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Opportunities to Improve the Role of Family Practice Nurses in Increasing the Uptake of Evidence-Based Smoking Cessation Interventions for Pregnant Women: An Exploratory Survey

Christina Cantin[*1], **Wendy E. Peterson**[2], **Barbara Davies**[2] and **Kirsten Woodend**[3]

[1]Champlain Maternal Newborn Regional Program, Ottawa, Canada

[2]School of Nursing, Faculty of Health Sciences, University of Ottawa, Ottawa, Canada

[3]Trent-Fleming School of Nursing, Peterborough, Canada

[*]Corresponding author: Christina Cantin, Perinatal Consultant, Champlain Maternal Newborn Regional Program, 2305 St Laurent Blvd, Ottawa, ON K1G4J8, Canada, Tel: 1613-737-2660; E-mail: ccantin@cmnrp.ca

Abstract

Background: Approximately 6-30% of Canadian women smoke during pregnancy. Prenatal care visits are an opportune time for Family Practice Nurses to provide evidence-based smoking cessation interventions. The purpose of this exploratory study was to describe: 1) Smoking cessation interventions by Family Practice Nurses during prenatal visits; 2) Family Practice Nurses' awareness and use of smoking cessation guidelines as well as the proportion of Family Practice Nurses who engage pregnant women who smoke in minimal interventions and intensive interventions; 3) the predictors of nurse-provided smoking cessation counseling for pregnant women and 4) the barriers to smoking cessation counseling.

Methods: A previously validated questionnaire measuring smoking cessation counseling practices was modified and converted to an electronic format. A bilingual invitation was emailed to the members of Ontario Family Practice Nurses' interest group of the Registered Nurses' Association of Ontario, Canada. Descriptive and multivariate analyses were completed. Predictors investigated included nurses' age, beliefs about their role in smoking cessation, self-efficacy to provide effective counseling, smoking cessation training, and interest in updating smoking cessation knowledge. Eighty-nine Family Practice Nurses working in primary care settings across Ontario, Canada responded.

Results: Nurses with higher levels of self-efficacy were more likely to provide smoking cessation counseling. Although nurses Ask, Advise and Assess, they are less likely to provide concrete assistance in the quitting process or arrange follow-up. The most commonly cited barriers to nurse-provided smoking cessation counseling included cost of medication, lack of time, and lack of knowledge. Fourteen percent of respondents reported that they never offer smoking cessation counseling to pregnant women.

Conclusions: Family Practice Nurses are not consistently providing evidence-based smoking cessation interventions for pregnant women. Disseminating research outlining effective strategies to increase nurses' self-efficacy to provide effective smoking cessation interventions may increase the uptake of evidence-based recommendations.

Keywords: Smoking cessation; Pregnancy; Primary care; Family Practice Nurses; Prenatal care; Evidence-based guidelines; Health promotion

Introduction

Smoking cessation (SC) counseling for pregnant women continues to warrant concerted diligence by health care professionals. The prevalence rates of smoking during pregnancy range from 6-34% in Canada, the United States and Australia [1-5]. The wide range in prevalence rates is likely due to the associated negative social stigma; mothers are reluctant to disclose their smoking behaviours due to feelings of guilt and shame [6-8]. However, there is no safe amount of smoking during pregnancy. Consequently perinatal health care providers, including nurses, must actively support women's efforts to stop smoking [7,9,10].

The 5 A's (Ask, Advise, Assess, Assist & Arrange) approach to treating tobacco use and dependence is the most frequently cited evidence-based strategy pertaining to SC counselling interventions [11]. Additionally, there are best practice guidelines that have been developed to specifically acknowledge the important role of nurses in SC [12]. Many guidelines include sections addressing special considerations for specific populations such as pregnant women [7, 13].

