Providing Smoking Cessation Interventions:

A Survey of Nurses in Primary Health Care Settings in Ontario, Canada

by

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Abstract

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Globally tobacco use and exposure to tobacco smoke represent some of the greatest risk factors for mortality. Best practice guidelines and standards of practice support nurses' provision of smoking cessation interventions. Nurses employed in primary health care settings interact with large numbers of people who smoke, and have the potential to significantly reduce tobacco use in the population. Evidence shows that nurses do not consistently implement smoking cessation interventions.

The purpose of this cross-sectional study was to describe nurses’ perceptions of factors that influence their intentions related to providing smoking cessation interventions in primary health care settings. A conceptual framework derived from the Theory of Planned Behavior and relevant empirical literature guided the study. A questionnaire measuring the concepts of interest was mailed to a random sample of Registered Nurses and Nurse Practitioners in Ontario. Responses of 237 eligible participants were available for analysis. Multiple regression analyses were used to examine the hypothesized relationships between nurses’ attitudes, subjective norms...
and perceived behavioural control, and their intention to implement smoking cessation interventions, and the association between intention and practice related to smoking cessation.

The Theory of Planned Behavior concepts explained up to 48.5% of variance in behavioural intention. Perceived behavioural control was most strongly associated with intention to provide smoking cessation interventions. Behavioural intention was correlated with smoking cessation practice. Analysis of responses to open-ended questions identified factors that facilitated (wish to improve patients’ health, organizational support, access to resources, a perception of patient readiness to quit, and training in smoking cessation) and hindered (lack of time, lack of patient readiness, lack of support and resources, and lack of knowledge) nurses' provision of smoking cessation interventions.

Overall, the study results suggest that nursing intention to engage in smoking cessation practices in primary health care settings was associated with organizational factors. Further research is required to explore how primary health care organizations can support nurses so that they fully realize their role in reducing the impact of tobacco use on the health of the people in Ontario.
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I want to see a day when tobacco claims no more lives.
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Chapter One

Research Problem

Overview

Globally tobacco use and exposure to tobacco smoke represent some of the greatest risk factors for mortality (WHO, 2013). Nurses have access to evidence-based practice guidelines to support smoking cessation interventions, and the Canadian Nurses’ Association and other nursing professional associations have included smoking cessation in their standards of practice (Schultz, 2003). Nurses interact with large numbers of people who smoke. Specifically, nurses who are employed in primary health care settings provide care to large numbers of individuals and have the potential to significantly reduce tobacco use in the population. However research has revealed that nurses do not consistently provide smoking cessation interventions for their patients who use tobacco. The results of some studies showed that only 35% of nurses offer smoking cessation interventions as part of their practice in primary care settings (Good, Frazier, Wetta-Hall, Ablah, and Molgaard, 2004). Most of what we currently know about the factors that influence nurses’ practice relative to smoking cessation is derived from studies conducted in acute care, ambulatory or primary health care settings within the United States (U.S.) or the United Kingdom (U.K.). Significant differences in how nurses’ role in smoking cessation is viewed exist between these two countries and Canada, specifically Ontario. The purpose of this study was to examine current nursing practice for smoking cessation in primary health care settings in Ontario, and nurses’ perceptions of the factors that relate to their intention to implement and actual implementation of evidence-based smoking cessation interventions in those settings.
The factors are derived from the concepts of the Theory of Planned Behavior (TPB) (Ajzen, 1985) and literature pertaining to health providers’ practices related to smoking cessation. The factors include attitudes about providing smoking cessation interventions, beliefs about how influential others in the practice setting view the provision of smoking cessation interventions, and perceived barriers and facilitators to providing smoking cessation interventions in the practice setting. Research has shown that specific personal and professional characteristics of individual nurses and specific practice setting characteristics are related to their decisions to provide smoking cessation interventions (Good et al., 2004; Gorin and Heck, 2004; Wewers, Sarna and Rice, 2006). Therefore, this study also examined the relationships between the individual nurses’ characteristics (i.e., age, history of tobacco use, and training and experience), characteristics of the practice setting (type of practice, location, and the presence of other health care providers), and their intention and provision of smoking cessation interventions. This study adds to the understanding of factors that affect nurses’ decisions to provide smoking cessation interventions in primary health care settings in Ontario.

**Background**

**Tobacco Use and Consequences in Canada.** It is estimated that more than 37,000 people will die each year in Canada due to smoking. Of those, 17,600 will die of cardiovascular diseases and 2,000 of smoking-related stroke (Health Canada, 2007). Smoking causes 90% of all lung cancers, which is the leading cause of death from cancer for both men and women (Canadian Cancer Statistics, 2007). Smoking also contributes to pancreatic, stomach, kidney, cervical, esophageal, laryngeal, and oral cancers as well as leukemia (Surgeon General’s Report, 2004). Smoking causes almost all cases of chronic obstructive pulmonary disease (COPD),
which is the 4th leading cause of death and disability in Ontario (Lung Association of Ontario, 2008). The majority of these deaths are premature, that is, they occur before the age of 70 and are preventable (Physicians for a Smoke Free Canada, 2010). Morbidity associated with tobacco use includes not only COPD, but also asthma, hypertension and heart failure (Reeve, Calabro, and Adams-McNeill, 2000).

Economically, smoking costs Canadian taxpayers over $17 billion annually, including $4.4 billion in health-care costs associated with the treatment of diseases directly related to tobacco use (Health Canada, 2007). Other costs include lost productivity, absenteeism, higher insurance costs incurred by individuals, as well as expenses related to facility safety and maintenance (Reeve et al., 2000).

The benefits of smoking cessation are well documented. Within 72 hours of quitting bronchial tubes relax, if undamaged, and breathing is easier. Lung capacity increases with the length of time without smoking with an increase of 20% in lung function within 2 weeks to 3 months of quitting. Within one to nine months of quitting, the cilia in the lungs begin to grow back; this helps clear mucous and debris from the lungs and prevents pneumonia. After a year, the risk of heart disease is reduced by one half, and after 15 years the risk is similar to that of a person who has never smoked. Cervical cancer risk is significantly reduced after 2 years of abstinence, and bladder cancer risk is halved. Lung cancer death rate decreases from 137 per 100,000 to 72 per 100,000 for one pack per day smokers after 2 years of quitting. Within 5 to 15 years of quitting the stroke risk is reduced to that of someone who never smoked. The risk of all cancers is decreased after 10 years of quitting and death from COPD is reduced compared to

The addictive properties of nicotine have been documented and have provided a clearer understanding of the physiological and psychological effects experienced by tobacco users when they attempt to stop using the product. Nicotine is thought to activate the brain’s “reward pathway”, enhancing the action of neurotransmitters such as dopamine and endorphins. The resulting sense of euphoria leads to chronic use. This chronic exposure results in molecular adaptations, which produce the symptoms of addiction and dependence. The tobacco dependent person experiences strong and unpleasant responses in the absence of dopamine stimulation from nicotine that manifest as irritability, agitation, and strong cravings (Hyman, 2001). While some people can manage to stop using tobacco and cope with the unpleasant symptoms of withdrawal, many will avoid cessation or will relapse without intervention. Sixty to 70% of smokers attempting to quit will use self-help materials, achieving an estimated quit rate of 8% to 25%. Counseling from any health professional has been shown to produce quit rates of 16 to 22.1% depending on the intensity of the intervention provided (Fiore, et al., 2008). The addition of nicotine replacement therapy or conjunctive pharmaceutical support with Bupropion has been shown to increase quit rates to as much as 35% in some studies (Wilkes, Evans, Henderson, Gibson, 2005).

Sixty-two percent (62%) of adult Canadian smokers report that they intend to quit smoking within the next 6 months (Canadian Tobacco Utilization Monitoring System, 2007) and there is evidence that smokers welcome advice and assistance from health providers regarding quitting smoking (Ossip-Klien, McIntosh, Utman, Burton, Spada, and Guido 2000). One survey
demonstrated that 43% of smokers in Ontario made a serious attempt to quit over a given one-year period (Ialomiteanu and Adlaf, 2007). On average, 20% of current smokers cease using tobacco every year (Canadian Tobacco Use Monitoring System, 2007). Given that there are clear benefits to ceasing tobacco use, and many people who use tobacco want to quit, reducing tobacco use is an important public health initiative for all health professionals, including nurses.

**Nursing and Tobacco Treatment.** Nurses provide care to large numbers of patients who smoke. Research has shown that nurses can be effective in helping patients quit using tobacco (Hall, Reid, Ukoumunne, Weinman, and Marteau, 2007; Sidorov, Christianson, Girolami, and Wydra, 1997; Wewers, 2006). Most governance and health professional associations have developed evidence-based guidelines that direct nurses to provide advice to quit and other smoking cessation interventions, such as motivational counseling and/or nicotine replacement therapy (NRT), in their daily practice (Schultz, 2003; Gorin and Heck, 2004). Despite this, nurses’ engagement in any type of smoking cessation intervention for patients who are dependent on tobacco is inconsistent (Good et al., 2004). Surveys of nurses in acute care and ambulatory care settings have identified a number of barriers to the utilization and implementation of evidence-based guidelines for smoking cessation including lack of training, lack of confidence and lack of space to provide interventions; perception of patients’ lack of motivation to quit (65%); having limited time (55%); lacking skills for providing smoking cessation interventions (32%); and lacking knowledge about smoking cessation (25%) (Good et al., 2004; Gorin and Heck, 2004; Wewers, Sarna, and Rice, 2006). Sarna et al. (2001) conducted a national survey of oncology nurses in the U.S. to identify their smoking cessation practices. The results revealed that nurses who encountered the greatest number of barriers were more likely to be smokers, younger than 45 years of age, less likely to have an advanced degree and
less likely to be a nurse practitioner. Similar surveys have been conducted in acute and ambulatory settings in Canada, the U.S. and the U.K. (Braun, Fowles, Solberg, Kind, Lando, and Pine, 2004; Good et al., 2004; Hall, Vogt, and Marteau, 2005; McEwan and West, 2001; Schultz, Johnson, and Bottorff, 2006) with reasonably consistent results. However, of the six studies reporting on primary health care nurses’ attitudes and beliefs about smoking cessation, only two studies were conducted in a Canadian setting (Schultz et al., 2006). Furthermore, only 10 of the 100 studies listed by Wells, Sarna, and Bialous (2006) on nursing research in smoking cessation targeted nurses in family practice or primary care settings. Whereas these findings have been very helpful in understanding how nurses perceive their role in smoking cessation, and what factors facilitate or hinder that role performance, they are limited in terms of the applicability of findings to primary care settings in Ontario. This issue is discussed in the next section.

**Nursing in Primary Care Settings.** Registered Nurses represent the largest group of health care professionals in the province of Ontario. The College of Nurses of Ontario 2012 Report reveals that there are 114,214 Registered Nurses and Nurse Practitioners registered in the province. Of those, 3.3 % or 3769 Registered Nurses and Nurse Practitioners are employed in Community Health Centres, Family Health Teams or other primary care settings (College of Nurses of Ontario, 2012). A 2003 report by the Institute for Clinical Evaluative Studies (ICES) showed that on average each person in the province would have four visits per year to their family doctor if they were under the age of 65 years. Those over 65 years will visit the doctor an average of seven times per year. This represents a large number of people who may be dependent on tobacco and who could have access to evidence-based interventions and on-going support for smoking cessation provided by nurses in primary care settings.
Nurse Practitioners in primary health care settings work in a collaborative model with other health care providers such as family doctors, social workers, health promoters, chiropodists, and others. Nurse Practitioners provide services to patients of all ages for episodic illnesses, primary and secondary prevention, health promotion, prenatal and postnatal care, and chronic disease management (CNO, 2007). Registered Nurses in primary care settings have more diverse roles and functions depending on the characteristics of the practice setting such as the structure and philosophy of care, the number of registered nurses employed, the number of physicians, and the number of Nurse Practitioners. However, most Registered Nurses and Nurse Practitioners provide primary and secondary prevention, patient education, health promotion, and counseling to some degree. Smoking cessation is an important health promotion and disease prevention objective (Reeve et al., 2000) and nurses are expected to integrate smoking cessation interventions into their practices (CNA, 2001). When the U.S. Agency for Health Care Policy and Research (later renamed the Agency for Healthcare Research and Quality) convened an expert panel to develop clinical practice guidelines for smoking cessation in 1993, it was determined that treatment delivered by primary care clinicians was a priority because 70% of smokers were seen in those settings every year (Fiore et al., 2008; Wewers, Sarna, and Rice, 2006). However, in her 2006 updated meta-analysis of nursing interventions for smoking cessation Virginia Hill Rice stated that there were only eleven studies, out of a total of over 100, of interventions delivered by nurses in non-hospital settings. Rice concluded that the likelihood of successful smoking cessation as a result of nursing interventions in these non-hospital settings was small. She suggested that given the large number of people who smoke and could be reached by nurses in non-hospital settings the potential for significant reductions in smoking prevalence is high. There is a great potential for reducing the use of tobacco and its harmful
health effects if nurses in primary care settings can integrate smoking cessation interventions more consistently in their day-to-day practice.

Nurses’ roles in primary health care settings in Ontario are diverse, covering a wide range from receptionist duties to the expanded scope of a Nurse Practitioner practice (Akeroyd, Oandasan, Alsaffar, Whitehead, and Lingard, 2009). The nurses’ role and scope of practice are often dependent on the individuals who manage the practice, and on the number and type of health care professionals working in the setting. There is rarely a nursing administrative structure that has direct authority over nursing roles and supervision of practice, as is the case in acute care institutions. Many nurses in primary care settings work in isolation from other nurses and have little or no access to opportunities for continuing education that could enhance their knowledge and confidence in providing evidence-based smoking cessation interventions. What is offered in terms of continuing education is often determined by non-nursing managers (Gibson and Heartfield, 2005). Funding in Ontario primary care settings is a factor that may influence nurses’ implementation of smoking cessation interventions. Physicians are paid incentives to provide smoking cessation interventions in Family Health Teams (FHTs), Family Health Groups (FHGs) and Family Practice Units (FPUs) (Ontario MOHLTC, 2009). Physicians may view nurses’ involvement in smoking cessation as a potential threat to their remuneration. This may limit nurses’ opportunities to provide interventions for smoking cessation beyond assessment and documentation of patients’ smoking status, and referral to physicians for smoking cessation interventions. By comparison, in the U.K. incentives for implementing smoking cessation interventions are paid to the primary health care practice and not to individual health care professionals. This resulted in a broadening of nurses’ scope of practice to cover a full range of primary and secondary prevention interventions including smoking cessation (Barr, 2005). This
may account for the larger number of studies focusing on primary health care nurses’ practice in smoking cessation done in the U.K. Therefore, the current knowledge about primary health care nurses’ attitudes and beliefs regarding smoking cessation interventions is derived from studies in settings and jurisdictions that are significantly different from primary health care settings in Ontario. Physician reimbursement and variability in nurses’ role in primary health care settings affect both Registered Nurses’ and Nurse Practitioners’ scope of practice in relation to smoking cessation. It is not known how often and to what degree nurses in primary care settings provide smoking cessation interventions and how often those interventions are based on the best available evidence. Understanding the factors in primary care settings that relate to nurses’ implementation of interventions with patients who smoke and how they implement interventions is necessary for clarifying and refining nursing’s role in the public health initiative to reduce tobacco use.

**Nursing Intentions to Integrate Evidence into Practice.** Evidence-based practice has become a dominant theme in nursing as a means of assisting nurses in making well informed and reliable intervention choices from an array of sources (Rycroft-Malone, Harvey, Seers, Kitson, and McCormack, 2004). Studies have demonstrated that implementation of evidence-based interventions can improve quit rates among patients receiving smoking cessation treatment (Katz, Muchlenbruch, Brown, Fiore and Baker, 2004). However, a number of studies demonstrate that nurses experience barriers to integrating evidence into practice regardless of the health concern involved (Rycroft-Malone et al., 2004). As is the case with smoking cessation interventions, nurses have also identified multiple barriers to implementing any best practice guideline or intervention in the clinical setting including limited computer skills, lack of research experience, and lack of adequate time and technology (Thompson, McCaughan, Cullum,
Sheldon, and Raynor, 2005). Researchers have studied these barriers and tried to understand the factors influencing nurses’ ability to implement research-based interventions. The Theory of Planned Behavior proposes factors affecting the likelihood that a person engages in a given behaviour (Ajzen and Fishbien, 1980). The theory clarifies the relationships between these factors and nurses’ intentions to implement evidence-based smoking cessation interventions in the primary care setting, as well as between intention and actual performance of the interventions. This study was designed to examine the influence of the following factors, consistent with those proposed by the Theory of Planned Behavior and reported in the literature on nurses’ intention and implementation of smoking cessation interventions: nurses’ attitudes toward the provisions of smoking cessation interventions, nurses’ perceptions of how influential others value the provision of these interventions, and nurses’ view of personal and situational barriers and facilitators to the provision of these interventions in their workplaces.

The results of descriptive studies identified individual nurses’ personal and professional characteristics, as well as practice features as factors contributing to their implementation of smoking cessation. These factors are consistent with Ajzen and Fishbein’s proposition that individual characteristics such as beliefs, self-efficacy, age, training and experience relate to the factors determining and contributing to intention and performance of any given behaviour (Ajzen, 1991, Ajzen and Fishbein, 1980; Heath & Crowell, 2007). This study also examined the relationship between the nurses’ characteristics and their intention to implement, and their actual use of, smoking cessation interventions in their day-to-day practice.
Problem Statement

Nurses in primary care settings provide care to large numbers of patients who may smoke. There is evidence indicating that nurses in in-hospital and ambulatory care settings provide effective smoking cessation interventions (Hall et al., 2007; Sidorov et al., 1997; Wewers et al., 2006). Despite the fact that evidence-based guidelines exist to help nurses provide effective interventions (Registered Nurses Association of Ontario, 2003; CNA, 2001; Katz et al., 2002), and nursing professional associations have stated that smoking cessation interventions are an expected component of nursing practice in all settings (CNA, 2001), available data indicate that nurses are not consistently offering smoking cessation interventions to patients who use tobacco (Wewers, Sarna and Rice, 2006). Results of surveys have described the barriers nurses encounter in providing smoking cessation interventions, such as lack of training, lack of time, and lack of space (Sarna et al., 2001) but most of the data come from acute care settings and ambulatory clinics. As well, few of the existing studies were guided by a theoretical framework to explain the associations between these factors and the provision of interventions. More information is needed about how these factors are experienced in primary care settings so that appropriate initiatives can be designed to support nurses in participating more fully in this important public health initiative and more patients can have access to evidence-based smoking cessation interventions.
**Research Questions**

The specific research questions addressed in this study are:

1. What is the nature of smoking cessation interventions provided by nurses in primary health care settings in Ontario?

2. What factors are associated with nurses’ intention and behaviour related to providing smoking cessation interventions to patients in primary health care settings?

