among dentists' advice, use of cessation medications and quitting outcomes (quit attempts and short-term quitting ≥ 30 days).

Results: Those who received dentists' advice were more addicted to tobacco, compared with those who did not receive dentists' advice (self-perceived addiction to tobacco: 96% vs. 89%, $p < 0.001$). Dentists' advice alone was not associated with making an attempt to quit smoking or short-term quitting. However, receiving dentists' advice in conjunction with cessation medications was associated with a higher likelihood of quit attempts (adjusted odds ratio [OR] 9.85, 95% confidence interval [CI] 7.77–12.47) and short-term quitting (adjusted OR 3.19, 95% CI 2.20–4.62), compared with not receiving dentists' advice and not using cessation medications.

Conclusion: Dentists play an important role in smoking cessation, because they can encourage patients to stop smoking and promote success by advising patients to use cessation medications.

The health consequences and economic cost of tobacco use are extensive.¹ By helping their patients quit smoking, health professionals play a key role in enhancing their health and well-being, and clinical guidelines have been developed to facilitate evidence-based clinical care in smoking cessation.^{2,3} The dental team, in particular, is fundamental to cessation. Because tobacco use has a significant impact on oral health (smokers have a greater risk of oral cancers, periodontitis and other oral diseases), dental professionals are uniquely qualified to conduct smoking-cessation interventions.⁴ Smoking is a risk factor for the destruction of hard and soft tissue around natural teeth.¹ Smoking affects inflammation, promotes the growth of periodontal

pathogens and reduces gingival blood flow.¹ Dentists, dental hygienists and other professionals have been on the front lines of tobacco control for many decades, and most dental practitioners have long believed that counseling is an important part of their practice.⁵ Advice from and intervention by dental professionals has also been shown to be effective, and at least 14 high-quality clinical trials have shown that dental professionals have helped tobacco users to quit.⁶

Dating from 2001, the Canadian Dental Association's official position is that it encourages "the eradication of the use of tobacco products. Studies indicate that dental counselling is effective in influencing patients to quit using tobacco. The Canadian Dental Association urges dentists to inquire about their patients' tobacco use and provide advice and encouragement to those interested in quitting."⁷

In 2012, the Ontario Tobacco Research Unit conducted a survey of 1966 dental health professionals in Ontario.⁸ It found that dental professionals, particularly dental hygienists, were enthusiastic about smoking cessation, and over 50% reported providing services of some sort at least some of the time, including advice to quit and warning of the dangers of smoking. Nevertheless, substantial barriers to providing smoking cessation services remain. Only 21% of respondents had received formal training in providing such services, and 29% were not at all confident in their knowledge and skills in this area. Lack of interest by patients and fear of alienation of patients are regarded as key barriers.⁸

Although the efficacy of smoking cessation advice from dental professionals in clinical settings is well known, information about its *effectiveness* in the general population of smokers in Ontario and Canada is limited. In this study, we examine the characteristics of smokers who received smoking cessation advice from dentists and the impact of that advice in a representative cohort of Ontario adult smokers.

Methods

Data Source

We used data from the Ontario Tobacco Survey (OTS). The OTS longitudinal panel is a population-based telephone survey of Ontario adult smokers (≥ 18 years of age) who were recruited and followed every 6 months for up to 3 years (maximum of 7 interviews: baseline and 6 follow-up interviews) between 2005 and 2011.⁹

Current smokers were eligible for inclusion in this analysis if they had smoked at least 100 cigarettes in their lifetime; smoked daily or occasionally in the past 30 days at the time of the interview; and were seen by a dentist at least once during the study. Overall, 2714 eligible smokers had been

seen by a dentist at least once during the study. On average, each eligible smoker contributed 2.8 observations over the 3 years of follow up, resulting in 7549 observations for analysis.

Measures

Dentists' advice was measured as a positive response to the survey question "Did the dentist advise you to quit or reduce smoking" among those who reported that they had seen a dentist in the past 6 months. Use of cessation medications was measured as a positive response to the survey question "In the past 6 months, did you use... to help you quit or reduce smoking, or stay smoke free?" This question was asked for each form of nicotine replacement therapy (NRT), including nicotine gum, patches, inhaler, nasal spray and lozenges, as well as bupropion and varenicline. The outcome of 1 or more quit attempts was measured as a report "trying to quit smoking completely" by a respondent during the follow-up period. Short-term quitting was measured as self-reported "not smoking for at least 1 month" at any follow-up interview.

Analysis

We conducted bivariate analyses using either a χ^2 test for categorical variables or a *t* test for continuous variables to examine the relation between sociodemographic characteristics or smoking-related variables and dentists' advice. Each eligible smoker contributed 1 data point, i.e., if a smoker was given advice 3 times during the 3-year follow up, he or she was included in the "receiving advice" group as 1 record; those who were seen by a dentist but never received advice were classified as "not receiving advice."

