Health Behavior Change as a Primary Healthcare Intervention with Special Reference to Physical Therapists and Smoking Cessation

by

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Abstract

Contemporary physical therapists have a professional responsibility to address lifestyle behavior risk factors related to the global burden of non-communicable chronic conditions. Smoking in particular is the leading cause of preventable death and disease and is a healthcare priority. An examination of the views, barriers and facilitators of physical therapists regarding smoking cessation interventions (including counseling), and assessment of health promotion in physical therapy curricula will form the basis to help advance this professional responsibility.

Chapter Two describes national survey findings focusing on the knowledge of smoking health effects, and views, barriers, facilitators and practice patterns of Canadian physical therapists with respect to smoking cessation interventions, specifically smoking cessation counselling.

Chapter Three examines the factors associated with the frequency that Canadian physical therapists counsel for smoking cessation. The key factors are high self efficacy and perceived preparedness to counsel and, to a lesser extent, professional views toward smoking cessation counselling and whether other members of physical therapists’ healthcare team also counsel.

Chapter Four describes the elements of effective smoking cessation advice prescribed by health professionals in clinical settings derived from a systematic review and meta-analysis. Advice characterized as brief, intermediate or intensive is effective for helping smokers stop smoking and is advocated as a viable component congruent with physical therapy practice.

Chapter Five describes findings from an international survey that examined the scope of health promotion related to lifestyle behavior risk factors, including content and instructional methodologies, in the curricula of entry-level physical therapy programs. Overall, health promotion is viewed as an important pillar of curricula. With the exception of exercise prescription, instructional methodologies related to practical applications and clinical competencies are not well represented as health topics. Chapter Six describes current gaps at the professional, practitioner, and educational levels with respect to health promotion as a primary
healthcare intervention in physical therapy practice with specific focus on smoking and smoking cessation. We conclude that physical therapists could better align their professional values with their expertise and practices to address the health priorities of the 21st century with respect to health behavior change related to unhealthy lifestyle conditions, specifically smoking.
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<td>SDT</td>
<td>Self determination theory</td>
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<td>TPB</td>
<td>Theory of planned behavior</td>
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<td>TTM</td>
<td>Transtheoretical model of change</td>
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<td>UBC</td>
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Co-Authorship Statement

Specific chapters of this dissertation are in preparation for publication in peer-review journals. One chapter (Chapter Four) has already been published. All of these manuscripts have multiple authors. The details of authorship contributions are listed below.

Chapter 2: Co-authors Dr. Elizabeth Dean, Dr. William C. Miller and Dr. Ryan Rhodes: Dr. Dean was responsible for jointly developing the study concept with me, as well as reviewing and editing all manuscripts. Dr. Miller and Dr. Rhodes contributed to the study design and data analysis as well as reviewing the manuscript drafts.

Chapter 3: Co-authors Dr. Elizabeth Dean, Dr. William C. Miller and Dr. Ryan Rhodes: Dr. Dean was responsible for jointly developing the study concept with me, as well as reviewing and editing all manuscripts. Dr. Miller and Dr. Rhodes contributed to the study design and data analysis as well as reviewing the manuscript drafts.

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Chapter 5: Co-authors Dr. Elizabeth Dean, Dr. William C. Miller and Dr. Ryan Rhodes: Dr. Dean was responsible for jointly developing the study concept with me, as well as reviewing and editing all manuscripts. Dr. Miller and Dr. Rhodes provided guidance with respect to the data analysis, and reviewing the manuscript drafts.

With respect to these co-author contributions, I, either in collaboration with those listed above, or with guidance from my doctoral supervisor Dr. Dean and my supervisory committee, was
principally responsible for the development of the concepts and design for the research work presented in this dissertation and each chapter including data collection, analysis and preparation of the manuscripts.
CHAPTER 1. LITERATURE REVIEW AND RATIONALE

1.1 Overview

Contemporary government white papers on the health of Canadians (Kirby & LeBreton, 2002; Romanow 2002) have identified two principal gaps: one, the gap between healthcare priorities based on epidemiological indicators (i.e., lifestyle risk factors and their chronic manifestations) and the responsiveness of the healthcare delivery system; and two, the gap between the need for the promotion of healthy lifestyles by health professionals and their skills and competencies to assess such need in a client or patient and, in turn, implement tailored strategies that effect sustained health behavior change. Chronic lifestyle conditions include those with major lifestyle determinants such as cardiovascular disease, hypertension, cerebrovascular disease, smoking-related conditions including chronic obstructive pulmonary disease, (COPD), cancer, and diabetes. Much is known about the prevention, in some cases cure, as well as the management of the risk factors for these lifestyle conditions and their manifestations through lifestyle behavior change (Dean 2009a; Dean 2009b). Thus, translating and implementing this unequivocal knowledge about the association between lifestyle behaviors and health is a priority in physical therapy which is consistent with its contemporary definitions.

The degree to which the gaps described above reflect a lag in translating and implementing knowledge about health behavior change into clinical practice and correspondingly in informing the curricula of entry level education of health professionals warranted elucidation. The apparent barriers to and lack of facilitators for translating and implementing knowledge related to health behavior change by health professionals as well as in professional curricula by educators was a focus of this work.
Physical therapists are health professionals who are uniquely suited to educate people about health, thus, we focused our study on this group. Such knowledge would help establish the degree to which scientific knowledge about health behavior change is being translated and integrated into professional practice and into the entry level education of physical therapists, and how clinical competency needs to be defined to effect optimal health education outcomes.

Physical therapists constitute the fifth largest established health profession in Canada and their hallmark is the exploitation of non invasive interventions, i.e., non pharmacologic and non surgical interventions. Physical therapists are committed to patient education. A systematic approach therefore to health education that is based on unequivocal evidence could enable physical therapists to better advance the assault on lifestyle risk factors and related chronic conditions by impacting the health of every client or patient. Such a profession level initiative could help reduce the substantial social and economic burdens associated with lifestyle conditions that are currently overwhelming the healthcare system in Canada and other countries.

This thesis was conceptualized to address these issues and reduce these gaps. This introduction first describes the justification for the need for health behavior change based on the epidemiological indicators as a physical therapy clinical competency and the justification for smoking cessation counselling, in particular, as a healthcare priority. Behavior change has long been a topic of great interest in the psychology literature and subsumes several leading theories and models in which self efficacy has been a prevailing construct. Leading health behavior change theories and models are briefly introduced to provide the reader with an understanding of the prevailing thoughts on the determinants of health behavior change. We focus on health behavior change as a potential clinical competency of the contemporary physical therapist to
better meet the needs of clients and patients in the 21st century. Then, based on this background, the specific purpose of the thesis and its research questions are outlined.

1.1.1 Health and Health Promotion

Comparable to the scientific inquiry of conventional areas of physical therapy, the terms that are fundamental to this work related to health and health promotion warranted definition. The World Health Organization (WHO) defines health as more than the absence of disease but also a condition of complete physical, mental and social well-being (World Health Organization, 1947) and health promotion has been broadly described as a course of action wherein people are enabled to increase control over and improve their health (World Health Organization, 1986).

National health policy perspectives on health promotion target the external influences affecting one’s choices made in a social context that can powerfully affect the health outcomes of individuals (Gorin & Arnold, 2006). Given that an overarching focus of this dissertation is on health promotion at the level of primary care with special reference to health behavior change as part of physical therapy practice, definitions of primary care and health promotion are in order.

We adopted a definition of primary care used by the American Academy of Family Physicians (AAFP) wherein primary care refers to care provided by health professionals who are specifically trained for and skilled in comprehensive first contact and continuing care of patients (American Academy of Family Physicians, 2009). This definition of primary care includes the diagnosis and treatment of acute and chronic illnesses, health promotion, disease prevention, health maintenance, counseling, and patient education (American Academy of Family Physicians, 2009). While the physical therapist may be limited with respect to diagnosis of acute and chronic illnesses, the model of physical therapy in Canada has moved towards that of primary care wherein physical therapists are now part of teams deploying collaborative and
interdisciplinary approaches, with the physical therapist as a direct access point within the healthcare system (Ashe and Mathur, 2004).

We adopted the definition of health promotion suggested by O’Donnell (1989) who characterized health promotion as assisting people to move towards a state of optimal health by helping them make changes in their lifestyles. This entails supporting positive health practices by enabling people to change their behaviors, enhancing their awareness and create supportive health environments. The mechanisms to bring about health behavior change to address lifestyle conditions by enhancing positive health and reducing the risk of ill-health require integrating components of health education, prevention, and health protection (Downie, Tannahill & Tannahill, 1996). In this way, health promotion as we define it addresses the Canadian national health policy objectives detailed earlier (i.e., addressing the epidemiological indicators of health), and the promotion of healthy lifestyles by health professionals.

1.2 Justification for Health Behavior Change: Epidemiological Indicators

1.2.1 Global Indicators

Over the past 100 years, global mortality has shifted from being caused mainly from communicable infectious diseases to non communicable conditions that largely reflect lifestyle choices including smoking; consuming food high in fat, sugar, salt, and animal protein, and low intake of vegetables and fruit; and limited physical activity (Chopra, Galbraith & Darnton-Hill, 2002). This shift has been attributed to the economic and technological advancements associated with “westernization” (Ezzati et al., 2005). Public health improvements such as clean drinking water, sanitation, vaccines and antibiotics largely decreased the prevalence of infectious diseases in the first half of the 20th century. The success of these public health initiatives has replaced infectious disease being the leading cause of death with chronic lifestyle conditions which have
been leading causes of morbidity and mortality over the past 60 years and projected to be so throughout the 21st century (Kirby & LeBreton, 2002). An unprecedented increase in chronic lifestyle conditions has been well documented in middle- and low-income countries which are the least well resourced to treat these conditions yet alone prevent them (Yach, Hawkes, Gould & Hofman, 2004).

The lifestyle conditions are indeed leading healthcare priorities. The WHO reports that of the chronic lifestyle conditions, non-communicable diseases such as vascular disease (in particular, ischemic heart disease, hypertension and stroke), cancers, chronic obstructive pulmonary disease (COPD) and diabetes have the greatest impact on mortality (World Health Organization, 2008) and contribute substantially to the overall burden of disease globally (Murray & Lopez, 1997). Such non-communicable diseases were responsible for an estimated 35 million deaths in 2005 (World Health Organization, 2008).

Chronic lifestyle conditions have been termed “diseases of affluence” (Trowell & Burkitt, 1981; McKeown, 1988; Ezzati et al., 2005) in that they can be substantially influenced by one or more lifestyle behaviors associated with the economic development in high-income countries such as in Canada and the US. In their seminal work, Mokdad and colleagues distinguished between the leading causes of death and actual causes of death in the American population (Mokdad, Marks, Stroup & Gerberding, 2004). The actual causes of the four leading causes of death, i.e., ischemic heart disease, cerebrovascular disease, cancer, and COPD, are directly attributed to tobacco use, poor diet, physical inactivity, and alcohol consumption (in order of contribution) (Mokdad et al., 2004). The current burden of chronic lifestyle conditions reflects people’s prior exposure to their risk factors whereas the future burden depends on one’s current exposure to risk factors (Yach et al., 2004). Designated as lifestyle behavior “risk factors”, they
underpin the leading causes of death today (Fine, Philogene, Gramling, Coups, & Sinha, 2004; Mokdad et al., 2004). Given that chronic lifestyle conditions are largely preventable, a compelling case can be made for contemporary health professionals addressing health behavior change as a priority in their clients and patients.

1.2.2 North American and Western European Indicators

In 1997, the four leading causes of death in Canada were cardiovascular disease, cerebrovascular disease, cancers and COPD (Statistics Canada, 2005). With respect to cardiovascular disease, the associated independent modifiable risk factors include smoking, physical inactivity, hypertension, diabetes, being overweight, and unfavorable cholesterol profiles (Yusuf, Giles, Croft, Anda & Casper, 1998; Tanuseputro, Manuel, Leung, Nguyen & Johansen, 2003). Accrual of these risk factors further increases the risk of cardiovascular disease and stroke; conversely, mortality related to cardiovascular disease and stroke can be reduced with a reduction in the prevalence of these risk factors (Yusuf et al., 1998).

Although individual behavior risk factors are associated with the development of chronic lifestyle conditions (Tanuseputro et al., 2003; Fine et al., 2004; Klein-Geltnik, Choi & Fry, 2006), risk factors often amass in clusters within individuals. A substantial proportion of the populations in North America and parts of Europe has one or more lifestyle behavior risk factors (Patterson, Haines & Popkin, 1994; Laaksonen, Prattala & Karisto, 2001; Schuit, van Loon, Tijhuis & Ocke, 2002; Berrigan, Dodd, Troiano, Krebs-Smith & Ballad Barbash, 2003; Fine et al., 2004; Reeves & Rafferty, 2005; Klein-Geltnik, Choi & Fry, 2006).

In the US, for example, the prevalence of people between 18 and 64 years of age who report at least one adverse lifestyle behavior such as smoking, physical inactivity, risky drinking or have a body mass index (BMI) \( \geq 25 \text{ kg/m}^2 \) (associated with poor nutritional habits and
inactivity) is 32.6% (Fine et al., 2004). The population prevalence of people presenting with a combination of two and three or more of these behaviors, however, is 40.7% and 17.0% respectively; only 9.7% of those surveyed reported no such adverse lifestyle behaviors (Fine et al., 2004). In Europe, an estimated 20% of the Dutch population between 20 to 59 years of age reported that they engaged in three or more of the following: poor nutritional habits, excessive alcohol intake, smoking, and physical inactivity (Schuit et al., 2002).

In Canada, the prevalence of people engaging in multiple risky lifestyle behaviors is comparable to that reported in the US (Klein-Geltnik et al., 2006). In 2000, a population cross-sectional self-report health survey of Canadians reported that an estimated 39% of people over 11 years of age presented with multiple risk factors including some combination of smoking, physical inactivity, risky drinking, or high BMI ($\geq 25$ kg/m$^2$). Forty percent of respondents reported having at least one risk factor with only 21% reporting no risk factors (Klein-Geltnik et al., 2006).

In Canadians, the association between lifestyle practices and non communicable lifestyle conditions was first documented over thirty years ago (LaLonde, 1974). LaLonde’s report published in 1974 on ‘A New Perspective on the Health of Canadians’ classified behaviors such as smoking, poor diet, physical inactivity and excessive alcohol use and abuse, as “self-imposed risks” and “destructive lifestyle behaviors” (LaLonde,1974).

Despite the publication of these data in widely disseminated reports over the intervening years, most Canadians have one or more unhealthy lifestyle behaviors. For example, most Canadians today do not meet the minimal requirements for physical activity (Klein-Geltnik et al., 2006). Physical inactivity has been implicated in several chronic lifestyle conditions. In 1995, 35.8% of deaths in Canada were reported to be due to these conditions, namely, coronary artery
disease, stroke, type II diabetes, and breast and colon cancers (Katzmarzyk, Gledhill & Shephard, 2000). Obesity is a risk factor for some cancers, heart disease, high blood pressure, stroke and type II diabetes (Birmingham, Muller, Palepu, Spinelli & Anis, 1999) and obesity rates appear to be increasing in Canada (Tremblay 2002; Tanuseputro et al., 2003). Similarly, although smoking in Canada has been showing a downward trend in recent decades, one in five Canadians continues to smoke (Klein-Geltnik et al., 2006).

1.3 Smoking Cessation as a Healthcare Priority

Of four leading lifestyle behavior risk factors, i.e., smoking, physical inactivity, risky drinking, and high BMI (≥ 25 kg/m²), smoking is the most important with respect to its associated multisystem morbidity and mortality. Because it is the leading cause of preventable death in North America, smoking warrants special attention as a healthcare priority. Smoking is the primary risk factor for cardiovascular disease, cancer and respiratory diseases and was responsible for 22% of deaths (men and women) in Canada in 1998 (Makomaski Illing & Kaiserman, 2004) and 30% of all deaths related to cancer (Skurnik & Shoenfeld, 1998). Not only is smoking the leading cause of death in Canada, but it accounts for a large proportion of premature deaths. The expected number of deaths before the age of 70 years in a cohort of 100,000 Canadians aged 15 years and older showed over a twofold risk of dying prematurely among male smokers and nearly twofold risk of premature death among female smokers (Ellison, Morrison, de Groh & Villeneuve, 1999). In male and female smokers, smoking accounted for 56% and 48% of premature deaths, respectively, mostly from cardiovascular disease and cancer (Ellison et al., 1999).
1.3.1 Morbidity Associated with Cigarette Smoking

Smoking has multisystem effects and has been implicated in multiple chronic lifestyle conditions as described. The systemic pathological effects of smoking may be less obvious than that of COPD because of the pervasive nature of the mechanism of chronic inflammation and injury to biological tissue. The age at which a person starts smoking not only affects the incidence of eventual smoking related disease but the age at which such disease manifests. Cross-sectional self-reported data of Canadian smokers between 35 and 64 years of age who started smoking either in adolescence (i.e., between 13 and 17 years of age) or young adulthood (i.e., between 18 and 22 years of age) reported greater incidences of COPD, ischemic heart disease and rheumatoid arthritis than people who reported having never smoked (Chen, 2003). The cumulative incidence of reporting having any one of these chronic diseases was highest in people who started to smoke in adolescence, i.e., at a younger age (Chen, 2003).

Generally, smoking has direct effects on virtually all organ systems and these multisystem effects result from both active and passive smoking (Skurnik & Shoenfeld, 1998). The following sub sections briefly describe some specific smoking-related morbidity and conditions.

1.3.1.1 Pulmonary Disease

The structure and function of airways (central and peripheral), alveoli and capillaries and the immune system of the lungs are altered by smoking cigarettes (American Thoracic Society, 1996). The mechanical nature of inhaling cigarette smoke into the lungs, lends itself to the obvious pathological diseases associated with smoking, namely, chronic lung diseases such as bronchitis and emphysema (COPD), and many cancers including those affecting the respiratory tract (Skurnik & Shoenfeld, 1998).
Cigarette smoking is a principal risk factor for the development of COPD, although the precise causal mechanism mediating the development of COPD as a result of tobacco smoke is not entirely clear (American Thoracic Society, 1996). The onset and progression of loss of lung function due to smoking appears to be dose-dependent. Loss of lung function in men is linked to both the duration of smoking and the number of cigarettes smoked daily, whereas in women the pack years smoked (defined as the product of 20 cigarettes smoked a day multiplied by the number of years smoked) appears to be associated with the loss of lung function (Beck, Doyle & Schachter, 1981).

Lung cancer and cigarette smoking are causally linked with adenocarcinoma being the most common type of lung cancer in smokers (USDHHS, 2004). Further, the risk of lung cancer is directly related to the number of cigarettes smoked daily (Morabia & Wynder, 1991). For both men and women, smoking at least 40 cigarettes a day compared with 20 cigarettes a day is associated with twice the risk of lung cancer (American Thoracic Society, 1996).

1.3.1.2 Cardiovascular Disease

Cigarette smoking is an independent risk factor for hypertension and atherosclerosis and the development of vascular disease (American Thoracic Society, 1996; Tanuseputro et al., 2003) including coronary artery disease, stroke, and peripheral vascular disease (Howard et al., 1998; Kurth et al., 2003a; Kurth et al., 2003b; USDHHS, 2004).

Smoking is causally related to endothelial injury and cell dysfunction that potentiates atherosclerosis in the arteries (USDHHS, 2004). The progression of atherosclerosis appears to be accelerated in people who actively smoke as well as those who are exposed to environmental smoke (second-hand smoke). Three-year longitudinal data have shown that current smokers have the greatest rates of atherosclerosis progression (expressed as carotid artery intimal-medial
thickness) compared to past and lifelong non smokers, irrespective of exposure to environmental tobacco smoke (Howard et al., 1998). People exposed to environmental smoke also have characteristics of an increased rate of progression of atherosclerosis compared to those who have not been exposed (Howard et al., 1998; Barnoya & Glantz, 2005).

The risk of hemorrhagic stroke in both men and women increases as a result of smoking (Kurth et al., 2003a; Kurth et al., 2003b). Women who smoked fewer than 15 cigarettes a day had a higher relative risk (RR) for total hemorrhagic stroke [RR: 1.93 (95% CI: 0.70-5.02)]; higher relative risks were reported for women who smoked more than 15 cigarettes a day [RR: 3.29 (95% CI: 1.72-6.29)] (Kurth et al., 2003a). The RR for total hemorrhagic stroke was 1.65 (95%CI: 0.61-4.50) for men who smoked less than 20 cigarettes a day and 2.36 (95% CI: 1.38-4.02) in men who smoked more than 20 cigarettes a day (Kurth et al., 2003b). In both studies, there appeared to be a direct relationship between the RR of hemorrhagic stroke and the number of cigarettes smoked.

1.3.1.3 Endocrine Conditions

Smoking has recently been reported to be an independent risk factor for type II diabetes (Willi, Bodenmann, Ghali, Faris & Cornuz, 2007). An extensive meta-analysis has shown that active smokers are at a 44% increased risk for type II diabetes (Willi et al., 2007). This association appears to be dose-dependent, with heavy smokers (≥20 cigarettes per day) at a 61 % increased risk. Causality was not established in this study, nonetheless, the results provide an additional compelling reason for supporting smoking cessation in patients, given that type II diabetes is a serious multisystem condition which increases one’s risk directly and indirectly of other lifestyle conditions such as cardiovascular disease and premature death (Mazzoni, Chait & Plutzky, 2008).
1.3.1.4 Musculoskeletal Conditions

Smoking tobacco is associated with untoward musculoskeletal consequences such as bone fracture and impaired wound healing, compromised bone mineral density, negative effects on the health of the lumbar disks, and possibly is associated with an increased risk of sustained hip or forearm fractures (Porter & Hanley, 2001).

The vasoconstrictive effects of smoking, mediated through nicotine or other chemicals, reduce cutaneous blood flow which can reduce the quality and rate of wound healing due to tissue hypoxia (Leow & Maibach, 1998). These vasoconstrictive effects of smoking may have a role in the association between smoking and developing long-term musculoskeletal disability such as meniscal injuries (Lincoln, Smith, Amoroso & Bell, 2003).

Further evidence in the form of a meta-analytic review of the epidemiological literature relating the effects of smoking on bone mass in men and women supports that smoking is an independent risk factor for reduced bone mass and fractures related to osteoporosis at the hip, forearm and lumbar spine (Ward & Klesges, 2001). Smoking is related to an increased rate of bone loss independent of body weight and this phenomenon appears to be dose-dependent; men appear to be more adversely affected than women with respect to prediction of fracture risks at the hip and spine (Ward & Klesges, 2001). Lifetime risks for hip fractures increased by 31% in women and 40% in men who smoke whereas fractures of the vertebrae increased by 13% and 32% in women and men, respectively (Ward & Klesges, 2001).

These musculoskeletal conditions are among those reasons why a person is treated by a physical therapist. Smoking cessation needs to be a primary clinical goal irrespective of whether a client’s smoking was the primary contributing factor or not.
1.3.2 Tobacco Related Mortality

1.3.2.1 Global Mortality

Cigarette smoking increases the risk of all-cause mortality independent of country of residence or the type of cigarette smoked in an apparently dose-dependent manner (Jacobs et al., 1999). Smokers in a seven-country study who smoked 30 cigarettes or more a day showed a 21% increase in 25-year death rates over non smokers (Jacobs et al., 1999). Smoking as few as 1 to 4 cigarettes a day increases the RR of dying prematurely from any cause and from ischemic heart disease in particular (Bjartveit & Tverdal, 2005).

Estimates of global mortality due to smoking for the year 2000 approximated 4.83 million (range: 3.94-5.93 million); cardiovascular disease was the most universal smoking-related cause of death (Ezzati & Lopez, 2003). Approximately half of these 4.83 million deaths occurred in high-income countries and the other half in middle- and low-income countries (Ezzati & Lopez, 2003). In addition, of these 4.83 million deaths, 2.69 million were reported to occur between 30 and 69 years of age and mostly in middle- and low-income countries (Ezzati & Lopez, 2003).

The number of tobacco-related deaths predicted between 1990 and 2020 is expected to increase from 3 million to 8.4 million with mortality projections in developed regions increasing from 1.6 million to 2.4 million (Murray & Lopez, 1997). By 2020, smoking has been predicted to be the cause of “more deaths than any single disease worldwide” (Murray & Lopez, 1997).

The aging demographic shift being observed nationally and worldwide brings with it serious health challenges including tobacco-related disability and mortality. This phenomenon has been described by some authorities as the single most important factor impacting global health for the foreseeable future (Murray & Lopez, 1997).
1.3.2.2 North American Mortality

Between 1995 and 1999 in the US, mortality due to smoking was estimated to be 440,000 each year (Centers for Disease Control and Prevention, 2002a). Similar estimates for the causes of death (435,000) due to smoking for the year 2000 were reported by Mokdad and colleagues (Mokdad et al., 2004). Canadian estimates for mortality related to tobacco use range from approximately 35,000 (translating to over 194,000 hospital admissions) (Single, Rehm, Robson & Truong, 2000) to over 47,500 each year (Makomaski Illing & Kaiserman, 2004).

The most recent Canadian mortality estimates directly related to smoking in 2002 was approximately 37,200; this amounted to 16.6% of all deaths in Canada that year (Rehm et al., 2006). Of the deaths caused by or related to tobacco use, approximately 47.5% were from cancer, 29.2% from cardiovascular disease, and 22.2% from respiratory disease (Rehm et al., 2006). Additionally, it was estimated that tobacco use was responsible for over 515,000 years of potential life lost and over 2.2 million days in hospital (Rehm et al., 2006).

1.3.3 Smoking Prevalence

1.3.3.1 Global Prevalence

Jha and colleagues estimated age and sex-specific prevalence of smoking based on the World Bank population statistics for 1995. In this analysis, an estimated 29% of the world’s population aged 15 years and older were smokers, representing approximately 1.1 billion people (Jha, Ranson, Nguyen & Yach, 2002). With respect to age, the highest prevalence of smoking was in people between 30 and 39 years of age (34%), and between 40 and 49 years of age (34%). The majority of the world’s smokers (82%) resided in low- and middle-income countries; in China alone, it was estimated that there were 429 million smokers (Jha et al., 2002). With respect
to the sex of the smokers, there were more male smokers worldwide (913 million) than there were female smokers (209 million) (Jha et al., 2002).

