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Patient Tobacco Use in Optometric Practice: A Canada-Wide Study

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ABSTRACT

Purpose. A national census survey of optometrists in Canada measured knowledge of ocular diseases associated with smoking cigarettes and current practice behaviors related to addressing tobacco use with patients, including prevention and cessation. Optometrists were also asked to identify tools to assist addressing tobacco use with patients.

Methods. An online bilingual (English/French) survey was developed and an e-mail with a link to the survey was sent to all 4528 optometrists registered in Canada. No participation incentives were provided. Frequency data were tabulated for survey items. Logistic regression models were fit to understand respondent characteristics associated with discussing tobacco use prevention and cessation with patients.

Results. The response rate was 19% (850 responses). Almost all respondents (98%) believed that smoking cigarettes was a risk factor for developing age-related macular degeneration; approximately half (55%) assessed the smoking status of patients during their initial visit; 7% reported that they discussed the benefits of tobacco use prevention with patients younger than 19 years; and 33% reported that they always or regularly assess their patients' interest in quitting smoking. Respondents who completed the survey in English were more likely (odds ratio, 2.4; 95% confidence interval, 1.01 to 5.65) to deliver prevention messaging, compared with respondents who completed the survey in French. Male respondents were less likely to assess patients' interest in quitting (odds ratio, 0.7; 95% confidence interval, 0.50 to 0.97) than female respondents. Most respondents (90%) were interested in a continuing education program about the impact of smoking on vision and eye health as well as strategies for discussing tobacco cessation and prevention.

Conclusions. Optometrists are aware of the impact of smoking on ocular health; however, most respondents do not systematically engage in tobacco use prevention and cessation practices. Providing optometrists with tools, including continuing education, may help support patient conversations about the risks of tobacco use and improve public health.
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Key Words: public health, tobacco, cessation, prevention, age-related macular degeneration

Tobacco use is the single most preventable cause of premature death in Canada.[1] In 2011, approximately 17% of Canadians aged 15 years and older smoked cigarettes (~4.9 million people).[2] Health Canada estimates that, every 11 minutes, a Canadian dies from tobacco use and that every 5 minutes, a teenager starts smoking.[1] Providing current smokers support to quit (cessation) and working to ensure younger people do not start using tobacco (prevention) are national public health priorities.

In addition to causing diseases that result in death, tobacco use is associated with numerous ocular diseases that result in vision loss. Smoking has been identified as the most important known preventable risk factor for developing age-related macular degeneration (AMD)[3–6] and the strongest environmental risk factor for all forms of AMD.[7] The more someone smokes, in terms of the number of cigarettes per day and years of smoking, the greater the likelihood of developing early AMD.[8] Epidemiological studies also indicate an association between smoking and an increased risk for age-related cataracts, particularly nuclear cataract[9]; inflammatory and infectious uveitis[10]; thyroid-associated ophthalmopathy[11,12]; optic neuropathy[13,14]; and ocular surface disorders.[15]

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Tobacco cessation is important to reduce ocular health risks. For example, compared with current smokers, ex-smokers reduce their relative risk for developing both dry and wet AMD in half.[6] There is a clear need to help educate Canadian smokers and nonsmokers about the role of tobacco use and ocular disease particularly because perceived health risks are relevant to smoking initiation[16] as well as abstinence and quit attempts.[17] Despite the documented association between tobacco use and eye disease, a 2011 study found that only a small proportion of Canadian adult smokers (13%) were aware that there is a link between smoking and "blindness."[18]

There have been calls for optometrists to play a greater role in raising awareness of "blindness" as another smoking-related health condition,[19] and there are indications that optometrists are open to being involved in supporting tobacco use prevention and cessation.[20] In Canada, optometrists are well positioned to address tobacco use with their patients, for a variety of reasons. First, optometrists provide more than two-thirds of the primary eye care services in Canada.[21] Further, a great proportion of Canadians receive eye care; a 2011 study estimated that approximately half of Canadians had an eye examination in the previous 5 years.[22]