**Significance of the Study**

Tobacco use continues to be the leading cause of preventable death in developed countries. Intervention by health professionals has been shown to increase smoking cessation rates but nurses have not consistently provided interventions to their patients who smoke. This study expands our knowledge about how nurses in primary health care settings are currently implementing smoking cessation interventions, the nature of those interventions and the factors that facilitate or hinder their intentions to implement interventions. This knowledge is useful in addressing identified barriers, in developing practice strategies and in altering features of the practice settings that support the implementation and integration of evidence-based smoking cessation interventions. Implementation of evidence-based smoking cessation interventions has been shown to decrease tobacco use among patients who smoke. Decreasing tobacco use among patients receiving primary health care reduces the morbidity and mortality associated with tobacco use and allows nurses to realize their potential to make a positive contribution to this important public health initiative.
Chapter Two

Literature Review and Theoretical Framework

Introduction

Tobacco use and exposure to tobacco smoke are among the most significant risk factors for mortality and morbidity in the developed world (WHO, 2013). Seventeen percent of Canadians 15 years or older are current smokers, and a large number of those people will suffer health effects related to tobacco use. Despite the fact that nurses are encouraged by their professional associations to include smoking cessation in their daily practices, and many nurses believe that this is an important role (Rice and Stead, 2008; Schultz et al., 2009), research has shown that the level of nursing engagement in smoking cessation interventions falls below recommendations (Schultz et al., 2009). There is significant empirical evidence available to guide smoking cessation activities but this evidence is not consistently applied in practice (Nagle, Schofield, and Redman, 1999). Research has revealed that nurses perceive a number of factors that either facilitate or hinder the integration of smoking cessation into their daily practice. Those factors relate to nurses’ attitudes and beliefs about the evidence related to tobacco use and smoking cessation, nurses’ perceptions of patients’ motivation to quit, nurses’ perception of the availability of necessary support and resources in their workplaces, and nurses’ confidence in their skills and knowledge to provide interventions (Braun et al., 2004; Good et al., 2004; Gorin and Heck, 2004; Hall et al., 2005; McEwan and West, 2002; Wewers, Sarna, and Rice, 2006; Schultz et al., 2006). Most of what is currently known about the factors related to nurses’ provision of smoking cessation interventions has been derived from studies of nurses in acute care settings in the U.S. and Canada, or in primary care settings in the U.S. or the U.K.
The context for nursing practice in acute care settings differs greatly from primary care settings (Alsaffar, 2005; Gibson and Heartfield, 2005) and workplace factors related to providing smoking cessation interventions are likely to be different as well. Primary care settings in the U.S. and the U.K. differ in some key ways from primary health care settings in Ontario, Canada. These differences relate specifically to nurses’ roles in smoking cessation in the workplace and how health care professionals are reimbursed for providing smoking cessation interventions (Barr, 2005). More needs to be known about the factors related to how nurses in primary health care settings in Ontario make decisions to provide smoking cessation so that tobacco control initiatives can be targeted to increase nurses’ engagement in this important health promotion and disease prevention activity. Therefore a conceptual framework was developed to delineate factors that are associated with primary health care nurses’ decisions to provide smoking cessation interventions for their patients who smoke. The framework integrates concepts of the Theory of Planned Behavior (TPB) and factors found to be empirically related to nurses’ implementation of smoking cessation interventions.

The TPB guided the conceptualization of the factors contributing to nurses’ implementation of smoking cessation interventions. The TPB is a psychological theory of behaviour developed by Ajzen in 1985 as an extension of the theory of reasoned action developed by Fishbein in 1967 (Ajzen, 1985). The theory proposes that the decision to engage in any behaviour is primarily determined by the strength of the intention to perform the behaviour. The intention to perform a given behaviour is related to the attitude, subjective norm and perceived behavioural control the person holds about performing the behaviour (Ajzen, 2006). This chapter presents a review of literature on factors that influence nurses’ implementation of smoking cessation interventions, followed by the conceptual framework that guided the study.
Literature Review

Despite availability of significant empirical evidence to guide smoking cessation activities, these interventions are not consistently applied in practice (Nagle, Schofield, and Redman, 1999). Evidenced-based clinical practice guidelines have been promoted as one strategy for improving the adoption of evidence in clinical practice for smoking cessation. These guidelines are intended to decrease variation in health care services and costs, and to improve the quality of care by synthesizing and translating research evidence into knowledge that guides clinicians’ practice (Rashidian, Eccles, and Russell, 2008; Schultz et al., 2009). However the process of guideline implementation has been shown to be complex and many factors have been found to influence implementation in practice (Grimshaw, Eccles, and Tetroe, 2004). Research has shown that providing practitioners with evidence-based guidelines alone is not enough to stimulate change in practice and other factors have been found to influence the uptake of evidence and its translation into new knowledge that will change clinical practice patterns (Grimshaw et al., 2004; Schultz et al., 2009). The factors related to clinicians’ decisions to provide smoking cessation interventions include the way the evidence is defined and valued by clinicians, the clinicians’ perception of patient motivation and intention to quit using tobacco, the context or workplace environment, clinicians’ role attitudes, and individual clinician characteristics.

Factors Related to the Integration of Evidence in Clinical Practice

Clinicians’ perceptions of evidence. This section reviews five studies that investigated how clinicians’ attitudes and beliefs toward research evidence are related to the uptake of that evidence into practice. Because nurses’ role and scope of practice in primary health care are
often defined by others in the practice setting (Gibson and Heartfield, 2005), the relationship between attitudes and the uptake of evidence is discussed from a general perspective and then more specifically as it relates to the integration of smoking cessation interventions by nurses.

The review of the literature revealed research conducted in the U.K. exploring the influences of evidence-based innovations on clinical behaviour. Two longitudinal comparative case studies were conducted separately in primary (Wood, Ferlie and Fitzgerald, 1998) and acute care settings (Fitzgerald, Ferlie, and Hawkins, 2003). Physicians, nurses, and allied health professionals were interviewed about the uptake of innovations, the influence of those innovations on their practice and on other health professionals, and the other factors that affected adoption of innovations. Dysart and Tomlin (2001) surveyed 400 Occupational Therapists (OTs) in the U.S. to examine how they use research. In a similar study Zipoli and Kennedy (2005) conducted a survey of American Speech-Language Pathologists to examine their attitudes towards, and implementation of, research and evidence-based practice. Grol, Dalhuijsen, Thomas, Veld, Rutten, and Mokkink (1998) conducted an observational study of general practitioners (GPs) in Holland. Clinicians were asked to report on their compliance with selected clinical practice guidelines and the researchers then matched uptake with specific pre-determined attributes of clinical practice guidelines that had been derived from an extensive literature review.

As viewed by clinicians who participated in these studies, evidence to support practice comes from a variety of sources and is subject to different interpretations that influence uptake (Dopson et al., 2002). Clinicians don’t value research evidence as much as they do local evidence derived from reflective practice (Wood, Ferlie and Fitzgerald, 1998) or the opinions of
trusted colleagues, even if they have positive attitudes toward research and clinical practice guidelines. The most influential attribute in terms of frequency of implementation of clinical practice guidelines in practice was whether the clinical practice guideline recommendation was compatible with existing local values (Zipoli and Kennedy, 2005). Dopson et al. (2002) found that clinicians would be more likely to implement research that helped solve an identified local clinical problem.

Clinicians resist implementation of evidence-based interventions that don’t reflect the tacit or experiential nature of practice and the complex process of implementation (Dopson et al., 2001; Wood, Ferlie and Fitzgerald, 1998). Dysart and Tomlin (2001) reported the same finding in their study and added that this attitude was more likely if the clinician had 15 or more years of experience.

Fitzgerald, Ferlie, and Hawkins (2003) examined how health professionals in primary health care settings view and implement evidence in practice. Their findings revealed that the professionals perceive that the credibility of evidence is a “debatable concept” and that there is no one source of evidence, “just competing bodies of evidence” (p. 225). Evidence from randomized control trials was not necessarily ranked higher than other sources of evidence in terms of credibility. The authors suggested that the perceived credibility of the evidence was influenced by other factors besides the quality of the research such as the source of the evidence, the content of professional debate and interaction, and trust in the source of the evidence.

The studies reviewed here represent a diversity of designs (survey, observation, and case study), contexts (primary and acute care) and participants (different health professionals). Furthermore, attitude toward evidence was not consistently defined or operationalized. Despite
these inconsistencies the studies’ findings support the argument that a relationship exists between
the integration of evidence into practice and how the evidence is perceived in terms of its
consistency with experiential knowledge, the opinions of colleagues, and the source of the
evidence. However, the strength and nature of that relationship was not fully explored or
measured.

Nurses’ Perceptions of Evidence. Ring, Coull, Howie, Murphy-Black and Waterson
(2006) conducted a descriptive, exploratory study to understand the factors related to nurses’
implementation of five nursing Best Practice Statements in acute care, long term care, and
primary care settings in Scotland in 2003. A postal survey inquired about nurses’ (n = 1278)
awareness and use of Best Practice Statements, and perceived benefits of using the Best Practice
Statements. Most respondents felt that the Best Practice Statements improved patient care but
only about 25% had actually implemented them. In addition, 109 nurses responded to open-
ended questions about the barriers to Best Practice Statement implementation. Lack of resources
such as time and training were most frequently cited (24.7%). The second most frequently cited
barrier was the perceived lack of relevance to practice (22.9%). The meaning of this theme was
not explored beyond that statement. Furthermore, the study did not include a BPS for smoking
cessation. Koehn and Lehman (2008) reported similar findings from their descriptive, cross-
sectional study of nurses in large acute care settings in the U.S. Respondents reported moderately
positive scores for attitudes toward evidence-based nursing and implementation of evidence in
practice. Nurses prepared at a baccalaureate level or higher had higher scores for positive
attitudes. The most common barriers to implementation of evidence in nursing practice were
time and knowledge.
Studies of nurses’ attitudes toward smoking cessation interventions have also examined nurses’ perception of the evidence related to smoking cessation. Sarna et al. (2004) found that 43.6% of oncology nurses (n = 1508) reported lack of confidence in the benefits of cessation as a barrier to implementation of evidence-based interventions. The nurses who lacked confidence were more likely to be young, more likely to be smokers and were less likely to have an advanced degree or have administrative responsibilities than those who did not lack confidence. Conversely, Schultz et al. (2006) surveyed acute care nurses in two hospitals in British Columbia, Canada and reported that overall, nurses had positive attitudes about evidence-based interventions and that nurses’ personal characteristics, such as age and smoking status, were not associated with their perceived barriers to providing smoking cessation interventions. The nurses participating in Schulz’s study were more likely to feel confident about the efficacy of smoking cessation interventions if they believed they had organizational support for their practice related to smoking cessation. Good et al. (2004) examined the smoking cessation practices of nurses working in primary care settings across the state of Kansas. Nurses in this study responded favorably to a question about the expected efficacy of smoking cessation interventions; specifically, 52% of the respondents were very optimistic expecting that 25% or more of their patients would be smoke free one year after receiving a smoking cessation intervention. There was no significant relationship between a positive belief about the effectiveness of smoking cessation interventions and nurses’ decisions to provide interventions in either of these studies. Hall, Vogt and Marteau (2005) conducted a postal survey of 152 practice nurses in the U.K. regarding their attitudes toward smoking cessation. Seventy-seven percent (77%) of participants responded positively when asked if they believed their smoking cessation interventions would persuade at least some of their patients to
Nurses who were ex-smokers or who had never smoked were more likely to see their interventions as effective. In a study of nurses practicing in the U.K., Puffer and Rashidian (2004) tested the utility of the Theory of Planned Behavior in explaining nurses’ intentions to implement smoking cessation guidelines with their patients who smoked. The authors reported a significant association between a positive attitude toward smoking cessation and intentions to provide interventions.

Health care providers, including nurses, in acute and primary care settings have reported variable attitudes toward evidence from a variety of sources including research, local experience, debate and consensus. All evidence is subject to interpretation and must be compatible with local values and experience, as well as relevant to practice in order for this evidence to be implemented in practice. Few studies have examined the relationship between a positive attitude toward the evidence for smoking cessation interventions and the intention to provide those interventions. The current study examined how nurses’ attitudes toward interventions for smoking cessation are related to nurses’ intention to provide those interventions in primary care settings.

**Nurses’ perception of patient motivation to quit smoking.** The studies reviewed here examined the relationship between health professionals’ perception of patient motivation to quit smoking and the provision of smoking cessation interventions. They consisted of cross-sectional surveys that limit causal inference. Four studies were conducted in ambulatory or primary care settings and two in acute care settings. The studies conducted in ambulatory and primary care settings have greater relevance to the current study, although all have been included in this review because of their focus on nurses’ perceptions. Overall the findings of the studies showed
that nurses are less likely to offer or provide smoking cessation interventions when they perceive that patients are not motivated to quit.

Nurses’ perceived lack of patient motivation to quit was cited as a barrier to implementation of smoking cessation interventions in all but one of the six studies (Braun et al., 2004; Good et al., 2004; Hall et al. 2004; Sarna et al., 2001; Schultz et al., 2006). In their study of nurses in primary care settings Braun et al. (2004) found that nurses considered perceived lack of patient motivation as a barrier to implementation, and nurses who felt that patients were not receptive to their advice about smoking cessation were less likely to initiate interventions. Good et al. (2004) reported that office nurses felt motivated to intervene when patients expressed a wish to quit using tobacco and were more likely to provide interventions to those patients. In three studies nurses identified a concern that asking about tobacco use or providing advice about the risks of tobacco use and the benefits of cessation, would increase patients’ stress, cause them to feel guilty, or be perceived as an invasion of privacy (Nagle, et al., 1999; Sarna et al., 2001; Schultz et al., 2006). Results of Schultz et al.’s (2009) study indicated that acute care nurses’ perceptions of relationship strain with the patient related to the introduction of smoking cessation interventions was associated with lower chances of integrating smoking cessation into daily practice within acute care settings ($R^2 = .238$). Conversely, Puffer and Rashidian (2004) found that ambulatory care nurses’ intentions to implement smoking cessation guidelines were not related to their perception of patient opinions about smoking cessation. The reason for the discrepancy in the findings is not clear but may be because the nurses who participated in the study were implementing smoking cessation interventions as part of a comprehensive program for coronary artery disease prevention and not addressing smoking alone as some of the other studies.
The results of most of the studies mentioned previously provide evidence that nurses may be influenced by their perceptions of patient intention or motivation to quit smoking when making decisions about implementing smoking cessation interventions. The current study examined nurses’ beliefs about patient motivation to quit using tobacco, and their perceptions about the influence of smoking cessation interventions on nurse-patient relationships, and how these two factors are related to nurses’ intention and provision of smoking cessation interventions.

**Clinical context.** Studies related to the role of context in the uptake of evidence in clinical practice by nurses or multidisciplinary teams including nurses are reviewed. The studies represent a variety of designs, samples and methodologies that range from large cross-sectional surveys, program evaluation, qualitative interviews, chart reviews and observational explorations. Some studies focused specifically on the role of context while others included context as one of many factors related to the implementation of clinical practice guidelines. Organizational support, the role of evaluation, perceived access to resources, and the role of opinion leaders and facilitators were examined in these studies.

Estabrooks, Midodzi, Cummings, Wallin and Hayduk (2007) analyzed cross-sectional survey data of 4,421 nurses in Alberta, Canada to test a theoretical model specific to organizational influences on research utilization. Their findings showed that nurses working in organizations described as having more positive cultures, leadership, and evaluation methods reported significantly higher rates of research utilization. Positive organizational cultures were characterized as those where there was support for innovative ideas, adequate staffing and support services, and unit autonomy over policies and procedures.
Dopson et al. (2001) evaluated a program designed to implement clinically effective practice in the U.K. (Promoting Action on Clinical Effectiveness). They reported that contextual factors were among the most important factors related to successful implementation of evidence in practice. Most significant was the extent to which the organization supported the implementation project with resources and integrated it with other work related to clinical effectiveness. An organizational culture that supported analysis of the environment and the interests of relevant professionals prior to implementing change, clarity of objectives, strong project management, and adequate, sustainable resources for implementation were more likely to be successful in implementing evidence. Davies et al. (2008) reported that providing adequate time and resources, such as staff replacement to attend educational sessions, increased the degree of implementation of evidence in the form of best practice guidelines (BPG). Ring et al. (2006) also found that a high level of priority for research utilization within the organization made implementation more likely.

Evaluation, in the form of chart audits and feedback related to performance indicators, has been reported as a positive factor in the implementation of evidence into practice. Ring et al. (2006) found that chart audits were a useful tool in supporting evidence-based practice when used as a means of guiding improvement related to specific deficits. Andrews, Tingen, Waller, and Harper (2001) studied factors related to the successful implementation of smoking cessation guidelines. Eleven (11) general practitioners and 6 Nurse Practitioners in 4 multidisciplinary primary care teams in the southeastern U.S. participated. Chart reviews were conducted to assess how well general practitioners and Nurse Practitioners implemented guidelines for brief intervention for smoking cessation after a single educational session regarding the guidelines. The researchers reported that staff education was not related to the rate of implementation;
however, feedback about the provision of smoking cessation interventions, from the chart audits provided by administration was related to increase in the likelihood that staff would initiate these interventions.

Thompson et al. (2005) conducted a multi-site, mixed-methods case study with nurses in three primary care organizations in the U.K. The aim of the study was to examine perceived barriers to accessing and using research-based information for nursing practice in primary care. Data were gathered through 82 interviews, 122 electronic surveys, and 270 non-participant observations of staff nurses and nursing managers. Participants believed that having limited time to access new information and limited time for decision-making were the most significant barriers they faced in terms of integrating research evidence into their clinical nursing practice.

When examining barriers to best practice guideline implementation perceived by nurses involved in implementing a variety of RNAO best practice guidelines, Ploeg, Davies, Edwards, Gifford, and Miller (2007) reported that respondents described lack of time and resources as key barriers, as well as limited integration of guideline recommendations into organizational structures and processes, and lack of organizational and system level changes. Similarly, Dopson et al. (2001) and Ring et al. (2006) reported lack of time and resources as factors commonly identified as barriers to the implementation of evidence.

Few studies addressed organizational variables related to implementation of evidence-based smoking cessation interventions. The results showed that in organizations where nurses are not expected to offer smoking cessation interventions nurses are not as likely to implement these interventions in practice and the interventions they do implement are not as likely to be effective (Rice and Stead, 2008). In their meta-analysis Rice and Stead (2008) found that 1) brief
interventions for smoking cessation provided by nurses in combination with other duties are less effective than more intense interventions with multiple contacts with the nurse (Bolman et al., 2002; Curry et al., 2003; Lancaster et al., 1999) and 2) the smoking cessation activities were delivered inconsistently (Aveyard et al., 2003; Janz et al., 1987; Nagle et al., 2005; Tonnesen et al., 1999). None of these studies reported significant cessation rates following the interventions delivered by nurses.

Braun et al. (2004) found that in settings where clinical practice guidelines, policies, procedures and prompts were not available, smoking cessation interventions were provided less frequently. Schultz et al. (2006) found that only 10% of nurses in the first of two acute care sites believed they had administrative support for their work in smoking cessation. At the second site, where nurses were significantly more likely to engage in smoking cessation activities, 60% of nurses reported having sufficient administrative support. Most (> 50%) nurses identified lack of time as a significant barrier to implementing evidence-based interventions for smoking cessation (Sarna et al., 2001; Good et al., 2004; Schultz et al., 2006).

McLeod et al. (2005) developed, implemented and evaluated a program for smoking cessation in general practice settings in New Zealand. Data were derived from interviews with practice nurses and general practitioners. Whereas there was no significant difference in smoking cessation activities (asking about smoking and recording smoking practices) in participating settings pre- and post-implementation, reported quit rates were slightly higher than the documented quit rates in other studies (Rice and Stead, 2008) after implementation of the program. The researchers attributed these higher rates to an autonomous, designated role for
nurses in the program, well-managed program procedures within each of the settings, adequate
time for consultation with participants, and adequate funding for health promotion.

The studies’ results support the hypothesis that organizations or practice settings in which
nurses have designated roles in smoking cessation, adequate time and space, and administrative
support in the form of resources, policies and prompts, have higher rates of implementation of
evidence-based interventions. Most of these studies were conducted in acute care settings, and
the context for primary health care settings differs significantly from that of acute care hospital
settings. The current literature does not address those differences or examine the relationship of
contextual factors in primary care settings to the implementation of smoking cessation
interventions by nursing staff. The current study examined the association between
organizational factors related to availability of resources, and the nurses’ intention and
implementation of smoking cessation interventions in primary care settings.