1.3.3.2 North American Prevalence

Based on the most recent nationally representative surveys, the prevalence of smokers in Canada aged 12 years and older (including occasional and daily smokers) was 23.6% in 2000 (Klein-Geltnik et al., 2006). The highest prevalence of smoking was in the age groups of 20-34 years (men: 29.6%; women: 22.7%) and 35-49 years (men: 29.4%; women: 24.5%) (Klein-Geltnik et al., 2006).

In 2000, the smoking prevalence in the US was 23.3% in people 18 years and older (Centers for Disease Control and Prevention, 2002). Male smokers (25.7%) outnumbered female smokers (21.0%); the highest prevalence of smoking was between the ages of 18-44 years (Centers for Disease Control and Prevention, 2002). Recent estimates for 2005 show that smoking prevalence was 20.9% in American adults (45.1 million) with 80.8% of these classified as daily smokers. Male smokers again outnumbered female smokers with prevalences of 23.9% and 18.1%, respectively (Centers for Disease Control and Prevention, 2006). Smoking prevalence in American adults did not decrease from 2004 to 2005. This finding supports that the trend toward a decline in smoking may be stalling at least in the US (Centers for Disease Control and Prevention, 2006).

1.3.4 Nicotine: Pharmacodynamics and Addiction

Nicotine is a significant component in tobacco smoke because of its causal relationship to smoking addiction. Nicotine is liberated from tobacco by the process of combustion, and carried to the level of the alveoli via tar droplets (Benowitz, 1988; Zevin, Gourlay & Benowitz, 1998). Physiologic buffering of nicotine allows for rapid absorption from the level of the alveoli to the
level of the blood (Zevin et al., 1998) and can enter the bloodstream and cross the blood-brain barrier within 10-20 seconds after inhalation (Benowitz, 1988). The mediation of nicotine levels in the blood is partially in control of the smoker. Smokers have some level of control over the amount of nicotine released into the bloodstream; this is mediated by the number of ‘puffs’ taken from a cigarette, but also the depth by which the tobacco aerosol is drawn from the cigarette (Benowitz, 1988). Nicotine is an addictive drug and the process leading to addiction to nicotine via the mechanics of smoking tobacco is rooted in a complex interplay of factors such as personality, social settings, learned or conditioned factors and pharmacology (Benowitz, 1997).

The pharmacodynamics of nicotine are such that it binds with acetylcholine receptors in the brain, neuromuscular junctions, adrenal medulla and autonomic ganglia (Benowitz, 1988). This is relevant; there is some speculation that nicotine acts to reinforce the release of specific neurotransmitters, and this reinforcement gives rise to some of the rewarding effects of smoking. For example, nicotine complements the release of dopamine and norepinephrine which are associated with appetite suppression and pleasure, acetylcholine which is associated with memory and behavioral tasks, and ß-endorphins which are associated with reduction in anxiety and tension (Zevin et al., 1998).

Smokers who quit smoking often experience withdrawal symptoms that include anxiety, difficulty concentrating, hunger, irritability, and restlessness (Hughes et al., 1992). Although many of these symptoms fade with time, their presence and level of severity create a proclivity to return to smoking.

1.3.5 Smoking Dependence, Cessation and Relapse

Cigarette smoking must also be understood from the perspective that it begins as a personal choice and then mediated by cultural and social factors (Henningfield, Schuh & Jarvik,
Smoking behavior persists in large part due to nicotine exposure and consequent dependence on nicotine exposure to meet the chemical needs of the body (Henningfield et al., 1995). Regular smoking can be viewed as a means of self-medication controlled by the smoker to satisfy a chemical dependency, but also influenced by social, cultural and environmental factors.

The development of a smoking habit or ‘career’ has been described as a process of smoking initiation and cessation cycles; smokers who continue with the habit may enter into oscillating periods of ambivalence (content with smoking habit) and cessation (ready to quit) (Prignot, 2000). It is during the cessation period wherein the smoker may enter several cycles of quitting smoking and relapsing; some continue to smoke until end-of-life morbidity imposes an aversion to smoking, or death ensues (Prignot, 2000).

1.3.6 Social Costs of Smoking

The economic costs of smoking can be categorized as direct and indirect costs (Single, Robson, Rehm & Rehm, 1998; Rehm et al., 2006). Directly, tobacco use accounted for over 208,000 hospitalizations and over three million hospitalization days in Canada in 1992 (Single et al., 1998). In that year, direct healthcare costs associated with tobacco were estimated to be over $2.6 billion (Cdn). Most of this cost ($1.75 billion) was attributed to the hospital-based treatment of tobacco-related disorders; a further $796 million accounted for physician costs and prescription drugs (Single et al., 1998). When indirect costs were calculated (productivity losses due to morbidity, mortality and crime), the cost of tobacco use rose to over $9.5 billion (Single et al., 1998).

In 2002, a cost-of-illness study of substance abuse in Canada characterized the ‘aggregate costs’ of tobacco use. Aggregate costs were calculated as the difference between a hypothetical
situation wherein no substance abuse exists and the estimated external costs of tobacco use (Rehm et al., 2006). Over $4.36 billion in direct healthcare costs were associated with tobacco use, with another $87 million attributed to smoking-related fire damage (Rehm et al., 2006). When productivity losses were calculated, the total cost of tobacco use rose to almost $17 billion (Rehm et al., 2006). As a proportion of the total cost of substance abuse (including those of alcohol and illicit drugs), tobacco accounted for over 42%.

1.4 Health Benefits of Smoking Cessation

Regardless of age or sex, current smokers have higher all-cause mortality than non-smokers (Taylor, Hasselblad, Henley, Thun & Sloan, 2002). One of the predominant benefits of quitting smoking is an increase in life expectancy compared with reduced life expectancy as a result of continuing smoking. Quitting smoking before reaching 50 years of age decreases the risk of dying by 50% over the next 15 years compared to people who continue to smoke (USDHHS, 1990). For example, men who quit smoking by 35 years of age have a life expectancy that is 6.9 years longer than if they continued smoking. For women, this added life expectancy is 6.1 years if they quit smoking by 35 years of age (Taylor et al., 2002).

Smoking abstinence for one year reduces the risk of coronary heart disease by about one half; continued abstinence for 15 years decreases the risk of coronary heart disease to the level similar to that of people who have never smoked (USDHHS, 1990). The risk of lung cancer is also reduced when a person quits smoking (USDHHS, 1990; Peto et al., 2000); there is a 30 to 50% decreased risk of developing lung cancer in people who have quit smoking compared with those who continue to smoke (USDHHS, 1990).
1.5 Health Behavior Change Theories and Related Models

Given the existing epidemiological evidence for countries with a high prevalence of lifestyle behavior risk factors including smoking, as well as increasing prevalence of chronic lifestyle conditions, it is reasonable that these conditions be priorities for health professionals.

Primary care provides an opportunity to address not only presenting medical conditions but also health behavior change that may have, in part, contributed to or influenced the presenting condition. In primary care, one-to-one interaction between patient and health professional often constitutes the context for effecting health behavior change. Primary care can provide health professionals with a ‘captive audience’ and opportunities for discussions pertaining to health behavior change in the form of ‘teachable moments’.

The conventional model for medical treatment at the level of primary care (including physical therapy interventions) however is the biomedical model that is impairment- and illness-focused (Li & Yoshida, 1998; Wade & Halligan, 2004). Conversely, the International Classification of Functioning, Disability and Health (ICF) describes the complex relationship between a patient’s health condition and contextual factors (environmental and personal factors) (World Health Organization, 2001). Wade and Halligan contend that the biomedical model cannot account for all forms of illness and critique the model’s assumptions, namely, that disease is characterized as the singular cause of illness, and that removal of the pathological threat will restore the individual back to health (Wade & Halligan, 2004). In this way, the biomedical model may be limited in that it may not address health behaviors and lifestyle risk factors underpinning the diseases of lifestyle that may be the cause of, compound, or exacerbate a presenting primary medical condition.
The psychobiological adaptation model (PBAM) on the other hand acknowledges psychological and psychosocial factors as well as biological and pathological factors at the level of treatment. The PBAM was the first model in physical therapy that integrated behavioral factors into care and the need to address these in patient education, and functions by addressing the treatment outcomes of the patient as a function of patient-therapy interaction (Dean, 1985). Treatment outcome was described as being dependent upon the interaction between the psychobiological factors of the patient and the clinical factors associated with the health provider. Primary psychobiological factors of the patient included psychological, pathological, anatomical and physiological with secondary factors characterized as sociological, stress management, lifestyle, and occupational or environmental. Therapeutic interventions, modalities, patient education and prevention characterized clinical factors related to the health professional. This type of approach is conducive to incorporating lifestyle health behavior change interventions.

Enabling people to initiate and achieve positive health behavior change through value changes, self efficacy and health behaviors is more challenging than simply providing health knowledge (Bandura, 2004). Human behavior reflects complex interactions among several factors including the environment, social factors, beliefs, psychological and physiological factors. Health behavior change interventions used by health professionals to elicit positive health outcomes are often based on behavior change theories and models rooted in the social cognitive domain. For effective health behavior change, the health professional needs to have a solid foundation in health behavior change theory (Martin & Fell, 1999). No single social cognitive model or theory to date has fully accounted for the variability in human behavior (Glanz, Rimer, & Lewis, 2001; Baranowski, Cullen, Nicklas, Thompson & Baranowski, 2003);
therefore, since social cognitive theories form the bases of many health behavior change interventions, a brief summary of these theories and model(s) is presented.

Social cognitive theories posit that a person adopts a change in (health) behavior based on that individual’s reason(s) for making that change which may include factors such as knowledge, belief, motivation, drive, attitude and self efficacy (Whitehead, 2001). Interventions for health behavior change focus on the mediating variables within these constructs. Within this framework, manipulating these mediating variables is thought to produce the desired outcome with respect to behavior change (Baranowski et al., 2003).

Three contemporary health behavior change theories and one model proposed to effect health behavior change will be described. The theories are social cognitive theory, theory of planned behavior and self-determination theory. The transtheoretical model of change is a popular framework addressing behavior change across multiple health behaviors (Prochaska et al., 1994).

### 1.5.1 Social Cognitive Theory

Social cognitive theory (SCT) states that determinants such as behavior, personal factors and environmental influences interact in a dynamic and reciprocal manner to effect behavior (Baranowski, Perry & Parcel, 2001). This is to say that these behavioral, personal and environmental determinants each influence each other simultaneously (Bandura, 1997).

Social cognitive theory states that cognitive processes such as self regulation and encoding of information are critical for a person’s capability to acquire and retain new behavior patterns (Bandura, 1997; Pajares, 2002). Cognitive processing and performance-based results are related to human behavior change (Bandura, 1977). People cognitively process the outcomes of a behavioral action via direct experience, or vicarious or symbolic observation. However, simply
performing a desired behavior may successfully reinforce that desired behavior. Bandura postulated that cognition and experience were reconcilable in that changes in behavior are mediated by cognitive processes, but experiences of mastery over behaviors that occur as a consequence of effective performances of such behaviors in turn induce and alter cognitive events (Bandura, 1977).

The constructs of SCT that operate as regulators and motivators for behavioral skills include the environment, situation, behavioral capability, expectations, expectancies, self-control, observational learning, reinforcements, self efficacy, emotional coping strategies, and reciprocal determinism (Bandura, 1997; Baranowski et al., 2001).

Of these constructs, the predominant construct emerging out of SCT for predicting and influencing health behavior change is self efficacy. Self efficacy has influenced varying components of health behaviors in smoking, physical exercise, and nutrition and weight control (Schwarzer & Fuchs, 1995; Allen, 2004), and recently in promoting exercise in individuals with diabetes (Allen, 2004).

Bandura purported that individuals direct their lives based on their beliefs of personal efficacy (Bandura, 1997). He defined personal self efficacy as a person’s assessment of their capacity to both organize and carry out courses of action necessary to achieve specific performances (Bandura, 1986). This perceived self efficacy depends on the perception of what a person can do with their skills, and not necessarily with the skills that one possesses (Bandura, 1986). Expectations of personal efficacy stem from performance accomplishments, vicarious experience (seeing others successfully cope with threats), verbal persuasion (a person is verbally encouraged that they can cope) and emotional arousal (Bandura, 1977).
Bandura differentiated between what he termed “efficacy expectations” (characterized as a conviction that an individual can successfully engage in a specific behavior) and “outcome expectations” (an estimation that a specific behavior will result in certain outcomes) (Bandura 1977; Bandura, Adams & Beyer, 1977). In other words, a person’s belief that a specific course of action will influence a desired outcome does not necessarily guarantee that the desired outcome will occur if that individual does not believe they are able to carry out that course of action (efficacy beliefs) (Bandura, 1977; Bandura et al., 1977).

Theoretically then, the stronger an individual’s perceived self efficacy, the greater the active efforts to engage in a behavior. Desired outcomes are a function of efficacy expectations, component capabilities and incentives (Bandura, 1977). Because SCT addresses the comprehensive dynamics of individual behavior and presents direction for the design of intervention strategies, it is an attractive model for health education and health behavior programs (Baranowski et al., 2001).

1.5.2 Theory of Planned Behavior

The theory of planned behavior (TPB) proposes that behavioral intention is the key antecedent for the likelihood of performing a specific behavior (Ajzen, 1991). Ajzen hypothesized that behavioral intentions reflect motivational factors that have a bearing on a behavior, and indicate both the degree of willingness to try the behavior, and the amount of effort in executing the behavior (Ajzen, 1991). The stronger the intention to perform or change a behavior, the greater the likelihood the behavior will occur.

The cognitive structure and theoretical underpinnings of the TPB are the independent constructs of attitude, perceived subjective normative perceptions and perceived behavior control (Armitage & Connor, 2001; Glanz et al., 2001). Attitude towards a certain behavior is
characterized as a negative or positive appraisal of engaging in a specific behavior, and perceived social subjective norm characterizes one’s perceptions of the social expectations of engaging in a specific behavior (Godin & Kok, 1996). Perceived behavioral control is defined as the perception or belief of the ease with which an individual can perform a specific behavior (Ajzen, 1991; Godin & Kok, 1996) and is associated with Bandura’s self efficacy construct (Ajzen, 1991). Perceived behavior control influences behavioral intention as well as the actual behavior (Ajzen, 1991).

A possible limitation of the TPB to explain behavior is that attitude, social norms and perceived control constructs will vary in their importance to the contribution to the intention construct for different behaviors and situations (Ajzen 1991; Blue, Wilbur & Marston-Scott, 2001). On one hand this makes it more difficult to generalize an intervention based on the TPB, but on the other it allows for greater precision with respect to targeted variables within the construct that mediate a specific intention or behavior within a specified population or individual.

### 1.5.3 Self-Determination Theory

Motivation to change, participate in and/or maintain a specified behavior is an integral component of self-determination theory (SDT). The SDT describes behavior change as a transition from ‘amotivation’ (an unmotivated state) to a fully integrated state (intrinsically motivated). SDT proposes that behaviors may be completely autonomous, reflecting personal importance, or behaviors may be controlled, carried out because of external pressures (conformity) or internal pressures (e.g. driven by feelings of guilt) (Baranowski et al., 2003). Proponents of SDT adhere to the organismic theory of human behavior (Deci & Ryan, 1985; Ryan & Deci, 2000; Sheldon, Williams & Joiner, 2003). Organismic theory describes life as an
active (not reactive) integrative embrace of challenges, characterized by utilizing creative
solutions in active response to those challenges (Sheldon et al., 2003). The degree to which
individuals are engaged or disengaged in life activities or behaviors is dependent upon social
influences that play a part in personal development and function (Ryan & Deci, 2000). It is
within this context that the SDT attempts to explain human motivation and personality (Ryan &
Deci, 2000).

Intrinsic motivation is the core construct of the SDT. Intrinsic motivation is
conceptualized as an inherent propensity and a self-organized state wherein the individual,
utilizing the experience of choice, engages with environmental challenges to expand his/her
capacities for exploration and learning (Deci & Ryan, 1985; Ryan & Deci, 2000; Sheldon et al.,
2003). The assumption is that this type of behavior is “automatically self-integrated” which
allows the person to utilize their creative and cognitive properties (Sheldon et al., 2003).

Some behaviors are externally motivated, however. People engage in behaviors, for example, that are part of their responsibilities. The acquisition of these externally regulated behaviors begins with the process of internalization whereby externally motivated behavior is transformed into a personal value (Deci & Ryan, 1985). At this point the behavior would, in essence, become autonomous and intrinsically motivated. However, behavioral regulation of extrinsically motivated behaviors rests on a continuum of behavioral regulation where extrinsically motivated behaviors exist between states of ‘amotivation’ (no motivation) to intrinsic motivation.

Applications of the SDT to augment health behavior change focus on presenting patients
with autonomy-supportive environments (Biddle, Soos & Chatzisarantis, 1999). Such
environments include supporting patient initiatives, understanding patient perspectives, offering
choice of treatments and encouraging/answering the patient’s questions (Sheldon et al., 2003; Williams et al., 2002). The SDT is thus amenable for integration into the practices of health professions like physical therapy where therapeutic management is often characterized by health education.

1.5.4 Transtheoretical Model of Change

One of the most popular and widely used behavior change models for health promotion/disease prevention for over 25 years is the transtheoretical model of change (TTM) (Prochaska & DiClementi, 1982; Bunton, Baldwin, Flynn & Whitelaw, 2000). The model’s origins are in psychotherapy and behavior change theories (Prochaska & Velicer, 1997). The TTM draws upon elements from social cognitive, motivational and relapse prevention theories (Morera et al., 1998). Originally derived from smoking cessation research, the TTM is unique in the sense that it hypothesizes the ‘how’ of a person as opposed to the ‘why’ of behavior change (Adams & White, 2003).

The TTM incorporates a stage-based model of change (Morera et al., 1998) and proposes that health behavior change occurs in individuals in sequential progression through six core stage constructs characterized as: pre-contemplation (not intending to take action in the near future), contemplation (intention to change within 6 months), preparation (intention to take action within a month), action (modifications made to lifestyle in past 6 months), maintenance (relapse prevention) and termination (no return to unhealthy habit) (Prochaska & Velicer, 1997).

These stages of change are underpinned by 10 processes of change described as covert and overt activities to help facilitate this process. These processes were ordered into two factors which can be emphasized more in some stages than in others. For example, experiential processes are found mostly in pre-contemplation and contemplation stages and include:
consciousness raising, dramatic relief, self-reevaluation, environmental reevaluation). Behavioral processes are linked primarily with action and maintenance stages and consist of contingency management, helping relationship, counterconditioning, stimulus control) (Prochaska & DiClemente, 1982; Prochaska, Velicer, DiClemente & Fava, 1988; Prochaska & Velicer, 1997).

Other constructs of the TTM include decisional balance which was based on the work of (Janis 1977) in which the individual weighs the pros and cons of changing the behavior, and self efficacy (Bandura, 1977; Prochaska & Velicer, 1997). Armitage refers to decisional balance and self efficacy as ‘predictors of change’ because it is through decisional balance and self efficacy that the processes of change are resolved (Armitage, Sheeran, Conner & Arden, 2004).

The strength of the TTM is its ability to rapidly categorize individuals into a specific stage of change (Rollnick, Heather, Gold & Hall, 1992). Stage of change allocation allows the health professional to proceed with an intervention that is tailored to a person’s stage of change. A tailored intervention matches the intervention to the defined stage. Interventions constructed to help an individual progress from one stage to the next will target the constructs upon which the TTM is based. The assumption that the processes of change construct within the TTM can be applied to a broad range of behaviors (Prochaska & Velicer, 1997) has been supported in a cross-sectional retrospective analysis decisional balance in 12 problem behaviors (Prochaska et al., 1994).

1.6 The Role of Health Professionals in Health Behavior Change with Special Reference to Physical Therapists’ Practice

There is compelling epidemiological evidence to support that health professionals including physical therapists need to be engaged in addressing lifestyle behavior risk factors that predispose their clients and patients to a range of chronic lifestyle conditions and premature
mortality. These risk factors and manifestations can complicate the presentation of other conditions being treated and alter the response to intervention and predicted recovery. There appears to be a major disconnect however between the knowledge of a health professional about the link between lifestyle behavior risk factors and chronic lifestyle conditions, and their practice priorities given this evidence (Mirand, 2003).

Smoking, as an example, is a highly injurious health behavior that is the leading cause of preventable death. There is unequivocal epidemiological evidence that smoking is causally related to multisystem morbidity and implicated in several chronic lifestyle conditions. On the strength of this evidence, several health professional associations have acknowledged smoking cessation as an important health service. In Canada, these associations include the Canadian Association of Occupational Therapists, Canadian Association of Social Workers, Canadian Dental Association, Canadian Medical Association, Canadian Nurses Association, Canadian Pharmacists Association, Canadian Physiotherapy Association, Canadian Psychological Association, Canadian Society of Respiratory Therapists (Canadian Pharmacists Association, 2001). Despite such professional commitment, however, smoking cessation interventions such as smoking cessation counseling appear not to be consistently applied when smokers present themselves at the level of primary care (Livaudais et al., 2005).

Primary care health providers, in particular physicians, often shoulder the responsibility of addressing both immediate health problems of the patient and preventive care (Yarnall, Pollak, Ostbye, Krause & Michener, 2003). This leaves little time for the administration of other preventive and health promotion services. Time to implement recommended preventive services may be viewed as too demanding to integrate within the scope of primary care (Yarnall, Pollak, Ostbye, Krause & Michener, 2003). Hudon and colleagues interviewed 35 Canadian physicians
and reported that they appeared to “cave in” under the pressure of needing to attend to impairment and illness with relative neglect of health promotion (Hudon, Beaulieu & Roberge, 2004).

The increasing prevalence of lifestyle behavior risk factors combined with time constraints within primary care necessitates a collective effort by health professionals including physical therapists to address health behavior change. Physical therapists remain uniquely positioned to address lifestyle behavior change in their clients and patients given their practice patterns (relatively prolonged visits over prolonged periods with opportunity for follow up), thus, are poised to be both adjuncts and leaders in a collaborative and complementary approach with other health professionals for the delivery of preventive services and health promotion (Yarnall, Pollak, Ostbye, Krause & Michener, 2003).

1.7 Purpose and Research Questions

The general purpose of this thesis was to examine elements in the professional practice of physical therapy that could help align healthcare priorities, namely, control of lifestyle risk factors, with professional practice and education, and potentially research directions.

To examine the degree to which health behavior change is viewed as a clinical competency by practicing physical therapists and physical therapy entry level academic programs particularly with reference to smoking cessation, the research questions were:

1. What is the level of knowledge of physical therapists with respect to health effects of smoking, their views about their roles in addressing smoking cessation with their patients, their perceived barriers to and facilitators of smoking cessation counseling including self efficacy (Chapter 2)
2. Based on the findings of Chapter 2, can a model be constructed that predicts those factors associated with how often physical therapists counsel their patients for smoking cessation? (Chapter 3)

3. How effective is advice for smoking cessation by a health professional in effecting quitting in a patient (Chapter 4)

4. What are the components of advice that would be amenable to being incorporated into physical therapy practice (Chapter 4)

5. To what extent do entry level physical therapy academic programs include health promotion in their curricula, specifically, what topics (including smoking cessation), hours of instruction, and instructional formats, i.e., theory, practical and clinical (Chapter 5)

6. Can recommendations be made about integrating health behavior change as a physical therapy clinical competency (Chapter 5)

The findings of this work could augment our understanding of the knowledge, views and practices of physical therapists with respect to health behavior change and smoking cessation in particular. Further, our findings may help inform how health education could be incorporated into physical therapy care, e.g., the systematic use of advice. In turn, such understanding could help align both physical therapy practice and professional education with the health priorities of the 21st century with respect to health behavior change to help prevent lifestyle conditions, in some cases cure them, as well as manage them. Finally, this work will direct future research and potentially professional policy related to health behavior change as a clinical competency in contemporary physical therapy practice.
1.8 References


Statistics Canada (2005). *Selected leading causes of death, by sex.* Retrieved from [http://www40.statcan.ca/l01/cst01/health36.htm](http://www40.statcan.ca/l01/cst01/health36.htm)


CHAPTER 2. SMOKING CESSATION AND COUNSELLING: KNOWLEDGE, VIEWS AND PRACTICES OF CANADIAN PHYSICAL THERAPISTS

2.1 Introduction

In Canada, approximately 88% of smokers visited a health professional in 2005 (Centers for Disease Control, 2007). Given this large proportion, primary care is an ideal setting whereby tobacco use can be addressed in smokers. Based on several lines of support, a compelling argument can be made for physical therapists providing smoking cessation counselling, (i.e., either initiating or supporting), for their clients and patients who smoke.

First, contemporary physical therapy is committed to health as opposed to the strictly the remediation of conditions and pathologies. The World Confederation for Physical Therapy, of which the Canadian Physiotherapy Association (CPA) is a member, has adopted the International Classification of Functioning, Disability and Health as a practice framework. This framework focuses on health and well being (World Health Organization, 2001).

Second, physical therapy is the quintessential established non invasive health care profession that exploits non invasive interventions, (i.e., non drug and non surgical interventions), to effect health and well being as well as remediate injury, illness and disease, specifically, education and exercise (Dean, 2009a; Dean, 2009b).

Third, smoking is the leading cause of preventable death, and contributes to multisystem morbidity (Mokdad, Marks, Stroup & Gerberding, 2004; USDHHS, 2004). Physical therapy outcomes can be seriously impaired in people who smoke either by the direct effects of smoking on organ systems (Howard et al., 1998; Skurnik & Shoenfeld, 1998; USDHHS, 2004) as well as
vasoconstrictive and hypoxic effects of nicotine leading to impaired perfusion, and delayed tissue healing and repair (Leow & Maibach, 1998). Further, smoking can lead to musculoskeletal impairments such as reduced bone mass, greater risk of forearm or hip fractures, and dysfunction of intervertebral disks (Hopper & Seeman, 1994; Porter & Hanley, 2001; Ward & Klesges, 2001).

Fourth, the CPA is officially committed to and endorses smoking cessation (Canadian Physiotherapy Association, 2008). In 2001, the CPA in partnership with several health professional associations acknowledged that smoking cessation “is one of the most important services a health care provider can offer” (Canadian Physiotherapy Association, 2008).