Second, most Canadians live in regions where routine eye examinations are covered by provincial health care plans until adolescence or early adulthood.[23] This aligns well for tobacco use prevention efforts because most experimentation and initiation take place during the early teenaged years.[24] Health Canada data from 2011 identified that the mean age at which students in grades 6 to 12 smoked their first whole cigarette was 13.4 years.[25] It is recommended that school-aged children visit the optometrist before entering first grade, and every 2 years thereafter,[21] providing many opportunities for tobacco use prevention education during childhood and early adolescence before smoking behavior is initiated. The US Prevention Services Task Force recommends that all primary care clinicians provide interventions to prevent initiation of tobacco use among school-aged children and adolescents.[26] There is good evidence that primary care–relevant interventions can prevent smoking initiation with children and adolescents.[27]

Third, optometrists are well positioned to address tobacco use with adult patients. Provincial health care plans in several regions of Canada ensure clinical services for individuals with certain systemic diseases that pose significant risk to ocular health—such as diabetes. This is particularly relevant given that people with diabetes who smoke are at a greatly increased risk for health complications.[28] Further, almost all Canadians older than 65 years (96%) live in provinces with publicly funded insurance plans that provide coverage for eye examinations.[29] There is strong evidence that brief interventions by health care professionals can double the likelihood that patients attempt to quit using tobacco.[30]

Few studies have sought to understand optometrists' involvement in tobacco use prevention and cessation. A study in 2005 of 629 optometrists in four US states (California, Oregon, Washington, and Arizona) found that approximately one-third of respondents routinely asked their patients about their tobacco use, although few (16%) advised their patients to quit tobacco use.[31] A 2012 study of 306 optometrists in Quebec (Canada) reported that most respondents (90%) were aware of some ocular diseases related to smoking; however, few advised patients to stop smoking (29%).[32]

A qualitative pilot study conducted in 2009 of 11 optometrists in southwestern Ontario found that participants were well aware of the associations of smoking with eye diseases such as AMD and advised patients who smoked about these risks; however, few systematically asked their patients about specific smoking behavior or interest in quitting. The optometrists in the study had neither referred patients to smoking cessation telephone quitlines and community-based services nor provided specific prevention messaging to younger patients about smoking and eye health.[20]

The current study sought to assess Canadian optometrists' knowledge of chronic ocular diseases associated with smoking cigarettes and their reported practices with respect to addressing tobacco use with patients. Study participants were also asked to identify barriers to patient discussions about tobacco use and possible tools, resources, and training that could support their involvement in addressing tobacco use.

METHODS

A review of the literature and the results of the pilot study, conducted in 2009 in southwestern Ontario,[20] reported the development of a 45-item bilingual (English and French) questionnaire. Institutional ethics clearance was obtained from the University of Waterloo's Office of Research Ethics (ORE# 17808).

Participants

Canada is composed of 10 provinces and three territories. Each province has its own optometric regulator, one territory (Yukon) regulates optometrists by its Department of Community Services, and the other two territories (Northwest Territories and Nunavut) have no regulatory authority and no registered optometrists. With the help of the regulators and Yukon's Department of Community Services, a comprehensive list of all practicing Canadian optometrists' e-mails was compiled (n = 4528). Potential survey participants received an e-mail outlining the objectives of the study and inviting them to complete a survey; e-mailed letters included a link to a Web-based survey. E-mails were delivered by the provincial regulatory authority or the Survey Research Centre at the University of Waterloo[33] (depending on the privacy policy of the regulator). Optometrists received the initial e-mail invitation at the end of February 2012, and if they had not completed the survey, they received weekly reminder e-mails until the end of March 2012. Phone calls were also used to invite and remind participants to complete the online survey. Phone, fax, and regular mail were used in cases where electronic contact with potential participants was ineffective. Participants could complete the survey in either of Canada's two official languages: English and French. No participation incentives were provided. In the letter describing the study, optometrists were told that at the end of the Web survey, they would be able to order free materials such as posters for their practice to help address tobacco use with their patients.[a]