The prenatal period is an opportune time to provide ongoing support and interventions for SC counselling due to the frequency of health care visits and women's high motivation to quit [14,15]. Every opportunity should be taken to assist women and their partners to reduce fetal and infant exposure to the harmful effects of tobacco smoking [16]. Given that 62% of women who quit smoking during pregnancy relapse within one year [3], counselling and support should

be provided throughout the perinatal period and continue beyond the pregnancy.

Despite the availability of evidence-based guidelines, there is variable uptake by nurses, midwives, and physicians in implementing practice recommendations [17-20]. Specifically, these studies have identified conflicting advice, inconsistent application of smoking cessation interventions, and lack of follow-up, as common problems. In Ontario, Canada, Family Practice Nurses (FPNs) work in primary care settings in collaboration with family physicians, and nurse practitioners. FPNs care for a range of patient populations including pregnant women. FPNs typically see women early and throughout pregnancy, postpartum and families' childbearing years. FPNs are therefore well positioned to provide early SC interventions and ongoing support. For example, postpartum interventions include encouraging smoke-free homes and teaching harm reduction strategies that can minimize infants' exposure to smoke [12,13]. Our search of the literature reveals a dearth of studies in which the role of FPNs, in providing smoking cessation interventions for pregnant women, has been examined. The purpose of this study was to explore the role of Family Practice Nurses (FPNs), in smoking cessation counselling for pregnant women.

Specific research questions include

1. What are 'Family Practice Nurses' current smoking cessation counselling practices for pregnant women seeking care at primary care settings in Ontario during routine visits?
2. What is FPNs' awareness and use of guidelines pertaining to smoking cessation? What proportion of FPNs engage pregnant smokers in minimal interventions and intensive interventions?
3. What factors are associated with Family Practice Nurses' smoking cessation counselling practices for pregnant women?
4. What are the barriers to FPN-led smoking cessation counselling interventions of pregnant smokers?

Methods

The study design was non-experimental, descriptive and correlational. The setting was primary care practices in the province of Ontario, Canada. A one-time cross-sectional electronic questionnaire was administered to a convenience sample of FPNs who provide prenatal care in primary care settings. In Ontario there are seven major models of primary care services that provide government funded health care such as Family Health Teams, Community Health Centres, and Family Health Networks [21,22]. There are approximately 4,300 primary care nurses in Ontario [22]. Participants were recruited via the Ontario Family Practice Nurses' Interest Group of the Registered Nurses' Association of Ontario (RNAO). The RNAO is a voluntary professional association for nurses. The inclusion criteria were: 1) currently employed as a nurse at a primary care setting in Ontario; 2) provide direct care for prenatal patients; and 3) able to read and write in English.

The data collection instrument for this study was a questionnaire modified from the "Smoking cessation counselling practices among Quebec nurses" questionnaire [19]. Utilizing the questionnaire by Tremblay et al. had two major benefits. First, the questionnaire had been previously administered to nurses [23]. Second, this instrument has been demonstrated to be reliable [19].

To collect data exclusively on the current smoking cessation interventions of Family Practice Nurses for pregnant women, four steps were taken to modify the questionnaire: conduct a literature review, obtain feedback on the questionnaire from four experts in perinatal care and/or smoking cessation, convert the final version of the questionnaire to electronic format in Survey Monkey and pre-test the modified questionnaire with five graduate students in the Masters in Nursing program at a large urban university who had experience in either smoking cessation counselling/interventions, primary health care or perinatal nursing.

Variables

Cessation counselling

In order to provide interventions and support to pregnant women who smoke, it is recommended that FPNs initially determine women's readiness to quit and motivation to quit [6]. Pregnant women will be either ready to quit or they will not be ready to quit and the subsequent interventions would necessarily be different. In this study, therefore, both of these situations were explored by utilizing two independent scales from the work of Tremblay et al. [19]: A "ready to quit" counselling scale and a "not ready to quit" counselling scale. Response options for each item in the scales ranged from 1 (FPN undertook practice with few or none of her pregnant patients who smoked) to 5 (FPN undertook practice with all or almost all of her pregnant patients who smoked).