To examine the association among dentists' advice, cessation medications and quitting outcomes, while controlling for confounding factors, we used logistic regression through generalized estimating equations (GEEs) with exchangeable correlation matrix, which take into account correlated error terms for repeated measures within individuals. Odds ratios and 95% confidence intervals were reported. All analyses were conducted using SAS v.9.3, and all *p* values were 2-sided.

Results

Smokers who received advice were more likely to be male, less educated and in poorer health; to have a higher perceived addiction to tobacco; to smoke daily and more cigarettes per day; to use cessation medications; and to receive advice to quit from other health professionals, but less likely to have home smoking restrictions, compared with those who did not receive advice (**Table 1**). Thus, smokers who received advice were more addicted to tobacco than

those who did not receive advice. In **Table 1**, each smoker only contributed one data point.

Rates of quit attempts and short-term quitting were higher among those who did not receive dentists' advice, compared with those who did (**Table 2**, Model 1). Rates of quitting were also higher among those who received advice from a dentist and used cessation medications and those who used medications alone compared with those who received dentists' advice alone and those who did not receive dentists' advice and did not use medications (**Table 2**, Model 2).

Adjusted logistic regression analysis using the GEE method showed that receiving dentists' advice was not associated with quit attempts (adjusted OR 1.07, 95% CI 0.92–1.25) and was not associated with short-term quitting (adjusted OR 0.78, 95% CI 0.60–1.01) compared with not receiving dentists' advice (**Table 2**, Model 1).

Compared with not receiving dentists' advice and not using cessation medications during follow up, receiving dentists' advice alone was not associated with quit attempts (adjusted OR 1.01, 95% CI 0.83–1.22) or short-term quitting (adjusted OR 0.78, 95% CI 0.56–1.08). Those who received dentists' advice and used cessation medications during follow up had a higher likelihood of quit attempts (adjusted OR 9.85, 95% CI 7.77–12.47) and a higher likelihood of short-term quitting (adjusted OR 3.19, 95% CI 2.20–4.62) (**Table 2**, Model 2). Using medications alone was also associated with a higher likelihood of quit attempts and short-term quitting (**Table 2**, Model 2). There was no difference in quitting outcomes between those receiving both dentists' advice and cessation medications and those who used cessation medications alone. Those who received dentists' advice were more likely to use cessation medications compared with those who did not receive dentists' advice (19.4% vs. 17.3%, $p < 0.05$; data not shown). In **Table 2**, each smoker might contribute multiple data points.

Discussion

In the general population of Ontario, a substantial number of smokers (nearly 54%) received advice to quit or reduce smoking from a dentist. This suggests that dental advice is a key component of the smoking cessation system. In this study, we found that dentists' advice, when given in conjunction with smoking cessation medications, was effective in encouraging quit attempts and promoting successful smoking cessation.

The efficacy of smoking cessation services provided by dental health professionals is well established in the literature. Randomized controlled trials indicate that routine smoking cessation counseling by dental health professionals has resulted in twice as many patients successfully quitting smoking cigarettes compared with control groups (16.9%

Table 1 Differences in baseline characteristics of smokers receiving and not receiving dentists' advice to quit smoking during follow up, according to the Ontario Tobacco Survey, 2005–2011.

Characteristic	Not receiving advice (n = 1258)		Receiving advice* (n = 1456)		p
	%	Mean (SD)	%	Mean (SD)	
Age (years)		43.9 (14.2)		43.2 (13.4)	0.16
Female	60.6		54.5		0.016
Education					
High school or less	41.3		48.6		< 0.0001
Some or complete post-secondary	58.7		51.4		
Marital status					
Never married	22.2		20.8		
Married/common law	54.9		57.2		0.29
Widowed/separated/divorced	23.0		22.0		
Self-perceived fair-poor health	14.7		20.1		0.0004
Self-perceived addiction to tobacco	89.2		96.4		< 0.0001
Daily smoking	75.7		89.8		< 0.0001
Cigarettes smoked per day		12.8 (10.5)		15.8 (9.9)	< 0.0001
Home smoking restrictions	52.4		44.3		< 0.0001
Ever use of cessation medications†	54.5		62.2		< 0.0001
Ever received advice to quit from other health professionals‡	62.6		83.2		< 0.0001

Note: SD = standard deviation.

* Receiving any advice to quit or reduce smoking from a dentist during the course of the study.

† Including nicotine replacement therapy, bupropion and varenicline.

‡ Including physicians, pharmacists and nurses.

vs. 7.7%¹⁰ and 13.3% vs. 5.3%¹¹). Most trials in dental settings report a quit rate comparable to that achieved by physicians.⁶

However, in this representative population of smokers, those who did not use smoking cessation medications did not appear to be helped by receiving dentists' advice alone. Given the consistent findings of the efficacy of

Table 2 The association between dentists' advice, use of cessation medications and quitting smoking, based on the Ontario Tobacco Survey, 2005–2011.