[a]Materials were developed based on feedback from survey participants and can be found at https://uwaterloo.ca/propel/resources

TABLE 1.
Characteristics of the Canadian optometrist sample

Sample size respondents, % (n)	100 (850)
Region where practice is located, % (n)	
British Columbia + Yukon	16.3 (136)
Prairies (Alberta, Saskatchewan, Manitoba)	13.4 (112)
Ontario	35.2 (294)
Quebec	24.0 (201)
Atlantic (New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland, and Labrador)	11.1 (193)
Years of practice, mean ± SD (range)	15.9 ± 12.2 (0–59), n = 832
No. optometrists in practice, mean ± SD (range)	3.5 ± 3.4 (1–40), n = 835
Sex, % (n)	
Male	40.1 (335)
Female	59.9 (501)
Practice employs support staff who manages appointments and refers patients to specialists, % (n)	Yes, 93.5 (785)
Country where respondent received optometry training, % (n)	
Canada	79.6 (669)
United States	17.4 (146)
Other countries	3.0 (25)
Reported personal smoking status, % (n)	
Smoker	0.0 (0)
Nonsmoker	90.0 (757)
Occasional smoker (nondaily)	1.4 (12)
Former smoker (quit <1 y ago)	0.1 (1)
Former smoker (quit >1 y ago)	8.4 (71)

Analysis

Frequencies were calculated for closed-ended questions dealing with reported knowledge of chronic ocular diseases associated with smoking cigarettes, behavior regarding assessing patient tobacco use and tobacco prevention and cessation strategies, interest in addressing tobacco use, anticipated barriers to greater involvement in addressing tobacco use with patients, and possible tools or resources to support cessation referrals in optometric practice. In the case of nonresponses, the reported proportions were based on the number of respondents for each question.

Open-ended responses were also invited for some questions. The bilingual lead researcher (R.D.K.) organized responses by themes and presented the range of ideas and, in some cases, the general proportion of ideas.

Statistical analyses were conducted to understand how different respondent characteristics were associated with reported practice behaviors including tobacco use prevention and cessation. Characteristics of interest included the following: language the survey was completed in (English or French), geographic region of Canada, sex (male or female), location of optometric training (Canada or another country), smoking status of respondent (ever and never smokers), number of years in practice (continuous variable), and geographic regions, which were Atlantic Canada (Newfoundland and Labrador, Nova Scotia, Prince Edward Island, and New Brunswick), Quebec, Ontario, Prairie provinces (Manitoba, Saskatchewan, and Alberta), and British Columbia and Yukon Territory. First, significance tests for bivariate associations (looking at each predictor variable separately) were conducted using chi-square tests with an α of 0.05 (binary logit and Fisher scoring optimization technique). Second, all independent variables were entered into a stepwise logistic regression model. The first model's dependent variable was related to prevention activities and used responses to "How old are your patients when you first ask them about smoking?" and response options included "9 years old or younger," "10 to 14 years old," "15 to 18 years old," "19 to 24 years old," and "25 years old or older." These response options were collapsed to 18 years or younger, and 19 years or older, to be consistent with the recommendations of the US Prevention Services Task Force. The second model's dependent variable was related to tobacco use cessation activities and used responses to "How often do you assess their interest in quitting?" and response options were "always," "regularly," "sometimes," and "never." These response options were collapsed to "always" and "regularly" versus "sometimes" and "never."

Survey frequencies and statistical testing were conducted using SAS 9.3 software (SAS Institute Inc., Cary, NC). Qualitative analysis was conducted using a Microsoft 2010 Excel spreadsheet.

RESULTS

The response rate was 19% (850 responses). The survey was completed in English (77.1%, n = 655) and French (22.9%, n = 195), similar to the national proportion of English and French speakers in Canada.[34] Most respondents were women (59.9%, n = 501), similar to Service Canada's 2012 estimate of women comprising 64% of the optometry labor workforce.[35] Participation by geographic region of Canada was also similar to the provincial and territorial proportions of Canadians living in those regions.[36] Most respondents reported that they received their optometric education in Canada (80%). Almost all reported that they were a nonsmoker (90%) and no respondents identified as a current smoker. Approximately 8% reported that they were a former smoker, whereas 1% reported that they were an occasional smoker defined as less than daily smoking. Further details about the sample are included in Table 1.