The literature on evidence-based practice emphasizes the role of change agents in
facilitating implementation of evidence into practice. Change agents are local champions
leading or facilitating the implementation of new guidelines. The concept is derived from
Roger’s Diffusion Theory wherein the social system plays an important role in the adoption of
innovations. According to the theory “early adopters” are integral members of the social system;
their focus is more local than that of innovators who are likely to have interests in ideas that lead
them out of the local system. It is from this category that the highest number of opinion leaders
emerge. Others in the local system look to them for guidance, information and advice (Rogers,
2002). However, few evaluations of the role of facilitation in successful implementation of
evidence into practice have been done (Rycroft-Malone, Kitson, Harvey, et al., 2002).
Ring et al. (2006) described a “clinical champion” as an opinion leader within the practice setting, often a specialist nurse, who worked to make the clinical area amenable to change by taking on such tasks as establishing working groups and providing training. These nurses had assigned roles as facilitators that included the authority to change local practices. Dopson et al. (2001) also reported that opinion leaders who emerged informally from within the group were considered by other staff as being very helpful when they supported the projects in the early stages, and as having a positive influence on the success of the implementation projects. In the clinical sites where these facilitator nurses were available awareness and use of Best Practice Statements was the highest. Davies et al. (2008) and Ploeg et al. (2007) described local champions and unit leaders as positive influences on implementation of changes in practice, but the specific responsibilities of these nurses were not discussed in detail. In the RNAO implementation project described by Ploeg et al. (2007), the authors reported that the RNAO provided external facilitators who arranged training, provided access to resources, and maintained inter-organizational networks to support implementation. Managers, staff and project leaders who participated in the project commented that the facilitators were influential in successful implementation of best practice guidelines.

No studies addressed the role of facilitators in the implementation of evidence-based smoking cessation initiatives. Good et al. (2004) suggested that since advanced registered nurse practitioners (ARNPs: a similar designation as Nurse Practitioner in Canada) were more likely than RNs and Clinical Nurse Specialist to ask patients about tobacco, ARNPs might play a leadership role in promoting smoking cessation activities among nurses. This role was not implemented or tested in this study or in other studies. Schultz et al. (2006) found that the site reporting higher implementation of smoking cessation had an in-house referral program. This
service included hospital pharmacists and Clinical Nurse Specialists that had had training in an accredited smoking cessation program. The authors posited that these experts might have acted as role models for the nursing staff and/or provided informal learning opportunities, but this proposition was never tested. The current study examined nurses’ access to experts in smoking cessation interventions such as experienced counselors and community programs and how these resources contributed to implementation of evidence-based smoking cessation interventions in primary care settings.

Individual characteristics of nurses. A review of the literature regarding smoking cessation interventions showed that individual characteristics of participating nurses were related to successful implementation of these interventions in practice. Age, education, smoking status, knowledge and skills, and confidence were characteristics that were frequently examined. Generally, nurses who were older, more educated, and did not smoke were more likely to implement smoking cessation interventions (Hall et al., 2005; Good et al., 2004; Gorin and Heck, 2004; McEwan and West, 2001; Nagle et al., 1999; Sarna et al., 2001; Schultz et al., 2003). Sarna et al. (2001) found that young nurses reported facing more barriers to engaging in smoking cessation activities with patients. It is possible that limited clinical experience and training in smoking cessation of young nurses explain this relationship, or younger nurses may be in more junior roles and have less autonomy in determining their work. Education levels were shown to be associated with successful implementation of smoking cessation interventions in two studies. Braun et al. (2004) found that a positive attitude toward the importance of providing smoking cessation interventions was higher with the number of years of clinical training achieved. Good et al. (2004) found that advanced practice nurses were more likely to feel positive about smoking cessation interventions than Registered Nurses and Licensed Practical Nurses. Nurses’ smoking
status was discussed as a factor related to the implementation of evidence-based smoking cessation in three studies. Sarna et al. (2001) found that nurses who had formerly smoked experienced fewer barriers to implementation than nurses who were currently smoking, or had never smoked. Good et al. (2004) and Braun et al. (2004) found that nurses who were currently smoking agreed less strongly with smoking cessation efforts, and were less likely to engage in smoking cessation activities.

In her 2003 review of the nursing literature regarding smoking cessation, Schultz found that nurses wanted to be role models and educators for smoking cessation but they felt ill prepared. Nagle et al. (1999) interviewed hospital nurses in New South Wales, Australia and found similar results. Sixty percent (60%) of respondents reported providing support to patients who wanted to quit, but only 24% felt competent in that role. Sarna et al. (2001) reported that at least 50% of nurses who responded to their survey reported that the lack of skills and knowledge was a significant barrier to implementing smoking cessation treatments. Good et al. (2004) found that 32% of nurses (n = 415) working in primary care settings in the state of Kansas expressed lack of knowledge and skills as barriers.

Good et al. (2004) found that 25% of participants believed they lacked the confidence to engage in smoking cessation. In addition 44% indicated that feeling confident motivated them to implement smoking cessation interventions. Hall et al. (2005) conducted a cross-sectional survey of a random sample of 200 practice nurses in the U.K. for the purpose of describing their attitudes toward giving smoking cessation advice. They reported that nurses who had more training in smoking cessation interventions, and those nurses who did not smoke, felt more positive about including these interventions in their practice. McEwan and West (2001)
conducted a postal survey of 303 general practitioners and 459 practice nurses chosen randomly from The National Department of Health General Practitioner database in England and Wales between January and March of 1999, soon after new national smoking cessation guidelines were introduced in Britain. The purpose of the survey was to assess self-reported behaviour, attitudes, and knowledge regarding smoking cessation of general practitioners and practice nurses. Sixty-six percent (66%) of practice nurses who responded to the survey reported having had extra training in smoking cessation interventions, and these nurses were more likely to provide assistance to smokers ($\chi^2=51.5, p<0.001$). Braun et al. (2004) conducted a cross-sectional survey of randomly selected primary care physicians, advance practice nurses, Registered Nurses, licensed practical nurses, and medical assistants in Minnesota to compare their attitudes and practices related to smoking cessation. The researchers found that participants who believed they were under-qualified to provide services implemented fewer smoking cessation interventions. Schultz et al. (2006) found that nurses participating in their study reported feeling that they lacked the skills required to provide effective smoking cessation interventions; the majority (> 85%) expressed the need for additional training and skills. Conversely, respondents who were confident about their ability to help a smoker quit reported higher rates of talking with patients about the benefits of quitting and providing advice about stopping. Lacking confidence and feeling poorly prepared for a role in smoking cessation may be the result of limited clinical experience or training, both of which have been suggested as necessary factors for integrating new information and evidence in clinical decision-making (Rycroft-Malone, Kitson, Harvey, McCormack, et. al., 2002).

Age, experience, higher levels of nursing education, training in smoking cessation, smoking status, confidence and a positive attitude toward the provision of smoking cessation
interventions have been shown to relate to the likelihood that nurses implement these
interventions in practice. The current study examined the relationship between these variables
and nurses’ intentions and practice related to providing smoking cessation interventions in
primary health care settings.

Summary of Literature Review

There is evidence that quitting smoking can greatly reduce the known serious health
effects for most people who use tobacco (Surgeon General’s Report, 2004). Nicotine, the active
ingredient in tobacco is a proven carcinogen and has demonstrated addictive properties.
Approximately 70% of current smokers want to quit (Braun, et al., 2004; Wewers, Sarna, and
Rice, 2006) and many of these will benefit from interventions provided by health care providers.
Nurses, like physicians and other health professionals, do not consistently provide evidence-
based smoking cessation interventions for their patients who use tobacco despite the availability
of clinical practice guidelines and the encouragement of their professional associations (Good, et
al., 2004). Research has shown the uptake and use of evidence into practice is a complex process
that is related to a number of individual, professional and organizational factors (Grimshaw et
al., 2004). Several factors have been identified but most of what we currently know about
nurses’ engagement in smoking cessation is derived from studies in acute care settings. Primary
health care settings present opportunities for reaching larger groups of patients who use tobacco
and need to be studied in greater detail. Furthermore, little is currently known about the
relationships between these factors and successful implementation of evidence in practice, and
what is known has not been derived from studies guided by a theoretical framework. As well,
the studies reviewed here have been conducted in jurisdictions that differ in resources and
incentives for smoking cessation from what is available in Ontario. The current study explored the relationships between these factors and nurses’ practices and intentions related to the provision of smoking cessation interventions, and is guided by a theoretical framework.

**Theoretical Framework**

**Introduction**

The purpose of the current study is to examine the nature of nursing practice for smoking cessation in primary health care settings in Ontario, and nurses’ perceptions of the factors that influence their intention to provide those interventions. A review of the literature has revealed that studies to date have identified a number of factors related to nurses’ decisions to provide smoking cessation interventions. Few of these studies used a theory to help explain the contribution of different factors to implementation of smoking cessation interventions. Schultz et al. (2009) chose an organizational behaviour theory to conceptualize relationships among factors and acute care nurses’ integration of smoking cessation interventions, because the focus of their study was nurses’ workplace behaviour. Earlier studies of nurses’ tobacco-related practice in acute care settings suggested that nurses’ perceptions of workplace climate were associated with their decisions to integrate smoking cessation interventions into their practice. A theoretical framework for the prediction of behaviour is an appropriate choice for this study designed to more clearly establish which factors are most strongly associated with nurses’ intentions regarding the provision of smoking cessation interventions in those settings. There is a large body of published studies regarding behaviour and behaviour change. These include
models that address patient behaviour (Health Belief Model), change in a societal context (Roger’s Diffusion of Innovations Theory and The Theory of Interpersonal Behaviour), readiness to change (Transtheoretical Model), and the prediction of individual behaviour based on intention (Theory of Reasoned Action and the Theory of Planned Behavior).

The Theory of Planned Behavior (TPB), an extension of the Theory of Reasoned Action (TRA) is one of the most widely used social cognition models for explaining intention and predicting the clinical behaviour of health professionals (Godin, Bélanger-Gravel, Eccles, and Grimshaw, 2008). The TPB is one of the most thoroughly tested of the social-psychological models (Armitage & Conner, 2001; Francis, et al, 2004; Perkins, et al., 2007). Results of theory testing showed that the concepts of attitude, subjective norm, and perceived behavioural control account for relatively large proportions of variance in intention to implement different behaviours in different settings (Hanbury, Wallace, and Clark, 2009; Perkins et al., 2007; Puffer and Rashidian, 2004; Walker, Watson, Grimshaw, and Bond, 2004).

The central tenet of the theory is that behaviour is primarily determined by the intention to perform that behaviour. Intention is related to beliefs and attitudes about the specific behaviour, beliefs about the expectations of important others and the motivation to comply with those expectations; expectation and motivation together, comprise subjective norm. The TPB extended the Theory of Reasoned Action with the addition of self-efficacy beliefs (perceived behavioural control) related to the performance of a given behaviour (Ajzen, 1991). The theory has been used in several studies exploring factors related to health care providers’ attitudes and beliefs about specific behaviours (Eccles, Grimshaw et al., 2004). In the current study the theory has been extended by the addition of factors derived from the literature on implementation of
smoking cessation interventions and knowledge translation. An integrated conceptual framework was developed (see Figure 1) to guide the current study of factors associated with primary health care nurses’ intention to provide smoking cessation interventions for their patients who smoke.

Figure 1:
Factors Associated with Nurses’ Intentions to Implement Smoking Cessation Interventions in Primary Care Settings

The Theory of Planned Behavior

The TPB is a social cognition model of behaviour (Ajzen, 1991; Nash, Edwards, and Nebauer, 1993; Puffer and Rashidian, 2004). The TPB proposes that the main determinant of behaviour is the intention to perform the specific behaviour, or behavioural intention (Ajzen,
Ajzen (1991, 2006) states that behavioural intention is influenced by three concepts: salient beliefs about the likely outcomes of the behaviour and evaluation of these outcomes (behavioural beliefs), beliefs about the expectations of important others and the motivation to comply with those expectations (normative beliefs), and beliefs about the factors that facilitate or act as barriers to the performance of the behaviour (control beliefs). Ajzen (1991, 2006) proposes relationships among these concepts.

Behavioural beliefs are an individual’s perceived association between performing a specific behaviour or action and the consequences and likely outcomes of performing the action (Ajzen, 1991, Perkins, et al., 2007). Specifically, behavioural beliefs are described as the individual’s overall evaluation of the behaviour, either positive or negative, and of the advantages or disadvantages of performing a given behaviour (Ajzen, 1991; Levin, 1999; Nash et al., 1992; Perkins, et al., 2004; Puffer and Rashidian, 2004). Together these behavioural beliefs produce a favourable or unfavourable attitude toward the behaviour (Ajzen, 2006). For example, if a nurse believes that providing smoking cessation interventions will help a patient quit smoking, and he or she believes that quitting smoking will have a positive effect on the patient’s health, then the nurse will have a positive attitude toward providing smoking cessation interventions.

Normative beliefs are described as an individual’s perception of what important others (referents) expect him or her to do in relation to a specific behaviour and the individual’s motivation to comply with those expectations (Ajzen, 2006; Perkins et al., 2004). Normative beliefs lead to perceived social pressures to perform the behaviour. This construct is referred to as the subjective norms (Ajzen, 2006). For example, Good et al. (2004) reported that nurses
identified a lack of recognition or rewards for providing smoking cessation interventions as a barrier preventing them from integrating these interventions into their practice. On the other hand these same nurses reported that they would be more likely to see smoking cessation interventions as part of their role if physicians in their practice setting requested their participation or if smoking cessation was an acceptable function of their role. Similarly, nursing organizations such as the Registered Nurses Association of Ontario (RNAO) (2003) and the Canadian Nurses Association (2001) consider the provision of smoking cessation interventions to be a standard of nursing care, and many nurses believe that providing smoking cessation interventions is an important part of their role (Rice and Stead, 2006; Schultz et al., 2009). It is not clear how much influence nursing culture has on nurses’ decisions to provide smoking cessation interventions.

Control beliefs refer to perceived barriers and facilitators related to an individual’s ability to perform a specific behaviour (Ajzen, 2006). These perceptions have also been labeled as self-efficacy beliefs and relate not only to the individual’s perceived ability to carry out the behaviour but also to their perceived ability to overcome the obstacles that stand in the way of implementation (Ajzen, 1991; Perkins et al., 2007). An individual may have positive attitudes and strong normative beliefs about a given behaviour but may not perform the behaviour if they believe they are prevented from doing so by barriers beyond their control or because the obstacles are too difficult to overcome or because they lack the necessary resources and opportunities (Levin, 1999; Nash et al., 1992; Perkins, et al., 2007; Puffer and Rashidian, 2004). For example, previous research has suggested that institutional commitment to tobacco reduction is related to an increased likelihood of clinicians providing smoking cessation interventions (Schultz et al., 2006).
These concepts in combination predict a behavioural intention. The more favourable the attitude and subjective norms, and the greater the degree of perceived behavioural control, the stronger the intention to perform the specific behaviour. If the actual degree of control is sufficient, individuals are expected to carry out the behaviour when given the opportunity (Levin, 1999; Nash et al., 1992; Perkins, et al., 2007; Puffer and Rashidian, 2004). Ajzen (2006) considers perceived behavioural control as a proxy for actual control in situations where it may be difficult to objectively determine actual control.

Intention then directly affects behaviour; the concept encapsulates the motivational influences related to behaviour. The relationship between intention and behaviour has been tested in a substantial number of prospective studies; these have supported this relationship. Moreover, it is possible to state that when intentions are stronger and more durable the more likely it is that the behaviour will be performed (Ajzen, 1991; Conner and Godin, 2007; Sheeran, Orbell, and Trafimov, 1999).

According to the theory, past behaviour is the best predictor of future behaviour as long as all other determinants are stable (Ajzen, 1991). This assumption of stability over time is one of the conditions for accurate prediction of behaviour. Intention and perceived behavioural control must remain unchanged in the interval between assessing intention and measuring behaviour (Ajzen, 1991; Conner and Godin, 2007; Sheeran, et al. 1999). The other requirement for accuracy is a high degree of correspondence between the measures of intention and perceived behavioural control (Ajzen, 1991, 2006).

The TPB has demonstrated predictive power but there remains a need to account for the residual variance in behaviour that is not explained by the model (Conner and Godin, 2007).
Ajzen (1991) and others (Sutton, 1998) have attributed some of this gap to inadequacies or errors in measurement. However others have suggested that other factors may influence or moderate relations between intentions and behaviour, and between past behaviour and future behaviour, and may add to the explanatory power of the model. For example, the literature concerning the properties of attitudes operates on the assumption that both the valence and the strength of attitudes are important. Strength of attitude is subordinate to a number of other properties that include, but are not limited to, temporal stability, accessibility, importance, interest, knowledge, direct experience, and affective-cognitive consistency (Conner and Godin, 2007; Sheeran, Orbell, and Trafimov, 1999). Conversely, in developing the TRA Ajzen and Fishbein (Ajzen, 1991) applied the principle of aggregation (Ajzen, 1991) that assumes that any measurement of a specific behaviour reflects the influence of various other factors depending on the specifics of the situation. By aggregating different behaviours, observed under different conditions, the sources of influence cancel each other out and result in an aggregate that is a “more valid measure of the underlying behavioural disposition than any single behaviour” (Ajzen, 1991). The TPB then postulates that all other variables, structural or personal, exert their influence indirectly through behavioural, normative and control beliefs and are not explicitly included or measured in the model (Sparks, 1998). In the current study personal characteristics, professional characteristics and specific characteristics of the practice setting have been added to extend the model in an effort to examine their influence on the perceived behavioural control-intention relationship.

**Application of the Theory of Planned Behavior.** The TPB has been used in many studies to understand, predict and design interventions to change health behaviours and health professionals’ behavioral intentions and behaviours (Armitage and Connor, 2001; Godin, et al., 2008). These include studies measuring and predicting nurses’ behaviours in relation to
providing specific interventions such as encouraging breast feeding, providing pain medication and implementing best practice guidelines (Godin, et al., 2008). In these studies nurses’ intentions to engage in specific patient care behaviours or interventions were related to attitudes, subjective norms and perceived controls. For instance, in their study of nurses’ intentions to provide smoking cessation interventions, as part of best practices related to the prevention of cardiac disease in primary care settings in the U.K., Puffer and Rashidian (2004) reported that attitude, subjective norm and perceived behavioural control explained up to 40% of the variance in intentions.

The literature reviewed for the current study revealed factors related to nurses’ implementation of evidence-based smoking cessation interventions that are consistent with the concepts proposed by the TPB. In particular it was found that in some studies nurses’ engagement in evidence-based practice was related to their beliefs and attitudes about the efficacy of smoking cessation interventions, and their beliefs about smoking cessation as an important role for nurses. However, nurses reported that they perceive significant barriers to implementation of evidence-based interventions that may not be entirely in their control, such as lack of time and resources. These factors fit well with the concepts of the TPB, which was operationalized in the framework that guided this study.

**Attitude.** The TPB conceptualizes attitude toward behaviour as an individual’s perception of an association between the expected outcomes of the performance of the behaviour and the importance of those outcomes as well as the attendant consequences. In this study attitude is described as nurses’ perceptions of the credibility and relevance of the evidence on smoking cessation interventions and their attitudes toward the importance of providing evidence-
based interventions for smoking cessation for patients who smoke. Positive attitude is defined as favourable beliefs about nurses’ roles in smoking cessation, and their beliefs about the effects of smoking and the efficacy of evidence-based interventions. Nurses who report positive attitudes toward providing smoking cessation interventions are likely to engage in smoking cessation interventions (Braun et al., 2004; Good et al., 2004; Sarna et al., 2001). For the purposes of the current study, evidence-based interventions referred to specific recommendations from evidence-based clinical practice guidelines or best practice guidelines that have been developed through critical analysis of well conceived and conducted research and expert consensus regarding smoking cessation. In Ontario these are the RNAO Smoking Cessation Best Practice Guidelines (2003) and the United States Department of Health and Human Services (USDHHS) Treatment of Tobacco Dependence and Use, Clinical Practice Guidelines (2008). Evidence also includes relevant literature regarding smoking cessation interventions and multidisciplinary and/or nursing literature regarding smoking cessation that nurses can access via journals, professional association publications, and on-line resources.