And, fifth, physical therapists constitute the fifth largest group of health professionals in Canada (Canadian Physiotherapy Association, 2004), thus they have the opportunity to impact people’s health as well as address their impairments. Physical therapists have practice patterns that are characterized by multiple visits over prolonged periods of time (Balfour, 1993; Fruth, Ryan & Gahimer, 1998; Lorish & Gale, 1999; Guilmette, Motta, Shadel, Mukland & Niaura, 2001). To effect health behavior change, such a practice pattern can facilitate successful cessation outcomes due to frequent contact, development of trust and support, as well as follow-up.

There are substantial social and economic burdens associated with smoking (Rehm et al., 2006; Single, Robson, Rehm & Rehm, 1998). By reducing the number of people who smoke, physical therapists can contribute directly to reducing these burdens on society, by both reducing active smoking in the smoker and passive smoking by the smoker’s family and others in his or her environment.

Unlike a few other health professions, relatively little is known about the views and practice characteristics of physical therapists with respect to addressing smoking cessation with
their patients, specifically smoking cessation counselling (Albert et al., 2005; Ashley, Brewster, & Victor, 2006; Hudmon, Prokhorov & Corelli, 2006; Laitakari, Miilunapalo & Vuori, 1997; Rea, Marshak, Neish & Davis, 2004). Social cognitive components, for example, such as views, barriers and facilitators to administering smoking cessation interventions, and constructs such as the self efficacy of physical therapists regarding their role in addressing smoking cessation with their patients are important to understand if physical therapists are to effectively incorporate smoking cessation counselling into their practices. Physical therapists may be under using opportunities to impact the health of Canadians through health behavior change including smoking cessation.

The purpose of this exploratory study was to examine the knowledge of Canadian physical therapists about the health effects of smoking and their reported practical knowledge to counsel for smoking cessation, their views and their self efficacy regarding their role in effecting smoking cessation in their patients who smoke, and their practices with respect to smoking cessation counselling. Such knowledge will help identify means of enabling physical therapists to align their practices with the contemporary mandate and vision of their professional associations.

2.2 Methods

2.2.1 Study Design and Survey Population

A cross-sectional survey study of a population of physical therapists living in Canada who are licensed by a provincial college was conducted.

There are ten provincial colleges in Canada. The registrar of each provincial college was contacted with a formal letter requesting the release of business contact information of licensed physical therapists. Of the ten provincial colleges contacted, six supplied full or partial lists of
contact information and two additional lists were obtained from the websites of each of these provincial colleges. Contact lists were not obtained from two provinces (Newfoundland and Prince Edward Island) despite repeated requests. We did not receive responses from the Yukon and Nunavut territories, thus, physical therapists residing in these territories could not be included in the study. The collection and collation of the included lists were completed in October 2008.

The lists provided by provincial colleges of physical therapy were collapsed, forming the sampling frame for the study. The lists from British Columbia, Saskatchewan, Manitoba, Ontario, Nova Scotia and New Brunswick were 100% complete. Some physical therapists declined to release their contact information for survey purposes, thus, the lists from Alberta and Quebec were incomplete. The list from Alberta included 98.3% of licensed physical therapists while the list from Quebec contained 63.3% of their licensed members. A total of 14,268 physical therapists constituted the sampling frame which, at the time of the survey, was calculated to represent approximately 85.2% of licensed physical therapists in Canada (Canadian Institute for Health Information, 2008).

2.2.2 Sampling Procedure

We used simple random sampling without replacement to derive a representative sample. A Microsoft Excel random number generator program was used to derive the sample. Randomization procedures were as follows: a list of names and contact addresses were received from each participating provincial college, after which each list of provincial college names was entered into a Microsoft Excel™ spreadsheet in the order that they were received. The names on these lists were given their own numerical code. These numbers were then entered into the Excel
program and randomized. The first 1000 numbers of this randomized list and their associated names constituted the sample.

2.2.3 Sample Size

The sample size for this study was calculated based on variance estimates of expected proportions of physical therapists who counselled for smoking cessation since this proportion was a key variable of interest in this study (Groves et al., 2004; Henry, 1990). Such proportions however were unavailable in the literature at the time of the study. Therefore the sample size was calculated from the estimates of variance using the proportions reported for other health professionals who counselled for smoking cessation (Hudmon et al., 2006; Neil-Urban, LaSala & Scott, 2001; Sarna et al., 2000). Based on this, a proportion of 45% was adopted, i.e., we estimated that 45% of physical therapists counselled for smoking cessation. The variance ($s^2$) based on this proportion was estimated to be 0.247 (probability value of $p=0.45$) where $s^2 = p(1-p)$ (Groves et al., 2004; Henry, 1990). Tolerable error was set at 5% (0.05) using a t-score of 1.96 indicating that our sample size was calculated to reflect a 95% level of confidence that the resultant proportion estimates would be within ± 5% of the true proportion (Henry, 1990).

There was an estimated 16,434 licensed physical therapists in the ten provinces and one territory of Canada in 2007 (Canadian Institute for Health Information, 2008). Between 2001 and 2007, there was an average annual net increase of 327 licensed physical therapists in Canada (Canadian Institute for Health Information, 2008). Based on this trend, the population of licensed physical therapists in Canada was estimated to be 16,751 for 2008. Using this finite population estimate, confidence level and tolerable error, a sample size of $n=372$ was required for our study.
We sent out 1000 surveys (over sample rate of 266%) to help achieve 372 survey responses.

### 2.2.4 Survey Instrument

To examine the knowledge of physical therapists about the health effects of smoking, their views and understanding about their roles in effecting smoking cessation in their clients and patients who smoke, and in their practices with respect to smoking cessation counselling, we constructed a composite survey instrument using questions from three independent surveys and related literature (Fiore et al., 2000; GTSS Collaborative Group, 2006; Hudmon et al., 2006; Rea et al., 2004).

The sociodemographic characteristics of the physical therapist respondents that we examined included age, sex, province, practice setting (size of community, inpatient/outpatient), employment status (practicing or not), predominant area of practice, years of clinical experience, education, country of origin, language spoken at home, and smoking status. Additional demographic information pertaining to physical therapists and their practices included degrees or qualifications other than their entry-level professional degree, and the age range of their clientele. To better understand the context in which smoking cessation might be implemented, additional measures were collected. These included barriers and facilitators related to smoking cessation counselling, estimates of the percentage of patients who smoke, how often physical therapists participated in smoking cessation counselling, smoking cessation counselling with respect to worksite practice type, and their interest in smoking cessation counselling training. For physical therapists who smoked, the stage of their readiness to quit smoking based on the transtheoretical model of change (i.e., pre-contemplation, contemplation, and preparation) (Prochaska & Velicer, 1997) was also recorded.
2.2.5 Knowledge and Views of Physical Therapists

We used a modified version of the Global Health Professional Survey on Smoking (GHPS) to assess the knowledge and views of physical therapists regarding smoking and smoking cessation counselling (GTSS Collaborative Group, 2006). The GHPS survey was originally developed by the World Health Organization, Centers for Disease Control and the Canadian Public Health Association to assess tobacco use and smoking cessation counselling in third and fourth year students of dentistry, medicine, nursing and pharmacy (GTSS Collaborative Group, 2006). The GPHS survey examined basic knowledge regarding the health effects of smoking, tobacco use, and training received on smoking cessation counselling training techniques. The GPHS survey uses a five-point Likert scale for knowledge and view questions (1= ‘strongly disagree’ to 5 = ‘strongly agree’). Minor modifications to the GHPS survey questions were required. These included changing the term ‘health professional’ to ‘physical therapist’ and changing an ‘urban/rural’ variable to a ‘size of community’ variable. Seven questions on the health effects of smoking, and eight questions regarding the professional views of physical therapists towards engaging in smoking cessation counselling with their patients were included. Twelve questions from the GHPS were excluded because they were not considered relevant to physical therapy practice nor survey purpose.

2.2.6 Barriers, Facilitators to Smoking Cessation Counselling, and the 5 A’s

Physical therapists were questioned about barriers to and facilitators of their counselling patients in smoking cessation. A five point Likert scale was used to assess the extent of agreement. Response options for this scale ranged from 1 = ‘strongly disagree’ to 5 = ‘strongly agree’. We created questions based on the 5 A’s clinical guidelines for tobacco cessation counselling (Fiore et al., 2000). The 5 A’s constitute a systematic course of action for health
professionals to help smokers stop smoking, by directing the health professional to 1) Ask about tobacco use, 2) Advise to quit smoking, 3) Assess willingness to attempt to quit, 4) Assist in the quit attempt, and 5) Arrange a follow-up meeting after the quit attempt. Each of the 5 A’s questions was coded with a dichotomous yes/no response.

2.2.7 Self Efficacy

Self efficacy (Bandura, 1977; Bandura, 1997), the principal factor in social cognitive theory, has been shown to be a determinant for the provision of smoking cessation counselling by health professionals to patients (Hudmon et al., 2006; Rea et al., 2004; Thompson, Schwankovsky & Pitts, 1993). We therefore included the self efficacy of physical therapists to counsel for smoking cessation as a variable of interest. The self efficacy of physical therapists to counsel for smoking cessation was assessed using a twenty item self efficacy scale tailored to smoking cessation counselling (Appendix A-1). This scale was a composite that combined questions from two independent self efficacy scales originally designed for pharmacists and physical therapists who were counselling for smoking cessation (Hudmon et al., 2006; Rea et al., 2004).

We adopted the questions, question structure and scoring described by Hudmon (2006) as the template for the composite self efficacy scale. Each question began with: “How confident are you that you…” followed by a situation-specific context related to smoking cessation. One of the questions adopted was modified slightly by replacing the word ‘pharmacists’ with ‘physical therapists’ to align the question with physical therapy practice. Each self efficacy question was scored using a five point Likert scale (ranging from 1 = ‘not at all confident’ to 5 = ‘extremely confident’).
The additional self efficacy questions adopted from Rea (2004) were modified to match the question structure and scoring of those reported by Hudmon (2006). The self efficacy questions from Rea (2004) consisted of the standard preface: ‘How sure are you that you could assist your smoking patients in reducing their smoking habits?’, paired with a situation-specific context and a six point Likert scoring (e.g., ‘very sure I could assist’ = 1 to ‘very sure I could NOT assist’ = 6). While the situation-specific contexts were retained for the composite self efficacy scale, for our purposes the preface was changed to match that used by Hudmon (2006): ‘How confident are you that you can assist your smoking patients in helping them quit smoking …’ An example of the changes appears in Appendix B-1.

The final composite survey was tested for face validity as well as for clarity and comprehensibility based on a convenience sample of physical therapists from Vancouver, British Columbia (n=5). The survey was further pilot tested in a convenience sample of 20 physical therapists from four provinces to test survey postal administration protocols and develop the data codebook.

The final version of the survey was written in English. A French version of the survey was available for physical therapists living in the provinces of Quebec and New Brunswick. The Provincial Language Translation Service (British Columbia) provided the forward translation from English to French and the back-translation from French to English based on methods consistent with established procedures for questionnaire translation (Bullinger et al., 1998).

The final twelve page composite survey consisted of 67 questions and space for comments (Appendix B-2). The survey package enclosed a cover letter and consent form on university letterhead, the survey, a letter of endorsement from the CPA, a five-dollar bill (unconditional financial incentive), and a self-addressed pre-stamped envelope to facilitate
respondents’ returning completed questionnaires (Edwards et al., 2002). The cover letter included signature endorsement by one of the investigators. The survey, cover letter and study procedures were approved by the institutional ethics review board of the University of British Columbia. To maintain anonymity and confidentiality, each survey package was identified with a unique identifier code.

2.2.8 Survey Administration

The survey was distributed by post. We adopted the tailored design procedures proposed by Dillman to increase the response rate and decrease the likelihood of respondent non-response (Dillman, 2000, Edwards et al., 2002). The tailored design method incorporates survey procedures to increase respondent trust, as well as heighten respondents’ perceptions of a reduced burden in participating and an increased reward for participating in the survey (Dillman, 2000). Dillman’s method involved sending a ‘pre-notice’ letter informing the respondents of an impending survey package approximately one week before the survey package was posted. Two follow-up reminder letters that included replacement surveys and pre-paid stamped return envelopes were mailed after the initial survey package at 18 and 34 days, respectively. All return envelopes were marked to help assess the temporal dynamics of survey return. Respondents were informed of the option to return a blank survey if they chose not to participate. The survey was administered between April and June 2009.

2.2.9 Data Management

Raw data were coded for data entry and entered into a SPSS version 12.0 computer program by an independent data entry agency. Quality control check was carried out by two independent data entry personnel using double-entry methods for all data with Data Entry Emulator® software. Coding involved linking variable names with survey questions and
included the description of codes with related variable definitions, closed and open ended questions, and missing values. Where appropriate, multiple response variables were collapsed or coded as binary (e.g., did or did not receive formal training in smoking cessation counselling).

2.2.10 Statistical Analysis

Descriptive statistics and cross-tabulations were used to describe the sociodemographic characteristics of the physical therapist respondents. These included frequencies, percentages, means, and standard deviations (SD) where applicable. Mean scores of each self efficacy question was summed. The average of these mean scores delineated the overall level of self efficacy. Internal consistency of the item list of questions pertaining to each physical therapist’s self efficacy regarding smoking cessation counselling was assessed with Cronbach’s \( \alpha \); a value of \( r \geq 0.70 \) was considered acceptable (Streiner & Norman, 2003). One-way analysis of variance (ANOVA) and Chi-square (\( \chi^2 \)) was used to assess differences between provinces and waves of survey returns for select variables. Spearman correlation coefficients were used to assess the relationships between ordinal variables. Alpha was set at 0.05.

2.3 Results

2.3.1 Survey Response

The provincial proportions of returned surveys appear in Appendix A-2. Of the 1000 surveys sent, a total of 738 were completed and returned. Fifty-five surveys (5.5%) did not reach the intended respondent because the physical therapist was no longer working at that address. Of those 55 surveys, 35 were from Ontario. Fourteen blank surveys were returned. The survey response rate was 78.1% based on those surveys that reached the respondents. A sample size of 372 was required to achieve a 95% level of confidence that the proportion estimates were within
± 5% of the true proportion. Based on the survey response we achieved, proportion estimates were calculated to be within ±3.6% of the true proportion (Lenz, 2006).

The proportional representation by province was within ±2% of proportions of physical therapists by province reported by the Canadian Institute for Health Information for the year 2007 (Canadian Institute for Health Information, 2008). The exceptions were the province of British Columbia which was over represented by 4.3% and the province of Ontario which was under represented by 6.3% (Canadian Institute for Health Information, 2008). Under representation of Ontario was reduced to 2.9% when the 35 Ontario surveys that did not reach their respondents were considered.

Non-response bias was assessed by examining differences across key demographic variables between the first ‘response wave’ of survey packages returned and each successive response wave of reminder packages. Each of the response waves was defined chronologically; time boundaries were based on the dates that the survey packages were posted. One-way ANOVA showed no differences for the variables of age and years of clinical practice across each response wave (data not shown). Further, chi-square analysis demonstrated no differences between each wave for the variables of sex, entry-level of qualification, interest in receiving training for smoking cessation, and how often smoking cessation counselling took place (data not shown).

2.3.2 Sociodemographic Data of Survey Respondents

The sociodemographic data of the survey respondents are presented in Table 2.1. The mean age (±SD) of physical therapists was 41.9±10.8 years (range: 22-74 years) and mean years (±SD) of clinical experience was 17.4±11.0 years (range: 0.4-51.0 years). Chi-square analysis demonstrated no differences in the proportions of male and female respondents from each
province. With respect to smoking, 82.4% of the physical therapists surveyed reported that they had never smoked cigarettes and 15.8% characterized themselves as former smokers; 1.7% reported being current smokers (n=729 reporting).

Over 80% of physical therapists reported holding a bachelor’s degree in physical therapy as their entry-level degrees with 55.7% of respondents reported achieving degrees or qualifications in addition to degrees in physical therapy (n=621 reporting). Of these, a bachelor’s degree in human kinetics/physical education (n=73; 11.8%) or biological sciences (n=32; 5.2%) was the predominant degree.

2.3.3 Practice Characteristics

Over 50% of the physical therapists reported practicing in the public setting (n=723 reporting) with over 60% reported practicing in out-patient settings (n=719 reporting). A total of 84.2% of physical therapists reported one principal area of practice with 15.% physical therapists reporting two or more areas they considered predominant in their practices. Table 2.2 summarizes physical therapy practice characteristics including principal area(s) of practice, private versus public practice characteristics, patient group and age range of patients.

2.3.4 Smoking Cessation Counselling in Practice

The mean proportion of patients who smoked (as estimated by responding physical therapists) was 24.2±16.2 % (n=643 reporting) and the median was 20.0% (Table 2.2). Where smoking cessation counselling was defined as both encouraging and assisting patients to quit smoking (n=717 reporting), 3.4% of physical therapists surveyed reported that they counselled all the time (100% of the time), 22.0% most of the time (75% of the time), 20.5% sometimes (50% of the time), 36.8% rarely (25% of the time) and 17.3% never (0% of the time). Table 2.3 characterizes the proportion of components of the 5 A’s system incorporated by physical
The 5 A’s system of addressing smoking cessation incorporates an ask, advise, assess, assist and arrange approach with patients. While 76.3% of physical therapists reported that they asked their patients if they smoked, only 21.4% reported that they assisted patients in their attempts to quit smoking. Responses to the 5 A’s questions are presented individually and collectively.

Table 2.4 shows the type of training received and interventions reportedly used by physical therapists to help smokers quit smoking. Also presented is the scope of perceived preparedness of physical therapists to counsel for smoking cessation. When interventions for smoking cessation were used, the most common form reported was counselling. With respect to “Other” forms of interventions, physical therapists reported using referrals to external medical or counselling support (n=41; 5.6%), acupuncture (n=14; 1.9%), or education and encouragement (n=21; 2.8%). Over 70% of physical therapists responded that they were ‘not at all prepared’ to counsel for smoking cessation, and 61.2% of physical therapists reported being interested in receiving training for smoking cessation counselling (n=688 reporting). When asked if other members of their healthcare teams (i.e., physicians, nurses, and addictions counsellors) provided smoking cessation counselling, 38.5% respondents reported yes, 27.5% said no, and 22.1% reported they did not know. Selected knowledge questions representing the views of physical therapists regarding the health effects of smoking are presented in Table 2.5. While 98.2% of physical therapists strongly agreed or agreed that passive smoking increases the risk of lung disease, this proportion of agreement decreased to 80.1% when asked if passive smoking increased the risk of heart disease. Only 21.4% of physical therapists strongly agreed that neonatal death was associated with passive smoking.
2.3.5 Professional Views Regarding Smoking Cessation Counselling

Over 76% of the physical therapists (n=737 reporting) surveyed agreed or strongly agreed that physical therapists should ask their patients about their smoking habits. When queried about advising their patients to stop smoking, this level of agreement reduced to 65% (n=726 reporting). Over half (51.9%) of physical therapists surveyed (n=729 reporting) agreed that the physical therapy profession should become more involved in assisting smokers to quit smoking, with 15.0% strongly agreeing with this statement. There was a direct association between the level of agreement of these professional views and the extent to which smoking cessation counselling occurred (r=0.274, p<0.01); i.e., the stronger the agreement, the more often counselling took place. With respect to whether physical therapists should receive training on smoking cessation strategies, 43.0% of physical therapists surveyed agreed and 13.8% strongly agreed (n=731 reporting). However, 14.8% strongly disagreed or disagreed. Approximately one quarter of respondents reported ‘not sure’ to questions that asked if the physical therapy profession should become more active in helping patients stop smoking, or if physical therapists should receive training for smoking cessation strategies. Further, 95.8% of physical therapists believed they should set an example by not smoking.

2.3.6 Self Efficacy, Barriers and Facilitators Towards Smoking Cessation Counselling

The mean (±SD) score for self efficacy was 2.67±0.56 (n=701 reporting); individual mean scores for self efficacy ranged from 1.05 to 4.95. Mean scores and SD for each self-efficacy question are presented in Appendix A-1. Cronbach’s α for internal consistency for the 20 item self efficacy was r =0.937 (n=701 reporting).
Reported barriers to smoking cessation counselling are summarized in Table 2.6 and Table 2.7. Responses for barriers were collapsed into three levels: strongly agree and agree, not sure, and disagree and strongly disagree. Barriers to smoking cessation counselling were divided into two categories: barriers to helping smokers quit smoking that were specific to the physical therapist (Table 2.6), and characteristics or behaviors of patients that presented as barriers for smoking cessation counselling (Table 2.7). The predominant factors that physical therapists perceived as barriers to helping their patients stop smoking were lack of resources available to counsel for smoking cessation and lack of time to counsel. Although a key barrier, lack of time was not related to the extent to which physical therapists counselled for smoking cessation ($r=0.065; p=0.085$). Key characteristics of patients perceived by physical therapists to be barriers for smoking cessation counselling were lack of patient compliance and long term commitment, and patient emotional/psychological issues.

When physical therapists were asked about the factors they perceived facilitated their patients who smoke, to quit, a free-standing seminar or workshop received the most favorable response with 77.0% of respondents reporting strongly agree or agree (n=718 reporting). Over half of the respondents reported strongly agree or agree to the potential usefulness of home DVD demonstration tapes (59.4%; n=716 reporting), a smoking cessation counselling newsletter (58.9%; n=718), and workshop at a national congress or provincial society meetings (52.9%; n=715 reporting). A comprehensive text on smoking was considered the least preferred means (49.4%; n=714 reporting).

2.4 Discussion

To the best of our knowledge, this is the first study to describe the knowledge, views and practices of Canadian physical therapists related to smoking and smoking cessation counselling.
Our findings are supported by the sizeable survey response rate (>78%) and proportional responses across the provinces.

2.4.1 Professional Views

There are several key findings arising from this survey study. First, the majority of Canadian physical therapists agreed that the physical therapy profession should be more active in assisting smokers to quit smoking than they are currently. This is in accordance with the position statement of the CPA regarding tobacco cessation (Canadian Physiotherapy Association, 2008). As a whole, physical therapists’ majority views held that both asking and advising smokers to quit smoking are clinical responsibilities. This observation is consistent with the literature related to other health professions (Ashley, Victor & Brewster, 2007; Maribet, Hennrikus, Lando & Vessey, 2001, Wetta-Hall, Ablah, Frazier & Molgaard, 2005). Some continuity was lost however when the question of receiving training for smoking cessation counselling was posed. While the majority of physical therapists agreed or strongly agreed that physical therapists should receive training for smoking cessation, 14.8% strongly disagreed or disagreed, and one quarter reported being unsure. Physical therapists who were unsure did not provide reasons for their lack of certainty; yet these physical therapists were highly knowledgeable about the negative health effects of smoking. Overall, Canadian physical therapists have divergent views with respect to whether smoking cessation counselling should be a clinical competency.

2.4.2 Knowledge

Close to twenty years ago, physical therapists’ knowledge of specific physiological responses to smoking was reported to be poor (Balfour, 1993). In our recent study, Canadian physical therapists were largely informed regarding the negative health effects of smoking. Some knowledge gaps existed, but these manifested as a disparity in the level of agreement among
physical therapists. For example, 20% of physical therapists surveyed replied not sure or disagreed with the statement that the risk of heart disease increased as a result of exposure to environmental tobacco smoke compared to the 80% who agreed or strongly agreed with this statement. This disparity was somewhat surprising given we included questions about smoking related morbidity and mortality that are well established in the literature (Anderson & Cook, 1997; Gergen, Fowler, Maurer, Davis & Overpeck, 1998; Janson, 2004). In our study, a small proportion of physical therapists reported being not sure or disagreed with these fundamental statements related to the negative health effects of smoking. We expected that this level of disagreement would be non-existent or negligible at best.

### 2.4.3 Preparation to Counsel and Training Received

Although physical therapists are largely cognizant that smoking has deleterious health consequences, few reported receiving training to counsel (formally or otherwise) and most reported not feeling prepared to counsel. We infer that the majority of physical therapists most likely lack both skills and knowledge to help their smoking patients quit smoking. Even if physical therapists have the skills to counsel, the majority appears not to have a high level of self efficacy to do so. Four of the five lowest self efficacy scores reported were related to confidence to engage in practical skills related to smoking cessation counselling. These included skills to counsel for an addiction and skills for monitoring and assisting in quit attempts (including coping mechanisms to defend against triggers to smoke).

One question related to confidence in therapeutic knowledge of smoking cessation pharmaceutical products. Smoking cessation counselling combined with pharmacological support has been shown to be more effective than smoking cessation counselling alone (Fiore et al., 2000). Physical therapists’ knowledge of pharmacological support may help encourage
continuity of care for the patient with respect to the outcome of quitting smoking, for example, referral to a pharmacist as an adjunct to counselling initiated and supported by a physical therapist.

Overall, reception to or reported interest in receiving training for smoking cessation counselling varied between Canadian physical therapists and other health professions. Whereas 56.8% of Canadian physical therapists surveyed reported interest in receiving training, other health professionals appear to be more amenable to the idea. For example, over 95% of dentists and 91% of office-based nurses have been reported to be willing or very willing to receive training for smoking cessation counselling, or indicated that they needed additional education related to tobacco control (Albert, Ward, Ahluwalia & Sadowsky, 2002; Wetta-Hall et al., 2005). Deficiencies in training for smoking cessation counselling exist across health professionals (Cabana et al., 2004; Neil-Urban et al., 2001; Makni et al., 2002; Sarna et al., 2000). Training for smoking cessation counselling has been shown to increase the likelihood that health professionals to counsel (Anderson & Jane-Llopis, 2004; Lancaster, Silagy & Fowler, 2002). The literature supports some distinctions with respect to stage of career with respect to means of training. During their entry-level training, health care professions may be best served by a skills-based curricula with educational measures, whereas upon graduation, practitioners may be better served with a combination of practice-based training with educational measures in their post graduation education (Anderson & Jane-Llopis, 2004). Thus, the type of smoking cessation training may depend on whether the health professional is training or practicing (Anderson & Jane-Llopis, 2004).
2.4.4 Smoking Cessation Counselling Practices

The third principal finding of this study supports that the extent to which physical therapists counsel for smoking cessation in terms of how often they counsel, is broad. More than half of physical therapists reported they counsel rarely or not at all. The scope of smoking cessation counselling across other health professions bears some similarity to that of physical therapists (O’Loughlin et al., 2001). In Canada, only half of smokers report receiving advice to quit or reduce smoking from their physician over the past year (from the time of being surveyed) (Centers for Disease Control and Prevention, 2007; Leatherdale & Shields, 2009).