Reported Knowledge of Chronic Ocular Diseases Associated with Smoking Cigarettes

Participants were asked "Which of the following chronic ocular diseases, do you believe, are associated with smoking cigarettes?" The list included seven diseases identified in the literature as

TABLE 2.
Reported knowledge of which ocular diseases respondents believe are associated with smoking cigarettes

Ocular disease	% (n)
AMD	98.1 (834)
Ocular surface disorders	76.2 (648)
Cataracts	72.8 (619)
Anterior ischemic optic neuropathy	61.2 (520)
Thyroid-associated ophthalmopathy	14.9 (127)
Uveitis	8.4 (71)
None of the above	0.1 (1)

TABLE 3.

How often are patient records updated regarding smoking status?

	% (n)
Always—every visit	14.8 (126)
Never	8.0 (68)
Only during their first visit	10.0 (85)
Sometimes—if the visit is a full oculo-visual assessment but not during a partial oculo-visual assessment	24.8 (211)
I ask about smoking status only if patients show signs of a health condition associated with smoking (such as COPD)	26.8 (228)
I ask about smoking status if patients show signs of an ocular health condition associated with smoking (such as AMD)	55.8 (475)

Note: respondents could check more than one option.

casually linked to smoking and an eighth option, "none of the above." Responses are reported in Table 2.

Reported awareness of the association between disease and smoking cigarettes varied from 98.1% (n = 834) with AMD to 8.4% (n = 71) for uveitis. Most respondents believed that smoking was associated with cataracts (72.8%, n = 619), anterior ischemic optic neuropathy (61.2%, n = 520), and ocular surface disorders (76.2%, n = 648). One respondent believed that smoking was not associated with any of the above diseases.

Reported Assessment of Patient Tobacco Use

Participants were asked a series of questions about if and when they address smoking with their patients. Just more than half of respondents (55.2%, n = 460) assess the smoking status of their patients during their initial visit. Respondents were asked how often they update the records of patients regarding smoking status. Response proportions are reported in Table 3.

Approximately 15% of respondents "always" update their patient records with respect to smoking status. Just more than half of respondents (55.9%, n = 475) assess the smoking status of patients if they show signs of an ocular health condition associated with smoking such as AMD. One in 10 respondents (n = 85) assess smoking status strictly during an initial visit and 8.0% (n = 68) never assess smoking status.

Most respondents (72.7%, n = 608) agreed that they were more likely to ask patients about smoking if they observed signs of tobacco use (such as tobacco odor or visible nicotine stains). Respondents were more likely to ask patients about smoking if they had a chronic health condition such as diabetes (51.6%, n = 433), cardiovascular disease (64.8%, n = 543), stroke (58.6%, n = 490), and hypertension (53.8%, n = 450). Optometrists could also list "other" health conditions in an open-ended response; 279 responses were collected. The most common response was AMD (35.5%, n = 99). Other common responses included dry eye, pulmonary disease (e.g., chronic obstructive pulmonary disease), obesity, cancer, alcoholism, mental health issues, asthma, cardiovascular disease, sleep apnea, and thyroid disease.

Reported Tobacco Use Prevention Activities

Respondents were asked "Do you ever provide information about the dangers of smoking and vision loss to your nonsmoking patients" (such as messages that might discourage nonsmokers from starting)? Approximately 28.6% (n = 239) of respondents reported "Yes."

Participants were also asked "How old are your patients when you first ask them about smoking?" Responses are reported in Fig. 1.