**Subjective norms.** Subjective norm refers to the individual nurse’s perception of how important others, or referents, in their environment view the provision of smoking cessation interventions as part of the nursing role, and how motivated nurses are to comply with those expectations. Important referents include other nurses in the practice setting, influential colleagues such as physicians, and patients.

**Perceived control beliefs.** In the current study, perceived control beliefs refer to the nurses’ perception of the presence and power of barriers and facilitators they experience in relation to the implementation of smoking cessation interventions, and their ability to overcome
obstacles to implementation. Barriers and facilitating factors include personal perceptions of organizational constraints, and patient preferences. Nurses have identified two factors that are associated with their perceived ability to provide smoking cessation interventions. 1) Confidence about providing smoking cessation intervention refers to the individual nurses’ perceived ability to help people quit smoking (i.e., having the required skills and knowledge). 2) Organizational factors relate to the provision of evidence-based smoking cessation. These included time, staffing, availability of required resources such as patient educational materials, the presence of policies and procedures for smoking cessation interventions (e.g., a described role for nurses), access to research in the practice setting, and feedback on the performance of smoking cessation interventions.

**Individual characteristics.** Individual characteristics of nurses have been shown to be associated with the likelihood of implementing evidence-based smoking cessation interventions. Younger age and current tobacco use are related to experiencing greater barriers to providing smoking cessation interventions (Braun et al., 2004; Good et al., 2004; Sarna et al., 2001). Nurses with a past history of smoking, advanced preparation in nursing, and training in smoking cessation are more likely to provide smoking cessation interventions to their patients who smoke. The following individual characteristics were examined in this study: age, current and past tobacco use, level of education, and number of years in practice.

**Intentions.** In the current study intentions refer to the individual respondent’s desire and self-prediction related to the provision of smoking cessation interventions for their patients who smoke. The time period is defined as within the next three months of completing the questionnaire.
**Behaviour.** The TPB postulates that past behaviour is a reliable predictor of future behaviour. In the current study behaviour refers to the individual respondent’s self-reported provision of smoking cessation intervention, to patients who smoke, within the three months prior to completing the questionnaire.

**Study Hypotheses**

The hypothesized relationships investigated in this study were derived from those proposed in the TPB and from relevant empirical evidence pertaining to nurses’ performance of smoking cessation interventions. Four specific hypotheses were tested in this study. These were:

**Hypothesis 1:** Nurses’ attitude, subjective norm and perceived behavioural control related to smoking cessation interventions are associated with nurses’ reported behavioural intention to provide smoking cessation interventions in the three months following completion of the study questionnaire.

**Hypothesis 2:** Nurses’ personal, professional and practice-related characteristics are significantly associated with nurses’ attitudes, norms, control and behavioural intention to provide smoking cessation interventions in the three months following completing the study questionnaire.

**Hypothesis 3:** There is a positive relationship between nurses’ reported past behaviour and behavioural intention related to the provision of smoking cessation interventions.

**Hypothesis 4:** Stronger perceived behavioural control is positively related to the provision of smoking cessation interventions (i.e., reported past behaviour).
Research has shown that nurses do not consistently provide evidence-based smoking cessation interventions for their patients who use tobacco. Several factors have been identified including attitudes toward clinical practice guidelines, the influence of others in the practice setting, and a number of organizational features. The TPB has been chosen as an appropriate framework to examine the relationships between these variables. The methodology applied in this study is described in the next chapter.
Chapter Three

Methodology

This chapter describes the methods applied in the current study. The study design, sampling methods, measures, analysis, and ethical considerations are discussed.

Study Design

This study employed a cross-sectional design to examine the hypothesized relationships between the specific factors and respondents’ intention to provide smoking cessation interventions. Data were collected at a single point in time by completing a questionnaire that was mailed to eligible Registered Nurses and Nurse Practitioners in the province of Ontario. Dillman’s Total Design Method (de Leeuw, Hox, and Dillman, 2008) was applied to improve the response rate.

Sample and Setting

The target population for this study consisted of Registered Nurses and Nurse Practitioners employed in primary health care settings in Ontario.

Inclusion and Exclusion Criteria

Inclusion criteria were: 1) Registered Nurse (RN) or Nurse Practitioner (NP) practicing in a Community Health Centre (CHC), a Family Health Team (FHT), a Family Health Integrated Network (FHIN), a Family Health Group (FHG), an Aboriginal Health Access Centre (AHAC),
or an academic Family Practice Unit (FPU), 2) involvement in direct patient care, and 3) ability to read and write in English. Nurses assuming exclusively administrative roles were excluded.

A “Request for Home Mailing Addresses” of potentially eligible nurses, who agreed to release their names for research purpose, was submitted to the College of Nurses of Ontario. The College maintains a registry of all Registered Nurses and Nurse Practitioners in the province that have agreed to the release of their name and contact information for research purposes. The eligibility of Registered Nurses and Nurse Practitioners was determined by the following fields chosen from the request form provided by College of Nurses of Ontario; Type of Nurse (RN, NP); Employed in Ontario; Nursing Employer (Community Health Centre, Physician’s Office/Family Practice Unit, Other Community); Position in Nursing (Advanced Practice Nurse-Clinical Nurse Specialist and other, Office Nurse, Primary Health Care Nurse Practitioner, Staff Nurse, Other); Primary Area of Practice (Ambulatory/Outpatients, Primary Care, Other).

Upon receipt of the names and addresses of registrants, each was given a code number. The code number was used on the questionnaires mailed to eligible nurses. Participants were not asked to identify the settings in which they practiced so nothing they reported about their work environment could be associated with a specific setting.

Sample Size Estimation

The sample size was estimated using two complementary strategies for determining power in multiple regression analysis. First, sample size estimation was based on an anticipated medium effect size of $f^2 = .15$ for the relationship between primary health care nurses’ attitudes and perceived behavioural control, and their intention to provide evidence-based smoking
cessation interventions. Puffer and Rashidian (2004) reported that the two independent variables (attitude and perceived behavioural control) were the most significant predictors of intention in their study of the utility of the TPB to explain primary health care nurses’ intentions to provide evidence-based smoking cessation interventions. Allowing for an alpha of 0.05 and with power set at 80% the minimum required sample size for the study was 147 (Cohen, 1999). This study used Likert and semantic differential scales to collect data about participants’ beliefs and attitudes toward providing smoking cessation interventions. There is ongoing controversy regarding the level of measurement of these scales. Some methodologists believe that these scales produce ordinal data and therefore cannot be analyzed using a parametric statistic such as multiple regression (Norman and Streiner, 2000). Others, including Ajzen (2006), state that the scales capture latent variables (attitude, subjective norms and perceived behavioural controls) and the total scores yield continuous variable values that can be analyzed with multiple regressions. Knapp (1990) also argued that these concerns could be addressed by ensuring a sample size large enough to increase the likelihood of normal distribution of the variables included in the regression analysis. In order to ensure adequate sample size this study followed Norman and Streiner’s (2000) recommendation for calculating sample size, which is to have a sample size equal to 5-10 participants multiplied by the number of variables. In this study there are 20 variables, therefore a sample size of 10 x 20 = 200 is required to achieve adequate statistical power. To ensure that this sample size is achieved, while accounting for possible non-response, 450 registered nurses were included in the postal survey.
Procedure

Dillman’s Total Design Method (de Leeuw, Hox, and Dillman, 2008) was used to improve response rates to the postal survey. Specifically the researcher prepared and mailed a pre-survey notification letter (Appendix A) that introduced and explained the study to Registered Nurse and Nurse Practitioners who met the study eligibility criteria. This was followed by the coded survey package one week later. This package contained a cover letter (Appendix B) addressed to the eligible nurse and provided a detailed description of the study, including risks, benefits, the significance of the study, and a number to call should they have questions, as well as a copy of the questionnaire containing the items measuring all variables of interest (Appendix H). A pre-stamped return envelope was provided. A reminder postcard (Appendix E) followed in one week and then a second mail reminder (Appendix C) containing another copy of the questionnaire was sent two weeks later. A final reminder (Appendix D), with a full package, was sent out within four weeks of the second mail reminder. A response card was included in each package that allowed respondents to indicate that they had completed the questionnaire and thus could avoid being sent subsequent reminder packages. They could also request a copy of the study results using that card (Appendix F).

Measures

Questionnaire Development.

Cognitive Interview Pre-Test. The measures were adapted from items used in two studies that investigated the same concepts, and developed according to Ajzen’s guidelines (Francis et al., 2004). The adaptations were made to specify the behaviour, smoking cessation,
and the location, primary health care settings, of interest to the study. The first study was a survey of nurses in acute care hospitals regarding their views and practices related to tobacco reduction that was developed by Schultz, Johnson, and Bottorff (2006). The items used in this study were adapted from the original questionnaire used by Sarna et al. (2001). In the second study, Puffer and Rashidian (2004) examined the utility of the TPB in explaining intention to implement smoking cessation guidelines among a small sample of primary care nurses in the United Kingdom. Schultz provided written permission to use the measures (Appendix I), and Puffer and Rashidian included their measures in a published article.

A cognitive-interview approach was employed to test nurses’ comprehension of the adapted measures. This approach was reported to be more efficient in identifying problems with the content of measures (i.e., less time, with fewer respondents, with less professional effort and at a lower cost) than traditional pilot testing strategies (Campanelli, 2008). This approach was designed to reveal participants’ thought processes in answering survey questions in relation to comprehension, recall, judgment, and response. A total of eight nurses participated in the process. Three were Registered Nurses working primary health care settings, two were Primary Health Care Nurse Practitioners, and three were graduate nursing students. The interviews focused on how the respondents arrived at their responses to the items, which may reveal difficulties or misunderstandings they may have encountered in doing so. Respondents were asked to participate in a two-hour interview session in a quiet, private place that was convenient for all participants. Three separate sessions were held: three with one respondent each, one with two and one with three. The interviewer kept written notes of the points raised during the sessions. These notes were analyzed and appropriate revisions to the survey questions made as needed. The revisions included clarifying the time frame for providing smoking cessation
interventions, describing the meaning of the terminology, i.e., smoking cessation interventions, and making questions more specific for items measuring evaluation of specific behaviours. Participants suggested that alternating the poles on the Likert scale created confusion so this strategy was not employed. Some items were added based on feedback including varenicline (Champix®) to the list of strategies employed for smoking cessation.

**Variables and Measures**

Measures of the main study concepts were adapted from those used in previous research. The reliability and validity of the adapted measures were evaluated and the results are represented in Chapter 4.

**Nurse-related information.**

**Personal characteristics.** The respondents’ individual characteristics of age, sex and personal smoking status were assessed.

**Professional characteristics.** Respondents were asked about the number of years that they had been in practice, their level of nursing education, and whether they worked full or part-time.

**Practice-related characteristics.** Respondents were asked about the type of practice that they worked in, such as a Community Health Centre, a Family Health Team, or an Aboriginal Health Access Centre, the type of other health care professionals with whom they worked, whether the physicians in the practice were paid extra for providing smoking cessation interventions, and whether their practice was located in an urban, rural or northern area.
Information on participant and practice characteristics was gathered with standard items and the responses were used to describe the sample. The relationships among selected personal, professional and practice related characteristics, attitude, subjective norms and perceived behavioural control and behavioural intention were also examined.

**Dependent variables.**

**Behavioural intention.** Behavioural intention referred to the respondent’s perception of the likelihood that they will engage in smoking cessation interventions. As per the guidelines for construction of a TPB questionnaire, the behaviour of interest must be carefully defined in terms of the Target, Action, Context and Time and must correspond to the variable, behavioural intention. The behavioural intention for this study is described as the nurses’ intention to provide smoking cessation interventions to their patients who smoke within the next three months. This variable was measured with two items adapted from the questions developed by Puffer and Rashidian, (2004). The first item asked respondents to rank their intention (I want) to provide smoking cessation advice to their patients over the next three months. The second asked them to rank the likelihood that they would provide advice (I will). A 7-point scale, ranging from strongly agree (7) to strongly disagree (1) was used. In their study the responses to the two questions were averaged to produce an overall intention score; the two items were internally consistent (α = 0.62) (Puffer and Rashidian, 2004). The same method was used in this study in compliance with the Generalized Intention Method as described by Francis et al. (2004). In the current study the internal consistency was high. Both items were summed to produce a total score for behavioural intention.
**Behaviour.** Behaviour was operationalized as the respondents’ self-report of their practice of providing smoking cessation interventions in the month prior to completing the survey. As per TPB guidelines two questions were asked. The first item had an exact numerical format that asked respondents to indicate the percentage of patients who smoke for whom they have provided smoking cessation interventions. The second was a rough numerical estimate of the frequency with which respondents offered smoking cessation interventions during the month prior to completing the questionnaire on a scale that ranged from *every time* to *never*. It was not possible to measure the internal consistency of these items because they were measured on different scales (Ajzen, 1991). The item measuring the provision of interventions was used as the dependent variable because it was more consistent with the research questions.

**Independent variables.**

**Attitude.** Attitude refers to the respondent’s evaluation of implementing smoking cessation interventions in terms of the efficacy of the interventions and the expected benefits for the patient. The TPB assumes that two components regarding attitude are active simultaneously: beliefs about the consequences of providing smoking cessation interventions and corresponding judgments about those outcomes (Ajzen, 1991). Direct measurement of attitude was achieved by using four different statements related to respondents’ views about the effectiveness and importance of specific smoking cessation interventions including advice to quit, counseling, recommending nicotine replacement therapy and referring patients to community programs for smoking cessation. These statements were based on the review of the literature regarding specific smoking cessation interventions provided by nurses. Four sets of response options that captured evaluative, instrumental and experiential assessments followed each statement. The
statements asked about respondents’ attitudes toward offering, providing, recommending and referring patients in relation to the four separate interventions described above. All responses were rated on a 7-point semantic differential scale ranging between extremely ineffective and extremely effective, very worthless and very useful, very inappropriate and very appropriate, and very useless and very useful. The scales ranged from 1 (negative) to 7 (positive). The internal consistency of these newly developed items was tested and the results are reported in the next chapter. Scores for the direct measures were averaged to produce a direct attitude score.

Indirect measures of attitude included beliefs about the importance of smoking cessation interventions. These were measured with 8 items adapted from Schultz et al.’s (2006) questionnaire. The authors did not provide information regarding the reliability and validity of these measures but they were tested for the current study. Test-retest reliability will be reported in this chapter, and internal consistency and validity will be discussed in Chapter 4. The items assessed the respondents’ beliefs about providing smoking cessation interventions and a corresponding evaluation of the outcome of the interventions. All items had a 7-point scale ranging from strongly disagree (1) to strongly agree (7). A total indirect attitude score was calculated by multiplying each belief score by the relevant evaluation score and summing all of the products across all beliefs. The scores for the evaluation items were recoded on a scale from -3 to +3 to make the calculation of a total score possible.

**Subjective norms.** Subjective norms referred to the respondents’ perceptions of how significant referents, that is, important others in their environment, view the importance or expectations regarding nurses’ roles in providing smoking cessation interventions to patients, and
respondents’ motivation to comply with these expectations. Direct and indirect subjective norms were measured.

Direct subjective norms were measured by three items adapted from the Schultz et al.’s (2006) questionnaire that focused on the respondents’ perception of how the role of nurses in smoking cessation intervention was viewed by other nurses and by patients in the respondents’ specific clinical practice setting. One new item was developed to measure respondents’ perceptions of the amount of pressure the respondents experienced in relation to complying with expectations. All items were rated on a 7-point scale ranging from definitely false to definitely true. The authors did not report reliability and validity for these items but they were tested in this study and the results are reported in chapter 4.

Six items were developed as indirect measures of respondents’ motivation to comply with the expectations of important others in the nurses’ workplace regarding nurses’ provision of smoking cessation interventions. Responses were rated on a scale ranging from disapprove-approve, definitely do not expect-expect, and not at all-very much. A total subjective norms score for indirect measures was calculated by multiplying normative beliefs scores by relevant motivation to comply scores and summing all of the products across all items. This required recoding the variables on a scale from -3 to +3.

**Perceived behavioural control.** The respondents’ perception of how easy or difficult it is to provide evidence-based smoking cessation interventions was operationalized as respondents’ confidence in their personal ability to provide these interventions, the perceived control they have over that decision, and the quality of the workplace in terms of support for smoking cessation and perceived patient motivation to quit.
Direct perceived behavioural control was measured with three items adapted from Schultz et al.’s (2006) measures. The items were direct measures of respondents’ perceived confidence in their ability to provide smoking cessation interventions, the control they have in making decisions about providing interventions, and the ease or difficulty they experience in providing these interventions. The 7-point scale was anchored by definitely true and very easy, and definitely false and very difficult.

Indirect perceived behavioural control was measured with four items adapted from Schultz et al.’s (2006) questionnaire. These items focused on the availability of specific resources and support in the practice setting including adequate time to engage in smoking cessation interventions with patients and a private space to provide interventions. Two items were used to assess respondents’ perceptions of patient motivation to quit using tobacco and the strain in their relationship with patients that resulted from introducing smoking cessation interventions. A 7-point scale was used for these items. One new item was added to examine the contribution of physician reimbursement for smoking cessation interventions to nurses’ intention to provide interventions. Respondents were asked to indicate if physicians in their practice setting were paid extra to provide smoking cessation interventions. The response options were yes, no or don’t know. The same approach for scoring indirect measures was applied here. The items were recoded and scores for control beliefs were multiplied by relevant scores for control belief power to produce a total score for perceived behavioural control.

Specific behavioural components of smoking cessation interventions: Nineteen items assessed this variable. The items were based on the description of the “Four As” guide for assisting patients with smoking cessation. The U.S. Public Health Services Clinical Practice
Guideline for Treating Tobacco Use and Dependence introduced a treatment model referred to as the “5 As” in the year 2000. The model was revised by the Registered Nurses’ Association of Ontario in 2003 for inclusion in their publication, Integrating Smoking Cessation Interventions into Daily Nursing Practice. This model is called the “4As” and includes four main categories of nursing practice: Ask (the patient about tobacco use), Advise (the patient about the risks of tobacco use), Assist (the patient to quit), and Arrange (for follow-up). The model has a strong evidence base and has been included in clinical practice guidelines in many jurisdictions (Bolman, et al., 2002; Marlow and Stoller, 2003; RNAO, 2003). The items (see Appendix A) were adapted from the work of Schultz et al. (2006). Respondents were asked to indicate the frequency with which they implemented specific activities related to asking patients about tobacco use, providing advice to quit smoking, assisting patients to quit, and arranging for follow-up. Responses were rated on a 7-point scale ranging from very rarely (1) to very frequently (7). The responses were used to describe the current nature of nursing practice in relation to smoking cessation and the implementation of best practice guidelines.

Reliability (Pilot Study). Test re-test reliability of the adapted measures was assessed on a sample of nurses in primary care settings. The questionnaire was mailed to 30 Registered Nurses and Nurse Practitioners twice, within an interval of three weeks (Francis, Eccles, Johnston, Walker, Grimshaw, Foy, et al., 2004; Hertzog, 2008). Sixteen (16) participants completed the questionnaire on both occasions. The test-retest reliability was examined for the scores quantifying each study variable as well as scores for specific smoking cessation activities. Table 1 summarizes these results. Overall, the correlation coefficients ranged from $r = 0.306$ for behavioural intention to $r = 0.837$ for indirect perceived behavioural control. The findings supported the test-retest reliability of the items assessing the study variables except for those
measuring the dependent variable, behavioural intention. This represents temporal instability of
the variable. Respondents’ perception of intention changed over the time between completing
the two tests; intention was significantly less positive on the second test for four of the
respondents. This is not an uncommon finding in studies of the TPB and may influence the
consistency of the intention-behaviour relationship but does not affect the predictive power of
the antecedent variables (Connor and Godin, 2007; Cooke and Sheeran, 2004; Sheeran, Orbell,
and Trafimov, 1999). However, when tested, the two items used to measure the variable
demonstrated strong internal consistency reliability (α=. 928). The item measuring behaviour
demonstrated acceptable test-retest reliability (r = 0.762). The correlation coefficients for the
specific smoking cessation activities (4 A’s) ranged from r = 0.729 (Assess) to r = 0.937
(Advise).