Model	Outcome by intervention	%*	Crude analysis			Adjusted analysis†		
			OR	95% CI	p	OR	95% CI	p
1	Quit attempt							
	No dentists' advice (reference)	21.5						
	Dentists' advice	19.7	1.11	0.98–1.26	0.11	1.07	0.92–1.25	0.38
	Quit ≥ 1 month							
	No dentists' advice (reference)	7.7						
	Dentists' advice	4.5	0.56	0.46–0.69	< 0.0001	0.78	0.60–1.01	0.063
2	Quit attempt							
	No dentists' advice + no medications (reference)	12.5						
	Dentists' advice alone	12.3	1.01	0.86–1.18	0.93	1.01	0.83–1.22	0.95
	Medications alone	54.1	7.35	6.12–8.81	< 0.0001	8.15	6.57–10.11	< 0.0001
	Dentists' advice + medications	59.5	9.04	7.33–11.15	< 0.0001	9.85	7.77–12.47	< 0.0001
	Quit ≥ 1 month							
	No dentists' advice + no medications (reference)	5.8						
	Dentists' advice alone	2.9	0.50	0.38–0.65	< 0.0001	0.78	0.56–1.08	0.13
	Medications alone	16.4	3.16	2.50–4.00	< 0.0001	4.06	3.01–5.47	< 0.0001
Dentists' advice + medications	10.8	1.93	1.44–2.58	< 0.0001	3.19	2.20–4.62	< 0.0001	

Note: CI = confidence interval, OR = odds ratio.

*Percentages were estimated based on multiple observations per individual.

†In Model 1, adjusted for baseline variables of age, gender and education and time-varying variables of self-perceived health, self-perceived addiction, daily smoking, cigarettes smoked per day, number of lifetime quit attempts, home smoking restrictions, advice to quit from other health professionals and use of cessation medications. In Model 2, adjusted for the same variables as in Model 1, except for medications.

smoking cessation, this is likely primarily a reflection of the substantial differences between smokers who received advice and those who did not. Those who received dentists' advice were more likely to be male, less educated, in poorer health and more addicted to tobacco smoking, i.e., Ontario dentists are providing advice to people who are more affected by their tobacco use. Thus, these patients will receive the greatest benefit from quitting smoking, but they are also the most challenging group to treat. Although many variables, including those related to tobacco addiction (such as daily smoking, number of cigarettes smoked per day and self-perceived addiction) were controlled for, unmeasured or unmeasurable variables (e.g., mental health issues and genetic differences) might contribute to the null association between receiving dentists' advice and quitting outcomes in our study.

Our results have 2 major implications for practice. First, dentists should ensure that their advice reaches a broader audience, including patients who are lighter smokers,

less addicted or have not yet fully developed nicotine dependence. Dental advice has been shown in clinical studies to be just as effective in this population, and this will help increase the absolute number of quit attempts driven by dental professional advice.

Second, to the extent appropriate, advice or information about health effects should be given in conjunction with evidence-based treatments that increase the likelihood of successful smoking cessation for patients. These treatments include pharmaceutical aids, such as nicotine patch and gum, bupropion and varenicline. Without dentists' advice, some smokers in this study would not have used cessation medications or would not have used medications appropriately to achieve the optimal outcome. Studies have shown that most smokers in the general population do not use cessation medications when trying to quit, and those who use them, do so for less than the recommended period.^{12,13} Dentists should provide quit advice to their smoking patients and encourage these patients to use

cessation medications as recommended for success. The Canadian Smoking Cessation Clinical Practice Guideline should be used to ensure that evidence-based practices are adopted and implemented by dentists across Ontario.³

Conclusion

In this study, we found that dentists' advice in conjunction with smoking cessation medications can encourage smokers to make quit attempts and can promote successful smoking cessation. The dental office can be an important source of smoking cessation pharmacotherapy, and more emphasis on this role is needed. Patients' increased awareness that dental professionals may be a smoking cessation resource, and dentists' increased confidence in providing pharmacotherapy can help patients quit smoking and improve their oral health. Dental practitioners have a credible and important role in providing smoking cessation services.¹⁴

THE AUTHORS



Dr. Zhang is a research officer, Ontario Tobacco Research Unit, University of Toronto, Toronto.



Dr. Bondy is an associate professor, Epidemiology Division, Dalla Lana School of Public Health, University of Toronto and a principal investigator of the Ontario Tobacco Research Unit, Toronto.



Ms. Diemert is a research officer, Ontario Tobacco Research Unit, University of Toronto, Toronto.



Dr. Chaiton is an assistant professor, Epidemiology Division, Dalla Lana School of Public Health, University of Toronto and a scientist at the Ontario Tobacco Research Unit, Toronto.

Correspondence to: Dr. Michael Chaiton, Ontario Tobacco Research Unit, T530, 155 College St, Toronto ON M5T 3S7. Email: Michael.Chaiton@utoronto.ca

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contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

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