Most respondents (53.6%, n = 423) do not ask patients about smoking until they are 25 years or older. Approximately 5% (n = 43)

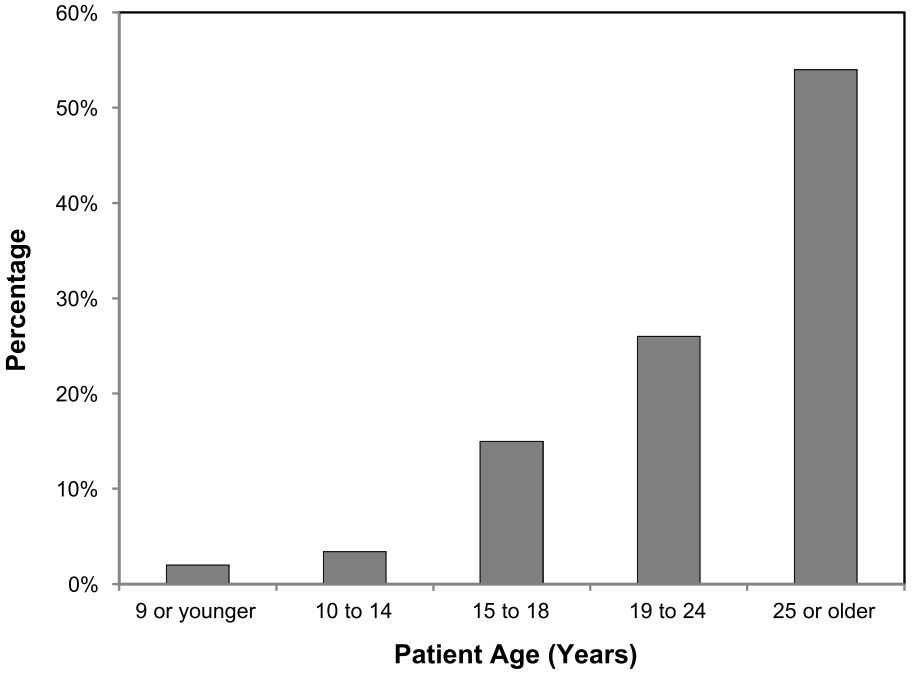

FIGURE 1.

How old are your patients when you first ask them about smoking? (n = 789).

TABLE 4.
Practitioner behaviors for patients who smoke

If patients smoke,	Always, % (n)	Regularly, % (n)	Sometimes, % (n)	Never, % (n)
How often do you assess how many cigarettes they smoke?	7.2 (60)	11.6 (97)	34.5 (289)	46.8 (393)
How often do you explain some of the risks associated with smoking, not related to eye health, such as cardiovascular disease?	7.4 (62)	14.1 (118)	43.5 (365)	35.1 (295)
How often do you explain some of the risks for their ocular health?	34.5 (289)	36.4 (305)	26.9 (226)	2.3 (19)
How often do you assess their interest in quitting?	10.5 (87)	22.1 (183)	42.4 (352)	25.1 (208)
How often do you advise they quit smoking?	26.4 (222)	31.2 (262)	34.6 (291)	7.7 (65)

of respondents reported that they ask patients 14 years or younger. Respondents were also asked "If patients are under the age of 18 and in the presence of other family members, do you ask them about smoking?"; 84.9% (n = 702) reported "No."

Statistical testing was conducted to understand what respondent characteristics might be associated with providing prevention-oriented messages to younger patients (those aged 18 and younger). The analysis included 768 respondents (82 respondents had missing information for one or more variables). Using stepwise logistic regression, it was identified that optometrists, who completed the survey in English, were significantly more likely to ask younger patients about smoking compared with respondents, who completed the survey in French ($p = 0.03$). A logistic regression model was run with all independent variables entered. Language remained a significant effect ($p = 0.05$); those completing English surveys were more likely than those completing French surveys to assess the smoking status at a younger age (odds ratio, 2.4; 95% confidence interval, 1.01 to 5.65).

Reported Activities Addressing Tobacco Use with Patients Who Smoke

Optometrists were asked what other details they collected about patients who smoke, including how much they smoke and their interest in quitting. Further, respondents were asked how often they explain general health risks associated with smoking and advise the patient to quit. Responses are reported in Table 4.