**Table 1**

<table>
<thead>
<tr>
<th>Study Variables</th>
<th>Pearson’s Coefficient (r)</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviour</td>
<td>0.762</td>
<td>0.001</td>
</tr>
<tr>
<td>Behavioural Intention</td>
<td>0.306</td>
<td>0.268</td>
</tr>
<tr>
<td>Direct Attitude</td>
<td>0.809</td>
<td>0.000</td>
</tr>
<tr>
<td>Indirect Attitude</td>
<td>0.533</td>
<td>0.041</td>
</tr>
<tr>
<td>Direct Subjective Norms</td>
<td>0.775</td>
<td>0.000</td>
</tr>
<tr>
<td>Indirect Subjective Norms</td>
<td>0.623</td>
<td>0.010</td>
</tr>
<tr>
<td>Direct Perceived Behavioural Control</td>
<td>0.793</td>
<td>0.000</td>
</tr>
<tr>
<td>Study Variables</td>
<td>Pearson’s Coefficient ($r$)</td>
<td>Significance ($p$)</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Indirect Perceived Behavioural Control</td>
<td>0.837</td>
<td>0.000</td>
</tr>
<tr>
<td>Reliability Statistic for Total Questionnaire</td>
<td>0.792</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Specific Smoking Cessation Activities (4As)

- Assess: 0.729, 0.001
- Advise: 0.937, 0.000
- Assist: 0.855, 0.000
- Arrange: 0.805, 0.000

**Qualitative Data.**

In addition to the measures of the concepts of interest, three open-ended questions were included at the end of the questionnaire to allow nurses to comment on any of the issues covered by the measures. Respondents were asked to record any other comments they may have that relate to motivators for providing smoking cessation and barriers to providing smoking cessation interventions. The term ‘motivator’ was used in the questionnaire because it is more consistent with the theoretical framework and with models of health professional behaviour. Ajzen (1991) states “intentions are assumed to capture the motivational factors influencing behaviour.” He made the distinction between motivational and non-motivational factors that influence the performance of any given behaviour, and added the concept of behavioural control. The variable attitude in the TPB is explicitly derived from the expectancy-value theory that is described by...
Wigfield and Eccles (2000) as a long-standing perspective on motivation that has been used to examine and explain how individuals make choices about the behaviours or tasks they will undertake. The variable subjective norms, is described as the individual’s salient beliefs about the expectations of important others and the individual’s motivation to comply with those expectations (Ajzen, 1991, 2006). Buetow (2007), in discussing health professionals’ behaviour, has described the term ‘motivator’ as incorporating both the extrinsic factors that facilitate a change in behaviour and the intrinsic factors that move professionals to change. These include the sense of improvement as a moral duty of professionals and the freedom to pursue improvement rather than the freedom from obstacles to improvement that is conveyed by the term ‘facilitator’. By using the term ‘motivator’ it is more likely that the questions posed would elicit responses that inform changes to policy and other factors that have meaning and value to nurses (Buetow, 2007). The term was also used in the questionnaire because nurses are health professionals and implementing best practices for smoking cessation into their daily practice represents an improvement in their professional performance; the word captured the complexity of that process more than the term ‘facilitators.’ Motivators in this context may be understood as internal constructs whereas facilitators represent those external structures and processes that support professional performance.

Data Analysis

Quantitative and qualitative data were collected for this study. The purpose of the quantitative data analysis was to test hypotheses related to 1) the relationship of attitude, subjective norm, and perceived behavioural control to nurses’ behavioural intentions in relation to providing smoking cessation interventions, and 2) the relationships among nurses’ personal
and professional characteristics and their reported intention to provide smoking cessation interventions. Data were also collected regarding the behavioural components of the smoking cessation interventions nurses were currently providing. Qualitative data were gathered through three items that provided respondents with an opportunity to give additional comments regarding the barriers, motivators, and any other experiences they had encountered in relation to providing smoking cessation interventions.

Descriptive statistics, (frequency distribution, measures of central tendency and dispersion) were used to characterize the demographic and professional profile of the respondents. The internal consistency reliability of multi-item measures was examined using Cronbach’s alpha coefficient. Total scale scores were computed to quantify the variables of interest, as explained in the previous sections. Descriptive statistics were used to examine the sample’s standing on these variables and the assumption of normality required for the planned multivariate analyses.

Multiple regression analyses were used to examine the relationship of nurses’ characteristics and the variables derived from the TPB to the dependent variable, behavioural intention. Francis et al. (2004) recommended this method in their Manual for Health Services Researchers. Frazier, Barron and Tix (2004) recommend multiple regressions as the preferred means of examining direct effects when the predictor variables are a mix of categorical and continuous, as they are in the current study. As well, multiple regression analysis was applied to be consistent with the analysis used in other studies of nurses’ intention related to providing smoking cessation interventions in primary care settings, and with other studies of health professionals’ behaviour utilizing the TPB (Armitage and Conner, 2001; Godin, et al., 2008;
Handeman, et al., 2010). Furthermore, the data in this study showed slight deviations from the assumption of normality and multiple regressions is robust against small deviations from normality (Cohen & Cohen 1983, pp. 112-114). The relationships between the characteristics of respondents, the characteristics of the practice settings, and the TPB concepts were examined with the Pearson’s correlation coefficient (see Correlation Matrix, Appendix H).

In their 2000 article, Statistical Guidelines for Studies of the Theory of Reasoned Action and the Theory of Planned Behaviour, Hankins, French and Horne discussed potential problems in analysis of this type of data using either multiple regression or structural equation modeling. The authors suggested that possible problems with the use of multiple regression relate to the assumption of linear relationships between the independent and dependent variables where a more curvilinear relationship may actually exist, the lack of residuals analysis, and the assumption that multiplicative composite scores for indirect measures can be treated as simple variables. They suggested that these potential problems could be managed by using the Adjusted R$^2$ rather than R as the best measure of explained variance, by ensuring that respondents’ self-report of their beliefs are elicited (direct measures) and by ensuring adequate sample size and power to decrease the probability of type II error. All of these strategies have been utilized in the current study.

To test the first study hypothesis, scores for behavioural intention were regressed on hypothesized independent variables including nurses’ attitude, subjective norms and perceived behavioural control, and personal, professional and practice setting characteristics. This procedure was carried out for both direct and indirect attitude, subjective norms and perceived behavioural control. The independent variables were entered in blocks to identify the unique
contribution of each category of factors to behavioural intention. The variables derived from the TPB were entered in the first block, followed by variables related to respondents’ demographic and professional characteristics in the second. Variables related to the characteristics of the respondents’ practice setting were entered in the final block. The categorical variables, level of nursing education, practice location, and practice setting, were dummy coded to facilitate interpretation of their influence on the dependent variable.

The relationship between behaviour (past report of providing smoking cessation interventions) and the intention to carry out the behaviour was tested with simple regression analysis. The scores for behaviour were regressed on the behavioural intention score. Similarly, simple regression was used to examine the relationship between perceived behavioural control and behavioural intention and behaviour.

Statistical analysis was conducted using SPSS 17. Adjusted $R^2$ was used to determine the amount of variance in the dependent variables accounted for by the model. Hypothesized relationships were considered supported if respective regression coefficients were statistically different from 0 ($p < .01$), and the magnitude of the coefficients is moderate to large (i.e., $\beta \geq .3$). As suggested by Ajzen’s original model (Ajzen, 1991) and by Puffer and Rashidian’s (2004) results, the possibility of multicollinearity exists between some of the independent (predictor) variables. The tolerance index and Variance Index Factor (VIF) tested for multicollinearity. A tolerance index of $\leq 0.01$ and a Variance Index Factor (VIF) $>5$ indicate multicollinearity.

The nurses’ responses to the open-ended questions were analyzed using a conventional inductive methodology (Elo & Kyngäs, 2008). On the first reading the comments were coded by the researcher using the open coding method. Each questionnaire was reviewed for comments
and themes were identified. Those themes were then sorted into categories that were created based on the three headings under the open-ended invitation for additional comments: motivators, barriers and other comments. On the second reading these comments were further categorized by clustering common themes and phrases, such as time, knowledge, and experience. A third review was conducted to allow for further reduction into relevant categories that described the motivators and barriers. Efforts were made to ensure that every category was thoroughly exhaustive and mutually exclusive by further review. The comments in each category were then quantified for reporting.

**Ethical Considerations**

Ethical approval was sought and received from the University of Toronto Research Ethics Board. Application was made to the College of Nurses of Ontario for access to the list of Registered Nurses and Nurse Practitioners working in primary health care settings in Ontario once research ethics approval was granted. Respondents were given detailed information regarding the study, including risks and benefits. The names and addresses of respondents were kept on a password protected data file. Only a unique study number identified respondents and only those numbers were documented on the study survey and to enter data into the protected data file. USB keys used to save the database were encrypted and password protected and stored in a secure location.
Chapter 4

Results

This chapter presents the study findings. The response rate and reliability of measures are reported. The demographic and professional characteristics of respondents, as well as their practice settings are described. Next the descriptive findings related to the concepts of the Theory of Planned Behavior (TPB) are provided followed by results of the multiple regressions used to test the study hypotheses. A summary of respondents’ qualitative comments is presented in the final section.

Response Rate

Four hundred and fifty eligible nurses (450) were mailed the study questionnaire. Of these 12 questionnaires were returned by Canada Post because of incorrect addresses. Seven nurses considered themselves ineligible for a variety of reasons including retirement, holding management positions, and working in areas where tobacco smokers were not encountered such as pediatric clinics and procedure clinics. Of the 431 potential respondents 237 nurses completed the questionnaire, yielding a response rate of 54.9%.

Reliability

The internal consistency reliability of the items measuring the study variables was examined. Table 2 summarizes these results. The Cronbach’s alpha coefficient was calculated for each variable measure and the specific smoking cessation activities. As shown in Table 2, the Cronbach’s alpha coefficient ranged from $\alpha = 0.307$ (Indirect Attitude Score) to $\alpha = 0.855$ (Direct Attitude Score). The direct measures demonstrated higher levels of internal consistency.
than indirect measures of the respective TPB concepts. The coefficient for the two items measuring the dependent variable intention demonstrated acceptable internal consistency reliability. The coefficient for the scale measuring specific smoking cessation activities (4 As) was $\alpha = 0.953$ supporting the internal consistency reliability of these items.

**Table 2**

**Internal Consistency Reliability of Study Variables’ Measures (n=237)**

<table>
<thead>
<tr>
<th>Study Variables</th>
<th>Cronbach’s Coefficient (α)</th>
<th># of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Attitude</td>
<td>0.855</td>
<td>20</td>
</tr>
<tr>
<td>Indirect Attitude</td>
<td>0.307</td>
<td>8</td>
</tr>
<tr>
<td>Direct Subjective Norms</td>
<td>0.798</td>
<td>4</td>
</tr>
<tr>
<td>Indirect Subjective Norms</td>
<td>0.640</td>
<td>6</td>
</tr>
<tr>
<td>Direct Perceived Behavioural Control</td>
<td>0.794</td>
<td>3</td>
</tr>
<tr>
<td>Indirect Perceived Behavioural Control</td>
<td>0.418</td>
<td>11</td>
</tr>
<tr>
<td>Intention</td>
<td>0.789</td>
<td>2</td>
</tr>
<tr>
<td>Specific Smoking Cessation Activities (4As)</td>
<td>0.953</td>
<td>19</td>
</tr>
</tbody>
</table>

**Validity of Direct and Indirect Measures of Study Variables**

Francis et al. (2004) recommend that a series of bivariate correlations between the direct and the indirect measures of the concepts in the TPB be conducted to confirm the validity of the
measures and to determine which of the variables to include in the analysis addressing the study’s objectives. The associations between direct and indirect measures of attitude, subjective norms and perceived behavioural control were examined using the Pearson’s correlation coefficient. The findings are presented in Table 3. The correlation between the direct and indirect measures of perceived behavioural control was relatively weak. The direct and indirect measures of attitude and subjective norms were strongly correlated. To avoid the problem of multicollinearity in the planned multiple regressions the indirect measures of these concepts were excluded from the final multiple regression models. The reported low internal consistency reliability coefficients for these measures also contributed to the decision to exclude the indirect measures of the TBP concepts from the regression analysis. Measures with low reliability attenuate the regression coefficients.

Table 3

<table>
<thead>
<tr>
<th>Study Variable</th>
<th>Correlation</th>
<th>p value</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Attitude</td>
<td>0.503</td>
<td>0.000</td>
<td>233</td>
</tr>
<tr>
<td>Indirect Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Subjective Norms</td>
<td>0.776</td>
<td>0.000</td>
<td>234</td>
</tr>
<tr>
<td>Indirect Subjective Norms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Perceived Behavioural Control</td>
<td>0.388</td>
<td>0.000</td>
<td>229</td>
</tr>
<tr>
<td>Indirect Perceived Behavioural Control</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Respondents’ Characteristics

In this section demographic and professional characteristics of respondents are described. The types of setting in which they worked are identified.

Personal Characteristics.

**Age and Sex.** The age and sex distributions of respondents who completed the questionnaire are presented in Table 4. The majority of respondents were women with an average age of 50.3 years (SD 10.5).

Table 4
Sample demographic characteristics: age and gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30 yrs</td>
<td>8</td>
<td>3.4</td>
</tr>
<tr>
<td>31-40</td>
<td>37</td>
<td>15.6</td>
</tr>
<tr>
<td>41-50</td>
<td>65</td>
<td>27.4</td>
</tr>
<tr>
<td>51-60</td>
<td>78</td>
<td>32.9</td>
</tr>
<tr>
<td>&gt;60</td>
<td>41</td>
<td>17.3</td>
</tr>
<tr>
<td>Not specified</td>
<td>8</td>
<td>3.4</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>221</td>
<td>93.2</td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
<td>5.5</td>
</tr>
<tr>
<td>Not specified</td>
<td>3</td>
<td>.01</td>
</tr>
</tbody>
</table>
**Personal History of Tobacco Use.** As shown in Table 5, about two thirds of the respondents reported they had never smoked and one third had quit smoking at the time the survey was conducted. Of the 89 respondents who quit or tried to quit smoking, 56 (62.9%) reported quitting ‘cold turkey’ indicating that they used no products or services and were able to stop abruptly; 17 (19.1%) reported they had used some product or service to help them quit. The remaining 15 (16.9%) nurses reported that they quit gradually by tapering down. Respondents reported using various products and services to achieve smoking cessation, which are summarized in Table 6. The most common were professional counseling, the transdermal nicotine patch, wellbutrin (Zyban®), nicotine replacement products other than the patch, and varenicline (Champix®). The largest number of respondents indicated that quitting on their own and varenicline were most helpful in achieving cessation, followed by nicotine replacement other than the transdermal nicotine patch.

**Table 5**

**Respondents’ personal history of tobacco use**

<table>
<thead>
<tr>
<th>Reported tobacco use</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never smoked</td>
<td>148</td>
<td>62.4</td>
</tr>
<tr>
<td>Quit smoking</td>
<td>80</td>
<td>33.8</td>
</tr>
<tr>
<td>Trying to quit</td>
<td>4</td>
<td>1.7</td>
</tr>
<tr>
<td>Thinking about quitting</td>
<td>5</td>
<td>2.1</td>
</tr>
<tr>
<td>Method or Product</td>
<td>Tried</td>
<td>Found Helpful</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------</td>
<td>---------------</td>
</tr>
<tr>
<td>Cold Turkey</td>
<td>56</td>
<td>56</td>
</tr>
<tr>
<td>Tapered</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Professional Counseling</td>
<td>26</td>
<td>1</td>
</tr>
<tr>
<td>NRT (not patch)</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>NRT (patch)</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>Zyban (wellbutrin)</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Champix (varenicline)</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Smoker’s Helpline</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Smoking cessation group</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Smoke-Enders</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Laser</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Hypnosis</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
Professional Characteristics.

Table 7 displays the descriptive statistics for respondents’ professional characteristics. Respondents were asked to indicate their highest achieved level of nursing education. About half (46.8%) of respondents reported having earned a diploma in nursing. The rest reported having baccalaureate or graduate degrees. Most respondents reported they were employed full-time. The largest group of respondents consisted of staff nurses. Those who reported that they worked as Nurse Practitioners represented 38.4 %, whereas 1.3 % reported filling clinical manager or coordinator positions such as outpost, office nurse, diabetic nurse educator (in a Family Practice), Director of Family Health Team and Team Leader. The average number of years in practice was 26.3 yrs (SD = 11.4) and the average numbers of years of practice in primary health care was 13.1 (SD = 10.0). Most (72.5%) respondents reported encountering frequently patients who smoke.

Table 7

Professional characteristics of respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>N=237</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>111</td>
<td>46.8</td>
</tr>
<tr>
<td>BScN</td>
<td>38</td>
<td>16.0</td>
</tr>
<tr>
<td>NP Certificate</td>
<td>63</td>
<td>26.6</td>
</tr>
<tr>
<td>MN/MScN</td>
<td>24</td>
<td>10.1</td>
</tr>
<tr>
<td>PhD</td>
<td>1</td>
<td>.4</td>
</tr>
<tr>
<td>Variable</td>
<td>N=237</td>
<td>%</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Time</td>
<td>144</td>
<td>60.8</td>
</tr>
<tr>
<td>Part Time</td>
<td>83</td>
<td>35.0</td>
</tr>
<tr>
<td>Casual</td>
<td>9</td>
<td>3.8</td>
</tr>
<tr>
<td>Primary Position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Nurse</td>
<td>132</td>
<td>55.7</td>
</tr>
<tr>
<td>Nurse Practitioner/Advanced Practice Nurse</td>
<td>91</td>
<td>38.4</td>
</tr>
<tr>
<td>Clinical Manager/Coordinator</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>4.6</td>
</tr>
<tr>
<td>Years in Practice (n=235)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>25</td>
<td>10.6</td>
</tr>
<tr>
<td>11-20</td>
<td>55</td>
<td>23.4</td>
</tr>
<tr>
<td>21-30</td>
<td>70</td>
<td>29.8</td>
</tr>
<tr>
<td>31-40</td>
<td>53</td>
<td>22.6</td>
</tr>
<tr>
<td>41-50</td>
<td>21</td>
<td>8.9</td>
</tr>
<tr>
<td>&gt;50</td>
<td>1</td>
<td>.4</td>
</tr>
<tr>
<td>Years in Primary Health Care (n=232)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>113</td>
<td>48.7</td>
</tr>
<tr>
<td>11-20</td>
<td>72</td>
<td>31.0</td>
</tr>
<tr>
<td>21-30</td>
<td>26</td>
<td>11.2</td>
</tr>
<tr>
<td>31-40</td>
<td>18</td>
<td>7.8</td>
</tr>
<tr>
<td>Variable</td>
<td>N=237</td>
<td>%</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>----</td>
</tr>
<tr>
<td>41-50</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td>&gt;50</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Encounter patients who smoke (n=236)

- Frequently: 171 (72.5%)
- Sometimes: 64 (27.1%)
- Never: 1 (0.4%)

**Practice Characteristics.**

The majority of respondents (47.3%) reported that physicians in their practice were not paid extra to provide smoking cessation interventions. Ninety-one (38.4%) indicated that physicians in their practice setting were paid extra and the remainder didn’t know whether or not the physicians they worked with were paid extra. The characteristics of the practice in which respondents worked are presented in Table 8. Most nurses were employed in either family health teams or in other types of practices. These were identified as private medical offices, Family Health Organizations, specialist offices, diet and health clinics, a weight-loss clinic, an internist’s office, a nurse practitioner led clinic, a maternity clinic, a public health clinic, and a sexual health clinic. Respondents indicated they worked in urban practices (60.2%), rural practices (31.8%), and Northern locations (8.1%).
### Table 8

**Characteristics of practice settings**

<table>
<thead>
<tr>
<th>Type of practice</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Health Team</td>
<td>104</td>
<td>44.1</td>
</tr>
<tr>
<td>Community Health Centres</td>
<td>52</td>
<td>22.0</td>
</tr>
<tr>
<td>Family Practice Units</td>
<td>37</td>
<td>15.7</td>
</tr>
<tr>
<td>Family Health Group</td>
<td>13</td>
<td>5.5</td>
</tr>
<tr>
<td>Aboriginal Community Health Access Centres</td>
<td>2</td>
<td>.8</td>
</tr>
<tr>
<td>Other types of practices</td>
<td>28</td>
<td>11.9</td>
</tr>
</tbody>
</table>

Tables 9 summarizes the types of other health professionals in the practice settings in which respondents were employed. Most respondents worked in practices with Family Doctors. Practices where there were no physicians were assumed to be public health clinics. Practices with one physician only are considered to be solo medical practices or Nurse Practitioner Led Clinics. Social workers were the most common other provider that respondents reported were working in their practice setting (61.4%). Other providers working in the practice setting who may have been providing smoking cessation interventions included health promoters (28.5%),
pharmacists (21.2%), addictions counselors (13.6%), respiratory therapists (7.2%), and smoking cessation counselors (1.7%).