"Ready to quit" counselling scale

The "ready to quit" counselling scale score quantifies FPNs' smoking cessation counselling practice with pregnant women who have indicated readiness to quit. This scale is comprised of 10 five-point likert scale items (minimum score=10; maximum=50) with higher total scores indicating FPNs provided more SC counselling to pregnant women who were "ready to quit" smoking.

"Not ready to quit" counselling scale

The "not ready to quit" counselling scale score quantifies FPNs' smoking cessation counselling practice with pregnant women who have indicated that they are not ready to quit. This scale is comprised of nine five-point likert scale items to determine the total "not ready to quit" counselling scale score (minimum score=9; maximum=45) with higher scores indicating FPNs provided more SC counselling to pregnant women who were "not ready to quit" smoking.

Awareness and Use of Guidelines

Respondents were asked about their awareness and use of SC guidelines at their place of work. Given that the respondents were members of the Ontario Family Practice Nurses' interest group of the Registered Nurses' Association of Ontario (RNAO), it was hypothesized that they would be aware of the RNAO best practice guideline (BPG) entitled "Integrating Smoking Cessation into Daily Nursing Practice" [12]. This BPG includes recommendations for nursing practice that are applicable to nurses working in all settings, with all patient populations and is available free on the internet. Respondents were asked about their practice related to two specific practice recommendations pertaining to minimal and intensive intervention. The first practice recommendation from the RNAO BPG suggests that "nurse's implement minimal tobacco use intervention using the "Ask, Advise, Assist, Arrange" protocol with all clients" (p. 22) [12]. Minimal intervention is defined as lasting one to three

minutes. Practice recommendation number six suggests that "nurses implement, wherever possible, intensive intervention with women who are pregnant and postpartum" (p.29) [12]. Intensive intervention is defined as lasting more than 10 minutes. Respondents were asked to estimate the amount of time that they spend providing smoking cessation counselling during a prenatal visit. Response options included: more than 10 minutes, 6-10 minutes, 3-5 minutes, less than 3 minutes, and "I never offer smoking cessation counselling".

Factors that influence counselling practices

Six independent variables were examined to determine if they were significant predictors of FPNs' SC counselling of pregnant women who were either "ready to quit" or "not ready to quit". The variables were FPNs' beliefs (defined as the belief that cessation counselling is the role of nurses), self-efficacy (defined as the self-perceived ability to provide effective cessation counselling), age, interest in updating smoking cessation knowledge, smoking cessation training received during nursing studies, and smoking cessation training received after nursing studies.

The variables were measured by either multi-item scales or single item indicators. Two multi-item scales were developed to analyse the variables "beliefs" and "self-efficacy" [19]. The variable "beliefs" was measured as the sum of six items related to beliefs ($\alpha = .76$). The variable "self-efficacy" was measured as the sum of 5 items ($\alpha = .89$). These scales were then verified to ensure that the Cronbachs Alpha were ≥ 0.7 [24] and that the reliability scores were consistent with those reported by Tremblay et al for beliefs ($\alpha = .76$) and self-efficacy ($\alpha = .84$) [19]. The remaining four independent variables were measured as single item indicators. Respondents were asked to indicate the year in which they were born and to reply yes/no to questions about their training and interest in smoking cessation.

Barriers

In order to better understand the reasons why FPNs may not offer SC counselling, the respondents were asked to identify the extent to which 17 factors were perceived to be barriers to providing SC interventions for pregnant women. Response categories were the following: highly significant barrier, significant barrier, sometimes a barrier, rarely a barrier, and never a barrier.

Data Collection

Ethical approval was obtained from the University of Ottawa Office of Research Ethics and Integrity. The Ontario Family Practice Nurses' interest group of RNAO sent an e-mail invitation in English & French via the group distribution list which included 503 member e-mail addresses. Data were collected between October 2011 and December 2011. The tailored design method was used to recruit participants [25]. A total of four contacts were sent (one e-mail invitation and three reminder e-mails), with all e-mail messages including a hyperlink to the SurveyMonkey questionnaire. A record documenting tracking of the e-mail messages was maintained.