Approximately half of respondents (46.8%, n = 393) never ask their patients how many cigarettes they smoke; very few (7.2%, n = 60) always ask. A greater proportion of optometrists regularly or always explain the risks smoking presents to ocular health (70.9%, n = 594) than to systemic health (21.5%, n = 180). A quarter of respondents (25.1%, n = 208) never assess the interest in quitting of their patients.

Statistical tests were conducted to understand what respondent characteristics might be associated with asking patients who smoke if they are interested in quitting. The analysis included 805 respondents (45 with missing information for one or more variables). Using stepwise logistic regression, it was identified that men were significantly less likely than women to assess interest in quitting ($p = 0.01$). Respondents who received their training in Canada were statistically less likely to assess interest in quitting than those who trained elsewhere ($p = 0.04$). Optometrists completing English surveys were also significantly more likely than those completing French surveys to assess interest in quitting ($p = 0.04$). When all effects were controlled for in a logistic regression model, sex remained significant ($p = 0.03$), with men being less likely than women (odds ratio, 0.7; 95% confidence interval, 0.50 to 0.97) to address smoking cessation.

Most respondents, 84% (n = 702), reported that they did not usually have information (such as pamphlets, posters, news stories, videos) about smoking and vision loss on display or available for their patients. When asked about the type of supports they provided to patients who smoke, the majority (58.0%, n = 493%) recommend their patients to talk to their family physician about quitting smoking. Some provide educational materials on the ocular effects of tobacco use (13.7%, n = 116) or recommend patients to use nicotine replacement therapy like nicotine gum or "the patch" (15.1%, n = 128). Few reported that they refer patients to a free telephone-based smoking cessation support service like the Smokers' Helpline (6.8%, n = 58). Some respondents (n = 32) reported that they provide "other supports"; the most common involved suggesting patients to seek prescription medication to quit, speak to a pharmacist or try "cold turkey," exercise, and/or undergo hypnosis. Some optometrists reported that they rely on personal stories/testimonials about how their family members were impacted by tobacco use, whereas others reported that they provide deep encouragement.

TABLE 5.
Optometrist priorities regarding practice behavior and learning goals

	Strongly agree, % (n)	Somewhat agree, % (n)	Somewhat disagree, % (n)	Strongly disagree, % (n)
Educate patients about smoking-related eye conditions	87.8 (738)	11.5 (97)	0.5 (4)	0.2 (2)
Document tobacco use at every visit	29.4 (247)	52.7 (443)	14.5 (122)	3.5 (29)
Advise patients who smoke to quit	57.8 (484)	36.6 (307)	4.3 (36)	1.3 (11)
Take an active role in helping patients who smoke to quit (e.g., connecting patients with cessation services)	25.7 (216)	54.8 (460)	16.2 (136)	3.3 (28)
Learn more about how to help patients quit smoking	38.7 (324)	44.6 (374)	13.8 (116)	2.9 (24)

Less than a quarter of respondents (22.2%, n = 186) were familiar with the cessation services that were available in their community (to help support smokers interested in quitting).

Perceived Scope of Practice and Reported Interest in Being More Engaged in Addressing Tobacco Use

Respondents were asked how appropriate it is for optometrists to be engaged in practice-based activities related to addressing tobacco use with their patients and how interested they were in learning more about how to help patients quit smoking. The results are presented in Table 5.

Almost all respondents agreed (strongly or somewhat) that optometrists should educate their patients about smoking-related eye conditions (99.3%, n = 835). Most respondents agreed (strongly or somewhat) that optometrists should document tobacco use at every visit (81.1%, n = 690), advise patients to quit smoking (94.4%, n = 791), and take an active role in helping patients to quit smoking (80.5%, n = 676). Most of the respondents (83.3%, n = 698) agreed (strongly or somewhat) that they wanted to learn more about how to help patients quit smoking.

Reported or Anticipated Barriers to Greater Involvement

Respondents were asked to consider why optometrists might not incorporate information about smoking impacts, prevention, and/or cessation into their practice. A list of 12 reasons was presented and respondents could select as many as they felt were relevant. In addition, an open-ended option was also provided for additional suggestions. Response proportions are reported in Table 6.