Table 9

Number and percentage of other health professionals working in respondents’ practice settings

<table>
<thead>
<tr>
<th>Family Doctors, Registered Nurses and Nurse Practitioners</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family Doctor (n=236)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-.5</td>
<td>9</td>
<td>38.1</td>
</tr>
<tr>
<td>1</td>
<td>38</td>
<td>16.1</td>
</tr>
<tr>
<td>2-4</td>
<td>80</td>
<td>33.9</td>
</tr>
<tr>
<td>5-9</td>
<td>72</td>
<td>30.5</td>
</tr>
<tr>
<td>10-14</td>
<td>17</td>
<td>7.2</td>
</tr>
<tr>
<td>15-19</td>
<td>10</td>
<td>4.2</td>
</tr>
<tr>
<td>&gt;20</td>
<td>8</td>
<td>3.4</td>
</tr>
<tr>
<td><strong>Registered Nurses (n=235)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>177</td>
<td>75.3</td>
</tr>
<tr>
<td>5-9</td>
<td>41</td>
<td>17.4</td>
</tr>
<tr>
<td>10-14</td>
<td>11</td>
<td>4.6</td>
</tr>
<tr>
<td>15-19</td>
<td>5</td>
<td>2.1</td>
</tr>
<tr>
<td>&gt;20</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Nurse Practitioners (n=235)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>214</td>
<td>91.1</td>
</tr>
<tr>
<td>5-9</td>
<td>21</td>
<td>8.9</td>
</tr>
</tbody>
</table>
Descriptive Findings Related to the Study Variables

This section presents the descriptive results pertaining to the TPB concepts. The variables of interest are respondents’ attitude, subjective norms, perceived behavioural control, behavioural intention and behaviour related to providing evidence-based smoking cessation interventions.

Independent Variables.

Descriptive statistics for the direct measures for each of the independent variables are reported in Table 10.

**Attitude.** Only the direct measure of attitude was included in the analysis. Respondents were asked questions regarding their beliefs regarding the efficacy of specific evidence-based interventions for smoking cessation including advice, counseling, nicotine replacement products and referral to a community program for smoking cessation. On average, respondents reported a positive attitude toward providing smoking cessation interventions (M = 5.57, SD = 1.3).

**Subjective Norms.** Direct subjective norms reflected respondents’ perceptions of the expectations of others in their work environment regarding the respondents’ role in providing smoking cessation interventions to patients. The mean score (M = 4.0, SD = 1.6) implied neither a positive or a negative norm.

**Perceived Behavioural Control.** Direct perceived behavioural control was measured with items asking respondents about their perceived self-efficacy, their confidence and the control they believe they have over their ability to provide smoking cessation interventions. The mean score (Mean = 4.77, SD = 1.6) was moderately positive, implying that respondents felt
they had a moderate degree of control over their work in relation to providing smoking cessation interventions.

Table 10
Mean scores for Theory of Planned Behaviour concepts (7 point Likert scale for direct measures; bipolar -3 to +3 scale for indirect measures)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitude (direct measures)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advice</td>
<td>5.50</td>
<td>1.32</td>
</tr>
<tr>
<td>Counseling</td>
<td>5.60</td>
<td>1.33</td>
</tr>
<tr>
<td>Nicotine replacement products</td>
<td>5.52</td>
<td>1.39</td>
</tr>
<tr>
<td>Referral to community programs</td>
<td>5.67</td>
<td>1.27</td>
</tr>
<tr>
<td>Total score for direct attitude</td>
<td>5.57</td>
<td>1.30</td>
</tr>
<tr>
<td><strong>Subjective Norms (direct measures)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others expect me to provide smoking cessation interventions</td>
<td>5.56</td>
<td>1.96</td>
</tr>
<tr>
<td>Nurses are expected to ask patients about smoking at every visit</td>
<td>4.05</td>
<td>2.23</td>
</tr>
<tr>
<td>Nurses are expected to provide smoking cessation interventions</td>
<td>4.23</td>
<td>2.30</td>
</tr>
<tr>
<td>Feel under pressure to provide smoking cessation interventions</td>
<td>2.16</td>
<td>1.64</td>
</tr>
<tr>
<td>Total score for direct subjective norms</td>
<td>4.00</td>
<td>1.61</td>
</tr>
<tr>
<td><strong>Perceived Behavioural Control (direct measures)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providing interventions is easy for me</td>
<td>4.32</td>
<td>1.8</td>
</tr>
<tr>
<td>I feel confidence in my ability to provide interventions</td>
<td>4.97</td>
<td>1.83</td>
</tr>
<tr>
<td>I am in control of my decisions to provided interventions</td>
<td>5.03</td>
<td>2.02</td>
</tr>
</tbody>
</table>
### Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total score for direct perceived behavioural control</td>
<td>4.77</td>
<td>1.59</td>
</tr>
</tbody>
</table>

### Dependent Variables

**Behavioural Intention.** Most respondents (46.6%) reported that they intended, over the next three months, to provide smoking cessation interventions for their patients who smoke. The mean score for behavioural intention was 5.65 (SD = 1.69, n = 236) on the 7-point scale.

**Behaviour.** Respondents were asked to estimate the percentage of patients who smoked for whom they had provided smoking cessation interventions in the month prior to completing the study questionnaire. The mean score for the frequency of the behaviour (i.e., providing smoking cessation interventions) was 3.4 (SD = 1.61). On average respondents reported providing smoking cessation interventions to approximately 21 to 40% of the patients who smoked, in their practices.

### Findings Related to the Research Questions

This study addressed two research questions and associated hypotheses. The results of these tests are presented in this section.

**Research Question One.** What is the nature of smoking cessation interventions provided by nurses in primary health care settings in Ontario?

Research question one was addressed by asking respondents to indicate the frequency with which they implemented 19 specific smoking cessation activities based on the four components of what is described as a brief intervention (the 4 As) (RNAO, 2003; Fiore, et al.,
Generally nurses were more likely to ask patients about their smoking status and to provide advice about the benefits of quitting, the risks of continued use of tobacco, and to advise patients to quit smoking or cut down on the amount they smoke. They were less likely to assist patients in quitting or to arrange follow-up appointments or referrals.

**Table 11**

Mean scores for performance of Specific Smoking Cessation Interventions (4 As)

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Mean Likert Score (0-7)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ask</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assess patient’s smoking status at clinic visits</td>
<td>5.45</td>
<td>1.87</td>
</tr>
<tr>
<td>Document patient’s smoking status on the chart</td>
<td>5.41</td>
<td>2.01</td>
</tr>
<tr>
<td>Assess the patient’s interest in quitting smoking</td>
<td>4.94</td>
<td>1.95</td>
</tr>
<tr>
<td><strong>Advise</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk to patients about the health effects of smoking</td>
<td>5.11</td>
<td>1.77</td>
</tr>
<tr>
<td>Talk about the benefits of quitting smoking</td>
<td>5.32</td>
<td>1.64</td>
</tr>
<tr>
<td>Provide a pamphlet</td>
<td>3.49</td>
<td>2.17</td>
</tr>
<tr>
<td>Advise patient to quit smoking</td>
<td>5.42</td>
<td>1.93</td>
</tr>
<tr>
<td>Advise patient to cut down on # of cigarettes smoked</td>
<td>5.38</td>
<td>1.91</td>
</tr>
<tr>
<td><strong>Assist with Quitting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discuss quitting strategies</td>
<td>4.77</td>
<td>2.01</td>
</tr>
<tr>
<td>Discuss strategies to cope with relapse</td>
<td>4.10</td>
<td>2.10</td>
</tr>
<tr>
<td>Interventions</td>
<td>Mean Likert Score (0-7)</td>
<td>SD</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Provide a pamphlet</td>
<td>3.69</td>
<td>2.27</td>
</tr>
<tr>
<td>Discuss NRT or other pharmaceuticals</td>
<td>4.64</td>
<td>2.17</td>
</tr>
<tr>
<td>Recommend NRT or other pharmaceuticals</td>
<td>4.57</td>
<td>2.25</td>
</tr>
<tr>
<td>Discuss counseling as a strategy to help quit smoking</td>
<td>4.41</td>
<td>2.19</td>
</tr>
<tr>
<td>Discuss behavioural treatments as a strategy</td>
<td>4.06</td>
<td>2.11</td>
</tr>
<tr>
<td>Discuss self-help groups as a strategy</td>
<td>3.32</td>
<td>2.06</td>
</tr>
</tbody>
</table>

**Research Question Two.** *What factors are associated with nurses' intentions, and behaviour related to providing smoking cessation interventions to patients in primary health care settings?*

The hypotheses associated with the second research question were tested using multiple regression analysis. The degree of multicollinearity among predictors was tested with the tolerance index. Specific variables were excluded from the final regressions because of significant collinearity related to the generation of dummy coded variables. To facilitate the interpretation of the regression coefficients associated with the individual, professional and practice characteristics the responses to these variables were dummy-coded. The excluded
variables were nursing education at the diploma and baccalaureate level, physician extra payment, practice location and practice type.

To test the entire conceptual model (Figure 1; page 36) independent variables were entered into the regression model in a block-wise fashion. The variables derived from the TPB were entered in the first block. The respondents’ age, smoking status, and experience in practice were entered in the second block. Variables related to the respondents’ practice setting and the presence of specific other providers were entered in the final block.

Overall the final regressions model explained 48.5% of variance in behavioral intention. The predictor variables attitude ($\beta = .213, p<0.01$), subjective norms ($\beta = .218, p<0.01$), and perceived behavioural control ($\beta = .343, p<0.01$) were significantly associated with a positive intention to provide smoking cessation interventions. The final model is presented in Table 12.

Table 12

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>F</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>0.327</td>
<td>0.101</td>
<td>0.213*</td>
<td></td>
<td>0.433</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>0.222</td>
<td>0.069</td>
<td>0.218*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Behavioural Control (D)</td>
<td>0.354</td>
<td>0.080</td>
<td>0.343*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Block 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.021</td>
<td>0.021</td>
<td>0.140</td>
<td></td>
<td>0.452</td>
</tr>
<tr>
<td>Variable</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>F</td>
<td>R²</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------</td>
<td>-------</td>
<td>--------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>NP</td>
<td>0.571</td>
<td>0.233</td>
<td>0.168</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MN/MScN</td>
<td>0.643</td>
<td>0.292</td>
<td>0.137</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking Status</td>
<td>-0.353</td>
<td>0.155</td>
<td>-0.134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience</td>
<td>-0.006</td>
<td>0.019</td>
<td>-0.040</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Block 3</strong></td>
<td></td>
<td></td>
<td></td>
<td>10.573</td>
<td>0.485</td>
</tr>
<tr>
<td>Social Worker</td>
<td>-0.243</td>
<td>0.232</td>
<td>-0.071</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addictions Counselor</td>
<td>0.402</td>
<td>0.25</td>
<td>0.095</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Promoter</td>
<td>0.359</td>
<td>0.223</td>
<td>0.111</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Doctor</td>
<td>0.002</td>
<td>0.015</td>
<td>0.008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Nurse</td>
<td>0.049</td>
<td>0.032</td>
<td>-0.103</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.01

Hypothesis 1: Nurses’ attitude, subjective norm and perceived behavioural control related to smoking cessation interventions are associated with nurses’ reported behavioural intention to provide smoking cessation interventions in the three months following completion of the study questionnaire.

Attitude, subjective norm and perceived behavioural control were significantly and positively associated with the dependent variable, intention. The magnitude of the association was low-moderate.
**Hypothesis 2:** Nurses’ personal, professional and practice-related characteristics are significantly associated with nurses’ behavioural intention to provide smoking cessation interventions in the three month following completing the study questionnaire.

Age, education at the Nurse Practitioner and the Masters’ level, experience, and smoking status were entered into the regression models predicting the dependent variable, intention. None of these variables demonstrated any association with intention.

Variables related to the respondents’ practice characteristics were entered into regression as predictors of intention. These variables included the presence of social workers, addictions counselors, health promoters, family doctors and registered nurses. None of these variables were significantly associated with behavioral intention.

Personal, professional and practice characteristics were examined in relation to the other TPB concepts as the TPB proposes that these factors would influence the dependent variable, intention, indirectly through association with the predictor variables. These variables did not demonstrate consistent correlation with the attitudes, subjective norms and perceived behavioural control as hypothesized in the model (Appendix H). Specifically only preparation as an NP ($r = 0.301, p = 0.001$), working in a practice with a Social Worker ($r = -0.269, p=0.001$), and working in a practice where MDs were paid extra to provide smoking cessation interventions ($r = 0.189, p = 0.001$) were significantly correlated with intention. The variable representing preparation as an NP was positively correlated to subjective norm and perceived behavioural control; preparation at the Master’s level was correlated with perceived behavioural control; having a Social Worker in the practice setting was negatively correlated with attitude, subjective norm and perceived
behavioural control; and having an RN in the practice settings was negatively correlated with perceived behavioural control. All of these correlations were significant at $p=0.01$.

**Hypothesis 3: There is a positive relationship between nurses’ reported past behaviour and behavioural intention related to provision of smoking cessation interventions.**

Simple regression was used to examine the relationship between self-reported past behaviour and behavioural intention (Ajzen, 1991). Nurses’ reported past behaviour related to the provision of smoking cessation interventions was positively associated with ($\beta = 0.663, p = 0.000$) their intention to provide those interventions in the future, accounting for 43.7% of the variance ($R^2 = 0.437$).

**Hypothesis 4: Stronger perceived behavioural control is positively related to the provision of smoking cessation interventions (i.e., reported past behaviour).**

To test this hypothesis, perceived behavioural control was entered into regression as a predictor of behaviour. Direct perceived behavioural control ($\beta = 0.645, p = 0.001$) was associated with respondents’ reported past behaviour related to the provision of smoking cessation interventions. This model accounted for 38.9% of the variance ($p = 0.001$).

In summary, the regression models explained a significant amount of variance in behavioural intention. All variables derived from the TPB were significantly associated with behavioural intention. Additional demographic and professional variables did not contribute to the variance in intention and were not consistently associated with TPB concepts.
Qualitative Findings

Respondents’ qualitative comments were analyzed to identify perceived motivators and barriers to the provision of smoking cessation interventions in their practice settings. Two hundred and seven (87.3%) respondents provided comments. The most frequently occurring are reported here. The responses have been grouped into categories that corresponded to the independent variables derived from the TPB; attitude, subjective norms and perceived behavioural control. A summary of categories, themes, and representative quotes about motivators and barriers are presented in Tables 13 and 14 respectively.

Motivators to providing smoking cessation interventions

Responses Related to Attitude. In terms of responses related to attitudes toward smoking cessation interventions respondents reported that they were most motivated to provide smoking cessation interventions by their wish for better health for their patients. Their comments included wanting to improve the health of patients’ families, preventing chronic illnesses and cancer, and decreasing health risks. Other less prominent themes related to attitudes included caring for patients with specific diagnoses who might benefit most from cessation or for those facing financial pressures, wanting to reduce health care costs, and believing that smoking cessation is important. These respondents were demonstrating positive beliefs in the benefits of providing smoking cessation interventions.

Responses Related to Subjective Norms. The common themes related to the perceptions of the expectations of others included the motivational power of having smoking cessation interventions integrated into team practices, and having recognition and collaboration within the
practice setting in relation to smoking cessation interventions. Some reported that receiving extra pay for providing smoking cessation interventions would motivate them, while others commented that they would be motivated if asked by a physician to provide smoking cessation interventions. For these respondents the expectations and support of important others in the practice setting would be motivators to providing smoking cessation interventions.

Responses Related to Perceived Behavioural Control. The common themes that emerged related to perceived behavioural control included quick and ready access to resources to support smoking cessation interventions, such as programs, incentives, pamphlets and counseling services, access to a supply of free nicotine replacement products, being involved in a dedicated smoking cessation program, having a smoking cessation counselor available for referrals, perceiving patient readiness to quit, having enough time to provide interventions, having a defined role in terms of providing smoking cessation interventions, and having special training in smoking cessation interventions and counseling.

Table 13
Motivators to providing smoking cessation interventions

<table>
<thead>
<tr>
<th>Corresponding Variables</th>
<th>Themes</th>
<th>n</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>Improved health for patients</td>
<td>66</td>
<td>“To improve the quality of my patients’ health.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“To prevent lung diseases.”</td>
</tr>
<tr>
<td></td>
<td>Specific health conditions or low income;</td>
<td>9</td>
<td>“I have patients with COPD and lung cancer; easier [for them] to quit.”</td>
</tr>
<tr>
<td></td>
<td>diabetes, CAD, HTN, COPD, asthma, lung</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>8</td>
<td>“Having a smoking cessation program at the Centre.”</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>----</td>
<td>---------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Integration of smoking cessation into team practices</td>
<td>7</td>
<td>“Interest from management to support/run programs”.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Recognition similar to physicians.”</td>
<td></td>
</tr>
<tr>
<td>Recognition and collaboration within the practice setting</td>
<td>3</td>
<td>“Need to provide incentives to NPs as provided to MDs for smoking cessation interventions.”</td>
<td></td>
</tr>
<tr>
<td>Incentive payments</td>
<td>2</td>
<td>“Physician has to see the importance of smoking cessation.”</td>
<td></td>
</tr>
<tr>
<td>Direction or request from MD</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Perceived Behavioural Control                        | 27 | “Lots of new educational material.” |
|                                                      |    | “Pamphlets, helpline information.” |
|                                                      |    | “Additional guides and educational tools would be beneficial.” |
| Easy access to resources (pamphlets, teaching materials) | 20 | “Patient desire”; “Patient readiness” |
|                                                      |    | “It is difficult to offer smoking cessation programs to patients unless they really want to quit!” |
|                                                      |    | “If patient initiates and comes in for help” |
| Perceived patient readiness to quit                  |    |                                                   |
| Access to free pharmaceutical aids to smoking cessation. | 17 | “Free NRT; that we can dispense” |
|                                                      |    | “Free smoking cessation products” |
|                                                      |    | “Government-sponsored programs such as Champix™.” |
| Funded, academically                                 | 16 | “For the past 3 years I have been part of a team of 4 providing smoking cessation...” |
Barriers to Providing Smoking Cessation Interventions

**Responses Related to Attitude.** None of the respondents cited a negative attitude toward smoking cessation interventions as a barrier to providing interventions however some respondents suggested that there were some patient attitudes that might act as barriers for patients. These included beliefs about tobacco held by those in the Aboriginal community and other unidentified cultural groups, fear of weight gain, and the use of tobacco by role models such as staff in the practice setting.