Data Analysis

The questionnaire data was downloaded from the SurveyMonkey website and imported into Statistical Package for the Social Sciences (SPSS) version 19.0. Respondents were excluded from data analysis if they did not complete the demographics section at the end of the questionnaire.

Descriptive statistics were compiled to describe the characteristics of the participants. To limit the number of variables used in a multiple linear regression, separate simple linear regressions were completed for the dependent variables "ready to quit" and "not ready to quit" with the six independent variables. Independent variables that had a significance level of $p < .20$ were entered into a multiple linear regression analysis [24].

Results

It was noted by the Ontario Family Practice Nurses' Interest Group that 3% (n=13) of messages were not delivered. One hundred FPNs entered the SurveyMonkey link. Of these 100 FPNs, four identified that they did not wish to participate, and seven said yes to participation in the study but did not answer any of the questions. Therefore, the response rate for this study was 18% (n=89). A further 25 respondents did not complete the demographics section of the questionnaire and were excluded from the data analysis resulting in a sample size of 64.

Demographics of FPNs

FPNs' demographics, smoking status and smoking cessation training are summarized in Table 1. All respondents were female. The majority of respondents were employed as registered nurses (91%) at either a Family Health Team (44%) or a physician's office (40%). There was nearly equal distribution of respondents from each of the sizes of communities in which the respondents worked, with somewhat more respondents in the rural group (33%). Two-thirds of the respondents worked full time (64%) and two-thirds reported that they were in their current position for less than 5 years (58%).

The FPNs' mean age was 48, with ages ranging from 26-67 years. The majority of respondents had a diploma in nursing (70%) which is obtained by completing a two or three year college program, while the remainder had a four year university degree in nursing. A small number of respondents received SC training during their studies (13%) and there was a threefold increase in the number of nurses who received SC training after their nursing studies (39%). Two-thirds of the FPNs reported always being non-smokers (64%) while one-third reported being ex-smokers (34%). There were no daily smokers and only one occasional smoker.

Current Smoking Cessation Counselling Practices with Pregnant Women

The majority of respondents (70%) reported that they see one to five pregnant women per day, with a further 12% of respondents who see more than five pregnant women per day. Respondents were asked to estimate the proportion of pregnant women who smoke for whom they routinely completed any of the the 5 A's of smoking cessation interventions (Table 2). The most commonly self-reported interventions were the first three A's (Ask, Advise, Assess) with only 42.8% of respondents providing all 5 A's.

		n(%)
Age (N= 60)	20-29	6 (10)
	30-39	8 (13.3)
	40-49	14 (23.3)
	50-59	26 (43.3)
	>60	6 (10)
Place of Work (N=63)	Family Health Team	28 (43.8)
	Community Health Centre	4 (6.3)
	Physician's Office	25 (39.1)
	Other*	6 (9.4)
Highest Nursing Education (N=63)	Bachelor's Degree	16 (25)
	Diploma	45 (70.3)
	Master's degree	2 (3.1)
Professional license (N=64)	Registered Nurse	58 (90.6)
	Registered Practical Nurse	4 (6.3)
	Nurse Practitioner	2 (3.1)
Years in Current Position (N=64)	Less than 2 years	11 (17.2)
	2-5 years	26 (40.6)
	6-10 years	10 (15.6)
	11-15 years	4 (6.3)
	More than 16 years	13 (20.3)
Employment Status (N= 64)	Full time	41 (64.1)
	Part time	20 (31.3)
	Casual	3 (4.7)
SC Training DURING Nursing studies (N=62)	Yes	8 (12.9)
	No	54 (87.1)
SC Training AFTER Nursing studies (N=62)	Yes	24 (38.7)
	No	38 (61.3)
Smoking Status (N= 64)	Always been a non-smoker	41 (64.1)
	An ex-smoker	22 (34.4)
	Occasional smoker	1 (1.6)
	Daily smoker	0
Size of Community (N=64)	Rural	21 (32.8)
	Small city <100,000	14 (21.9)
	Medium city 100-500,000	15 (23.4)
	Large city >500,000	14 (21.9)