The most common perceived barrier to optometrists incorporating smoking education and cessation support into their practice was insufficient knowledge about cessation services (66.2%, n = 563). Other commonly reported reasons included insufficient appointment time (56.5%, n = 480) or appropriate information or materials (54.6%, n = 464). A small proportion of optometrists (3.4%, n = 29) reported that ineffective cessation services and the fear of losing patients were contributing factors. Approximately a quarter of respondents (27.1%, n = 230) pointed out that insufficient reimbursement was a deterrent to providing tobacco prevention and cessation in their practice.

Approximately 5% (n = 44) of respondents identified other reasons listed in the open-ended responses including general discomfort in addressing the subject and a belief that smokers already know they should quit. Other respondents discussed the idea that addressing smoking with patients is akin to "hassling" them and so discussions are fruitless and pointless. Other respondents explained that they need to triage issues and that quitting smoking is seldom at the top of the list of what needs to be done. Many respondents justified not addressing tobacco use because they believed that it is more the job of family physicians or addiction specialists.

TABLE 6.

Reasons why optometrists might not incorporate information about smoking into their practice

Possible reason	Selected, % (n)
Insufficient knowledge about cessation services available	66.2 (563)
Insufficient time during patient visits	56.5 (480)
Lack of appropriate information/materials for patients	54.6 (464)
Concern about patient resistance	50.1 (424)
Lack of patient compliance	48.6 (413)
Lack of patient motivation or interest	48.2 (410)
Lack of sufficient training to address smoking	46.7 (397)
Outside scope of practice or better done by other health care providers	28.2 (240)
Insufficient reimbursement from insurance/province/territory	27.1 (230)
Concern about losing patients	14.6 (124)
Support staff resistance to additional work	10.0 (85)
Ineffective smoking cessation services	3.4 (29)

Possible Tools, Resources, and Training to Support Cessation Referrals into Optometric Practice

The survey also asked respondents if specific mechanisms could facilitate the incorporation of cessation referrals into optometric practice. Most respondents (83.9%, n = 713) indicated that the development of supportive materials such as fact sheets, Web sites, and posters for offices may help, along with more training for optometrists (60.2%, n = 512) and the provision of government-insured services (57.8%, n = 491). Open-ended responses were provided by approximately 2.5% of respondents (n = 21) and included a call for continuing education in a variety of formats for optometrists and/or their staff. One optometrist indicated that media campaigns may help raise awareness of the association between smoking and vision loss. Several optometrists identified the need for the optometry profession to be more holistic and treat patients' health rather than just treating their ocular system. Another respondent indicated that it was more difficult to discuss tobacco use with patients if the family physician has not already provided quit advice.

The vast majority of optometrists (95.9%, n = 808) reported never having received training on tobacco addiction or how to address tobacco use in practice. Almost all optometrists (90.1%, n = 755) indicated that they were interested in learning about the impact of smoking on vision and eye health, and most optometrists (78.5%, n = 658) were interested in learning how to provide smoking prevention and cessation advice to patients.

DISCUSSION

This is the first national census study of Canadian optometrists to understand patient tobacco use in optometric practice. The results are consistent with previously published studies assessing optometrists in North America[20,31] and the United Kingdom,[37] where most practitioners reported that they did not regularly assess tobacco use with their patients, and fewer still discussed cessation with their patients.

Almost all optometrists in the current study believed that smoking is associated with AMD; however, knowledge levels of associations were lower for other eye diseases, including cataract, thyroid-associated ophthalmopathy, and uveitis. There is a need

to increase knowledge translation between researchers and optometrists about important disease associations with tobacco use.

Many optometrists reported that they do not regularly and systematically assess patient tobacco use, particularly among patients younger than 25 years. Many more optometrists need to assess tobacco use at each visit in all patients older than 10 years. Vision loss from smoking is an important health outcome to be communicated—not only because it can greatly impact quality of life but also because it is an impact that patients fear. A study in the United Kingdom suggested that fear of blindness may be more effective to motivate teenagers to stop smoking than fear of chronic diseases that cause death such as lung or heart disease.[38]

There are other opportunities for optometrists to play a greater role in supporting patients who smoke. Almost a third of respondents reported that they only sometimes or never explain the risks from smoking and ocular health and more than 40% only sometimes or never advise patients to quit.