Lack of time was cited by over 60% of our survey respondents as a key barrier against counselling (motivation to counsel notwithstanding), which is similar to values reported for registered nurses, advanced practice nurses and physicians (Neil-Urban et al., 2001). Surprisingly, in our study, lack of time was not related to how often a physical therapist reported counselling for smoking cessation (r=0.065; p>0.05). Thus factors other than time constraints appear to be important determinants of smoking cessation counselling.

We asked questions pertinent to the 5 A’s approach to characterize the mechanics of smoking cessation counselling (i.e., the ‘whats’ of counselling). The 5 A’s is a systematic evidence based framework to help smokers stop smoking that was developed for practitioners in primary practice (Fiore et al., 2000; Fiore, 2008). The 5 A’s are endorsed by the American Physical Therapy Association (American Physical Therapy Association, 1997) and have been allocated as one of the tasks of health care providers in Canada by the Canadian Task Force on Preventive Health Care (Elford, MacMillan & Wathen, 2001). The practical utility of the 5 A’s approach is such that the strategies are brief and require approximately three minutes to administer by the clinician (Fiore et al., 2000).
In our study, more than three quarters of physical therapists reported that they ask their patients about tobacco use, the first of the 5 A’s; however, when the 5 A’s were examined cumulatively, only a small proportion (1.6%) of respondents was comprehensive in its approach, i.e., adhering to all five components of the framework, with fewer than half ‘asking and advising’ their patients to quit smoking. The lack of prevalence of smoking cessation counselling by Canadian physical therapists, including the 5 A’s, is consistent with that reported by other health professions and represents a gap in an essential component of health promotion in primary care practice vis-à-vis active intervention and support for an unhealthy behavior that is a leading cause of preventable death (Ashley et al., 2007; O’Loughlin et al., 2001; Rea et al., 2004; Sarna, et al., 2000; Scanlon, Clark & McGuiness, 2008).

Given that the proportion of patients who smoke reported by physical therapists is consistent with the Canadian national average or higher (66% of physical therapists estimated that ≥ 20% of their patients smoked and 19.4% estimated that ≥ 40% smoked), smoking cessation as a legitimate part of physical therapy clinical practice is justified. The higher estimated prevalence may be explained by reports that people with disabilities smoke more than those without disabilities (Armour, 2007). This strengthens further the legitimacy of smoking cessation counselling as a clinical competence given people with disabilities constitute a large and discrete group treated by physical therapists. Smoking cessation programs administered during the course of rehabilitation can be highly effective (Paone et al., 2007) thus smoking cessation initiated and supported by physical therapists is warranted.

There were inconsistencies between knowledge and perceived barriers to counsel expressed by the physical therapists we surveyed, and what is known about quitting characteristics of smokers cited in the smoking cessation literature. For example, a substantial
majority of physical therapists agreed or strongly agreed that lack of patient compliance and lack of long-term commitment by the patient to stop smoking were barriers to helping smokers quit. Many smokers however make several attempts to quit smoking before succeeding. The concept of the ‘lifecycle of the smoker’ acknowledges that multiple smoking relapses can occur during the quitting process (Hughes, Keely & Naud, 2004; Prignot, 2000). Lack of commitment and lack of compliance were viewed as barriers by physical therapists, but this view is not consistent with the cyclical nature of smoking cessation.

The desire to quit smoking is pervasive in smokers. More than 70% of smokers want to quit smoking (Centers for Disease Control and Prevention, 2002), and findings from the 2006 Canadian Tobacco Use Monitoring Survey showed that half of Canadian smokers (> 15 years of age) tried to quit smoking in the previous year, with one third of smokers reporting intentions to make a quit attempt in the following month (Leatherdale & Shields, 2009).

Even for those patients who may not be motivated to quit smoking, the literature is explicit in that the prescription of advice as a smoking cessation intervention by a health professional increases the likelihood that a patient quits (Bodner & Dean 2009; Gorin & Heck, 2004; Mojica et al., 2004). Approximately one third of the physical therapists we surveyed however were not sure or disagreed with this statement. Smoking patients may require many episodes of encouragement before they consider quitting smoking (Neil-Urban et al., 2001). Multiple episodes of external advice and encouragement, especially by health professionals, increase the likelihood by threefold that a smoker will make a quit attempt (An et al., 2008).

In our study, there was a significant difference between the proportions of physical therapists who counselled for smoking cessation in practice settings with or without the provision of counselling by other health care members (data not shown). When workplace
counselling was cross-tabulated with practice setting (private versus public), the extent of counselling by physical therapists was greater in the public rather than the private workplaces (data not shown.) It is reasonable to hypothesize that the environment in the public setting may be more supportive of physical therapists participating in smoking cessation counselling with their clients and patients than in the private setting, e.g., training to counsel is made available as part of professional development, or related to organizational directives within the practice.

Enabling smokers to quit first involves motivating them to initiate a quit attempt and then helping them to not relapse after they have quit smoking (Hughes, Keely & Naud, 2004). The 5 A’s framework facilitates this process and can be readily adopted within the context of physical therapy practice. Physical therapists have several characteristics that ideally position them to advise and counsel patients to quit smoking using the 5 A’s approach. First, physical therapists are primary health care professionals who are engaged in education with every client or patient in addition to having extensive backgrounds in anatomy, physiology, and pathology (Balfour, 1993; Laitakari et al., 1997; Fruth et al., 1998; Lorish & Gale, 1999; Guilmette et al., 2001; Canadian Physiotherapy Association, 2004). Canadian physical therapists must successfully complete qualifying examinations of essential competencies. These competencies defined within a specified scope of “measurable knowledge, skills, and attitudes” represent key clinical proficiencies in seven dimensions (Canadian Physiotherapy Association, 2004). Part of the essential competencies fulfilled by physical therapists includes patient assessment and diagnosis/clinical impression with intervention planning. This extraction of supplementary health information identifies the environmental demands and health factors that influence a patient’s function and physical performance and support health education and counselling in general.
(Canadian Physiotherapy Association, 2004). These are relevant to tobacco use and fit the first four of the 5 A’s framework, i.e., to ask about tobacco use, advise to quit smoking, assess willingness to quit and assist in the quit attempt.

Additionally, physical therapy management typically consists of multiple, prolonged contact times with clients or patients (Balfour, 1993; Fruth et al., 1998; Lorish & Gale, 1999; Guilmette et al., 2001). Repeated and prolonged contacts increase the likelihood of the physical therapist establishing rapport with clients or patients and being able to assess tobacco use, readiness to quit, and learning style, and then implement smoking cessation strategies to effect sustained progress in cutting back smoking and eventually quitting, or at least, to support the efforts of other health care team members (e.g., the family physician) (Yarnall, Pollak, Ostbye, Krause & Michener, 2003). Being able to have contact with a client or patient over time also enables the physical therapist to follow-up and encourage the individual which fulfills the fifth ‘A’ of the 5 A’s approach, i.e., arrange a follow up visit.

2.5 Implications

The findings of our study have important implications for physical therapy. First, several indicators support that the promotion of health including smoking cessation need to be not only endorsed but implemented or supported within and across health care professionals in their practices given the pandemic of lifestyle conditions and the contribution of smoking to these. Given that physical therapists are committed to health promotion, Dean and others (2009b) have strongly advocated that health education including smoking cessation should be the clinical competency of physical therapy (Bodner & Dean 2009).

Smoking can interfere with a patient’s clinical presentation and recovery as well as long term health; thus, smoking cessation warrants being a management priority in physical therapy.
practice. Both short and long term benefits to health of quitting smoking have been well documented in active smokers who quit and of reduced exposure to environmental cigarette smoke in those who do not smoke (USDHHS, 1990).

Physical therapists are uniquely positioned to implement smoking cessation strategies in their clients and patients. Furthermore, physical therapists often see their clients over prolonged visits and periods of time, thus have an opportunity to develop rapport and trust. Even brief advice from a health care professional can be effective in enabling a smoker quit (Bodner & Dean, 2009; Fiore et al., 2000). The 5A’s approach readily allows for the development of a smoking cessation counselling framework within physical therapy practice.

National physical therapy associations like the CPA and the American Physical Therapy Association have endorsed smoking cessation as integral to health promotion and being an essential health service. Further, a majority of Canadian physical therapists are interested in receiving training for smoking cessation counselling. Thus, there is a need for smoking cessation counselling training for practicing physical therapists, but training should also be incorporated into the curricula of entry-level academic physical therapy programs. This would help address the inconsistencies between physical therapists’ perceptions about smokers’ intentions and desires to quit smoking, but also bridge the gap between knowledge and practice, with the goal of making smoking cessation counselling a clinical competency.

2.6 Limitations

Response bias is a potential limitation of survey questionnaire studies. In this study, respondents may have felt compelled to express negative views about smoking and positive views about smoking cessation counselling because of the adverse publicity in Canada about smoking and associated health and public hazards. Furthermore, people who are attracted to
physical therapy as a profession are likely not to favor smoking. These factors may have contributed to the large response rate of the study. Alternatively, respondents who smoke or strongly support an individual’s right to smoke may be less averse to smoking’s negative effects and less committed to physical therapists initiating or supporting smoking cessation clinically.

The answers to questions about smoking cessation counselling could have been perceived by respondents as a reflection of their professional practices. Thus, social desirability bias may have influenced whether or not specific questions were answered, or, if answered, influenced the level of agreement of response. These points are speculative and could be studied further.

The self efficacy scale we used was derived from two independent self efficacy scales applied to respondents from two other health professions (Hudmon et al., 2006; Rea et al., 2004). While the situation-specific context of the questions was not changed, we did adopt the question prefaces and scoring methods (five point Likert scale) used by Hudmon (2006) and applied it to the questions used by Rea (2004) which had used an alternate method of scoring (six point Likert scale); however, the internal consistency of the self efficacy scale used in our study is strong (r>0.90).

We used simple random sampling procedures to obtain our representative sample of Canadian physical therapists. However, the sampling frame we constructed was not complete. The exclusion of the provinces of Newfoundland and Prince Edward Island, and the territories from the sampling frame despite constituting a small proportion of the population of physical therapists in Canada, nevertheless, biased the representativeness of the sample. Additionally, only partial college lists were available from Alberta and Quebec which may have influenced the representativeness of the responses especially from Quebec.
2.7 Conclusion

Based on a novel survey questionnaire study of 738 Canadian physical therapists (78.1% response rate), major gaps were apparent between their knowledge about the negative health effects of smoking and their reported competence in smoking cessation counselling, their commitment to smoking cessation counselling, their views of their professional responsibility to initiate and/or support smoking cessation in their patients and physical therapists’ motivation to do so.

Our findings may be useful to the CPA and its branches and professional regulatory bodies to both inform and develop post graduate courses in health behavior change specifically related to smoking cessation counselling, and potentially to accreditation bodies and academic programs to inform their curricula in this priority area of health care. If professional bodies and academic programs through both their educational mandates can address the barriers that were identified by physical therapists to smoking cessation counselling, these gaps may be minimized, the health of Canadians improved, and the social and economic burdens of smoking reduced. Finally, expertise in smoking cessation counselling includes the principles of strengthening self efficacy in counselling for health behaviour change in general; expertise that is essential in addressing lifestyle conditions in adults and children this century.
Table 2.1  Sociodemographic characteristics of physical therapists

<table>
<thead>
<tr>
<th>Age (years) (n=732)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>109</td>
<td>14.9</td>
</tr>
<tr>
<td>30-39</td>
<td>229</td>
<td>31.3</td>
</tr>
<tr>
<td>40-49</td>
<td>191</td>
<td>26.1</td>
</tr>
<tr>
<td>50-59</td>
<td>162</td>
<td>22.1</td>
</tr>
<tr>
<td>60+</td>
<td>41</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Clinical experience (years) (n=733)

<table>
<thead>
<tr>
<th>Clinical experience</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1-9</td>
<td>217</td>
<td>29.6</td>
</tr>
<tr>
<td>10-19</td>
<td>209</td>
<td>28.5</td>
</tr>
<tr>
<td>20-29</td>
<td>169</td>
<td>23.1</td>
</tr>
<tr>
<td>30-39</td>
<td>119</td>
<td>16.2</td>
</tr>
<tr>
<td>40-49</td>
<td>17</td>
<td>2.3</td>
</tr>
<tr>
<td>≥50</td>
<td>2</td>
<td>0.3</td>
</tr>
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</table>

Sex (n=730)

<table>
<thead>
<tr>
<th>Sex</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>574</td>
<td>78.6</td>
</tr>
<tr>
<td>Male</td>
<td>156</td>
<td>21.4</td>
</tr>
</tbody>
</table>

Language spoken at home (n=730)*

<table>
<thead>
<tr>
<th>Language spoken at home</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>567</td>
<td>77.7</td>
</tr>
<tr>
<td>French</td>
<td>167</td>
<td>22.9</td>
</tr>
<tr>
<td>Other</td>
<td>55</td>
<td>7.6</td>
</tr>
</tbody>
</table>

Entry-level qualification (n=734)

<table>
<thead>
<tr>
<th>Entry-level qualification</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diploma</td>
<td>84</td>
<td>11.4</td>
</tr>
<tr>
<td>Bachelor’s</td>
<td>596</td>
<td>81.2</td>
</tr>
<tr>
<td>Masters</td>
<td>51</td>
<td>6.9</td>
</tr>
<tr>
<td>Doctorate</td>
<td>3</td>
<td>0.4</td>
</tr>
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</table>

Other degrees/qualifications (n=621)

<table>
<thead>
<tr>
<th>Other degrees/qualifications</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>346</td>
<td>55.7</td>
</tr>
<tr>
<td>No</td>
<td>275</td>
<td>44.3</td>
</tr>
</tbody>
</table>

Size of residential community (n=717)

<table>
<thead>
<tr>
<th>Size of residential community</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5,000 - 9,999</td>
<td>61</td>
<td>8.5</td>
</tr>
<tr>
<td>10,000 - 49,999</td>
<td>117</td>
<td>16.3</td>
</tr>
<tr>
<td>50,000 - 99,999</td>
<td>104</td>
<td>14.5</td>
</tr>
<tr>
<td>100,000 - 499,999</td>
<td>202</td>
<td>28.2</td>
</tr>
<tr>
<td>500,000 - 1 million</td>
<td>113</td>
<td>15.8</td>
</tr>
<tr>
<td>&gt; 1 million</td>
<td>120</td>
<td>16.7</td>
</tr>
</tbody>
</table>

*Values add up to more than 100% as more than one language spoken at home
Table 2.2  Clinical practice characteristics of physical therapists

<table>
<thead>
<tr>
<th>Practice setting† (n=723)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>261</td>
<td>36.1</td>
</tr>
<tr>
<td>Public</td>
<td>366</td>
<td>50.6</td>
</tr>
<tr>
<td>Private and Public</td>
<td>56</td>
<td>7.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient group characteristics† (n=719)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-patient</td>
</tr>
<tr>
<td>Out-patient</td>
</tr>
<tr>
<td>In- and out-patient</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principal area of practice* (n=726)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthopedics/Musculoskeletal</td>
</tr>
<tr>
<td>Cardiovascular/Cardiopulmonary</td>
</tr>
<tr>
<td>Neuromuscular</td>
</tr>
<tr>
<td>Geriatrics</td>
</tr>
<tr>
<td>Pediatrics</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age range of patients†* (n=725)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 years</td>
</tr>
<tr>
<td>7-17 years</td>
</tr>
<tr>
<td>18-64 years</td>
</tr>
<tr>
<td>≥65 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated proportion of patients who smoke (n=643)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19%</td>
</tr>
<tr>
<td>20-39%</td>
</tr>
<tr>
<td>≥40%</td>
</tr>
</tbody>
</table>

†Percentages do not include physical therapists who are not practicing (n=40).
*Areas of practice presented in this table are not mutually exclusive. Percentages reflect more than one dominant area of practice.
Table 2.3  Proportion of physical therapists (%) who incorporate the 5 A’s of counselling (i.e., ask, advise, assess, assist, and arrange) into clinical practice, both individually and collectively

<table>
<thead>
<tr>
<th>Task</th>
<th>Individually (n=705)</th>
<th></th>
<th></th>
<th>Collectively (n=705)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I ask whether or not my patients use tobacco</td>
<td>538</td>
<td>76.3</td>
<td>167</td>
<td>23.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I encourage my patients who smoke, to stop smoking</td>
<td>393</td>
<td>55.7</td>
<td>312</td>
<td>44.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I assess whether or not my patients are willing to make a quit attempt</td>
<td>188</td>
<td>26.7</td>
<td>517</td>
<td>73.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I assist my patients who smoke in their attempt to quit</td>
<td>151</td>
<td>21.4</td>
<td>554</td>
<td>77.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I arrange a time to follow-up on my patient's attempt to quit smoking</td>
<td>28</td>
<td>4.0</td>
<td>677</td>
<td>96.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I ask if my clients smoke and encourage them to quit</td>
<td>341</td>
<td>48.4</td>
<td>364</td>
<td>51.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I ask, encourage and assist my clients to quit smoking</td>
<td>82</td>
<td>11.6</td>
<td>623</td>
<td>88.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I ask, encourage and assist my clients, and assess willingness to make a quit attempt</td>
<td>43</td>
<td>6.1</td>
<td>662</td>
<td>93.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I ask, encourage, assist, assess and arrange a follow-up</td>
<td>11</td>
<td>1.6</td>
<td>694</td>
<td>98.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*’No’ refers that none or some, but not all of the actions listed are performed.*
### Table 2.4 Proportion of physical therapists (%) who are prepared to counsel for smoking cessation, who have received training to counsel, and the interventions physical therapists used as part of counselling

<table>
<thead>
<tr>
<th>Preparedness to counsel for smoking cessation (n=722)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very well prepared</td>
<td>12</td>
<td>1.7</td>
</tr>
<tr>
<td>Somewhat prepared</td>
<td>193</td>
<td>26.7</td>
</tr>
<tr>
<td>Not at all prepared</td>
<td>517</td>
<td>71.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Training received for smoking cessation counselling</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical therapy school (n=715)</td>
<td>16</td>
<td>2.2</td>
</tr>
<tr>
<td>Conferences, symposia, workshops (n=713)</td>
<td>46</td>
<td>6.5</td>
</tr>
<tr>
<td>Special programs (n=720)</td>
<td>18</td>
<td>2.5</td>
</tr>
<tr>
<td>Other (n=730)</td>
<td>34</td>
<td>4.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interventions used</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional remedies (n=630)</td>
<td>40</td>
<td>6.3</td>
</tr>
<tr>
<td>Self-help materials (n=645)</td>
<td>94</td>
<td>14.6</td>
</tr>
<tr>
<td>Counselling (n=662)</td>
<td>201</td>
<td>30.4</td>
</tr>
<tr>
<td>Medication (n=634)</td>
<td>38</td>
<td>6.0</td>
</tr>
<tr>
<td>Other (n=697)</td>
<td>107</td>
<td>15.4</td>
</tr>
<tr>
<td>Health effects of smoking</td>
<td>Strongly agree</td>
<td>Agree</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
</tr>
<tr>
<td>Smoking is harmful to your health (n=738)</td>
<td>710 96.2</td>
<td>18 2.4</td>
</tr>
<tr>
<td>A patient’s chances of quitting is greater if a health professional advises him or her to quit (n=738)</td>
<td>125 16.9</td>
<td>360 48.8</td>
</tr>
<tr>
<td>Neonatal death is associated with passive smoking (n=732)</td>
<td>157 21.4</td>
<td>282 38.5</td>
</tr>
<tr>
<td>Maternal smoking during pregnancy increases the risk of sudden infant death syndrome (n=732)</td>
<td>195 26.6</td>
<td>305 41.7</td>
</tr>
<tr>
<td>Passive smoking increases the risk of lung disease in non-smoking adults (n=732)</td>
<td>470 64.2</td>
<td>249 34.0</td>
</tr>
<tr>
<td>Passive smoking increases the risk of heart disease in non-smoking adults (n=731)</td>
<td>306 41.9</td>
<td>279 38.2</td>
</tr>
</tbody>
</table>
Table 2.6  Proportion of responses by physical therapists (%) to factors perceived as barriers to help patients stop smoking

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Strongly agree/agree</th>
<th>Not sure</th>
<th>Strongly disagree/disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of adequate reimbursement (n=719)</td>
<td>259 36.0</td>
<td>154 21.4</td>
<td>306 42.5</td>
</tr>
<tr>
<td>Lack of resources (n=717)</td>
<td>506 70.6</td>
<td>90 12.6</td>
<td>121 16.8</td>
</tr>
<tr>
<td>Intrusion into patient’s privacy (n=721)</td>
<td>386 53.6</td>
<td>151 20.9</td>
<td>183 25.4</td>
</tr>
<tr>
<td>Lack of motivation (n=717)</td>
<td>223 31.1</td>
<td>160 22.3</td>
<td>334 46.5</td>
</tr>
<tr>
<td>Unpleasant personal experience (n=716)</td>
<td>76 10.6</td>
<td>139 19.4</td>
<td>501 69.9</td>
</tr>
<tr>
<td>Language barrier (n=715)</td>
<td>155 21.7</td>
<td>127 17.8</td>
<td>433 60.5</td>
</tr>
<tr>
<td>Lack of success (n=710)</td>
<td>172 24.2</td>
<td>261 36.8</td>
<td>277 39.0</td>
</tr>
<tr>
<td>Lack of time (assuming motivation) (n=712)</td>
<td>443 62.2</td>
<td>120 16.9</td>
<td>149 20.9</td>
</tr>
</tbody>
</table>
Table 2.7  Proportion of responses by physical therapists (%) about factors related to the patient that are perceived as barriers to patients’ quitting smoking

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Strongly agree/agree</th>
<th>Not sure</th>
<th>Strongly disagree/disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Lack of patient compliance (n=714)</td>
<td>581</td>
<td>81.4</td>
<td>83</td>
</tr>
<tr>
<td>Patient emotional/psychological issues (n=717)</td>
<td>539</td>
<td>75.1</td>
<td>130</td>
</tr>
<tr>
<td>Patient has no long-term commitment (n=716)</td>
<td>528</td>
<td>73.7</td>
<td>137</td>
</tr>
<tr>
<td>Patient doubts effectiveness of approach (n=718)</td>
<td>444</td>
<td>61.9</td>
<td>197</td>
</tr>
</tbody>
</table>
2.8 References


CHAPTER 3. FACTORS ASSOCIATED WITH SMOKING CESSATION COUNSELLING BY CANADIAN PHYSICAL THERAPISTS

3.1 Introduction

Despite downward trends, cigarette smoking remains the leading cause of preventable death in North America (Mokdad, Marks, Stroup & Gerberding, 2004). Health professionals generally agree that advising patients who smoke to stop smoking is an important component of clinical practice (McCarty, Hennrikus, Lando & Vessey, 2001; O’Loughlin et al., 2001; Wetta-Hall, Ablah, Frazier & Molgaard, 2005; See Chapter 2). In a joint statement, multiple health professional organizations in Canada have endorsed for several years that helping smokers to stop smoking is one of the most pre-eminent health services a health professional can offer (Canadian Physiotherapy Association, 2001). Such approaches should be comprehensive and may include assessments, smoking cessation counselling and pharmacological support (Canadian Physiotherapy Association, 2001). Smoking cessation counselling in particular, with ongoing support and relapse prevention strategies, has been acknowledged as an effective strategy (Canadian Physiotherapy Association, 2001). However, smoking cessation counselling practiced by health professionals however is not optimal rather, smokers in primary care do not regularly receive counselling specifically aimed at quitting (Livaudais et al., 2005; Sarna et al., 2000).

With special reference to physical therapists practicing in Canada, the characteristics of smoking cessation counselling including its prevalence are largely unknown. In a recent companion study (Chapter 2), however, physical therapists varied widely with respect to the extent to which they counselled for smoking cessation. The majority of the physical therapists

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2 A version of this chapter will be submitted for publication. Bodner, M.E., Dean, E., Rhodes, R. and Miller, W.C. Factors associated with smoking cessation counselling by Canadian physical therapists.
(52.6%) surveyed reported counselling either not at all (0% of the time) or rarely (25% of the time) (see Chapter 2). In one study, American physical therapists reported assisting with smoking cessation only about 17% of the time (Rea, Marshak, Neish & Davis, 2004) yet the American Physical Therapy Association had endorsed smoking cessation as a physical therapy responsibility for several years prior to the publication of this work (American Physical Therapy Association, 1997).

Physical therapists are committed to promoting health in their patients (Dean, 2009a; Dean, 2009b; Canadian Physiotherapy Association, 2005) and, in the case of smoking cessation counselling, they are uniquely positioned in the healthcare delivery system to initiate and support smoking cessation in their patients. Compared with other healthcare professionals, physical therapists have relatively prolonged contact time with patients, thus they have a prime opportunity for re-evaluation and follow-up, given multiple and prolonged treatment sessions, and a professional commitment to exploiting non-invasive approaches that include patient education (Balfour, 1993; Dean 2009a; Dean, 2009b; Fruth, Ryan & Gahimer, 1998; Lorish & Gale, 1999; Guilmette, Motta, Shadel, Mukland & Niaura, 2001). Smoking cessation advice that is clear and personalized and imparted to patients by a health professional increases long term quit rates (6-12 months abstinence) over and above control patients (Bodner & Dean 2009; Gorin & Heck, 2004; Fiore et al., 2000). Advice can be effective when administered in as little as three minutes and is augmented when advice is administered multiple times coupled with follow-ups (Bodner & Dean 2009; Fiore et al., 2000). This type of smoking cessation intervention style is congruent with physical therapy practice characteristics.