N does not equal 64 because some respondents did not answer all questions. *Academic Family Residency Training Centre, University or College Health Clinic, Family Medicine Group, Other

Table 1: Family Practice Nurses' demographics, smoking status and smoking cessation training

Smoking cessation intervention	Nurses who routinely provide SC intervention to half or more of their pregnant clients n (%)
Ask/Document smoking status	51/63 (81.0)
Advise client to quit smoking	44/62 (71.0)
Assess readiness to quit smoking	44/62 (71.0)
Assist*	33/59 (56.0)
Arrange follow-up appointment	30/58 (51.7)
* Refer the client to community resources, self-help materials, other health care professionals, or smoker's helpline	

Table 2: Proportion of Family Practice Nurses who provided the 5 A's of smoking cessation interventions to pregnant clients who smoke

Awareness and Use of Smoking Cessation Guidelines

Approximately half of the respondents (53%) were able to identify the guideline in use at their place of work. The most frequently reported guidelines being used by FPNs were the RNAO BPG "Integrating Smoking Cessation Intervention into Daily Nursing Practice" (44%) and the Ottawa Model for Smoking Cessation (36%). Thirty-seven percent of respondents reported that they did not use a particular guideline at their place of work while 10% of respondents did not know which guideline they use at their place of work.

Over half of respondents (58%) identified that they were aware of the RNAO BPG. Of the 37 respondents who were aware of this BPG, the majority of respondents (81%) identified that they had read the document. Of the respondents who had read the RNAO BPG, the results were mixed in terms of usefulness of the BPG to change practice; 48% identified that it helped to change their SC practice a "whole lot" or "quite a lot".

Participant self-reported practices were compared to the minimal and intensive smoking cessation interventions, as per the RNAO BPG Practice Recommendations. Fourteen percent of respondents reported that they never offer smoking cessation counselling to pregnant women. Twenty-seven percent of respondents identified that they spend one to three minutes (minimal intervention), during a prenatal visit, counselling pregnant women who smoke. Approximately half of the respondents (52%) reported that they spend between three to ten minutes. Six percent of respondents spend 10 or more minutes counselling (intensive intervention) as per the recommendations by RNAO for pregnant women.

Factors Associated with FPNs' Smoking Cessation Counselling for Pregnant Women

Data analysis was completed in order to determine which factors predicted FPNs' smoking cessation counselling for pregnant women who were "ready to quit" and "not ready to quit". None of the six

independent variables were correlated >.80 and therefore, there was no evidence of multicollinearity. Finally, internal consistency was tested. The Cronbach's alpha for the "beliefs" and "self-efficacy" scales were .76 and .89 respectively indicating that they were reliable measures.

Counselling women who are "ready to quit"

The mean counselling score for pregnant women who are "ready to quit" was 29.3 [SD= 13.4] (range of scores was 10- 48, with higher scores indicating FPNs provided more SC counselling). Simple linear regressions were completed for the dependent variable "ready to quit" and each of the six independent variables (Table 3).

	Ready to quit				Not ready to quit			
	n	ß	t	p	N	ß	t	p
Beliefs	53	.525	4.450	<.001*	54	.514	4.360	<.001*
Self-efficacy	54	.678	6.709	<.001*	55	.528	4.566	<.001*
Age	50	-.108	-.763	.449	51	-.074	-.528	.600
Interest in updating SC knowledge	54	.110	.804	.425	55	-.053	-.388	.700
SC training during nursing school	54	.167	1.231	.224	55	.115	.854	.397
SC training after nursing school	52	.386	2.986	.004*	53	.324	2.466	.017*
* significant predictor								

Table 3: Simple linear regression: SC counselling for pregnant women

Independent variables for which the simple linear regression coefficients were p<.20 included beliefs (p<.001), self-efficacy (p<.001), and SC training after nursing school (p=.004) [24]. These three variables were therefore included as independent variables in the multiple linear regression analysis predicting SC counselling for women who are "ready to quit". Overall, the regression was significant [F (3,51)= 19.284, p<.001, R²=.547]. Of the three predictors investigated, only self-efficacy (p<.001) was a significant predictor of SC counselling of women who are "ready to quit" (see Table 4).