The results of this survey, in particular the open-ended responses, indicate that many Canadian optometrists are uncomfortable addressing tobacco use with patients because they believe that society already "hassles" people who smoke. Many optometrists felt little would come of their additional "criticism" and rationalized that they are not the "best" suited primary care professional to support cessation. These findings point to a need to shift practitioner attitudes so that tobacco prevention and cessation are recognized as being within the role of optometrists as primary health care providers. It is important to know that most Canadian smokers regret that they started smoking,[39] and almost half of smokers try to quit in a given year (3 in 10 try more than once).[40] The concerns voiced by Canadian optometrists in this study, like perceived patient resistance, are similar to findings from research with other health care providers including nurses.[41] A meta-analysis of randomized clinical trials and quasi-experiments concluded that reviewed patients who receive advice to quit smoking from "any health care provider" will result in increased quit rates.[42] Optometrists diagnose, treat, manage, and prevent diseases and disorders of the eye and vision system and its related structures, some pathologies of which are manifestations of systemic disease. Given tobacco's role in contributing to or causing numerous ocular diseases, patients, with education, are likely to understand why optometrists should be discussing tobacco use as part of their practice.

One of the most frequently identified barriers to offering more tobacco cessation support to patients was a lack of knowledge about cessation and local cessation services. This can be addressed many ways, including through the provision of optometric continuing education and by including optometrists in local cessation systems.

This study revealed two compelling findings that deserve further study. First, respondents who completed the English survey were more than twice as likely as those who completed the French survey to speak to younger patients about tobacco use. In Canada, smoking rates in predominantly French-speaking regions, like Quebec, have historically been higher than the rest of Canada. In 2003, for example, smoking prevalence in Quebec was the highest in the country. However, Quebec smoking rates have decreased in recent years and are now close to national averages. How this history may influence practice behaviors is unclear, but there may be an important difference between English- and French-speaking optometrists in Canada. Second, male optometrists were significantly less likely than their female counterparts to assess interest in quitting among their patients who use tobacco. Again, the reasons for this difference are currently unknown but further study will be important to understanding these differences to improve optometric practice behavior.

The response rate for this study was lower than desired; optometrists who already address tobacco use with their patients may have been more likely to participate in the survey. Delivering the survey online may have limited some participation and the different groups delivering the invitation e-mail (provincial regulator in some instances and the Survey Research Centre in others) may have influenced response rates.

The capacity to improve public health, prevent disability and disease associated with tobacco use, and improve overall quality of life is well within the scope of practice for optometrists as primary health care professionals, and one of the encouraging findings of this study is that there are optometrists actively involved in tobacco prevention and cessation. Yet, there is more to be done because the majority are limited by insufficient knowledge, skills, and support in the form of educational materials to support patients to quit and encourage younger patients to not initiate using tobacco.

Effective strategies that optometrists can use to support smoking cessation in their busy optometric practice have been identified.[43] The goal is to begin discussion with patients, briefly deliver information, and motivate their engagement. For this to be done effectively, optometrists need to feel confident asking about smoking and motivating a quit attempt. Different frameworks or approaches are recommended, including the ABC framework used by numerous types of health professionals, including optometrists.[43] The ABC framework includes "asking about smoking," giving "brief advice to quit," and offering "cessation treatment." Other effective frameworks or approaches include the 5A model (ask, assess, advice, assist, arrange follow-up).[44] Opportunities for continuing education around cessation—including training specifically for optometrists—need to continue to increase.

The implications of tobacco use on ocular health are too large to ignore, and through the provision of optometry-specific resources and continuing education programs related to tobacco use, optometrists can gain further knowledge, confidence, and tools to effectively address tobacco use with their patients.

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