<table>
<thead>
<tr>
<th>Barriers to Providing Smoking Cessation Interventions</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported program within the practice setting</td>
<td>16</td>
</tr>
<tr>
<td>Training in smoking cessation</td>
<td></td>
</tr>
<tr>
<td>Time to provide interventions</td>
<td>11</td>
</tr>
<tr>
<td>Having an expert smoking cessation counselor to refer patients to</td>
<td>9</td>
</tr>
<tr>
<td>Access to clinical practice guidelines for smoking cessation</td>
<td>2</td>
</tr>
</tbody>
</table>
**Responses Related to Subjective Norms.** Respondents suggested that having other providers in the practice who were assigned to provide smoking cessation interventions was a barrier for them. They may have believed that they were not expected to provide smoking cessation interventions because the role had been assigned to others. Others reported that working with physicians who were able to bill for providing smoking cessation interventions was a barrier.

**Responses Related to Perceived Behavioural Control**

The most commonly reported barrier overall was lack of time; respondents stated that they did not have enough time to provide smoking cessation interventions. Other barriers included perceived lack of patient readiness to quit, lack of free pharmaceutical products to support smoking cessation, lack of resources to support smoking cessation interventions, lack of knowledge, lack of availability of guidelines, lack of privacy or space to provide smoking cessation interventions and lack of confidence in respondents’ ability to provide adequate support or effective interventions.

**Table 14**

**Barriers to providing smoking cessation interventions**

<table>
<thead>
<tr>
<th>Corresponding Variables</th>
<th>Themes</th>
<th>n</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>No responses related to Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>Other providers in the practice setting provide</td>
<td>37</td>
<td>“Usually refer to physician for counseling.” “Not part of my job description.”</td>
</tr>
<tr>
<td>Perceived Behavioural Controls</td>
<td>Not enough time (role is not designed to include smoking cessation)</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Physicians want to do only since there is a $ benefit. They get upset if not booked with them first.”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Perceived Behavioural Controls

<table>
<thead>
<tr>
<th>Lack of perceived patient readiness to quit</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Time; client comes in for other issues so need to leave time for counseling re: smoking”</td>
<td></td>
</tr>
<tr>
<td>“Main barrier is too many patients and not enough time.”</td>
<td></td>
</tr>
<tr>
<td>“Time! One nurse works with 3 doctors at a time plus we have patients walk-in for injections (B12, allergy shots)”</td>
<td></td>
</tr>
<tr>
<td>“Time—there is absolutely no time during my day to interview any patient on any matter—I am nurse, receptionist, secretary and phlebotomist”</td>
<td></td>
</tr>
<tr>
<td>“RN’s not working to full scope.”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lack of free pharmaceuticals to aid in cessation</th>
<th>57</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Patient resistance”</td>
<td></td>
</tr>
<tr>
<td>“Clients not motivated”</td>
<td></td>
</tr>
<tr>
<td>“Work mostly with mental health and addictions—most of whom have no desire to quit.”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lack of resources</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Patients can’t afford NRT or have no drug coverage.”</td>
<td></td>
</tr>
<tr>
<td>“People in practice often very low income; quitting is expensive.”</td>
<td></td>
</tr>
</tbody>
</table>

| Lack of pamphlets to hand out. |
| “Lack of support material to give” | 22 |
In summary, a positive attitude toward smoking cessation interventions, positive expectations of important others in the practice setting, and a higher perceived degree of control over their practice were significant contributors to nurses’ intentions to provide smoking cessation interventions to patients who smoked. Individual, professional and practice-related characteristics were not directly associated with intention. Time, training, access to resources and perceived patient readiness to quit were frequently reported to be motivators. Lack of time, lack of opportunity, lack of resources and lack of knowledge were identified as common barriers to the provision of smoking cessation interventions.
Chapter 5

Discussion

Nurses in primary care settings interact with large numbers of people who smoke. Although these nurses have the potential to significantly reduce tobacco use in the population, research has shown that nurses do not consistently implement smoking cessation interventions. The purpose of this study was to describe current nursing practices for smoking cessation and the association between nurses’ attitude, subjective norms, perceived behavioral control and nurses’ intentions related to the provision of smoking cessation interventions, in Ontario primary care settings. In this chapter the study findings are discussed in relation to the theoretical model that guided the study and to previous research regarding the provision of smoking cessation activities by Registered Nurses and Nurse Practitioners. The limitations of the study are discussed as well as implications of the study results for nursing research, practice and education.

Descriptive Findings

Response Rate

The response rate for this study was 54.9%. This is lower than response rates observed in other studies of primary health care nurses’ smoking cessation attitudes and activities; however, it is consistent with response rates for mailed questionnaires within the nursing profession. Asch et al. (1997) conducted a meta-analysis of response rates to mail surveys reported in medical journals. Twenty-four of the studies included in the meta-analysis targeted nurses and the reported mean response rate was 61% (SD ±23). Todd et al. (2007) conducted a survey of Registered Nurses in family practice and primary health care settings in Nova Scotia and
achieved a response rate of 54.5%. Therefore, the current study response rate falls within the range reported in the literature. The required sample size was attained and the sample characteristics were representative of the target population, as displayed in Table 15.

The reasons for nurses’ deciding not to participate in the study could not be assessed. Several factors could have contributed to that decision. Nurses may have chosen not to complete the mailed questionnaire because of their own smoking behavior or perception of smoking cessation interventions; nurses who smoke may not have favorable attitudes toward these interventions (Sarna et al., 2001). Other possible reasons for not participating in the study include not having had enough time to complete the lengthy questionnaire, or working in settings where the majority of the patients were not smokers (e.g., pediatric) and therefore, their specific role responsibilities did not include provision of smoking cessation interventions, making the questionnaire content irrelevant to their practice.

**Sample Characteristics**

To determine the representativeness of the sample, the characteristics of participants in this study were compared to the demographic profile of nurses employed in the province of Ontario published by the College of Nurses of Ontario (CNO, 2011). Data from the College of Nurses did not separate nurses by clinical specialty so the sample was compared to averages for all Registered Nurses in the province of Ontario. The characteristics and smoking rates of respondents were compared to Canadian data (Table 15).
Table 15

Characteristics of respondents and population of nurses in Canada

<table>
<thead>
<tr>
<th>Variable</th>
<th>Current Study</th>
<th>Nurses in Ontario* or Canada**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>50.3 yrs</td>
<td>RNs 42.5 yrs*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NPs 44.6 yrs*</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5.5%</td>
<td>5.4 %*</td>
</tr>
<tr>
<td>Female</td>
<td>93.3%</td>
<td>94.6%*</td>
</tr>
<tr>
<td>Not specified</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>Smoking Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>62.4%</td>
<td>58.3%**</td>
</tr>
<tr>
<td>Quit</td>
<td>35.4%</td>
<td>33.8%**</td>
</tr>
<tr>
<td>Smoking</td>
<td>3.8%</td>
<td>6.3%**</td>
</tr>
<tr>
<td>Nursing Preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RNs</td>
<td>73.4%</td>
<td>98.2%</td>
</tr>
<tr>
<td>NPs</td>
<td>26.6%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

*CNO, 2012
**Lally, et al. (2008)

The older age of nurses in primary care settings is consistent with studies of nurses in these settings in another Canadian jurisdiction (Todd, Howlett, McKay, and Lawson, 2007). Accordingly, the sample included a more experienced group of nurses than provincial averages. The distribution of men and women in the study was consistent with the provincial average as was the distribution of nurses working full-time, part-time and on a casual basis.

The study sample was representative of the provincial nursing workforce and was comparable to the population targeted in other studies of nurses in primary care settings in terms of educational preparation with one exception; more study respondents were prepared as Nurse
Practitioners. This reflects specific policy directions in the province of Ontario. For the last 15 years the Ministry of Health and Long Term Care in Ontario has supported a province-wide educational program to prepare Primary Health Care Nurse Practitioners and employment of the program graduates as Nurse Practitioners in primary health care settings.

Respondents reported smoking at a rate that is lower than what has been reported for nurses in Canada (Lally, et al., 2008) and in similar studies from Australia and the U.S. (Berkelmans, Burton, Page, and Worrall-Carter, 2010; Good et al, 2004; Sarna, Bailous, Karabi, & Yang, 2012). This represents a potential selection bias in the current study. Nurses who smoke have been shown to be less likely to engage in smoking cessation interventions and have less confidence in the positive effects of those interventions (Sarna et al., 2001). Furthermore, self-reported smoking prevalence is prone to underestimation. West et al. (2007) demonstrated that using standard self-report questions as a mean of assessing smoking prevalence among the general population underestimated actual tobacco use by 2.8 % in the U.K., 0.6% in the U.S, and 4.4% in Poland. Lack of consistent methodology in these studies was suggested as a possible reason for the differences in findings across countries rather than actual reporting bias; specifically, each study used different questions to assess tobacco use and duration of use. However, it remains that the actually smoking rate may be higher in this study sample than what has been reported by respondents. Analysis of the relationship between a nurse’s personal history of tobacco use and her or his attitude toward providing smoking cessation interventions could be limited by these potential biases in the current study.
Discussion of Findings Related to the Research Questions and Hypotheses

Research Question 1. What is the nature of smoking cessation interventions provided by nurses in primary health care settings in Ontario?

Respondents were asked to report the frequency with which they provided specific smoking cessation activities. The activities were derived from nursing clinical practice guidelines, and included the “4 As”: Ask, Assess, Assist, and Arrange. Nurses reported that they consistently assessed and documented patients’ smoking status and patients’ willingness to quit. This finding was not consistent with other studies of nurses in primary care settings; nurses in the current study were more likely to engage in these activities. The reason for this difference is not clear (Good et al., 2004; McEwan and West, 2001; Sarna et al., 2001). Good et al. (2004) suggested that a lack of administrative support for smoking cessation presented a barrier to engagement in these specific activities in their study. In Ontario, The Registered Nurses Association of Ontario has implemented a province-wide initiative to raise awareness of the best practice guidelines for smoking cessation in nursing practice since 2008 (RNAO, 2008) and provide a variety of means to access those guidelines. The reported nursing activities in smoking cessation in the current study may be related to the impact of this initiative, although respondents were not asked if they were aware of these specific resources. While the association between having guidelines available and nurses’ intentions to provide smoking cessation interventions was not examined quantitatively, many respondents indicated having access to guidelines was a motivator and a lack of guidelines acted as a barrier to the implementation of smoking cessation interventions. In addition some respondents stated that they were not aware of the availability of best practice guidelines in print and on-line. It is not clear if this is an issue of lack of time to
search and access guidelines, lack of knowledge as to the existence of guidelines, or lack of organizational expectation or support for the use of guidelines in primary care settings (Gibson and Heartfield, 2005). Availability of resources increases perceived behavioural control, which contributes to positive behaviours as proposed by the TPB.

Generally nurses in primary care settings who participated in this study were not as consistent in assisting patients to quit smoking. Specifically, they did not always offer nicotine replacement therapy (NRT) or counseling or arrange for follow-up visits or referrals to experts or programs focused on smoking cessation as frequently as they assessed and documented tobacco use. Nurses in this and other studies reported experiencing barriers such as lack of resources and organizational support, lack of confidence, lack of knowledge and lack of dedicated time for the provision of smoking cessation interventions. Lack of resources, and thus lack of perceived control over their practice in relation to smoking cessation, likely contributes to this inconsistency in providing comprehensive interventions. The implementation of these specific interventions requires more knowledge, experience and confidence and is not likely to be undertaken if those antecedents and resources are not present. This finding is consistent with the TPB proposed relationship between perceived behavioural control and behaviour.

**Research Question 2.** What factors are associated with nurses’ intentions and behaviour related to providing smoking cessation interventions to patients in primary health care settings?

**Hypothesis 1.** Nurses’ attitude, subjective norm and perceived behavioural control related to smoking cessation interventions are associated with nurses’ reported behavioural intention to provide smoking cessation interventions in the three months following completion of the study questionnaire.
This study examined the relationship of nurses’ attitude, subjective norms and perceived behavioural control to their intention to provide smoking cessation interventions. The results of regression analysis indicated that nurses were more likely to plan to provide interventions when they had positive beliefs about the interventions, when they perceived that providing smoking cessation interventions was an expectation of nursing practice within their setting, when they perceived that they were able to provide effective interventions, when they had confidence in their ability and when they believed they had control over their decision to provide interventions.

*Attitude.* Attitude or beliefs about specific smoking cessation interventions were associated with positive intentions to provide those interventions. The relationship between positive attitudes or beliefs and intention was also found by Puffer and Rashidian (2004). It is consistent with the propositions of the TPB that attitudes toward a given behaviour, along with subjective norms and perceived behavioural control, are the theoretical determinants of the intention to perform that behaviour. Generally, the more favourable the attitude toward the behaviour, the stronger the intention to perform the behaviour. The relative influence of each of these determinants varies according to specific situations and behaviours (Ajzen, 1991). In the open-ended questions, nurses in this study reported that they were motivated to provide interventions by their beliefs about the benefits of smoking cessation for patients’ health and the health of patients’ families. They believed that interventions would help prevent chronic diseases and would benefit patients suffering from specific diseases related to tobacco use such as Chronic Obstructive Lung Diseases, lung cancer, diabetes, heart disease, hypertension and mental illness. This is consistent with the findings from Puffer and Rashidian (2004); they reported a significant association between positive attitudes toward, and intention to provide, smoking cessation interventions. This finding was not generally reported in other studies of
nurses’ implementation of evidence. Nurses reported positive attitudes toward evidence in several studies but this was not associated with implementation of evidence (Good et al., 2004; Koehn and Lehman, 2008; Ring et al., 2006).

Subjective Norms. In studies guided by the TPB subjective norms are often a non-significant contributor to intention and have been described by some as the weakest component of the theory (Sparks et al., 1995). Others (Armitage and Conner, 2001) have suggested that the unreliability of measures of subjective norms is a factor accounting for this low performance. For example, in many studies only a single item is employed to measure subjective norms; the reliability of one-item measures is questionable, which may attenuate the relationship between subjective norms and behavioral intention or behaviour. This was reported by Puffer and Rashidian (2004). In their study there was no demonstrated association between subjective norms and intention to provide smoking cessation interventions. In the current study four items were used as direct measures of subjective norms; the items demonstrated acceptable reliability, which may have contributed to the observed significant association of subjective norms with intention. Some respondents commented that working in a practice where there was recognition for the importance of smoking cessation and the ability to collaborate with a team motivated them to provide interventions. This supports the relative importance of the expectations of others in the formation of the intention to provide interventions, as hypothesized in the TPB. It is likely also true that in practices where nurses are expected to provide smoking cessation interventions, the required resources are available to support their practice.

Perceived Behavioural Control. According to the TPB, intention to engage in a behavior is dependent to some degree on the individual’s ability to act on that intention, or their
perception of the degree of control they have over the performance of a given behaviour. Perceived behavioural control provides some information related to the extent to which individuals encounter barriers to performing a given behaviour (Ajzen, 1999; Armitage and Connor, 2001). In their review of 185 independent studies of the TPB Armitage and Connor (2001) reported that perceived behavioural control accounted for significant percentage of the variance in intention. This relationship was replicated in the current study. Perceived behavioral control contributed more to intention than did attitudes or subjective norms. This is also consistent with results from Puffer and Rashidian’s study (2004). Generally organization support in terms of the provision of resources, space, time, and guidelines has been reported as being associated with the implementation of evidence into practice (Davies et al., 2008; Dopson et al., 2001; Ring et al., 2006).

**Hypothesis 2.** Nurses’ personal, professional and practice-related characteristics are significantly associated with nurses’ attitudes, norms, control and behavioural intention to provide smoking cessation interventions in the three months following completing the study questionnaire.

In the current study, nurses’ personal, professional and practice-related characteristics were not directly associated with the formation of a positive intention to provide smoking cessation interventions. This supports the TBP and Azjen’s contention that if these characteristics exert any effect on intention the effect is indirect; the characteristics are related to attitude, subjective norms, and perceived behavioural control, which in turn are associated with intention. Puffer and Rashidian (2004) reported similar findings. These indirect relationships were not tested in this study; however, the correlation between characteristics and the
Hypothesis 3. There is a positive relationship between nurses’ reported past behaviour and behavioural intention related to the provision of smoking cessation interventions.

The hypothesis was supported by the study findings. Nurses’ reported past behaviour related to providing smoking cessation interventions was associated with an intention to provide the same in the future. This relationship is likely to be stronger for those respondents who have stable intentions over time (Sheeran, Orbell, and Trafimow, 1999). In the current study it was not possible to test the temporal stability of intention; however, the pilot study demonstrated that intention was not stable over time. This limitation is discussed further later in this chapter.

Several studies reported that nurses who had experience in providing smoking cessation interventions were more likely to report confidence in their ability and were more likely to provide smoking cessation interventions (Braun, et al., 2004; Good, et al., 2004; McEwan and West, 2001).

Hypothesis 4. Stronger perceived behavioural control is positively related to the provision of smoking cessation interventions (i.e., reported past behaviour).

In the current study perceived behavioural control was positively associated with the provision of interventions, thus upholding the hypothesis. Respondents, who believed that providing interventions was relatively easy for them, were confident in their ability to provide
the interventions and believed they had control over their decision to provide interventions were more likely to provide them. As above, these findings were reported in other studies of nursing engagement in smoking cessation interventions in primary health care settings (Braun et al., 2004; Good et al., 2004; McEwan and West, 2001).

Discussion of Findings Related to Qualitative Results

Some common themes emerged for respondents’ comments regarding the motivators and barriers they encountered in relation to providing smoking cessation interventions. These are discussed below.

Time. Respondents reported a lack of time as the most common barrier they faced in providing smoking cessation interventions. This is consistent with the findings of a number of other studies related to not only smoking cessation interventions but to the implementation of evidence in practice overall (Davies et al., 2008; Dopson et al., 2001; Good et al., 2004; McEwan and West, 2001; Ploeg et al., 2007; Sarna et al., 2001), but the meaning of time in this context was not fully explored. This study, as others, did not measure nurses’ estimation of the amount of time required to deliver specific interventions.

Role Designation. In the current study, respondents reported that they were too busy with other tasks to be able to implement interventions and that this was related to their role in the practice and whether or not they were able to incorporate smoking cessation interventions into their assigned day’s work. Some reported being busy doing a number of non-nursing activities as part of their assigned role. It appears that the decision to provide smoking cessation interventions is not entirely within the individual nurse’s control. The role of nurses is often
decided by others, such as physicians or administrators, who may not fully appreciate their competencies and scope of practice (Di Costanzo, 2012). For example, sixty-one percent of Registered Nurses in academic family practice units have reported that they are not working to full scope and often do work that could be done by non-nursing support staff (Allard, Frego, Katz and Holas, 2010); this may be the result of employer or organizational policies. Others have noted that the role of nurses in primary health care settings has been described as ambiguous, and poorly defined and often blurred with the role of other health professionals (Akeroyd, Oandason, Alsaffar, Whitehead, and Lingard, 2009). In these environments it may not be possible for nurses to independently incorporate smoking cessation interventions into their daily practice. This is consistent with the literature; in settings where nurses lack designated roles related to smoking cessation, they are less likely to provide interventions (Rice and Stead, 2008).

**Perceived patient readiness to quit.** This factor has been cited in many studies as a motivator or a barrier to providing smoking cessation interventions and respondents reported the same in the current study (Good et al., 2004; McEwan and West, 2001). A lack of patient motivation to quit limits the nurses’ perceived control over their ability to provide interventions. While many health providers perceive this lack of readiness, there is good evidence that the majority of current smokers want to quit (CTUMS, 2007). It may be that with additional training and access to best practice guidelines nurses can develop strategies to address patient resistance. The potential influence of a knowledge deficit regarding patient motivation to quit, as a barrier to behavioural control, is consistent with the assumptions of the TPB whereby a lack of perceived behavioural control influences intention.
Privacy. A number of respondents reported not having private space in the practice setting to provide interventions for patients. This lack of a designated space for nursing work is related to issues of role definition and expectations. When nurses are not provided with space to provide care to individual patients, their ability to provide care consistent with their scope is limited.