Counselling women who are "not ready to quit"

The mean counselling score for pregnant women who are "not ready to quit" was 30.6 [SD=13.4] (range was from the minimum 9 to maximum 45 score possible), with higher scores indicating FPNs provided more SC counselling to pregnant women who were "not ready to quit" smoking. Simple linear regressions were completed for the dependent variable "not ready to quit" and each of the six independent variables (Table 3). Independent variables that had a regression coefficient for which p<.20 included beliefs (p<.001), self-

efficacy (p<.001), and SC training received after nursing school (p=.017). These three variables were therefore included as independent variables in the multiple linear regression analysis predicting SC counselling for women who are "not ready to quit".

Overall, the regression was significant [F(3,52)=10.108, p<.001, R²=.382]. Of the predictors investigated, only self-efficacy (p=.018) was a significant predictor of SC counselling of women who are "not ready to quit" (see Table 4).

	Ready to quit			Not ready to quit		
	ß	t	p	ß	t	p
Beliefs	.144	1.149	.256	.287	1.979	.053
Self-efficacy	.585	4.545	<.001*	.366	2.443	.018*
SC training after nursing school	.113	1.041	.303	.061	.478	.635
Ready to quit: df(3,51) F=19.284, p<.001, R²=.547, adj R²=.518						
Not ready to quit: df(3,52) F=10.108, p<.001, R²=.382, adj R²=.344						
* significant predictor						

Table 4: Multiple linear regression results for SC counselling for pregnant women

Barriers to Smoking Cessation Interventions

The three most frequently identified significant or highly significant barriers to providing SC interventions for pregnant women included the following: cost of medication (55%), lack of time (52%), and lack of knowledge about smoking cessation (33%).

Discussion

This study describes FPNs' SC counselling practices for pregnant women who are seeking routine prenatal care at primary care settings in Ontario, Canada. The results of this exploratory study support our hypothesis that the RNAO BPG guideline was the most frequently reported SC guideline used by FPNs. However, the majority of FPNs in this study are not providing the intensive intervention recommended for pregnant women. Furthermore, FPNs are not consistently implementing all aspects of the 5 A's of smoking cessation guidelines. Respondents identified that for half or more of the pregnant women they see, during routine prenatal care visits, 56% "Assist" with the quitting process and 52% "Arrange" follow-up support. This finding is consistent with other studies exploring health care providers' counselling practices for pregnant smokers in Canada and the United States [18,26, 27]. Despite having evidence-based best practice guidelines for smoking cessation for more than a decade, the rate of guideline implementation is sub-optimal. It is likely that additional organizational and professional support is required to help FPNs achieve optimal cessation counselling practices.

FPNs have an important role in the provision of perinatal care given that the majority of respondents (70%) reported that they see one to five pregnant women per day, with a further 12% of respondents who see more than five pregnant women per day. FPNs are optimally situated within the Canadian health care system to provide smoking cessation counselling; however, they are often overlooked in studies or reports about the collaborative maternity care team. All health care

providers need to work to their full scope of practice to maximize health care funding dollars and optimize patient outcomes. Physicians, midwives, nurses and other health care professionals need to be held accountable for their respective roles and responsibilities in providing interventions to pregnant women who smoke. FPNs must advocate for their role in providing smoking cessation interventions and they must be supported by their nursing and interprofessional colleagues to improve their efforts to provide SC interventions for pregnant women because a "strong dose-response relationship exists between intensity of tobacco dependence counselling and effectiveness" (p. 202) [28]. FPNs need to implement the full range of smoking cessation interventions, as appropriate, for each woman. However, the appropriate interventions would be different depending on whether or not the woman is ready to quit smoking.