Findings from the smoking cessation literature show that the practice of smoking cessation counselling by health professionals appears to be mediated by several factors within
the socio-cognitive domain. These factors include knowledge, professional views and attitudes towards smoking cessation counselling (i.e., agreement that smoking cessation counselling is or should be part of professional practice), barriers to counselling (e.g., lack of patient compliance and lack of training), preparedness to counsel and self-efficacy (Ashley, Brewster & Victor, 2006; Brothwell & Gelskey, 2009; Fagan, 2007; Hudmon, Prokhorov & Corelli, 2006; McCarty et al., 2001, O’Loughlin et al., 2001; Thompson, Schwankovsky & Pitts, 1993; Wetta-Hall et al., 2005).

Of these, the pre-eminent factor is self efficacy. Self efficacy is considered a key construct in behavior change theories and models accounting for much of the variance in purposeful behavior (Fishbein et al., 2001). It is the key construct in social cognitive theory (Bandura, 1977; Bandura, 1986; Bandura, 1997; Bandura, 1998) and has been adopted into several other prominent social cognition theories including the transtheoretical model of change (Prochaska & DiClemente, 1982; Prochaska & Velicer, 1997) and the theory of planned behavior (Ajzen, 1991).

Self efficacy is described as the personal belief about one’s capacity to both organize and carry out courses of action necessary for the accomplishment of specific achievements. It is hypothesized to play a central role in the regulation of thought processes, motivation, and affective states leading to those actions (Bandura, 1998).

Self efficacy beliefs provide the foundation for human motivation since the incentive to participate in and adhere to specific behaviors occurs only if people believe that those behaviors will produce the intended outcomes (Pajares, 2002). Although certain skills are requisite for specific behavior performance, self efficacy depends not so much on one’s skill set, but rather on the perception of what one can do with one’s skills to effect an intended outcome (Bandura,
Therefore, active efforts to engage in a specific behavior are greater the stronger a person’s self efficacy in relation to that behavior (Bandura, 1977). The enhancement of efficacy beliefs can augment personal motivation for behavioral efforts and concomitant successes, or outcomes, related to those behaviors (Maibach & Murphy, 1995).

The construct of self efficacy may not be informative if it is referred to in general terms (Bandura, 1997); this is to say that self efficacy is specific to a particular behavior or domain of functioning, as opposed to a construct that can be generalized across behaviors (Maibach & Murphy, 1995). Thus, from an applied point of view, the exploration of the meaning of self efficacy with reference to a specific behavior becomes more germane. For example, a factor analysis of a self efficacy scale may discriminate sub-scale components that could be selectively targeted to increase self efficacy.

If self efficacy is a factor related to a specific health promotion behavior, then understanding the components of self efficacy may help inform specific training interventions for physical therapists to 1) increase their self efficacy where low levels exist, and in turn, 2) increase their counselling for smoking cessation. This has implications for instituting interventions that are specific for increasing the self efficacy of physical therapists with respect to smoking cessation counselling.

Findings from a previous companion study (Chapter 2) showed that although Canadian physical therapists reported that they counselled for smoking cessation, the extent to which such counselling occurred (i.e., all the time, most times, sometimes, rarely, never) varied considerably.

The purpose of the present study was to identify the factors that explained the likelihood for how often Canadian physical therapists counsel for smoking cessation. To elucidate the
relationships among these factors and selected variables and smoking cessation counselling, we proposed constructing a model. Previous work has shown self efficacy to be a factor associated with the likelihood that health professionals counsel for lifestyle behavior changes including smoking cessation (Hudmon et al., 2006; O’Loughlin, et al., 2001; Rea et al., 2004; Thompson et al., 1993). Thus, we included self efficacy as a variable of interest in our study. We hypothesized that self efficacy is a factor associated with smoking cessation counselling in Canadian physical therapists.

3.2 Methods

The detailed methods used for this questionnaire survey study are described in Chapter 2 which describes a companion study titled “Smoking cessation and counselling: knowledge, views and practices of Canadian physical therapists”.

3.2.1 Study Design

A cross-sectional survey of the population of physical therapists living in Canada and licensed by provincial colleges of physical therapy was conducted. Postal methods were used to circulate the surveys. Contact lists including postal addresses were obtained from eight provincial colleges and combined into a master list or sampling frame. A random sample of 1000 physical therapists (without replacement) was drawn from this master list to constitute a representative sample.

3.2.2 Survey Instrument

The survey instrument included a modified version of the Global Health Professional Survey on Smoking (GTSS Collaborative Group, 2006). This survey was designed to obtain information regarding tobacco use and smoking cessation counselling performed by third and fourth year medical, dental, nursing and pharmacy students. Our survey included
sociodemographic information as well as smoking cessation counselling practices by other members of the healthcare team, knowledge of the health effects of smoking, and physical therapists’ views regarding smoking cessation counselling as part of their practices.

An additional question asked was how often physical therapists counselled for smoking cessation. Further, the self efficacy of physical therapists to counsel for smoking cessation was assessed by combining questions from two independent self efficacy scales related to smoking cessation in order to create a single twenty item scale (Hudmon et al., 2006; Rea et al., 2004). Questions pertaining to physical therapists’ self efficacy regarding smoking cessation counselling were scored using a five point Likert scale (score ranges from 1 or ‘not at all confident’ to 5 or ‘extremely confident’). The internal consistency of this scale using Cronbach’s alpha was established previously (r=0.937) (Chapter 2).

Questions on the perceived barriers to and facilitators for smoking cessation counselling relevant to physical therapists were asked and scored using a five point Likert scale (score ranges from 1 or ‘strongly disagree’ to 5 or ‘strongly agree’). Questions about the 5 ‘A’s’ approach that are inherent in the Agency for Health Care Policy Research (AHCPR) Clinical Practice Guidelines for Tobacco Cessation (Fiore et al., 2000; Fiore, 2008) were added to help delineate the constituents of smoking cessation counselling. The 5 ‘A’s’ are a series of five sequential steps that health professionals can use to help smokers quit smoking. They include 1) Asking about tobacco use, 2) Advising smokers to quit smoking, 3) Assessing a smoker’s willingness to attempt to quit, 4) Assisting the smoker in their quit attempt and, 5) Arranging a follow-up meeting after the quit attempt. Response options to each of the 5A’s questions were binomial (yes/no).
The survey consisted of 67 questions with space for comments. The survey was translated into French based on the back translation method (Bullinger et al., 1998) so that the survey could be circulated to physical therapists in the French-speaking provinces of Quebec and New Brunswick. Details of the survey questions appear in Chapter 2.

3.2.3 Survey Administration

We adopted the tailored design method to encourage participant response (Dillman, 2000). This method required that each physical therapist receive an introductory ‘pre-notice’ letter by post, followed a week later by a survey package that included a cover letter, consent form, survey, self-addressed pre-paid return envelopes and a financial incentive. In our study, the financial incentive was five dollars. Non-respondents were sent follow-up reminder letters with replacement surveys with self-addressed pre-paid return envelopes at 16 and 34 days after the initial mailing. The study procedures were approved by the ethics review board of the University of British Columbia. The survey was administered between April and June 2009.

3.2.4 Data Management

Raw data were coded for data entry and entered into a SPSS version 12.0 computer program by an independent data entry agency. Two independent data entry personnel carried out quality control using double-entry methods for all data with Data Entry Emulator® software.

3.2.5 Statistical Analysis

3.2.5.1 Descriptive Statistics

Descriptive statistics (frequencies, percentages, means, standard deviations and standard errors where appropriate) and cross-tabulations were used to describe the sociodemographic information of the physical therapists who were sampled. Spearman’s rho assessed relationships among ordinal variables. Internal consistency of the item list of questions pertaining to physical
therapists’ views towards smoking cessation was assessed using Cronbach’s α. A Cronbach’s α of r≥0.70 was a minimum standard for acceptable internal consistency (Streiner & Norman, 2003).

3.2.5.2 Exploratory Factor Analysis

Because a composite self efficacy scale was included as part of the survey instrument, data reduction using principal axis factor (PAF) methods was conducted on the item lists for self efficacy and physical therapists’ views regarding smoking cessation counselling to explore potential subscale factors in the composite self efficacy scale (DeVellis, 2003).

The Kaiser-Meyer Olkin measure was used to assess sampling adequacy for factor analysis. Bartlett’s test of sphericity was used to test the appropriateness of the item lists for factor analysis. Item loadings with absolute values less than 0.30 were suppressed and not included in the factor analysis for both item lists. Factor rotation was conducted using direct oblimin with Kaiser normalization methods, and factor extraction was delineated by examining benchmark eigenvalues greater than 1.0 coupled with visual analysis of scree plots (DeVellis, 2003).

The PAF for self efficacy revealed a two-factor structure for smoking cessation counselling conducted by physical therapists. Factor 1 was labelled ‘skills and knowledge’ and Factor 2 was labelled “support and education”. A two-factor structure emerged from the PAF for physical therapists’ views. Factor 1 was related to the physical therapists’ views regarding the profession of physical therapy and smoking cessation counselling and was labelled “professional views”. Factor 2 was labelled “role modeling” as it was related to the perceived public perception of physical therapists and whether they smoked or not.
The independent continuous factor scores for both sets of items were retained as potential variables for inclusion into the regression analysis.

### 3.2.5.3 Ordinal Regression

Multivariate ordinal logistic regression based on cumulative log odds was used to assess the likelihood as to which independent variables were factors for how often physical therapists counselled for smoking cessation (O’Connell, 2006).

The logit link function was used in the ordinal regression model. Logits derived from ordinal regression were converted to odds ratios (OR) by taking the inverse natural log of the calculated logit. Odds ratios were expressed using 95% confidence intervals with 5% confidence limits. An OR of 2 implies a twofold likelihood of the event occurring. The assumption of proportional odds for the ordinal model was assessed using the test of parallel lines. The model was also assessed using multivariate linear regression analysis that operated as a diagnostic to test for multicollinearity. Multicollinearity was investigated by assessing changes in the variance inflation factor. Further, multivariate linear regression allowed for the analysis of residuals to identify violations of model assumptions. Variance of the residuals (homoscedasticity) was assessed using the Durbin-Watson test. Alpha was set at 0.05 for all the analyses.

### 3.2.5.4 Ordinal Regression Model Building Strategy

In building the ordinal regression model, we attempted to minimize the risk of specification error and model bias by using an approach in which the model building strategy proceeded in stages (Berk, 1983; Hosmer & Lemeshow, 2000). The model building strategy for ordinal regression began with the construction of a bivariate correlation matrix relating the independent variables to the dependent variable. Independent variables that were univariate predictors, significant at $p<0.25$, were initially retained for possible inclusion into the model.
A ‘best subsets’ model approach was used to select several potential explanatory models (Berk, 1983; Hosmer & Lemeshow, 2000). With a best subsets model approach the researcher is able to compare a series of models using summary statistics and then select a ‘best set’ of variables based on statistical merit or other verifiable basis (King, 2003).

The selection of the initial best-subsets model for this study was mediated in part with the Akaike’s Information Criterion (AIC) for model-fitting (Cetin & Erar 2002; Menard, 1995). The AIC uses the following equation: 

\[ AIC = -2\left(\text{log-likelihood}\right) + 2K \]

where the log-likelihood indicates model fit and K equals the number of variables in the equation. A low AIC indicates a better-fitted model. Over-fitting the model is mediated by the addition of the 2K value to the log-likelihood value; in other words, the more variables that are added to the model increase the value of the AIC. Once a best-subsets model was selected, other predictors (specifically, barriers to counseling) that were not univariately significant but reported as significant correlates for smoking cessation counseling the literature (Neil-Urban, LaSala & Scott, 2001; Sarna et al., 2000) were added independently to the best-subsets model for further model development (Berk, 1983).

### 3.2.5.5 Model Variables

Several independent variables of interest were initially selected from the survey for potential inclusion into the model based on univariate statistical significance. These included the following ordinal variables: barriers to smoking cessation (i.e., lack of time, lack of resources, lack of patient compliance, lack of physical therapist motivation, intrusion into patient’s privacy, and no long term patient commitment) and preparedness to counsel. Binomial variables (yes/no) included training received to counsel for smoking cessation. Smoking cessation counselling by
other members of the healthcare team (i.e., counselling by professionals other than physical therapists) was included as a categorical variable. Continuous variables included age and self efficacy. Factors extracted from the physical therapists’ views scale and the composite self efficacy scale based on the PAF were statistically significant and thus met the criteria for inclusion. Based on the model building strategy, a final best subset of independent variables was retained for the final model. A description of the dependent and final independent variables follows.

3.2.5.6 Dependent Variable

The dependent variable for ordinal regression was defined by the response to the question “Where counselling is defined as encouraging and assisting patients to stop smoking, how often do you counsel patients who smoke, to stop smoking?” Response options were ordinally ranked: all of the time (100% of the time), most of the time (75% of the time), sometimes (50% of the time), rarely (25% of the time) and never (0% of the time). The response options ‘all of the time’ was collapsed into ‘most times’ due to the small number of ‘all of the time’ responses (n=24; 3.3%). Therefore a four level ordinal variable was used in the final regression. The average of the mean scores of each self efficacy question established the level of overall self efficacy.

3.2.5.7 Independent Variables

Several independent variables of interest were initially selected from the survey for potential inclusion into the model. Ordinal variables included perceived barriers towards smoking cessation counselling (i.e., lack of time, resources, patient compliance, motivation, patient long term commitment), physical therapist’s views regarding smoking cessation counselling, and their reported preparedness to counsel. Perceived barriers and physical
therapists’ views were scored based on a five point Likert scale that ranged from 1 (strongly agree) to 5 (strongly disagree).

The variable of preparedness to counsel for smoking cessation was assessed based on the following question: “How prepared do you feel you are to counsel patients on how to stop cigarette smoking?” Response options included ‘very well prepared’, ‘somewhat prepared’ and ‘not at all prepared’. Few physical therapists (n=12) responded ‘very well prepared’ so these responses were collapsed into the ‘somewhat prepared’ category. We hypothesized that because of the small number of respondents in the ‘very well prepared’ category, loss of natural variance would be minimized. The final preparedness variable was classified as binary (prepared/not prepared).

One categorical variable, provision for smoking cessation counselling in the workplace (workplace counselling variable) was retained. This variable question required physical therapists to respond to the statement, “In my place of work, other members of my healthcare team (i.e., physicians, nurses, addictions counsellors, etc.) provide smoking cessation counselling” with either ‘yes’, ‘no’, ‘don’t know’, or ‘not applicable’. Responses of ‘don’t know’ and ‘not applicable’ were collapsed together. The final variable consisted of three levels.

Continuous variables included age and the PAF factors extracted from ‘physical therapist’s views’ toward smoking cessation counselling’ and self efficacy. These factors included ‘professional views’ extracted from the physical therapists views toward smoking cessation counselling scale and two factors labelled ‘skills and knowledge’ and ‘support and education’ from the self efficacy scale (details in Results).

During the building of the ordinal regression model extracted factors ‘skills and knowledge’ and ‘support and education’ were independent univariate predictors of smoking
cessation counselling behavior. However, these factors were correlated with each other ($r=0.636; p<0.001$), and the issue of multicollinearity soon became apparent when they were included simultaneously into the ordinal regression model (in place of self efficacy) with the final model variables. Thus, these factors were not independently retained for the final model; instead, the total self efficacy variable was used.

3.3 Results

3.3.1 Descriptive

Proportional representation of the physical therapists we sampled from each province was within ±2% of the proportions reported by the Canadian Institute for Health Information with the exception of British Columbia (+4.3%) and Ontario (-2.9%) (Canadian Institute for Health Information, 2008). The number of physical therapists who returned surveys was 738. Fifty-five surveys were returned to the investigators because the respondents were no longer working at the addresses provided by the professional associations. When these 55 surveys were subtracted from the overall number of surveys sent out, the return rate was 78.1%. Sociodemographic and clinical practice characteristics for these respondents are reported in Chapter Two (Table 2.1 and Table 2.2). The extent to which physical therapists counselled for smoking cessation expressed as a percentage of time they counselled overall appears in Table 3.1.

The mean score for the twenty self efficacy items was $2.68±0.55$ (n=670) indicating that overall, physical therapists reported low self efficacy for smoking cessation counselling. The values for skewness and kurtosis were 0.072 and 0.550, respectively. The mean ($±$SD) score for physical therapists’ views was $3.88±0.57$ (n=681). The values for skewness and kurtosis were $-0.672$ and 0.905, respectively.
3.3.2 Internal Consistency

Cronbach’s α for internal consistency for the 7 item physical therapists’ views was \( r=0.791 \) (n=681). The item “physical therapists who smoke are less likely to advise people who smoke to stop smoking” was removed from the items on physical therapists’ views because this statement fit the definition of an opinion more than a professional view. When we removed this item before performing the factor analysis, Cronbach’s α for physical therapists’ views increased to \( r=0.817 \).

3.3.3 Exploratory Factor Analysis

The PAF analysis using direct oblimin (oblique) rotation of the twenty self efficacy items (n=670) and seven physical therapists’ views items (n=681) was conducted on the data collected from this survey.

3.3.3.1 Self Efficacy PAF

For self efficacy, the Kaiser-Meyer Olkin measure of sampling adequacy was 0.947 supporting that the sample was favorable for factor analysis. Bartlett’s test of sphericity was significant \( \chi^2 (190, N = 670) = 7802.2, p<0.001 \), further supporting that the factor analysis was appropriate. Results from the PAF for self efficacy revealed the emergence of a two-factor structure. Together, these factors explained 52.2% of the total variance. Fourteen items loaded onto Factor 1 accounted for 43.2% of the variance (eigenvalue=9.1) and were related to self efficacy with specific reference to ‘skills and knowledge’ associated with smoking cessation counselling and was named accordingly. Six items loaded onto Factor 2 which explained a further 9.0% of the variance (eigenvalue=2.2), was related to “support and education” for smoking cessation counselling and was labelled accordingly. Factor loadings (factor-item correlations) for the 20 items ranged between 0.463 and 0.847 for Factor 1 (mean factor
loading=0.672), and 0.709 and 0.848 for Factor 2 (mean factor loading= 0.769). The distributions for factor scores for Factor 1 and 2 were normal (skewness=0.347 and -0.496, respectively). The results of oblique rotation for the self efficacy items as evidenced by the pattern matrix produced by the PAF appear in Appendix A-3.

3.3.3.2 Physical Therapists’ Views PAF

For the items related to physical therapists’ views, the Kaiser-Meyer Olkin measure of sampling adequacy was 0.805, suggesting that the sample was favorable for factor analysis. Bartlett’s test of sphericity was significant \( \chi^2 (21, N = 681) =1652.4, \ p<0.001 \) supporting further that the factor model was appropriate. A two-factor structure emerged from the PAF for physical therapists’ views. Combined, these factors accounted for 52.8% of the total variance. Five items loaded onto Factor 1 which accounted for 41.5% of the variance (eigenvalue = 3.36). These items related to the physical therapists’ views regarding the profession of physical therapy and smoking cessation counselling; they were labelled “professional views”. Only two items loaded onto Factor 2 which accounted for another 11.3% of the variance (eigenvalue = 1.19). The items in Factor 2 were specific to the perceived public perception of physical therapists and their smoking behavior so this factor was labelled “role modeling”. Factor loadings (factor item correlations) for the seven items ranged between 0.562 and 0.798 for Factor 1 (mean factor loading=0.681), and 0.681 and 0.874 for Factor 2 (mean factor loading= 0.778). The distributions of factor scores for Factors 1 and 2 were normal (skewness = -0.607); however for Factor 2 the skewness was -1.567. The results of the oblique rotation for physical therapists’ views as evidenced by the pattern matrix produced by the PAF appear in Appendix A-4 and Plots of the two loading factors for self efficacy and physical therapists’ views using direct-oblimin rotated solution appear in Appendices A-5 and A-6, respectively.
3.3.4 Ordinal Regression Model

A total of 694 out of 738 respondents were initially retained for inclusion into the ordinal regression analysis. Pediatric physical therapists who indicated that smoking cessation counselling was not applicable to their practices, and physical therapists who answered negatively or not at all to all 5 A’s questions were removed from the analysis. Listwise deletion excluded another 54 respondents leaving a final n=640 for ordinal regression.

Physical therapists, who reported high self efficacy and reported that they were prepared to counsel for smoking cessation, were more than twice as likely to counsel for smoking cessation to a greater extent than those who reported low self efficacy and lacked preparedness.

Furthermore, the extracted factor ‘professional views’ towards smoking cessation counselling were also significant in the model, but the effect was less (OR=1.65). In workplace environments where other health professionals counselled for smoking cessation, the odds were 76% greater that a physical therapist would also counsel for smoking cessation. Age, although statistically significant, accounted for little variance and did not add meaningful information to the findings. The results of the ordinal regression analysis indicating the ORs for the independent variables related to the extent to which Canadian physical therapists counselled for smoking cessation appear in Table 3.2.

Overall, the ordinal regression model was significant based on the change in deviance score for model fit; the -2 log likelihood value for the ordinal model was 1511.25, significantly different from the intercept model $\chi^2 (6, N = 640) = 202.04, p<0.001$. Pseudo $R^2$ value for the ordinal model was $r=0.291$ (Nagelkerke’s $R^2$).

We used a cumulative odds ordinal regression model to assess the factors associated with the likelihood of the frequency to which physical therapists counselled for smoking cessation.
One of the assumptions of cumulative odds models is that the effect of the explanatory variable is comparable across all cumulative logit comparisons (O’Connell, 2006). This assumption of proportional odds of the ordinal model was not violated when tests of parallel lines were assessed ($p=0.121$). We nonetheless investigated this assumption further by conducting separate binary logistic regression analyses in accordance with the recommendations of O’Connell (2006). While there was some departure from linearity with respect to the trends of the ORs across the logistic models, the direction of the trend was similar across all independent logistic regression models. Furthermore, the average of the ORs across the binary logistic regression models was equivalent to the OR of the ordinal model.

### 3.4 Discussion

To our knowledge, this is the first survey to explore the factors contributing to the likelihood of how often Canadian physical therapists counselled for smoking cessation. A total of 640 physical therapists constituted the sample used in the analysis and accounted for the physical therapists for whom smoking cessation counselling was not applicable in their practice settings. Therefore, approximately 92.2% of eligible respondents were assessed for the factors of interest, or 86.7% of the total number of respondents.

An ordinal regression model (cumulative ORs) was used to assess the independent effects that the factors of preparedness to counsel, self efficacy, professional views towards smoking cessation counselling, workplace counselling, and age had on the likelihood of how often physical therapists counselled for smoking cessation. Cumulative odds models are interpreted such that the ORs derived from calculated logits are maintained when the dependent categories of counselling are combined (cumulative) and compared with the lower categories, i.e., the odds
are proportional across categories (O’Connell, 2006). The discussion of the findings of the study follows.

We hypothesized that self efficacy is a predictor of how often Canadian physical therapists counsel for smoking cessation. The principal finding of our study was that physical therapists counselled for smoking cessation more often by a factor of two if they reported higher levels of self efficacy for smoking cessation counselling compared to physical therapists who reported lower levels of self efficacy. Similar effect sizes for the association of self efficacy to smoking cessation counseling have been shown in other studies. O’Loughlin (2001) also reported that in general practitioners high levels self efficacy increased the likelihood of smoking cessation counseling by a factor of two. The effect of self efficacy was not as strong in pharmacists, with self efficacy increasing the odds of counseling by 63% (Hudmon et al., 2006).

In general, self efficacy is characterized as a predictor of behavior (DeVellis & DeVellis, 2001) and is a factor associated with participation in and governance of health promotion activities in primary care. The stronger a person’s self efficacy with respect to a particular behavior, the more that individual will persist in that behavior, notwithstanding related obstacles or aversive experiences (Bandura, 1977). Self efficacy is a predictor of counselling for smoking cessation across a range of health professionals, e.g., physicians and pharmacists as well as physical therapists (Hudmon et al., 2006; O’Loughlin, et al., 2001; Rea et al., 2004).

The meaning of the construct of self efficacy has been debated (Cahill, Gallo, Lisman & Weinstein, 2006; Kirsch, 1982; Rhodes and Blanchard, 2007). Cahill reflected on Bandura’s assertions that behavioral actions were regulated and influenced by the anticipation of negative emotional consequences of those actions (i.e., anxiety and fear) (Bandura, 1977; Cahill et al.,
2006). Such consequences amount to an outcome expectancy, the influence of which can be assuaged given stronger self efficacy to perform the desired behavior (Bandura, 1977).

However, with respect to testing the theoretical constructs of self efficacy, Cahill and colleagues argued that it was essential to discriminate whether or not a person was willing or able to perform a task (Cahill et al., 2006). In other words, if a person had the requisite skills for a specific behavior (able) and they chose not to perform the behavior (willing), this could imply that outcome expectancies (negative ones) were driving that person’s actions. Outcome expectancies have been shown to influence self efficacy statements. When confidence items were used to measure self efficacy for performing physical activity, Rhodes and Blanchard (2007) demonstrated that positive outcome expectancies and motivation did, in part, influence responses in personal judgements of confidence.

In the present study, however, it was unlikely that negative consequences, at least those related to anxiety or personal discomfort, were barriers for counselling. Few physical therapists (10.1%) agreed or strongly agreed that an unpleasant personal experience was a barrier to counsel for smoking cessation (data not reported). Further, this variable was not related to smoking cessation counselling ($p=0.190$) (data not reported). An inference can be made that in terms of negative outcome expectancies, unpleasant personal experiences would not deter physical therapists from counselling their patients who smoke.

Bandura (1977) suggested that a person’s efficacy expectations reflects his or her positive previous experiences related to a task or outcome, and in turn, a greater likelihood that a given behavior will be repeated. But such behavior cannot be expected if the requisite skills and knowledge to perform it are absent (Bandura, 1977). Our findings supported this when the factors extracted from the self efficacy variable were examined.
During the building of the ordinal regression model, factors ‘skills and knowledge’ and ‘support and education’ extracted from the self efficacy variable were significant univariate factors and were also significant in the multivariate best subsets ordinal regression model. Entered together however, issues pertaining to multicollinearity became problematic for the ordinal model. To avoid problems with multicollinearity we chose to include the self efficacy variable in the model instead of both factors. Thus, in this study, while the composite self efficacy scale retained most of the predictive variance, it is difficult to interpret because it lacks precision (Rhodes, Plotnikoff & Spence, 2004).