Discussion of the Findings in Relation to the Theory of Planned Behaviour

The TBP concepts accounted for a significant portion of variance in respondents’ intention to provide smoking cessation interventions. The framework provided a means of conceptualizing and categorizing factors related to intention thus providing guidance for developing and evaluating initiatives to increase nursing engagement in smoking cessation.

While the TPB was useful in accounting for the contribution of specific factors directly related to intention this was not so for factors that are indirectly related. Direct and indirect measures of attitudes and subjective norms were strongly correlated in this study, thus supporting the theoretical assumptions of the TPB. However, there was no strong correlation between the direct and indirect measures of perceived behavioral control and the measures used were not reliable. Puffer and Rashidian (2004) reported similar findings and have suggested that the belief statements used as indirect measures of perceived behavioural control were not salient to the population that they surveyed. Ajzen (1999) stated that perceived behavioural control could be an incorrect or inaccurate measure of actual control. This could be true in the current study as well. The tool could be refined by including items derived from the comments provided by participants in this study regarding the control issues they experience in daily practice. Further development and testing would help confirm the contribution of these new items. There needs to
be further study to explore the relationship of these factors with nurses’ intention in relation to providing smoking cessation interventions.

**Limitations of the Study**

There are limitations to this study including the sample selection, response rate, threats to validity related to self-reported and cross-sectional data, and temporal instability of the variable intention in the pilot study.

The sample was selected from the College of Nurses of Ontario database of Registered Nurses and Nurse Practitioners working in primary health care settings who indicated that they were interested in participating in research. This sample may not be fully representative of the nurses working in primary health care in Ontario in that the number of Nurse Practitioners in the sample was higher than the provincial average; however, this distribution is consistent with the pattern in primary health care settings.

The lower than expected response rate increases the potential for selection bias. However, the accrued sample was representative of nurses working in Ontario, and large enough to achieve statistical power and reduce the risk of Type II error.

The data collected for this study were based on self-report of demographic information, smoking cessation practices, and independent and dependent variables. Response biases (acquiescence or social desirability) may have been introduced thus presenting a potential threat to construct validity. For example there is a potential risk that the reported rate of providing smoking cessation interventions may have been overestimated. As well, the number of respondents reporting that they were currently smoking was lower than the prevalence found in
other studies of nurses. This may represent a potential reporting bias and may limit
generalization of these results since nurses who smoke are less likely to have positive attitudes
toward smoking cessation interventions and less likely to implement these interventions.

The data in this study were gathered at a single point in time by use of a mailed
questionnaire. No causal inferences can be made based on the results of this study and the
relationships discussed ought to be viewed with caution.

The temporal instability of the dependent variable intention in the pilot study limits the
reliability of the intention-future behaviour relationship hypothesized in the TBP. This limitation
could be the result of measurement bias wherein respondents’ answers to the questions regarding
intention changed as a result of completing the questionnaire on the first occasion; something in
the questionnaire caused them to alter their intention to provide smoking cessation interventions,
i.e., testing effect. The differences in intention between the first and second test were toward a
negative intention. Thus some respondents may have believed that they would provide smoking
cessation interventions in their practices but having seen the detail about those interventions
provided in the tool, they might have reconsidered their intention. It is not possible to state that
intentions will consistently predict respondents’ future behaviour related to providing smoking
cessation interventions if their intentions are not stable over time.

**Implications for Research**

The current study confirms what is currently known about what factors influence the
intentions of nurses in primary health care settings to provide smoking cessation interventions.
The results are consistent with most of the previous research and provided more detail and
context about the meaning of some factors associated with intention. Nurses in primary care settings do not always have control over their work and roles and may not be free to add initiatives like smoking cessation.

A longitudinal design measuring intention and observed behaviour at several points in time would allow for assessment of the relationships between and among the variables providing stronger evidence of causality, specifically temporality.

Respondents provided information regarding specific motivators and barriers they encountered in practice. Incorporating these factors into an instrument that can be used in future research may provide more information about how those factors relate to nurses’ intentions to provide smoking cessation. This specific information would be useful to suggest modifications in primary care nurses’ practice and education and developing interventions to increase nurses’ engagement. The differences between Nurse Practitioners and Registered Nurses in terms of training, roles and practices related to smoking cessation were not explicitly explored in this study but the findings do suggested that preparation at the Nurse Practitioner level is related to positive role expectations and greater perceived autonomy in relation to providing smoking cessation interventions. A further examination of the differences between nurses and nurse practitioners in relation to providing smoking cessation interventions may reveal useful information regarding how each group and the staffing mix that best contribute to this important nursing role.

The pilot study used to test the survey tool demonstrated temporal inconsistency in the scores on behavioural intention. This is an important construct of the TPB and this phenomenon needs to be examined further. Further studies could be designed to test the reproducibility of this
phenomenon and explore the factors that influence any change in intention over time. Overall
the lack of stability in the variable is a weakness that may limit the generalizability of the study
findings. Without having measured respondents’ understanding of what constituted smoking
cessation interventions for the purposes of the study, it is not possible to state that completing the
questionnaire did not affect their future intentions. It may be that changing the order of the
questions in tool (asking about intentions at the end of the questionnaire) or providing a detailed
description of evidence-based smoking cessation interventions at the beginning of the tool may
have improved the stability of intention.

**Implications for Practice**

In primary health care settings, nurses’ intentions to provide smoking cessation
interventions were related to a number of workplace factors such as role expectations, a defined,
recognized and supported role in smoking cessation activities, and an organizational commitment
to smoking cessation. Similar findings have been reported in other studies and pertain not only
to nurses but to other providers as well (USDHHS, 2008; Schultz et al., 2006; Schultz, Hossain,
and Johnson, 2009). Training, access to resources including written materials on smoking
cessation and nicotine replacement therapy, and availability of cessation experts are important
components of a committed organizational smoking cessation program; they have been
suggested as key factors in motivating clinicians to become engaged in these practices
(USDHHS, 2008). Respondents in the current study reported that they would be more likely to
provide smoking cessation interventions if they had access to evidence-informed guidelines
within the practice setting; designated space to provide interventions; and access to resources
such as patient-education materials and smoking cessation aides to assist them in providing
effective interventions. These findings could assist nurse-managers and clinical directors in evaluating, modifying and developing practice settings that support nurses in providing smoking cessation interventions. In such settings intentions may be more stable over time and would be more reliable predictors of behaviour. They may also be helpful in determining the degree of nursing engagement required in specific practice settings and for informing review and development of best practice guidelines for smoking cessation. For example, where there is access to specialized smoking cessation counselors and practitioners, nursing staff in the setting need not implement all aspects of a comprehensive smoking cessation program (i.e., the 4As). It may be appropriate for nurses and other health professionals in those settings to engage in brief interventions to identify patients who smoke, offer advice and refer patients on to expert providers. This specialized role might be filled by Nurse Practitioners who have had more training and experience in counseling and prescribing medication. Nurse Practitioners may also fill the role of “clinical champions” for smoking cessation in their clinical settings given their advanced preparation in leadership roles. These specific and specialized roles may be more easily implemented if financial incentives were provided to the practice setting in general and not limited to specific practitioners such as physicians. Practice leaders and administrators would have the financial capacity to provide the tools and leadership required for successful smoking cessation programing.

According to the TPB, implementation of these contextual changes promotes a positive change in nursing practice and consequently, positive health outcomes for patients who smoke. Most importantly, nurses require a defined role in smoking cessation in the practice setting and that role needs to be supported by the primary health care organization.
Implications for Education

While training in smoking cessation interventions was not examined quantitatively, respondents indicated that knowledge was a motivator for their involvement in smoking cessation activities. Clinical practice guidelines and evidence-based strategies are available and should be included in undergraduate and graduate level nursing education. There are resources available for curriculum development such as the curriculum handbook developed by The Registered Nurses Association of Ontario (RNAO, 2011).

The RNAO has developed a province wide program to assist nurses in implementing best practices for smoking cessation in a variety of settings including primary care. This is one of a number of continuing education opportunities that exist in the province to support nursing practice in smoking cessation. Mechanisms can be employed in primary health care organizations to ensure that nurses have access to these educational opportunities. Nurses in this study reported that having participated in additional education related to smoking cessation motivated them to provide these interventions. Exploring strategies for ensuring nurses have access to continuing education may prove useful in increasing nurses’ engagement in this area of practice. There are a number of educational programs for smoking cessation that are available to nurses in Ontario. The Training Enhancement for Applied Cessation Counseling and Health (TEACH) is a comprehensive educational program that is low cost and can be delivered within the workplace, thus reducing costs for the employer and the employee. The RNAO provides a province-wide program for the implementation of best practice guidelines for smoking cessation that provides funding to participating organizations and there are a number of free on-line educational programs for nursing and other health providers.
Conclusions

The purpose of this study, guided by the TPB, was to describe current nursing practices related to the provision of smoking cessation interventions in primary health care settings in Ontario, and to examine the factors derived from the TPB related to nurses’ intentions to provide those interventions.

In terms of implementing smoking cessation interventions, nurses in this study were likely to ask patients about their tobacco use, document that information and advise patients about the benefits of quitting. They were less likely to assist patients in making a quit attempt or to arrange for follow-up.

Nurses’ intentions to provide interventions were significantly related to positive attitudes about the efficacy of smoking cessation interventions, positive role expectations, and perceived control over their ability to make decisions about providing interventions. Reported past behaviour in relation to these interventions was correlated with nurses’ perceived control over the performance of those interventions, and the expectations of important people in the practice setting.

Nurses reported that having designated, supported roles in smoking cessation, perceiving patient readiness to quit, and practising in workplaces with organized, multidisciplinary smoking cessation programs were strong motivators to provide smoking cessation interventions. Lack of designated time, lack of perceived patient readiness to quit, and lack of administrative support acted as barriers to implementing the interventions in practice.
This study adds to our knowledge about the nature of nursing practice related to smoking cessation in primary health care settings in Ontario and identifies specific issues that could be targeted in research, practice, and education to improve the level of nursing engagement. Nurses held strong beliefs about the benefits of providing smoking cessation interventions to their patients who use tobacco but did not always have enough control over their role to allow them to engage in and fully implement these interventions. Nurses need the commitment and support of primary health care organizations if they are to fully realize their role in reducing the impact of tobacco use on the health of the people of this province.


Health Canada. (2007). *Canadian Tobacco Use Monitoring Survey (CTUMS)*


Appendix A

Title: Providing Smoking Cessation Interventions in Primary Health Care Settings: A Survey of Nurses in Ontario, Canada.

Investigator: Shelley Walkerley NP-PHC MN Doctoral Student

Introduction

In about a week’s time you will be receiving a package regarding the study mentioned above. The package will contain an introductory letter, a questionnaire and a response card.

A research project about nurses’ beliefs, attitudes and current practices related to providing smoking cessation interventions is being conducted by Shelley Walkerley, a doctoral student at the Lawrence S. Bloomberg Faculty of Nursing at the University of Toronto. The project is under the supervision of Dr. Souraya Sidani. The purpose of the study is to describe current nursing practice for smoking cessation in primary health care settings, and nurses’ perceptions of the factors that influence their intention to provide interventions in those settings.

You have been selected to participate in this study because you are a registered nurse or nurse practitioner working in a primary care setting in Ontario.

Participation

Participation in this study involves completing a questionnaire that will require about 20-30 minutes of your time. The questions are about your training, your experience providing smoking cessation interventions, your opinions about the role of nurses in smoking cessation, and your own professional practice in this area.

Confidentiality

The questionnaire is completely anonymous. There are no identifying marks of any kind on the questionnaire and you can use the enclosed prepaid envelope to return the questionnaire to the investigator. Your anonymity and privacy are of the greatest importance and will be protected at all times. All information will be stored in a secure place and only the investigator and Dr. Sidani will have access to it. The results will be presented to meet the requirements of a doctoral degree, and potentially at conferences or in academic publications.
Risks and Benefits

There are no benefits to you for participating in this study. However, the results will contribute to the growing body of nursing research related to smoking cessation. There are no costs to you except the time spent answering the questionnaire. All postage is paid by the investigator. There is no compensation for your participation. Any risks to you will be minimized by the means described to protect your personal information.

Consent to Participate

Completing the enclosed questionnaire and returning it to the investigator indicates that you have given your consent to participate in the study. You may decline from answering any of the questions in the questionnaire.

Contact Information

Please contact me at 416-201-0792 or email: shelley.walkerley@utoronto.ca, or the thesis supervisor, Dr. Souraya Sidani at 416-979-5000 # 2572 or email: ssidani@ryerson.ca if you have any questions

Thank you very much for your help.

Shelley Walkerley NP-PHC MN
Doctoral Student
Title: Providing Smoking Cessation Interventions in Primary Health Care Settings: A Survey of Nurses in Ontario, Canada.

Investigator: Shelley Walkerley NP-PHC  MN  Doctoral Student

Introduction

A research project about nurses’ beliefs, attitudes and current practices related to providing smoking cessation interventions is being conducted by Shelley Walkerley, a doctoral student at the Lawrence S. Bloomberg Faculty of Nursing at the University of Toronto. The project is under the supervision of Dr. Souraya Sidani. The purpose of the study is to describe current nursing practice for smoking cessation in primary health care settings, and nurses’ perceptions of the factors that influence their intention to provide interventions in those settings.

You have been selected to participate in this study because you are a registered nurse or nurse practitioner working in a primary care setting in Ontario.

Participation

Participation in this study involves completing a questionnaire that will require about 20-30 minutes of your time. It was developed specifically for this study and asks questions about your training, your experience providing smoking cessation interventions, your opinions about the role of nurses in smoking cessation, and your own professional practice in this area. The questionnaire was designed to provide information (from aggregate data only) that will be fulfill the investigator’s requirements useful to nurses, health care organizations, and faculties that want to develop and support nurses in their role in providing smoking cessation interventions.

The questionnaire is completely anonymous. There are no identifying marks of any kind on the questionnaire. Use the enclosed prepaid envelope to return the questionnaire to the Lawrence S. Bloomberg Faculty of Nursing at the University of Toronto, which is collecting the data.

When you return the questionnaire, please mail the enclosed postcard separately, so that your name can be removed from the mailing list. If you would like to receive a summary of the results when the study is finished, please indicate so on the postcard. If you are not practicing as a registered nurse in a primary health care setting in Ontario, please indicate this on the reply card and return it to faculty. Your name will be removed from the mailing list.
Confidentiality

The results of this study will characterize registered nurses in primary health care settings in Ontario as a group and only aggregate data will be used in reporting the results of this study - no individual or very small group data will be reported. Your anonymity and privacy are to the greatest importance and will be protected at all times. You will be assigned a code number that will appear on the questionnaire you complete. Your name will not appear on any forms except the enclosed postcard. All information will be stored in a secure place and only the investigator and Dr. Sidani will have access to it. Once the data base is created, all information linking your name to a code number will be destroyed as well as all completed questionnaires. The findings of this study will be used to fulfill the requirements of the investigator’s dissertation research. The results will be presented to meet the requirements of a doctoral degree, and potentially at conferences or in academic publications.

Risks and Benefits

The benefits to you for participating in this study are the knowledge that you have contributed to the growing body of nursing research related to smoking cessation. There are no costs to you except the time spent answering the questionnaire. All postage is paid by the investigator. There is no remuneration or compensation for your participation. Any risks to you will be minimized by the means that your personal information will be protected.

Consent to Participate

Completing the enclosed questionnaire and returning it to the investigator indicates that you have given your consent to participate in the study. You may decline from answering any of the questions in the questionnaire.

Contact Information

Please contact me at 416-201-0792 or at my email: shelley.walkerley@utoronto.ca or my thesis supervisor, Dr. Souraya Sidani at 416-979-5000 # 2572 or email: ssidani@ryerson.ca if you have any questions.

Thank you very much for your help.

Sincerely,

Shelley Walkerley NP-PHC  MN

Doctoral Student
Title: Providing Smoking Cessation Interventions in Primary Health Care Settings: A Survey of Nurses in Ontario, Canada.

Investigator: Shelley Walkerley NP-PHC MN, Doctoral Student

About three weeks ago, you were asked to participate in a study of registered nurses and nurse practitioners in Ontario. As of today your completed postcard has not been received.

I believe that the data being collected will prove to be valuable in understanding nurses’ practices in providing smoking cessation interventions for patients who smoke.

I am writing to you again because each questionnaire is important to the study. Your name was drawn in a random sample of registered nurses and nurse practitioners in Ontario, and, in order for the study to provide a true characterization of the profession it is essential that a response rate of close to 100% be achieved. Please return the response postcard separately from the completed questionnaire. The questionnaire is completely anonymous and confidential. Please do not make any identifying marks on it.

A replacement questionnaire and response card have been enclosed, in case those sent earlier have been misplaced.

If you have already completed and returned the questionnaire, please accept my thanks and return the postcard again; do not complete a second questionnaire.

Please contact Dr. Sidani (ssidani@ryerson.ca or (416) 979-5000, #2572) or myself if you have any questions or concerns.

Thank you for your cooperation and participation,

Sincerely,

Shelley Walkerley NP-PHC MN, Doctoral Student
(416) 201-0792
shelley.walkerley@utoronto.ca
Title: Providing Smoking Cessation Interventions in Primary Health Care Settings: A Survey of Nurses in Ontario, Canada.

Investigator: Shelley Walkerley NP-PHC MN, Doctoral Student

About six weeks ago, you were asked to participate in a study of registered nurses and nurse practitioners in Ontario.

A research project about nurses’ beliefs, attitudes and current practices related to providing smoking cessation interventions is being conducted by Shelley Walkerley, a doctoral student at the Lawrence S. Bloomberg Faculty of Nursing at the University of Toronto. The project is under the supervision of Dr. Souraya Sidani. The purpose of the study is to describe current nursing practice for smoking cessation in primary health care settings, and nurses’ perceptions of the factors that influence their intention to provide interventions in those settings. You have been selected to participate in this study because you are a registered nurse or nurse practitioner working in a primary care setting in Ontario.

A replacement questionnaire and response card have been enclosed, in case those sent earlier have been misplaced. Please return the response postcard separately from the completed questionnaire. The questionnaire is completely anonymous and confidential. Please do not make any identifying marks on it. Completing the enclosed questionnaire and returning it to the investigator indicates that you have given your consent to participate in the study. You may decline from answering any of the questions in the questionnaire.

If you have already completed and returned the questionnaire, please accept my thanks and return the postcard again; do not complete a second questionnaire.

Please contact Dr. Sidani (ssidani@ryerson.ca or (416) 979-5000, #2572) or myself if you have any questions or concerns.

Thank you for your cooperation and participation,

Sincerely,

Shelley Walkerley NP-PHC MN, Doctoral Student
(416) 201-0792
shelley.walkerley@utoronto.ca
Title: Providing Smoking Cessation Interventions in Primary Health Care Settings: A Survey of Nurses in Ontario, Canada.

Dear Registered Nurse or Nurse Practitioner,

Last week you were sent a questionnaire regarding the role of registered nurses and nurse practitioners in smoking cessation in primary care settings.

If you have already returned the questionnaire, thank you. If you have not done so, please complete and return the questionnaire at your earliest convenience.

Thank you,

Shelley Walkerley NP-PHC MN, Doctoral Student

BUSINESS REPLY MAIL

Shelley Walkerley NP-PHC
Lawrence S. Bloomberg Faculty of Nursing
University of Toronto
155 College St.
Suite 130
Toronto ON
M5T 1P8
I have completed the questionnaire for registered nurses and nurse practitioners and returned it separately.

☐ Please send me a summary of the results at the above address.

**OR**

☐ I am not a registered nurse or nurse practitioner practicing in the community. Please remove my name from your mailing list.

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**BUSINESS REPLY MAIL**

Shelley Walkerley NP-PHC  
Lawrence S. Bloomberg Faculty of Nursing  
University of Toronto  
155 College St.  
Suite 130  
Toronto ON  
M5T 1P8
Appendices G and H are contained in supplementary documents