In this study, FPNs' self-efficacy predicted the frequency and quality of their SC counselling for pregnant women who were "ready to quit" and for pregnant women who are "not ready to quit". FPNs that had a higher self-perceived ability to provide effective SC counselling were more likely to provide SC counselling. In contrast to our findings, Tremblay et al. found that nurses' self-efficacy and beliefs were significantly associated with SC counselling of women who were "ready to quit", and that only beliefs were significantly associated with the "not ready to quit" counselling score for nurses. Further exploration of FPNs' beliefs with a larger sample of FPNs would yield greater information regarding the extent to which beliefs influence counselling interventions for pregnant women.

Bandura defines perceived self-efficacy as "belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (p.3) [29]. According to Bandura's Social Cognitive Theory of self-efficacy [29], it may be that FPNs who have higher levels of self-efficacy for smoking cessation counselling are more likely to put greater effort into counselling pregnant women, are more likely to persevere despite obstacles or failures, and are more likely to achieve the level of accomplishment that they set forth to attain. It is possible that FPNs may lack the ability to adequately address social realities, suggest appropriate strategies to overcome barriers, and their work environments may lack the structure to monitor women's progress towards SC goals [29]. Although SC training was not a significant predictor of counselling practices in the current study, researchers have suggested that health care providers' self-efficacy to provide effective counselling can be enhanced through additional education [19,26,27]. In the current study, only 39% of respondents had received training in smoking cessation interventions after their nursing studies and one third (33%) of participants identified lack of knowledge regarding SC as a significant to highly significant barrier to providing SC interventions for pregnant women.

In the current study, the two most frequently self-reported "significant" or "highly significant" barriers to providing SC interventions for pregnant women were cost of medication (55%) and lack of time (52%). In a literature review of quantitative studies pertaining to health care providers' engagement in smoking cessation with pregnant smokers, lack of time was identified as the most frequently reported systemic/organizational barrier [18]. Similarly, in a study exploring US midwives' knowledge, perception, beliefs and practice support regarding tobacco dependence treatment for pregnant women, the authors reported that cost of medication (63.4%) and lack of time (48.8%) were common barriers to counselling pregnant women [26]. Abatemarco et al. identified other barriers to the provision of SC interventions for pregnant women: patients are

resistant to advice (81.1%), patients lacked interest (78.1%), competing priorities in the visit such as acute illness (72.9%) and lack of training or experience in smoking cessation (72.8%). Price et al. surveyed 93 midwives in Ohio regarding their perception and use of smoking cessation in nurse-midwives practice; midwives in this study reported minimal to no barriers to providing SC counselling for pregnant women [27]. The majority of respondents perceived there were no barriers to counselling pregnant women and only 14% of midwives in this study identified lack of time as a barrier.

Interventions to reduce the barriers to FPN-provided SC should be implemented. A surprising finding was that cost of medication was the most frequently identified barrier given that there a number of programs in the province that provide smoking cessation medications or nicotine replacement therapies at a reduced cost or for free. For example, residents of the province who are eligible to receive Ontario Drug Benefits will receive free smoking cessation medications if needed. Additionally, there are programs offered through public health units in the province specifically developed for pregnant women whereby nicotine replacement therapy is provided as appropriate. Information regarding available programs to provide smoking cessation support for pregnant women should be widely promoted.