Self efficacy for smoking cessation counselling has been shown to increase following a theory-based training program in nurses (Barta & Stacy, 2005; Laschinger & Tresolini, 1999). The factors that were extracted from our self efficacy scale, such as ‘skills and knowledge’ provide meaningful information regarding the discrimination of the specific sub skills related to self efficacy that are required for smoking cessation counselling at least, as we have shown, by physical therapists. This was validated in part by supplementary comments made by physical therapists in this study with respect to their lack of training in and knowledge of smoking cessation counselling (data not shown). However, it has been shown that clinical interventions for smoking cessation administered by community pharmacists are strongly and independently associated with strong knowledge and skills (basic and applied) about smoking and smoking cessation (Ashley et al., 2006). As such, the delineation of the factors that underpin the self efficacy of physical therapists with respect to smoking cessation counselling yields some insight into the specific interventions or training programs needed to increase this skill.

Preparedness to counsel was also a predominant factor associated with smoking cessation counselling, yet few health professionals feel prepared to counsel (Brothwell & Gelskey, 2009;
Chapter 2). The proportion of physical therapists who reported being very well prepared to counsel was minimal (1.7%), thus these respondents were collapsed into the ‘somewhat prepared’ category; therefore, in our study, the ‘prepared to counsel for smoking cessation’ variable in this study implied feeling at least ‘somewhat prepared’. As we showed, the likelihood that physical therapists counselled more often increased by a factor greater than two if they reported being prepared to counsel compared to those physical therapists who reported that they weren’t prepared. We did not examine the specific characteristics that may explain degree of counselling preparedness (e.g., psychologically prepared and emotionally prepared), thus, these remain unknown.

Differences in the perception of being prepared to counsel and perceived effectiveness for helping patients change their lifestyle behaviors have been reported. For example, 91% of general medical practitioners in the United Kingdom (Midlands, England) reported being prepared or very prepared to counsel for smoking cessation, yet only 40% reported feeling effective or very effective in actually doing so (McAvoy, Kaner, Lock, Heather & Gilvarry, 1999). This percentage however increased to 64% when respondents were asked if they believed they could be prepared with appropriate training and support for smoking cessation counselling.

Given that being somewhat prepared to counsel was a slightly more effective factor for smoking cessation counselling than self efficacy, further investigation is needed to elucidate the meaning of preparedness with respect to smoking cessation counselling, its predictive characteristics, and its relationship to self efficacy. For example, findings in the field of education showed that teachers with a greater sense of preparedness for classroom behavior management had greater self efficacy to do so (Giallo & Little, 2003). This finding supports that perceived preparedness with respect to one’s confidence is important in effectively carrying out a
behavior. Although based on an educational context, this example is relevant because education is a key component of counselling including smoking cessation (Fiore et al., 2000).

Factors that had lower risks for how often of smoking cessation counselling included whether other health professionals also counseled for smoking cessation in the physical therapists’ workplaces, and positive professional views towards smoking cessation counselling.

Within their places of work, physical therapists counselled for smoking cessation more often if other members of their healthcare teams also counselled, compared to physical therapists whose team members did not. This is consistent with the bivariate findings in Chapter Two that showed that a greater proportion of physical therapists counselled for smoking cessation if other workplace professionals also counselled.

From an effectiveness perspective, the extent of counselling that occurs in the workplace by multiple health professionals appears paramount. Smoking cessation advice administered to a client or patient by more than one health professional almost triples the likelihood that an individual will make a quit attempt (An et al., 2008). The more health professionals who address smoking cessation with their patients, the greater the odds that the patient will quit. Further investigation is required to examine how smoking cessation counselling manifests in practice settings where smoking cessation counselling is encouraged or perceived to be the role of a specific or multiple health professionals, and also examine the factors that explain why smoking cessation counselling is conducted more often by physical therapists in work environments where health professionals other than physical therapists counsel for smoking cessation.

Physical therapists’ professional views towards smoking cessation counselling also increased the effect (albeit small) with respect to the extent to which smoking cessation counselling took place. Favorable attitudes that health professionals have regarding their
professional roles in addressing smoking cessation with their patients is positively related to increased smoking cessation counselling (Ashley et al., 2006; McCarty et al., 2001; O’Loughlin, et al., 2001). For example, in a sample of general practitioners from Montreal, Canada, beliefs or attitudes that were very favorable towards smoking cessation more than tripled (OR=3.6) the likelihood of ‘completeness’ of counselling for smoking cessation (defined as the proportion of patients counselled, the number of visits that counselling was provided, and the minutes devoted to counselling each visit (O’Loughlin, et al., 2001). In our study, the operative word in the questions we asked included ‘should’ which suggests that physical therapists who counsel for smoking cessation do so in part because of their perception that it is their professional obligation.

3.5 Limitations

The primary limitation of our study is that inherent to survey questionnaires and self report. Given that smoking has increasingly become taboo within Canadian society, that there are more social constraints on when and where smokers can smoke, and that, as healthcare providers, physical therapists may feel inclined to be anti-smoking, we believe our findings could reflect social desirability response bias.

Listwise deletion used in correlational and regression analyses introduced a loss of subject data or biased responses which constitutes a potential limitation to the generalizability of our findings. Data from the 694 physical therapists which were retained for ordinal regression, however only 640 physical therapists answered all questions relevant for inclusion into the regression analysis. This amounted to 92.2% of the eligible sample for the regression analysis and 86.7% of the total sample.

The self efficacy scale we used combined independent smoking cessation self efficacy scales and included changing the scoring for the self efficacy questions that we adopted from
Rea (2004) from a six point to a five point Likert scale. This may have implications for the reliability and validity of our final scale in accordance with the potential loss of variance associated with a reduction in the number of score options. However, equivalence has been observed between scores derived from 5 point and 7 point Likert scales based on their shared variance (Colman, Norris & Preston, 1997). While the final scale used in our study retained strong internal consistency, the psychometrics of the scale requires further evaluation.

3.6 Implications

Given that a majority of the Canadian physical therapists we studied (>60%) were interested in receiving smoking cessation counselling training (Chapter 2), the findings of this study help to inform the nature and extent of such training to increase the likelihood that physical therapists counsel smokers to quit and counsel them more often. In particular, training strategies that incorporate education and activities to increase practitioners’ self efficacy with respect to smoking cessation counselling are preferable with self efficacy focusing on incorporating factors related to ‘skills and knowledge’ and ‘support and education’. With respect to incorporating training in smoking cessation counselling in entry-level academic physical therapy programs, enactive or real experiences should be included to increase practitioner self efficacy (Bandura, 1986). Nursing and medical students reported that exposure to factual information related to risk factors associated with specific health promotion topics, along with actual practice in clinical settings, were the two pre-eminent factors contributing to their confidence towards health promotion counselling (Laschinger & Tresolini, 1999).

Our findings have implications for health promotion with respect to addressing lifestyle risk factors in addition to smoking. Behavior-specific self efficacy generalizes to other behaviors (Bandura, 1977). This has merit for increasing the likelihood of lifestyle counselling in other
priority areas of health (i.e., optimal nutrition, weight control, physical activity and exercise, no or moderate alcohol consumption, sleep hygiene and stress management).

Most Canadian physical therapists we studied report that minimally asking and advising patients to stop smoking is a professional responsibility (See Chapter 2). Although positive professional views towards smoking cessation counselling had a small effect on the extent to which physical therapists reported they counsel, this is still informative for provincial and national professional organizations such as the Canadian Physiotherapy Association (CPA) to both educate and advocate further the role that physical therapists have with respect to improving the health of Canadians vis-à-vis smoking cessation.

Our findings would be augmented by both quantitative and qualitative replication and extension studies. Focus groups for example would help inform professional education with respect to ways and means of teaching and evaluating physical therapists and students vis-à-vis health behavior change, smoking cessation specifically.

3.7 Conclusion

A gap exists between the need for smoking cessation initiatives by healthcare providers including physical therapists as advocated in Canadian health white papers (Kirby & LeBreton, 2002; Romanow, 2002), the endorsement to do so by the CPA (Canadian Physiotherapy Association, 2001) and the reported self efficacy of Canadian physical therapists to do so. In addition to being endorsed, smoking cessation counselling, like counselling for other deleterious lifestyle behaviors, warrants being a professional clinical competency. Physical therapists need the knowledge and skills to initiate and support smoking cessation in their patients and provide continuity of care and follow-up to maximize the probability of patients’ quitting over the long term. Smoking cessation counselling will be more effective if supported by the healthcare team.
as a whole, and especially, if the team is in close proximity. Finally, competency in the skills related to smoking cessation counselling could facilitate physical therapists’ effecting other lifestyle behavior changes such as promoting optimal nutrition, weight loss, and physical activity in their patients.
### Table 3.1  Proportion of physical therapists (%) who counsel for smoking cessation all or most times, sometimes, never or rarely

<table>
<thead>
<tr>
<th>Extent of counselling (n=717)</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>All + Most times (75-100% of the time)</td>
<td>182</td>
</tr>
<tr>
<td>Sometimes (50% of the time)</td>
<td>147</td>
</tr>
<tr>
<td>Rarely (25% of the time)</td>
<td>264</td>
</tr>
<tr>
<td>Never (0% of the time)</td>
<td>124</td>
</tr>
</tbody>
</table>
Table 3.2  Ordinal regression analysis results showing odds ratios for the independent effects of self efficacy, preparedness, professional views towards smoking cessation counselling, smoking counselling responsibilities in the workplace, and age to counsel for smoking cessation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Logit</th>
<th>SE of logit</th>
<th>Wald</th>
<th>p</th>
<th>Odds ratio</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self efficacy</td>
<td>0.840</td>
<td>0.167</td>
<td>25.28</td>
<td>&lt;.001</td>
<td>2.32</td>
<td>1.67 - 3.22</td>
</tr>
<tr>
<td>Preparedness</td>
<td>0.974</td>
<td>0.188</td>
<td>26.80</td>
<td>&lt;.001</td>
<td>2.65</td>
<td>1.83 - 3.83</td>
</tr>
<tr>
<td>Professional views</td>
<td>0.493</td>
<td>0.094</td>
<td>27.34</td>
<td>&lt;.001</td>
<td>1.64</td>
<td>1.36 - 1.97</td>
</tr>
<tr>
<td>Workplace counselling</td>
<td>0.563</td>
<td>0.178</td>
<td>10.04</td>
<td>&lt;.01</td>
<td>1.76</td>
<td>1.24 - 2.49</td>
</tr>
<tr>
<td>Age</td>
<td>0.016</td>
<td>0.007</td>
<td>5.01</td>
<td>&lt;.05</td>
<td>1.02</td>
<td>1.00 - 1.03</td>
</tr>
</tbody>
</table>

SE: standard error; CI: confidence interval
3.8 References


CHAPTER 4. ADVICE AS A SMOKING CESSATION STRATEGY: A SYSTEMATIC REVIEW AND IMPLICATIONS FOR PHYSICAL THERAPISTS

4.1 Introduction

Smoking is the leading cause of preventable death (Mokdad, Marks, Stroup & Gerberding, 2004) and causes or is linked to chronic obstructive lung disease (COPD), heart disease, hypertension and stroke, and many cancers (Howard et al., 1998; Kurth et al., 2003a; Kurth et al., 2003b; Skurnik & Schoenfeld, 1998; U.S. DHHS, 2004). In 2000, global estimates of mortality related to smoking approached five million (Ezzati & Lopez, 2003) and, by 2020, smoking is expected to cause “more deaths than any single disease worldwide” (Murray & Lopez, 1997).

In addition to the common manifestations of smoking such as COPD and cancers of the respiratory tract (Skurnik & Schoenfeld, 1998), smoking potentiates atherogenesis secondary to endothelial injury and cell dysfunction (USDHHS, 2004). Unequivocally, cigarette smoking is a primary risk factor for cardiovascular disease (Tanuseputro, Manuel, Leung, Nguyen, & Johansen, 2003) including coronary artery disease, hypertension, stroke and peripheral vascular disease (Howard et al., 1998; Kurth et al., 2003a; Kurth et al., 2003b; USDHHS 2004). Furthermore, smoking is associated with negative musculoskeletal consequences including bone fracture and impaired soft tissue healing (Leow & Maibach, 1998; Porter & Hanley, 2001; Ward & Klesges, 2001), compromised bone mineral density and unfavorable effects on lumbar disk health, and increased risk of sustained hip or forearm fractures (Porter & Hanley, 2001; Ward & Klesges, 2001).

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Hughes (2003) advocated that enabling smokers to quit first involves motivating them to initiate a quit attempt, and then after having quit, helping them not to relapse. Indeed, many smokers seek information on how to quit smoking and some 70% of smokers indeed want to quit (Centers for Disease Control and Prevention, 2002). As such, the health care system and, in particular, the health professional in primary health care, can be instrumental in identifying, evaluating, treating, following up and referring smokers; potentially yielding a high number of long-term abstainers (Ockene, 1987).

Not all smokers report receiving assistance from health care providers to quit. In Canada, approximately 88% of smokers visited a health professional in 2005; and of these, only half (54%) reported they were advised to stop smoking (Centers for Disease Control and Prevention, 2007). Despite this apparent paucity of attention to modifying smoking behavior by health professionals, recent findings support a cumulative benefit of multiple smoking cessation interventions when administered by more than two health professionals (An et al., 2008). In fact, smokers who reported receiving smoking cessation advice from two or more health professionals were nearly three times as likely to make a quit attempt (An et al., 2008). Thus, it appears, at least in primary care, the more types of health professionals helping their clients or patients stop smoking, the greater the odds they will. This is informative from the perspective of the ‘career’ of a smoker wherein a smoker may make several attempts to quit before permanently succeeding.

Ideally, successful smoking cessation is characterized by a point in time when a smoker abstains from smoking indefinitely. This is not the typical profile however as relapses are common (Hughes, Keely & Naud, 2004). There appears to be no set duration of abstinence wherein a safe point for cessation maintenance occurs (Gilpin, Pierce & Farkas, 1997; Ockene et
al., 2000). Relapse may be a temporary setback and abstinence is attained once again. Smoking cessation may best be viewed as a process, characterized by multiple quits and relapses before sustained abstinence is achieved (Prignot, 2000).

Health professionals including physical therapists are important sources of smoking cessation interventions as smokers and non-smokers alike have intermittent contact with them, either annual or situational (Ockene, 1987). Physical therapists have a tradition of being health educators; however, this is not typically viewed as a clinical competence within that profession (Dean, 2009). The profession of physical therapy however has identified smoking cessation as a goal in smokers. Both the Canadian Physiotherapy Association and the American Physical Therapy Association, for example, have acknowledged that smoking cessation is a critical element of health promotion which is integral to contemporary definitions of physical therapy (American Physical Therapy Association, 1997; Canadian Physiotherapy Association, 2008). However, little information exists regarding the extent to which physical therapists engage in smoking cessation with their patients (Rea, Marshak, Neish & Davis, 2004).

Although the busy physical therapist may verbalize concern about additional workload, smoking cessation would constitute ‘value added’ to the care provided to the individual and his or her family, and to society as a whole. With relatively little additional time expenditure, the client benefits from the multisystem health benefits of quitting and, in addition, quitting may improve outcomes for the referred problem, e.g., improved capacity to heal. Furthermore, as health professionals who work closely with people with disabilities over prolonged periods, physical therapists have a particularly important role to play with respect to smoking cessation in this population given smoking rates among people with a disability appear to be higher than those without disability (Armour et al., 2007).
Smoking is a complex behavior with multiple determinants (Hudmon et al., 2003; Piper et al., 2004) and smoking cessation interventions have become correspondingly complex, characterized by multi-faceted components (Shiffman, 1993). Complex multi-component intervention studies, while successful, have hampered the identification of the active components of smoking cessation intervention which in part limits incorporation of smoking cessation into clinical practice as the clinician lacks the practical skills to effect long-term smoking cessation (Curry et al., 2003; Piasecki & Baker, 2001). The combination of these factors may contribute to health care providers abdicating responsibility for initiating smoking cessation in patient care.

However, recent meta-analyses of systematic reviews of smoking cessation interventions support that brief as well as more intensive smoking cessation advice from health professionals is effective for sustained quitting (Gorin & Heck, 2004; Lancaster & Stead, 2004; Mojica et al., 2004; Rice & Stead, 2008). Given that physical therapists incorporate patient education as part of treatment, imparting smoking cessation advice to patients who smoke is both practical and cogent. While extensive smoking cessation advice that is time-consuming may be less practical in a clinical setting and may warrant referral to another type of professional, advice that is brief may not only be effective, but its effect sustained when combined with on-going follow-up (Mojica et al., 2004).

The purpose of this systematic review was to selectively study the role of advice, as a mode of smoking cessation intervention that could be administered by health professionals, and specifically, by physical therapists in practice. The outcomes we hoped to achieve were twofold. First, we hoped to extend the findings of previous systematic reviews of smoking cessation advice administered by health professionals and to elucidate the specific components of such advice that are associated with long-term quit rates. Unlike previous reviews, we would achieve
this by incorporating extensive qualitative descriptions of included articles along with quantitative assessments of the effects of advice (meta-analysis). Second, based on our findings, our intent was to encourage and enable physical therapists to optimize their time in initiating or supporting smoking cessation in the context of daily patient care, based on judiciously administered advice.

4.2 Methods

4.2.1 Search Strategy

We incorporated a sequential search strategy; first, we accessed the electronic databases of MEDLINE, CINAHL EMBASE and PsychINFO, using thesaurus-based keyword searches and MeSH terms. All MeSH terms were included as specific keywords within these databases and that of the Cochrane Central Register of Controlled Trials (CENTRAL). Keywords used were “smoking cessation”, “advice”, “counseling”, and “health personnel”. Variations of these terms including truncation were incorporated depending on the thesaurus-based definition used by the electronic database. Searches were limited to the English language.

Hand-searching of journals was also conducted and included key journals that featured articles on smoking (Gorin & Heck 2004; Liguori & Hughes 1996). The following journals were hand-searched: Addiction, Addictive Behaviors, American Journal of Preventive Medicine, Annals of Internal Medicine, Archives of Internal Medicine, Cancer, Epidemiology, Biomarkers and Prevention, Health Psychology, Journal of Behavioral Medicine, Journal of Substance Abuse, Nicotine and Tobacco Research, Preventive Medicine and Tobacco Control. The baseline year for hand searching was dependent upon the year of journal inception. For journals with longer histories of publication, we selected 1968 as a baseline year. The rationale for this was based on evidence towards individualized smoking cessation counseling beginning as early as
1969 (Porter & McCullough 1972; Williams, 1969). Finally, searches of reference lists of systematic reviews regarding relevant smoking cessation interventions were conducted (Carr & Ebbert, 2006; Gorin & Heck, 2004; Lancaster & Stead, 2008; Law & Tang, 1995; Rice & Stead, 2008).

4.2.2 Inclusion and Exclusion Criteria

The priority of our study was to include studies that incorporated advice or counseling as part of care delivered by a health professional. We were interested in assessing the effectiveness of smoking cessation interventions that promote long-term cessation; in particular, we were interested in practical smoking cessation advice or counseling given within the context of a clinical visit or interaction. To this end, we chose to include only those studies that were defined as effectiveness studies, i.e., studies in which the interventions were applied by a health professional within a clinical context, or a clinical staff member recruited to implement smoking cessation intervention. Efficacy studies typically conducted in highly structured, controlled experimental situations were excluded (Lichtenstein et al., 1996).

Some smokers quit spontaneously with quit rates estimated at 6% (Cohen et al., 1989). Self-quitting has been observed in individuals participating in a control or usual care group in a smoking cessation study. Our review included randomized controlled and clinical controlled studies to account for the effect of the smoking cessation advice intervention over and above self-quitting rates. For our purposes, the control groups were defined as receiving no advice (pure control) or usual care.

Inclusion criteria for our source articles were determined a priori. Studies that met the criteria for inclusion were those that were published, peer-reviewed, randomized-controlled or quasi-controlled studies, full-text, written in the English language, and incorporated smoking
cessation quit rate as an outcome measure. Studies that involved nicotine replacement therapy (NRT) were included as long as the NRT was included as a treatment arm that was separate and distinct from the advice intervention arm.

There remains no consensus on the requisite outcome measures needed to evaluate the relative success of interventions over time (West, Hajek, Stead & Stapleton, 2005). For our purposes, articles were included in the analysis if they provided at least one follow-up at five months post intervention or longer (Fiore et al., 2000), included self-report with or without biochemical verification of abstinence in the final follow-up, and incorporated ‘intention to treat’ analysis to assess quit rates, or provided sufficient information allowing for the calculation of smoking cessation rates in accordance with intention to treat (Fiore et al., 2000; West et al., 2005). Intention to treat is a more conservative method to assess quit rates, thus, was used in our review. Where possible, intention to treat quit rates were calculated from relevant source studies and incorporated into the results.

Because we were particularly interested in assessing the effect that advice or counseling interventions have on stopping smoking over and above that which might be expected in a control group or a group receiving usual care, we adopted the most rigorous definition of control or usual care. Thus, studies were excluded if they 1) did not include a control group or usual care, 2) included subjects who recently quit smoking, 3) administered NRT as part of the advice/counseling intervention, 4) did not follow-up for a minimum of five months post-intervention, 5) incorporated professional counselors or psychologists to carry out the intervention, 6) did not include a personal interaction between health professional and patient, 7) defined the control group as minimal care or intervention, 8) incorporated structured smoking cessation advice as part of usual care or control, 9) intentionally gave guidance or information to
subjects on how to quit smoking as part of the control/usual care condition, 10) targeted youth specifically (≤18 years), or 11) incorporated other concomitant lifestyle changes (e.g., diet and physical activity) in conjunction with smoking cessation intervention.

4.2.3 Study Selection

The abstraction of articles was based on inclusion and exclusion criteria and conducted by the primary author (MB) who reviewed titles and abstracts. These were cross-referenced by the second author (ED). Abstracts that fit the inclusion criteria were retained for full-text review. Full-text review was conducted on all retained abstracts that met the inclusion and exclusion criteria. A random sample of articles were extracted and double-checked by the second author (ED) for reliability purposes. In the event of discrepancies vis a vis inclusion or exclusion, these were resolved by the two investigators.

4.2.4 Quality Assessment

We used the PEDro scale to assess methodological quality of each study (Maher, Sherrington, Herbert, Moseley & Elkins, 2003). The PEDro scale has been adapted from the Delphi list for quality assessment of randomized control trials in systematic reviews (Verhagen et al., 1998). A score is calculated out of ten by summing the eleven items characterizing the methodological rigor of each study (Maher et al., 2003). Although there are no established criteria to quantify a score for the PEDro scale, we considered a score of 7-10 to be of high quality, 4-6 of fair quality and 0-3 of poor quality.

4.2.5 Smoking Cessation Outcomes

We assessed the rigor of smoking cessation outcomes for each study. Several studies reported multiple smoking cessation outcomes. We report only the most rigorous outcomes for
each study. We used the following definitions of abstinence, presented in levels of greatest to least rigor 1) continuous abstinence that was biochemically verified (West et al., 2005), 2) point prevalence and biochemically verified, 3) continuous abstinence without biochemical verification, and 4) point prevalence without biochemical verification.

### 4.2.6 Data Analysis

Smoking cessation advice or counseling intervention has been characterized according to level of intensity (Fiore et al., 2000). For purposes linked to the administration of advice or counseling interventions in clinical practice, we apportioned advice or counseling intensity to three levels based on the current literature and practical considerations.

Advice or counseling was defined as brief if it was conducted within ten minutes or less, took place within a single visit to the health provider and did not include follow-up (Ashenden Silagy & Weller, 2003; Piasecki & Baker, 2001). Brochures or leaflets could be part of brief advice, however.

Intensive advice was defined as either 1) the total contact time with the health professional exceeding 30 minutes, or 2) consisting of multiple individual sessions, each exceeding ten minutes with a minimum of four sessions (Fiore et al., 2000).

We defined an intervention as being of intermediate intensity if it lasted longer than ten minutes but less than 30 minutes or if it satisfied the brief intervention definition and included one or more follow-ups (i.e., telephone, written, and personal), self-help manuals or behavior change intervention based on psychosocial theory.

### 4.2.7 Meta-Analysis

The meta-analyses investigated the effect of brief advice, intermediate advice and intensive advice on smoking cessation outcomes compared with usual care. All studies reported
dichotomous outcomes (i.e., quit smoking or did not quit); we used only the most rigorous definition of smoking cessation reported in each study in the meta-analysis. Meta-analysis was conducted to assess the chance of a person quitting smoking if she or he exposed to an advice or counseling intervention. Meta-analysis was conducted with RevMan version 5.0 software (Review Manager, 2008) and with a random-effects model (Mantel-Haenszel method); risk ratios (RRs) were used to estimate pooled treatment effects (Rice & Stead, 2008). Weighted mean differences were calculated and reported with a 95% confidence interval. Statistical significance of the overall effect was set at p<0.05 and statistical significance for heterogeneity between studies was indicated if p<0.10 (Lau, Ioannidis & Schmid, 1997). We chose a random-effects model given the range of smoking cessation interventions. We anticipated marked variation across subjects based on factors such as nicotine addiction, motivational state, age and sex. This was confirmed after reviewing the characteristics of the patients in our source studies. We also anticipated differences in the type of health professionals administering the intervention. We used the I² value (in the form of a percentage) which expresses the total variation across studies due to heterogeneity instead of variation due to chance (Higgins, Thompson, Deeks & Altman, 2003). A sensitivity analysis (based on funnel plots) to assess for publication bias was performed with respect to the intensity of the intervention advice, i.e., brief, intermediate or intensive.