A simple intervention would be to refer women to the Smokers' Helpline via faxed referral, or to encourage women to self-refer via the website http://smokershelpline.ca/ or phone number 1-877-513-5333. The Smokers' Helpline is a federally funded program (Health Canada) which provides support to residents in 7 provinces including Ontario. The helpline would be able to connect women to local resources or provide direct quit coaching via phone, online support or text messaging. Referral to a smoking cessation program or service would also help to minimize the perceived time barrier and lack of SC knowledge reported by participants. By assisting women in this way, FPNs will be fulfilling clinical practice guideline recommendations, assuming they follow-up to ensure that the resource has been helpful to the women.

Further research is required to identify effective strategies to increase FPNs' knowledge regarding SC. Tong et al. conducted a national survey of US health professionals' smoking prevalence, cessation practices and beliefs [30]. Tong et al. reported that having training in SC was positively associated with performing multiple components of the 5 A's of the smoking cessation guidelines (Ask, Advise, Assess, Assist, Arrange) [30]. There is evidence that student nurses do not receive adequate education in SC and consequently nurses do not feel prepared to perform this aspect of the nursing role [19,31]. Given that in this study there was a threefold increase in SC training after nursing studies, it would appear that FPNs are interested in enhancing their knowledge. Some FPNs work in isolation from peers and may have limited access to continuing education opportunities [32]. Internet-based education may be a cost effective and convenient way for FPNs to acquire additional knowledge [33]. A variety of resources including on-line modules can be found on the Tobacco Free RNAO website [34]. Additionally, the Centre for Addiction and Mental Health host a website entitled "Prevention of Gestational and Neonatal Exposure to Tobacco Smoke" (Pregnets) which provides extensive information pertaining to pregnant and postpartum women [35].

This study is limited by a low response rate and a lack of generalizability of findings. The findings must be interpreted with caution. A similar study regarding smoking cessation practices among primary care providers in Ontario was conducted at the same time and response fatigue may have contributed to a low response rate. An internet-based recruitment method versus mailed questionnaires was used because e-mail is the primary mode of communication with these members of the FPNs' interest group and mailing addresses were not available. The nurses who completed the questionnaire were members of a voluntary professional association and may not be representative of the FPN population in Ontario. A larger and more representative sample size with predefined mailing lists is needed to more confidently draw conclusions regarding the nurses' role in providing smoking cessation for pregnant women. Additionally, a minority of respondents received training in SC which may have lessened the statistical power to assess the impact of training on SC counselling practices. Future studies should recruit FPNs through regulatory colleges which have mailing addresses available and defined processes for research involving their members. In the future, researchers should consider a combined recruitment method of mailed and internet surveys with careful attention to the timing of the questionnaire distribution.

The strengths of this study were the utilization of a previously validated instrument and the exploration of nurses' SC counselling for pregnant women who were not ready to quit smoking. Although minor adaptations were made to the instrument to ensure relevancy for pregnant women, the reliability and content validity remained high.

Conclusion

Eighty-two percent of Family Practice Nurses surveyed in this study reported seeing pregnant women on a daily basis in their primary care practices. The results from this exploratory survey indicate that the majority of FPNs in this study are not fully implementing evidence-based smoking cessation interventions during routine care. Of the predictors investigated, self-efficacy was a significant predictor of counselling pregnant women who were "ready to quit" (p<.001) and "not ready to quit" (p=.018). FPNs that have high self-efficacy to provide effective smoking cessation counselling are more likely to provide interventions.

Disseminating research outlining effective strategies to increase nurses' self-efficacy to provide effective smoking cessation interventions may increase the uptake of evidence-based recommendations. Interventions to address the barriers to FPN-provided SC should be implemented. Greater promotion of community programs is recommended. As FPNs become more familiar with smoking cessation programs for pregnant women then perhaps referrals to these programs will increase thereby decreasing the perceived barrier of time and cost of medication. Family practice nurses can empower, motivate, and support pregnant women who smoke so that SC efforts started during pregnancy will not stop with the birth of the child but rather continue towards life-long abstinence. Now is the time to make the 5 A's of smoking cessation counselling routine practice for all nurses working in all settings, especially FPNs who work with pregnant and postpartum women.

Acknowledgement

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