4.3 Results

4.3.1 Search Selection

The initial literature search based on electronic databases yielded 1184 articles: 417 articles from EMBASE, 389 from MEDLINE, 101 from CINAHL, 51 from PsychINFO and 226 from CENTRAL. These articles were downloaded into Endnote Version 7.0 and compiled for
de-duplication. De-duplication reduced the number of articles to 853. These 853 articles were then filtered through the inclusion criteria. Sixty-two articles were retained after a review of titles and abstracts. Full-text review was applied to each of the 62 articles for further scrutiny with respect to the inclusion criteria. Of these, 24 articles met the inclusion criteria for review. Hand-searching of journals returned another six articles. Eight studies contained two or more advice or counseling interventions that were compared with usual care; therefore the total number of individual interventions contained within the 30 studies was 42 (Jamrozik Vessey & Fowler, 1984; Janz et al., 1987; Research Committee of the British Thoracic Society, 1990; Russell, Wilson, Taylor & Baker, 1979; Sanders et al., 1989; Severson, Andres, Lichtenstein, Gordon & Barckley, 1998; Slama, Redman, Perkins, Reid & Sanson-Fisher, 1990; Stewart & Prosser, 1982, Yilmaz, Karacan, Yoney & Yilmaz, 2006).

Our source studies were conducted in the following countries: the United Kingdom, including England and Scotland (eleven studies), the United States (seven studies), the Netherlands (four studies), Norway (two studies), Australia (two studies), Canada (two studies), Turkey (one study) and Denmark (one study).

4.3.2 Quality Assessment

The mean PEDro scale score assessing methodological quality of each individual study was 5.10±1.14. Four studies were rated as having good methodological quality (score ≥7), 24 studies were rated as fair quality (score 4-6) and two studies were rated as poor quality (0-3).

Allocation concealment was reported in four studies (Research Committee of the British Thoracic Society, 1990; Quist-Paulsen & Gallefoss, 2003; Taylor, Houston-Miller, Killen & DeBusk, 1990). Six studies used cluster randomization and allocated either the health professional (Haug, Fugelli, Aaro & Foss, 1994; Wilson et al., 1990) professional practice
or geographical province (de Vries, Bakker, Mullen & van Breukelen, 2006) to intervention or usual care. Two studies used cluster allocation with methods not consistent with randomization. One study assigned clinics to either experimental or control conditions with extended randomization of the experimental condition to two separate interventions (Janz et al., 1987).

Self-selection to the control or experimental group occurred in one study: four hospitals out of eleven self-selected their control or experimental status with the seven remaining hospitals randomized to control or experimental assignments (Bolman, de Vries & Van Breukelen 2002).

The remaining studies allocated the patient to intervention or usual care. Of these, randomization for allocation to intervention or usual care groups was reported in twenty-four studies; however, only five of these studies incorporated procedures that used third party independent blinded allocation concealment (Quist-Paulsen & Gallefoss, 2003; Research Committee of the British Thoracic Society, 1990; Stewart & Rosser, 1982; Taylor et al., 1990). Five studies did not provide details on how the randomization procedures were performed (McDowell, Mothersill, Rosser & Hartman, 1985; Rose & Hamilton, 1978; Slama et al., 1990; Tonnesen et al., 1996; Vetter & Ford, 1990). Three studies did not use allocation methods consistent with randomization. In these studies, the patients were allocated to experimental or control groups based on the day of attendance or when a specific day was designated as ‘control’ or ‘treatment’ (Burt et al., 1974; Richmond, Austin & Webster 1986; Sanders et al., 1989).

Two studies reported that patients in the usual care/control group were blinded to their participation in a smoking cessation program (Pieterse, Seydel, de Vries, Mudde & Kok, 2001; Rose & Hamilton, 1978). One study blinded the patients in the control group to the study intervention by embedding smoking information within a cardiorespiratory risk screening battery
that screened for multiple risk factors (Rose & Hamilton, 1978). Patients in the other study were not informed of the experimental nature of the study (Pieterse et al., 2001).

The average follow-up rate across studies was 80.6±14.4 % with six studies reporting follow-up rates greater than 90% (Haug et al., 1994; McDowell et al., 1985; Quist-Paulsen & Gallefoss, 2003; Russell, Merriman, Stapleton & Taylor, 1983; Slama et al., 1990; Tappin et al., 2005; Yilmaz et al., 2006). Two studies reported follow-up rates of less than 50% (Groner, Ahijevych, Grossman & Rich., 2000; Molyneaux et al., 2003) and two studies did not report follow-up data (Research Committee of the British Thoracic Society, 1990).

4.3.2.1 Similarity of Groups at Baseline (Including Motivation)

Twenty-six studies reported no differences for baseline measures between usual care and intervention groups. Four studies reported notable differences in selected demographics (Bolman et al., 2002; Morgan et al., 1996; Richmond et al., 1986; Severson et al., 1998). Morgan et al. (1996) reported differences between the percentage of patients who smoked within 30 minutes of waking (usual care 81.1%, intervention, 72.3%); in one study, there were more men in the control group than in the intervention group (34 vs. 55% respectively, p<0.01) (Richmond et al., 1986). Severson (1998) reported a difference between minimal and extended interventions with respect to those having made a quit attempt in the previous 12 months (35.0 and 41.1% respectively, p<0.05) and those thinking of quitting within the next 30 days (26.4 and 33.0% respectively, p<0.01). Differences in the motivational phase of patients in usual care and intervention groups were reported by Bolman et al. (2002). Specifically, more patients in the intervention group were described as being in the internal motivation phase compared with those in usual care (63% vs. 43%). However, a greater percentage of usual care patients was described as being in the external motivation phase compared to those in the intervention group (35% vs.
29%) (Bolman et al., 2002). Intention to quit was greater for intervention patients compared to those receiving usual care when the hospital was used as the unit of analysis (Bolman et al., 2002).

4.3.2.2 Adherence to Intervention

Adherence to intervention protocols by health professionals was assessed with questionnaires and interviews assigned to patients or participating intervention providers in eight studies. Treatment fidelity was reported by patients in four studies (Morgan et al., 1996; Jamrozik et al., 1984; Pieterse et al., 2001; Quist-Paulsen & Gallefoss, 2003) and by the health professional in two studies (Hilberink et al., 2005; Slama et al., 1990). Stewart & Prosser (1982) assessed the degree of adherence to intervention by physicians by examining whether or not they placed a “smoking sticker” on the patient’s chart indicating that the intervention had taken place.

Patients in the Pieterse et al. (2001) study reported general physician compliance with the intervention protocol, however the effort that physicians invested in counseling the non-motivated patient was somewhat mitigated. Patient recall in the study of Morgan et al. (1996) suggested that physicians gave advice to stop smoking to 88.4% of patients who smoked and gave a self-help guide to 95.8% of these patients. Substantially fewer of these patients (30.9-44.8%) however recalled that the physician delivered the optional aspects of treatment (e.g., setting a quit date or scheduling a follow-up). Conversely, Quist-Paulsen & Gallefoss (2003) reported that only 59% of patients in the intervention group recalled firm, unequivocal advice to stop smoking from their nurse. Hilberink et al. (2005) reported that over 70% of physicians recalled that they attended to the intervention protocol as arranged.
4.3.2.3 Intervention Training

Thirteen studies reported that participating health professionals had received some training in smoking cessation. The total hours required for training was reported in eight studies (Bolman et al., 2002; deVries et al., 2006; Morgan et al., 1996; Pieterse et al., 2001; Severson et al., 1998; Slama et al., 1990; Taylor et al., 1990; Tonnesen et al., 1996). Training time was reported to range from 0.88 to 12 hours with an average of 3.8±3.7 hours. Three studies did not report the time requirement for training (Janz et al., 1987; McDowell et al., 1985; Sanders et al., 1989). One study reported that training spanned five days (Tappin et al., 2005).

Sixteen studies did not report whether the health professionals received training for the administration of the intervention (Burt et al., 1974; Demers, Neale, Adams, Trembath & Herman, 1990; Groner et al., 2000; Haug et al., 1994; Hilberink et al., 2005; Jamrozik et al., 1984; Molyneaux et al., 2003; Quist-Paulsen & Gallefoss, 2003; Research Committee of the British Thoracic Society, 1990; Richmond et al., 1986; Rose & Hamilton, 1978; Russell et al., 1979; Russell et al., 1983; Stewart & Prosser, 1982; Vetter & Ford, 1990; Yilmaz et al., 2006).

In some cases, health professionals either provided smoking cessation interventions consistent with their own personal styles (Jamrozik et al., 1984; Russell et al., 1979; Russell et al., 1983; Stewart & Prosser 1982; Vetter & Ford, 1990) or reported not receiving direction with respect to providing advice or counseling (Haug et al., 1994). Four studies reported both the training of health professionals and reported adherence to smoking cessation intervention (Hilberink et al., 2005; Morgan et al., 1996; Pieterse et al., 2001; Slama et al., 1990).

4.3.3 Subjects

In the source studies in this review, 14,550 patients were part of interventions and 10,591 patients served as control subjects or usual care. The descriptions of patients are shown in Tables
4.1 and 4.2. Thirteen studies in this review characterized patients as those visiting their physician for no specific presenting condition (Demers et al., 1990; Jamrozik et al., 1984; Janz et al., 1987; McDowell et al., 1985; Molyneaux et al., 2003; Pieterse et al., 2001; Richmond et al., 1986; Russell et al., 1979; Russell et al., 1983; Sanders et al., 1989; Slama et al., 1990; Stewart & Prosser, 1982; Wilson et al., 1990). Patients who presented with or were recovering from untoward cardiac events (e.g., acute myocardial infarction, myocardial infarction survivors, or coronary problems) participated in four studies (Bolman et al., 2002; Burt et al., 1974; Quist-Paulsen & Gallefoss, 2003; Taylor et al., 1990). Two studies applied smoking cessation interventions to older patients (Morgan et al., 1996; Vetter & Ford, 1990).

Three studies included pregnant women or women receiving pre-natal care (devVries et al., 2006; Haug et al., 1994; Tappin et al., 2005). The remaining studies included patients with COPD or other pulmonary conditions (Hilberink et al., 2005; Tonnesen et al., 1996), patients with smoking related conditions (Research Committee of the British Thoracic Society, 1990), mothers with children (Groner et al., 2000; Yilmaz et al., 2006), men at high risk for cardiovascular disease (Rose & Hamilton, 1978) and dental patients (Severson et al., 1998). In three studies, smoking cessation interventions were administered to patients who were hospitalized (Bolman et al., 2002; Molyneaux et al., 2003; Taylor et al., 1990).

4.3.4 Health Professionals

Physicians constituted the largest group of health professionals to provide a smoking cessation intervention in sixteen studies (Demers et al., 1990; Haug et al., 1994; Hilberink et al., 2005; Jamrozik et al., 1984; McDowell et al., 1985; Morgan et al., 1996; Pieterse et al., 2001; Richmond et al., 1986; Rose & Hamilton 1978; Russell et al., 1979; Russell et al., 1983; Slama et al., 1990; Stewart & Prosser, 1982; Wilson et al., 1990). Nurses were the intervention
providers in eight studies (Groner et al., 2000; Quist-Paulsen & Gallefoss, 2003; Sanders et al., 1989; Taylor et al., 1990; Tonnesen et al., 1996; Vetter & Ford, 1990; Yilmaz et al., 2006). Dental personnel (Severeson et al., 1998) and midwives (deVries et al., 2006; Tappin et al., 2005) comprised the remainder of the intervention provider types. Four studies incorporated more than one type of health professional to administer the intervention (Bolman et al., 2002; Burt et al., 1974; Janz et al., 1987; Molyneaux et al., 2003).

4.3.5 Interventions

Details of the smoking cessation interventions in our source studies are presented in Table 4.3. We considered interventions within each article as separate and distinct from one another. In this sense, 30 studies were included in this systematic review but, because several of these articles performed more than one intervention, this amounted to 40 distinct interventions. Of these, nineteen interventions met our definition of advice that was of brief intensity, seventeen were categorized as advice that was of an intermediate intensity and four were described as intense advice.

4.3.5.1 Adjuncts to Advice or Counseling

Eight studies incorporated self-help materials in the form of written materials (deVries et al., 2006; Groner et al., 2000; Janz et al., 1987; McDowell et al., 1985; Morgan et al., 1996; Richmond et al., 1986; Tappin et al., 2005; Taylor et al., 1990). Written materials in two studies were classified at being written at fourth and eighth grade reading levels, respectively (Groner et al., 2000; Morgan et al., 1996). Three studies used videos as adjunct material for intervention (de Vries et al., 2006; Hilberink et al., 2005; Severson et al., 1998). Brochures, pamphlets or both were used as adjuncts to the intervention in four studies (Burt et al., 1974; Molyneaux et al., 2003; Slama et al., 1990; Stewart & Prosser, 1982). No intervention in any study made mention
of adaptation to an individual’s cultural background nor was the learning style of the subjects reported in any of the studies.

4.3.5.2 Follow-up

Thirteen source studies reported following up with their patients as part of the intervention. Follow-up consisted of various genres and included face-to-face (Rose & Hamilton, 1978; Richmond et al., 1986; Bolman et al., 2002), phone calls (Quist-Paulsen & Gallefoss, 2003; Severson et al., 1998; Taylor et al., 1990) and postal methods (letter or postcard) (Groner et al., 2000; McDowell et al., 1985; Research Committee of the British Thoracic Society, 1990; Tonnesen et al., 1996). Combined modalities for follow-up included personal visit and letters (Research Committee of the British Thoracic Society, 1990), letters and phone calls (Morgan et al., 1996), and face-to-face with phone calls (Quist-Paulsen & Gallefoss, 2003). Follow-up meetings were offered in two studies (Haug et al., 1994; Pieterse et al., 2001).

4.3.5.3 Questionnaires

Table 4.4 shows the components within questionnaires administered to patients. Beyond measuring current smoking status, fourteen studies reported using questionnaires that assessed the smoking habits and behavior of their patients or attitudes towards smoking, (Bolman et al., 2002; de Vries et al., 2006; Groner et al., 2000; Haug et al., 1994; Hilberink et al., 2005; McDowell et al., 1985; Molyneaux et al., 2003; Morgan et al., 1996; Quist-Paulsen & Gallefoss, 2003; Russell et al., 1983; Stewart & Prosser, 1982; Tappin et al., 2005; Taylor et al., 1990; Tonnesen et al., 1996). Nicotine addiction assessed by the Fagerstrom Tolerance Questionnaire, Fagerstrom Test for Nicotine Dependence or the Nicotine Dependence Questionnaire was carried out in seven studies (Bolman et al., 2002; Groner et al., 2000; Hilberink et al., 2005; Molyneaux et al., 2003; Taylor et al., 1990; Tonnessen et al., 1996; Yilmaz et al., 2006). Nine studies used
questionnaires to assess smoking related psychological or behavioral characteristics of their patients (Bolman et al., 2002; Groner et al., 2000; Hilberink et al., 2005; McDowell et al., 1985; Molyneaux et al., 2003; Morgan et al., 1996; Russell et al., 1983; Slama et al., 1990; Taylor et al., 1990).

4.3.5.4 Behavior Change Framework

Psychological behavior change frameworks underpinned or supported the smoking cessation intervention in seven studies. These frameworks included the stage of change theory (Bolman et al., 2002; Hilberink et al., 2005; Morgan et al., 1996; Tappin et al., 2005) self-efficacy (de Vries et al., 2006), and social learning theory (Bolman et al., 2002; Taylor et al., 1990). Two studies used motivational interviewing (Bolman et al., 2002; Tappin et al., 2005) and one study, the health belief model (Groner et al., 2000). Janz et al. (1987) reported that self-efficacy was a component in the health message delivered by physicians.

4.3.6 Usual Care

Usual care was described in 23 studies (Table 4.4); the characteristics of usual care varied across studies. In two studies, for example, patients in the usual care condition were blind to the fact that they were part of a study investigating smoking cessation (Pieterse et al., 2001; Rose & Hamilton, 1978). In two other studies, however, advice was given by the health professional for the following reasons: a) if smoking cessation was the reason the patient sought out his or her health care provider, b) if smoking cessation advice queries were initiated by the patient, or c) if the health professional believed that it was unethical to withhold such advice (Pieterse et al., 2001; Stewart & Prosser, 1982). Eight studies used the term “usual advice” or “usual care” but did not describe usual care conditions. Nine studies reported that neither information nor advice about stopping smoking was given to usual care patients (Groner et al.,

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2000; Molyneaux et al., 2003; Pieterse et al., 2001; Richmond et al., 1986; Rose & Hamilton, 1978; Russell et al., 1983; Slama et al., 1990; Tonnesen et al., 1996; Yilmaz et al., 2006). The usual care groups in the fourteen studies that used questionnaires were given the same questionnaires as those in the intervention groups.

**4.3.7 Meta-Analysis**

Twenty-nine source studies out of thirty were selected for meta-analysis. One study was excluded because we were unable to make contact with the primary author regarding information relevant for the intention to treat calculation (Yilmaz et al., 2006).

Overall, 40 studies were included for meta-analysis since eight articles compared two or more advice or counseling interventions to the same usual care group (Jamrozik et al., 1984; Janz et al., 1987; Research Committee of the British Thoracic Society, 1990; Russell et al., 1979; Sanders et al., 1989; Severson et al., 1998; Slama et al., 1990; Stewart & Prosser, 1982). This meant that individuals in the usual care group would be counted more than once in our analysis. We adopted the procedures of Gorin & Heck (2004) to avoid violating the assumptions of independence by including and then excluding each intervention within multiple-intervention studies into the meta-analysis (Gorin & Heck, 2004). The exclusion of interventions did adjust the RRs but not to the extent that they changed the interpretation of the overall findings. Four studies did not present results with intention to treat and so we adjusted accordingly before conducting the meta-analysis (Demers et al., 1990; McDowell et al., 1985; Russell et al., 1979; Slama et al., 1990).

Sensitivity analyses were carried out for publication bias and for studies that met a grade A for allocation concealment (four studies). Other sensitivity analyses performed included excluding studies that incorporated less than 12 months temporal outcome measures and studies
that did not use biochemical verification. The RR were not altered although the RR did decrease to 1.45 (95% CI = 1.23, 1.71) for studies that were graded A for allocation concealment.

For all intervention intensities, advice or counseling given to patients moderately increased the chance of quitting smoking compared with usual care patients. Brief intensity interventions increased the chance of quitting smoking by 74% (RR 1.74; 95% CI =1.37, 2.22) with a moderate level of heterogeneity reported (I² = 58%) (Table 4.5). Sensitivity analysis for publication bias reduced the RR to 1.43 (95% CI=1.23, 1.68) with concomitant reduction heterogeneity to I² = 15% (p=0.28) when studies outside the 95% CI were removed from the analysis.

Intermediate intensity interventions resulted in a RR of 1.71 (95% CI=1.39, 2.09) with moderate heterogeneity reported (I² = 51%; p=0.008) (Table 4.6). Sensitivity analysis for publication bias reduced the RR to 1.64 (95% CI=1.37, 1.97) with concomitant reduction in heterogeneity to I² = 40%; p=0.05 when studies outside the 95% CI were removed from the analysis. Intensive intensity interventions resulted in a RR of 1.60 (95% CI=1.13, 2.27) with significant heterogeneity to I² = 75%; p=0.008 (Table 4.7).

We also assessed the impact of cluster-allocated studies on the analysis. Removal of these studies from the analysis adjusted the RR upwards to 1.84 (95% CI=1.39, 2.45), (I² = 61%; p=0.0008) for brief intensity and adjusted the RR downwards to 1.69 (95% CI=1.24, 2.32), (I² = 53%; p=0.02) for intermediate intensity interventions.

Four studies incorporated NRT as an adjunct to assist those patients with strong nicotine dependence (Morgan et al., 1996; Pieterse et al., 2001; Tappin et al., 2005; Taylor et al., 1990). Where possible, we removed subjects who used NRT and quit smoking (n=5) from the analysis. In principle, the use of NRT in these studies violated our exclusion criteria; however, the
inclusion of these studies adjusted the RR only minimally. For example, Pieterse et al. (2001) reported that the contribution of NRT to the intervention did not produce any effect due to low statistical power and small differences between users and non-users of NRT. Similarly, Morgan et al. (1996) reported that there was no difference among intervention patients receiving a prescription for nicotine gum and those who did not. A sensitivity analysis carried out after excluding these studies did not alter the RRs.

Written self-help materials (RR=1.62; 95%CI= 1.20, 2.20) (Table 4.8), advice supported by psychological or motivational underpinnings (RR=1.70; 95% CI=1.32, 2.21) (Table 4.9) and follow-up after advice (RR=1.55; 95% CI=1.29, 1.86) (Table 4.10) also had moderately positive effects on the probability of quitting smoking, but all components had significant heterogeneity. Post-hoc analyses for follow-ups were assessed for those follow-ups carried out in person, phone and written form. The RRs for follow-up carried out in person (RR=1.87; 95%CI=1.22, 2.88), were greater than those carried out by phone (RR=1.51; 95% CI=1.20, 1.91) and in written form (RR=1.35; 95% CI = 0.99, 1.83).

4.4 Discussion

Physical therapists have a long tradition of patient education and are committed to the health and wellbeing of their patients based on contemporary definitions of physical therapy. The multisystem negative effects of smoking have been well established, and these can impact the speed and quality of recovery from a range of injuries as well as illnesses and acute exacerbations of chronic conditions. Despite smoking being the leading cause of preventable death, and ostensibly illness, health behavior change including smoking cessation is not viewed as yet as a clinical competence. Thus, we examined the literature in this light to enable physical
therapists to potentially embrace advice through personal interaction with respect to initiating or supporting smoking cessation.

The findings of this systematic review show that patients who receive smoking cessation advice/counseling from a health professional at varying levels of intensity, i.e., brief, intermediate and intensive, have a greater probability of quitting smoking (i.e., abstaining for at least six months) than patients in a control group or those receiving usual care. This confirms and extends previous reports related to the role and effectiveness of smoking cessation advice/counseling administered by a health professional (Gorin & Heck, 2004; Lancaster & Stead, 2004; Mojica et al., 2004; Rice & Stead, 2008). To the best of our knowledge, however, this is the first systematic review to pair an extensive qualitative description with quantitative analysis of smoking cessation advice imparted by a range of health professionals using the broadest timeframe and incorporating rigorous standards for establishing effects of advice interventions (West et al., 2005).

Although health professionals including physicians, nurses and dentists have been reported to be effective in promoting smoking cessation (Gorin & Heck, 2004; Lancaster & Stead, 2004; Mojica et al., 2004; Rice & Stead, 2008), we were particularly interested in the provision of advice or counseling as the intervention and the operant characteristics of such advice responsible for leveraging the sizes of the effects of interest, rather than inter-provider comparisons. In addition, we focused on the effect of advice/counseling for a range of patients: those visiting their health care provider for no specific health reason to patients with health conditions related to smoking or belonging to a special population (i.e., pregnant women or people with cardiovascular disease).
The types of advice that we reviewed were conducted face-to-face. We chose this specifically to align advice parameters that are consistent with physical therapy practice. In some cases, brief advice was conveyed in a manner that was suited to the health provider’s particular style, but in others advice was prescribed or the style was not reported. The style of brief advice delivered was variable even within studies. For example, in the study reported by Demers et al. (1990), half of the providers delivered advice using a more personal approach while the other half gave advice using a standardized prescriptive approach. In this study, the manner by which the intervention was delivered was evenly distributed between emotional exhortation, and facts and information (Demers et al., 1990).

Across our source studies, intermediate and intensive types of advice/counseling were associated with a range of features, most notably self-help materials, follow-up, and psychological or motivational strategies. Self-help materials included written and video which served as adjuncts to advice/counseling. Some materials were tailored specifically to the smoker’s characteristics. For example, Morgan et al. (1996) used a self-help guide that was designed specifically for long-term heavy smokers over 50 years of age that included overt information about the health benefits of quitting smoking and health consequences if smoking continued. Only two studies reported the level of reading proficiency required for the self-help materials used (Groner et al., 2000; Morgan et al., 1996), and in many studies the name and source of material were provided but the characteristics and message type within these materials were not. Thus, how adjuncts such as self-help materials complement the stop-smoking advice message is unclear. It is noteworthy that Kottke, Battista, DeFriese & Brekke (1988) reported twenty years ago that two important components of smoking cessation are the mode of client...
education and educational message content. These attributes of the provision of advice however tend to be absent in the majority of smoking cessation studies.

Follow-up was a key component in studies examining intermediate and intensive advice for effecting smoking cessation. The characteristics of follow-up however were varied, e.g., taking place in person, by phone or in written form. Effectiveness of smoking cessation advice appears to be increased with greater personal involvement of the advice provider (i.e., face-face>phone>written), however, this component of meta-analysis was performed post-hoc therefore these results should be considered exploratory and, at best, preliminary.

In this systematic review, four studies incorporated the transtheoretical model of change (TTM) (Prochaska, 1996) as part of the strategy for delivering smoking cessation advice. The TTM hypothesizes that behavior change occurs in a sequential manner characterized by a movement through pre-contemplation (no intent to take action), contemplation (intent to take action) preparation (ready to take action), action (overt action) and maintenance (continued health behavior change in the absence of relapse) (Prochaska, 1996). As such, behavior change theories or models such as the TTM allow for a tailored approach for the delivery of the stop smoking message that is specific to the smoker’s motivational state. Over 42% of smokers have been reported to be in the pre-contemplation stage, 40% in the contemplation stage and 17.6% in the preparation stage (Fava, Velicer & Prochaska, 1995) which suggests that the majority of smokers could be influenced with respect to quitting in the right contextual environment and with support.

The diversity of components used across advice/counseling interventions speaks to the heterogeneity of effect that has been observed across intermediate and intensive advice/counseling interventions. Further, Law & Tang (1995) hypothesized that the intervention
provider alone presents a form of heterogeneity vis a vis level of commitment to and enthusiasm for the intervention that cannot be generalized across providers.

### 4.4.1 Methodological Considerations

There are a number of issues that create interpretive challenges associated with the effectiveness of smoking cessation advice (Fiore, Piasecki & Baker, 1995). First, the deception assessment issue declares uncertainty about the rate at which patients may attempt to manipulate the outcomes (Fiore et al., 1995). Of primary importance in smoking cessation studies in general is the outcome of quitting smoking. Quitting is often defined on the basis of self-report which is not entirely reliable. Although this potential confounder can be detected with biochemical verification of quitting smoking, this is not routinely done. Seventeen studies in our review did not use biochemical methods to verify smoking cessation in their patients. However, although the strength of the effect was weakened to some extent, the effectiveness of advice/counseling was not altered when these studies were removed from the analysis.

Second, evaluation uncertainty can occur where changes in smoking behavior result simply by the smoker providing informed consent and data such as accessing information (e.g., questionnaire) related to smoking habits (e.g., self-efficacy and motivation to quit smoking, history of smoking, quantified daily smoking or perceived health risks, smoking diaries) (Fiore et al., 1995). Responses to questions about one’s smoking habits may be influenced by the well-documented Hawthorne effect where subjects’ behaviors change merely from being the focus of study. Furthermore, drawing the smoker’s attention to his/her smoking behavior in the absence of intervention is a form of feedback to the patient and may be sufficient to effect health behavior change. Our systematic review identified sixteen studies that assessed the smoking habits and attitudes of the patient respondents based on questionnaires. ‘Questionnaire effects’
appeared to influence smoking cessation outcomes. In one study, 1.6% of subjects who simply answered questions pertaining to smoking habits and attitudes were continuously abstinent from smoking at one month and one year compared to 0.3% of the control group (Russell et al., 1979). It is noteworthy that this original work was published 30 years ago supporting a substantial lag time in the translation of smoking cessation knowledge related to advice.

The third issue is physician or health provider effects in which the intervention provider can be a source of bias. In addition to the health care provider being a potential authority figure, some may have greater skill imparting a stop smoking message and others may have a greater commitment to addressing smoking cessation in their patients (Fiore et al., 1995; Law & Tang, 1995). Conversely health care providers who promote quitting may strengthen smoking behavior in their patients if, in fact, they themselves smoke. Training health professionals to deliver smoking cessation messages effectively and with attention to evaluating outcomes may not only impart confidence and clinical competence related to smoking cessation in their patients but, also, augment their perceived effectiveness (Cummings et al., 1989) and commitment to assuming responsibility for doing so. Such factors may promote greater adherence by patients to the intervention protocol. It has been suggested that medical and postgraduate medical education should incorporate competencies in counseling patients to increase the capacity and motivation of medical practitioners to promote quitting and smoking abstinence in their patients (Ockene, 1987).

Finally, consistency and continuity with respect to the delivery of the components of the intervention and the inclusion of measures to assess aspects of the counseling process and outcomes are fundamental in establishing a treatment effect. For example, patients in the intervention group in the study by Pieterse et al. (2001) reported that over 88% of providers
recommended quitting smoking to their patients with 95.8% of these patients receiving self-help materials. However, only 35.1% of these same patients received a follow-up letter which was an integral part of the intervention protocol.

4.5 Implications

There are several important implications for physical therapists with respect to incorporating smoking cessation into clinical practice. First, contemporary definitions of the role of physical therapists invariably include health, health behavior change, risk factor reduction and prevention (Dean, 2009). Second, physical therapists have had a long standing commitment to patient education within their treatments. As such, smoking cessation advice, as a component of education for patients who smoke, can be incorporated readily into physical therapy practice. The Treating Tobacco Use and Dependence guidelines provide an excellent framework for the implementation of smoking cessation in clinical practice. This document provides guidelines for brief advice and are summarized in the “5 A’s” approach: 1) Ask about tobacco use 2) Advise to quit in a clear, personalized manner 3) Assess willingness to attempt to quit  4) Assist in the quit attempt using counseling or pharmacological aids, and 5) Arrange a follow-up meeting after the quit attempt (Fiore et al., 2000; Fiore et al., 2008).

While these guidelines make available a framework, the findings of this systematic review have demonstrated the heterogeneity and nuances of advice given, and therefore smoking cessation ‘successes’ must be viewed in the context of both the individual smoker and the health professional interventionist.

However, this is where the physical therapist has an advantage. The practice pattern of physical therapists typically consists of prolonged visits that initially are frequent and over an extended period of time. This practice pattern enables the physical therapist to, over time, build
rapport and trust with the patient and better ascertain the patient’s readiness to quit smoking and assess his or her learning style and so tailor the advice intervention according to the patient (Balfour, 1993; Fruth, Ryan & Gahimer, 1998; Guilmette, Motta, Shadel, Mukland & Niaura, 2001; Lorish & Gale, 1999).

Furthermore, according to the findings of this review, follow-ups also increase the risk that a patient will stop smoking. Follow-ups can be readily integrated within this practice pattern to include an on-going assessment of tobacco use (as in the case of relapse), the monitoring of cessation progress, and the provision of on-going support and encouragement (Balfour, 1993; Canadian Physiotherapy Association, 2004; Guilmette et al., 2001; Fiore et al., 2008; Fruth et al., 1998; Laitakari, Miilunapalo & Vuori, 1997; Lorish & Gale, 1999). These components as revealed in this review, are fundamental to effecting positive change in their patients’ health behaviors including smoking cessation.

Improved health behaviors can address primary health concerns as well as potentially mitigate signs and symptoms of other problems the patient may have that may not be directly related to smoking, e.g., musculoskeletal complaints. There is an increasing emphasis on health education given a patient’s health is the backdrop to a presenting problem and given the prevalence of multiple lifestyle risk factors and co-morbidity related to lifestyle conditions in adults and increasingly in children. A patient’s health profile is not only important on its own but also in terms of how it may impact the patient’s referred problem. To this end, and with respect to counseling, smoking cessation may reflect attributes of the provider to address smokers’ needs rather than the actual content of the intervention message (Janz et al., 1987). This may be the case for individuals with morbid conditions that are directly associated with smoking or are worsened by smoking (e.g., COPD and heart disease), but may be less apparent in medical
conditions that are not overtly related to smoking (i.e., patients who visit their health professional for no presenting smoking-related condition). Even for smokers receiving orthopedic care, physical therapists can leverage a ‘teachable moment’.

Third, an essential component of their role as a health care provider is to practice in conjunction with other team members. With respect to smoking cessation, a range of other practitioners may be involved depending on the specific needs of a given patient. By virtue of their role, the physical therapist can initiate smoking cessation or support it and liaise with other team members as needed. This may require close contact with the physician if pharmacological support is indicated.

Fourth, health counseling including smoking cessation (initiation or on-going support) by physical therapists can be considered a 21st century competency requiring targeted assessment, and targeted intervention, evaluation and follow-up (American Physical Therapy Association, 1997; Canadian Physiotherapy Association, 2008). The literature as well as clinical practice has focused largely on impairment outcomes. Our findings however reinforce the need for attention to learning outcomes and integrating the physical therapist’s recommendations and advice with respect to health behavior change, prescriptively, i.e., based on a given individual. Attention to health behavior change and effecting this within the framework of physical therapy practice is needed in professional entry-level education as well as in practice. Because physical therapists in the 21st century require superior competence in multiple health behavior change in the majority of clients and patients, these competencies warrant being reflected in professional and continuing education, research as well as practice. These reasons as well as primary health benefit constitute compelling arguments for smokers to quit.
4.6 Limitations

Our methodology for capturing the literature of interest was rigorous however it is possible that studies that met our inclusion criteria were missed. Sensitivity analyses suggested publication bias, thus, cannot be ruled out entirely. The conclusions based on our source studies need to be considered in light of their methodological heterogeneity. This was particularly evident with intensive interventions. There were a range of study designs, subjects who participated including medical diagnoses, environments, ages, interventions and short- and long-term measurement of outcomes. With respect to advice, there are numerous dimensions and characteristics of advice including qualitative as well as quantitative distinctions. In the studies we reviewed, advice was often characterized as brief, or moderately intense or intense. Further, the same descriptor was not consistently used across studies, or descriptors were not defined. The content of advice was also neither consistent nor consistently described. Rigorous research designs however warrant strict standardization, thus, patients may receive too little as well as too much of the intervention of interest. Both violations may negatively affect the desired outcomes, therefore, biasing the results of the study, and not be cost effective. This reduces the validity of the observed effectiveness of the intervention. Smoking cessation studies are not immune to this inadvertent methodological violation.

4.7 Conclusion

Physical therapists typically see patients over prolonged visits and over prolonged periods of time. Thus, they are uniquely positioned to initiate and support patients in smoking cessation including all important follow-up. In sum, brief, intermediate and intensive advice by health professionals can effect smoking cessation in patients who smoke. Such advice can be readily integrated into physical therapy practice and used to initiate or support on-going smoking
cessation in clients irrespective of reason for referral. Self-help materials, follow-up and interventions based on psychological or motivational frameworks are particularly effective components of intermediate and intensive advice interventions. Incorporating smoking cessation as a physical therapy goal is consistent with the contemporary definition of the profession and the mandates of physical therapy professional associations to promote health and wellbeing and, in particular, smoking cessation for primary health benefit and to minimize secondary effects. Thus, advice is an evidence-based strategy to effect smoking cessation that can be exploited in physical therapy practice. Health behavior change including smoking cessation warrants being considered as a clinical competency in physical therapy.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Participants</th>
<th>Country</th>
<th>Design</th>
<th>Age</th>
<th>Sex</th>
<th>Education Level</th>
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</thead>
<tbody>
<tr>
<td>Bolman (2002)</td>
<td>Smokers admitted to cardiac wards</td>
<td>Netherlands</td>
<td>Quasi-experimental</td>
<td>UC = 57.3±10.9 yr INT = 56.2±10.6 yr</td>
<td>UC: M (78%); F(22%) INT: M (78%); F(22%)</td>
<td>Up to vocational school UC = 78% INT = 86%</td>
</tr>
<tr>
<td>Burt (1974)</td>
<td>Male survivors of acute myocardial infarction</td>
<td>United Kingdom</td>
<td>RCT</td>
<td>NR</td>
<td>UC = NR INT = M (100%)</td>
<td>NR</td>
</tr>
<tr>
<td>Demers (1990)</td>
<td>Patients from two medical practices</td>
<td>USA</td>
<td>RCT</td>
<td>UC ≤29 yr (36%) 30-49 yr (52%) ≥50 yrs (12%) INT ≤29 yr (46%) 30-49 yr (47%) ≥50 yr (7%)</td>
<td>UC: M(35%); F(65%) INT: M (35%); F(65%)</td>
<td>NR</td>
</tr>
<tr>
<td>deVries (2006)</td>
<td>Women pregnant not more than twice</td>
<td>Netherlands</td>
<td>RCT</td>
<td>UC: 29.4±4.39 yr INT: 28.6±4.32 yr</td>
<td>F (100%)</td>
<td>UC Low: 61.6% Med: 23.8% High: 14.6% INT Low: 47.1% Med: 38.2% High: 14.7%</td>
</tr>
<tr>
<td>Groner (2000)</td>
<td>Female caregivers ≥ 16 yr accompanied a child &lt;12 yr to a primary care center</td>
<td>USA</td>
<td>RCT</td>
<td>NR</td>
<td>F: (100%)</td>
<td>NR</td>
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<tr>
<td>Haug (1994)</td>
<td>Daily smokers; pregnant and non-pregnant women</td>
<td>Norway</td>
<td>RCT</td>
<td>Pregnant 25.9 (25.4-26.3) yrs Non-pregnant 27.6 (27.1-28.2) yrs</td>
<td>F: (100%)</td>
<td>NR</td>
</tr>
<tr>
<td>Reference</td>
<td>Participants</td>
<td>Country</td>
<td>Design</td>
<td>Age</td>
<td>Sex</td>
<td>Education Level</td>
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<td>Hilberink (2005)</td>
<td>Patients ≥ 35yr age diagnosed with COPD ( n=392 )</td>
<td>Netherlands</td>
<td>RCT</td>
<td>UC: 60.1±11.5 yrs</td>
<td>UC: M(55.4%); F (44.6%)</td>
<td>UC Primary: 48.0% Secondary: 38.5% Advanced: 7.4%</td>
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<td></td>
<td>INT: 58.0±12.1 yrs</td>
<td>INT: M(46.3%); F( 53.7%)</td>
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<tr>
<td>Jamrozik (1984)</td>
<td>Adults &gt; 16 yr ( n=2110 )</td>
<td>England</td>
<td>RCT</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Janz (1987)</td>
<td>Patients attending outpatient clinic, ≥18 yr, smoking ≥ 5 cigs/day, willing to participate ( n=356 )</td>
<td>USA</td>
<td>Quasi-experimental</td>
<td>UC: &lt;30 yrs (11%)</td>
<td>UC: M (32%); F (68%)</td>
<td>UC &lt;High School (22%)</td>
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<td></td>
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<td></td>
<td>30-60 yrs (72%)</td>
<td>INT: M (46%); F (54%)</td>
<td>High School (26%)</td>
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<td></td>
<td>&gt;60 yrs (17%)</td>
<td>INT2: M (40%); F (60%)</td>
<td>&gt;High School (52%)</td>
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<td>INT &lt;30 yrs (12%)</td>
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<td>30-60 yrs (75%)</td>
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<td></td>
<td>&gt;60 yrs (18%)</td>
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<tr>
<td>McDowell (1985)</td>
<td>Patients &gt;15 yr, smoking for at least one year, currently smoking ≥1 cig/day willing to join study ( n=183 )</td>
<td>Canada</td>
<td>RCT</td>
<td>Collapsed 36.3 yrs</td>
<td>Collapsed M:(40%); F:(60%)</td>
<td>Collapsed 45% university educated</td>
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<td>Range: (16-70)</td>
<td>N=366</td>
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</tr>
<tr>
<td>Molyneaux (2003)</td>
<td>Medical and surgical patients ≥ 18 yr ( n=274 )</td>
<td>England</td>
<td>RCT</td>
<td>UC: 51.0±15.8 yr</td>
<td>UC: M (58.7%); F (41.3%)</td>
<td>NR</td>
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<tr>
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<td></td>
<td>INT: 47.8±15.3 yr</td>
<td>INT: M (56.0%); F (44.0%)</td>
<td></td>
</tr>
<tr>
<td>Morgan (1996)</td>
<td>Smokers aged 50-74 seeing physician for a non-crisis event ( n=659 )</td>
<td>USA</td>
<td>RCT</td>
<td>UC: 59.5 yr</td>
<td>UC: M (42.4%); F(57.6%)</td>
<td>NR</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>INT: 60.9 yr</td>
<td>INT: M(45.5%); F (54.5%)</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Participants</td>
<td>Country</td>
<td>Design</td>
<td>Age</td>
<td>Sex</td>
<td>Education Level</td>
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<tr>
<td>Pieterse (2001)</td>
<td>Patients in clinic setting aged 18-70 yr (n=530)</td>
<td>Netherlands</td>
<td>RCT</td>
<td>UC = 35.6 yr</td>
<td>UC = M (38.4%); F (61.6%)</td>
<td>Mod – 59.9%; High – 23.4% INT</td>
</tr>
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<td></td>
<td>INT = 35.8 yr</td>
<td>INT = M (41.6%); F (58.4%)</td>
<td>Low – 15.5%; Mod – 63.6% High – 20.9%</td>
</tr>
<tr>
<td>Quist-Paulsen (2003)</td>
<td>Patients &lt; 76 yr old admitted for myocardial infarction, unstable angina,</td>
<td>Norway</td>
<td>RCT</td>
<td>UC: 57±9 yr</td>
<td>UC: M (75%); F(25%)</td>
<td>UC: 27% no education after primary school</td>
</tr>
<tr>
<td></td>
<td>or care following coronary bypass surgery (n=240)</td>
<td></td>
<td></td>
<td>INT: 57±9 yr</td>
<td>INT: M(76%); F(24%)</td>
<td>INT: 39% no education after primary school</td>
</tr>
<tr>
<td>Research Committee of British Thoracic</td>
<td>Newly attending or re-referred patients ≥16 yr of age who had disease related</td>
<td>United Kingdom</td>
<td>RCT</td>
<td>Collapsed 51±13 yr</td>
<td>Collapsed M: 59.2%; F: 40.8%</td>
<td>NR</td>
</tr>
<tr>
<td>Society (1990)</td>
<td>to or aggravated by smoking (n=1462)</td>
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<tr>
<td>Research Committee of British Thoracic</td>
<td>Newly attending or re-referred patients ≥16 yr of age who had disease related</td>
<td>United Kingdom</td>
<td>RCT</td>
<td>Collapsed 50±9 yr</td>
<td>Collapsed M: 58.9%; F: 41.5%</td>
<td>NR</td>
</tr>
<tr>
<td>Society (1990)</td>
<td>to or aggravated by smoking (n=1392)</td>
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<tr>
<td>Richmond (1986)</td>
<td>Patients between 16-65 yr of age who attended the general practice (n=200)</td>
<td>Australia</td>
<td>RCT</td>
<td>UC: 37 yr</td>
<td>UC: M (55%); F (45%)</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>INT: 41 yr</td>
<td>INT: M (34%); F (66%)</td>
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</tr>
<tr>
<td>Rose (1978)</td>
<td>Male civil servants of London smokers with high cardiovascular disease risk</td>
<td>England</td>
<td>RCT</td>
<td>UC: 53.0 yr</td>
<td>M (100%)</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>(n=1445)</td>
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<td>INT: 52.8 yr</td>
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</tbody>
</table>
Table 4.1 (continued)  Design and participants

<table>
<thead>
<tr>
<th>Reference</th>
<th>Participants</th>
<th>Country</th>
<th>Design</th>
<th>Age</th>
<th>Sex</th>
<th>Education Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russell (1979)</td>
<td>Patients aged ≥ 16 yr and older who attended surgeries n=2138</td>
<td>England</td>
<td>Quasi-experimental</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Russell (1983)</td>
<td>Patients aged ≥ 16 yr and older who attended surgeries n=1377</td>
<td>England</td>
<td>Quasi-experimental</td>
<td>Collapsed 40.5 yr</td>
<td>Collapsed M: 43%; F:57%</td>
<td>NR</td>
</tr>
<tr>
<td>Sanders (1989)</td>
<td>Patients aged 16-65 yr, attending physician practice between Monday and Friday n=1393</td>
<td>England</td>
<td>RCT</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
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<tr>
<td>Severson (1998)</td>
<td>Patients &gt;15 yr reporting for a dental hygiene visit n=4029</td>
<td>USA</td>
<td>RCT</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Slama (1990)</td>
<td>Patients aged 18-64 yr, self- reported smokers n = 311</td>
<td>Australia</td>
<td>RCT</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Stewart (1982)</td>
<td>Patients over the age of 11 yr; smoking at least one cig/day n=691</td>
<td>Canada</td>
<td>RCT</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
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<tr>
<td>Tappin (2005)</td>
<td>Pregnant smokers n=762</td>
<td>Scotland</td>
<td>RCT</td>
<td>UC = 26.9±6.6 yr INT = 26.5±5.8 yr</td>
<td>F (100%)</td>
<td>NR</td>
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<tr>
<td>Taylor (1990)</td>
<td>Patients aged ≤70 yr hospitalized for treatment of acute myocardial infarction n=173</td>
<td>USA</td>
<td>RCT</td>
<td>NR</td>
<td>UC : M (88%); F(12%) INT: M (83%); F (17%)</td>
<td>NR</td>
</tr>
<tr>
<td>Tonnesen (1996)</td>
<td>Patients referred to a lung clinic from physician for chest radiography and/or lung function testing. n=507</td>
<td>Denmark</td>
<td>Open, randomized study</td>
<td>UC = 56 yr (range 21-70 yr) INT = 53 yr (range 23-70 yr)</td>
<td>UC: M (53.1%); F (46.9%) INT: M (48.5%); F(51.5%)</td>
<td>NR</td>
</tr>
<tr>
<td>Vetter (1990)</td>
<td>Patients registered with group practice n=471</td>
<td>United Kingdom</td>
<td>RCT</td>
<td>NR</td>
<td>UC: M (52.6%); F (47.4%) INT: M (51.5%); F (48.5%)</td>
<td>NR</td>
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</table>
Table 4.1 (continued)  Design and participants

<table>
<thead>
<tr>
<th>Reference</th>
<th>Participants</th>
<th>Country</th>
<th>Design</th>
<th>Age</th>
<th>Sex</th>
<th>Education Level</th>
</tr>
</thead>
</table>
| Wilson (1990)  | Patients aged 16-64 yr attending the general practitioner  
    \( n=1109 \) | Australia | RCT    | Collapsed  
    16-44 yr: 77.9% 
    \( \geq 45 \) yr: 22.1%  | Collapsed  
    M: 45.6%; F: 54.4% | Collapsed |
| Yilmaz (2006)  | Mothers with children  
    \( n=363 \) | Turkey   | RCT    | NR              | F(100%)         | NR              |

RCT = randomized controlled/clinical trial; UC = usual care or control; INT = intervention; NR = not reported; M = Male; F = Female; Collapsed: values averaged for UC and INT
<table>
<thead>
<tr>
<th>Reference</th>
<th>Smoker Definition</th>
<th>Smoking Years</th>
<th>Cigarettes/Day</th>
<th>Age Started Smoking</th>
<th>Previous Quit Attempts</th>
<th>Stage of Change</th>
</tr>
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<tr>
<td>Bolman (2002)</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>Pre-contemplation</td>
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<td>Burt (1974)</td>
<td>NR</td>
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<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>Pre-contemplation</td>
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<tr>
<td>DeVries (2006)</td>
<td>Smoked at least one cig/day at time of recruitment</td>
<td>NR</td>
<td>UC: 18.4 ± 8.51 INT: 17.4 ± 8.46</td>
<td>UC: 15.4 ± 2.51 yr INT: 14.9 ± 2.28 yr</td>
<td>NR</td>
<td>Pre-contemplation</td>
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<tr>
<td>Groner (2000)</td>
<td>&gt;1 cig/day in the previous week</td>
<td>UC: 9.96±6.9 INT: 10.28±5.7</td>
<td>UC: 12.99±8.4 INT: 15.01±9.7</td>
<td>NR</td>
<td>UC: 3.4 ± 1.2 INT: 2.36 ± 2.9</td>
<td>Pre-contemplation</td>
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<td>Haug (1994)</td>
<td>Pregnant smoker: ≥5 cig/day in three months before pregnancy; Non-pregnant smoker: ≥5 cig/day in last three months</td>
<td>NR</td>
<td>Pregnant 9.5 (9.0-10.1) Non-pregnant 13.4 (12.6-14.2)</td>
<td>Pregnant 16.0 yr (15.8-16.3) Non-pregnant 16.2 yr (15.9-16.5)</td>
<td>NR</td>
<td>Pre-contemplation</td>
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<tr>
<td>Hilberink (2005)</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>UC: 71.6% INT: 75.0%</td>
<td>Pre-contemplation</td>
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<tr>
<td>Jamrozik (1984)</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>Pre-contemplation</td>
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<td>Janz (1987)</td>
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<td>Pre-contemplation</td>
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</table>
Table 4.2 (continued)  Participant characteristics (Smoking related)

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<thead>
<tr>
<th>Reference</th>
<th>Smoker Definition</th>
<th>Smoking Years</th>
<th>Cigarettes/Day</th>
<th>Age Started Smoking</th>
<th>Previous Quit Attempts</th>
<th>Stage of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>McDowell (1985)</td>
<td>NR</td>
<td>NR</td>
<td>UC: 23.5</td>
<td>INT: 25.2</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>UC 86% made quit attempt in past; Avg: 4 attempts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Molyneaux (2003)</td>
<td>Last cig was within 28 days</td>
<td>UC: 35.4 ± 16.0</td>
<td>UC: 15 (median)</td>
<td>INT: 20 (median)</td>
<td>UC: 79.5% INT: 80.2%</td>
<td>NR</td>
</tr>
<tr>
<td>Morgan (1996)</td>
<td>Smoked in the last 7 days before physician visit</td>
<td>UC: 41.6</td>
<td>UC: 20.9</td>
<td>INT: 19.0</td>
<td>NR NR NR</td>
<td></td>
</tr>
<tr>
<td>Quist-Paulsen (2003)</td>
<td>NR</td>
<td>UC: 37.6 ± 11.5</td>
<td>UC: 15.6 ± 8.3</td>
<td>INT: 14.3 ± 5.7</td>
<td>UC: 2.3 ± 3.0 INT: 2.3 ± 3.1</td>
<td>NR</td>
</tr>
<tr>
<td>Research Committee of British Thoracic Society (1990)</td>
<td>NR</td>
<td>NR</td>
<td>Collapsed 17 ± 10</td>
<td>NR NR</td>
<td>NR</td>
<td></td>
</tr>
<tr>
<td>Research Committee of British Thoracic Society (1990)</td>
<td>NR</td>
<td>NR</td>
<td>Collapsed 17 ± 9</td>
<td>NR NR</td>
<td>NR</td>
<td></td>
</tr>
<tr>
<td>Richmond (1986)</td>
<td>NR</td>
<td>NR</td>
<td>UC: 22</td>
<td>INT: 25</td>
<td>NR NR</td>
<td>NR</td>
</tr>
<tr>
<td>Russell (1979)</td>
<td>NR</td>
<td>NR</td>
<td>NR NR</td>
<td>NR</td>
<td>NR</td>
<td></td>
</tr>
<tr>
<td>Russell (1983)</td>
<td>Answered ‘yes’ to the question: “Are you a smoker?”</td>
<td>NR</td>
<td>Collapsed 17.5</td>
<td>NR NR</td>
<td>NR</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Smoker Definition</td>
<td>Smoking Years</td>
<td>Cigarettes/Day</td>
<td>Age Started Smoking</td>
<td>Previous Quit Attempts</td>
<td>Stage of Change</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------</td>
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</tr>
<tr>
<td>Sanders (1989)</td>
<td>Answered ‘yes’ to the question: “Are you a smoker?”</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Severson (1998)</td>
<td></td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Slama (1990)</td>
<td></td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Stewart (1982)</td>
<td>Self-reported</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Tappin (2005)</td>
<td></td>
<td>NR</td>
<td>NR</td>
<td>UC: 11.3 yr (range: 0-45)&lt;br&gt;INT: 11.7 yr (range: 0-40)</td>
<td>UC: 14.7 yr (range: 6-28)&lt;br&gt;INT: 15.1 yr (range: 8-26)</td>
<td>Minimum 1 quit attempt&lt;br&gt;UC: 70%&lt;br&gt;INT: 66%</td>
</tr>
<tr>
<td>Taylor (1990)</td>
<td></td>
<td>NR</td>
<td>NR</td>
<td>UC: 25.0 ± 15.0 yr &lt;br&gt;INT: 25.0 ± 16.0 yr</td>
<td>UC: 17.0 ± 4.0 yr &lt;br&gt;INT: 18.0 ± 4.0 yr</td>
<td>UC: 3.8 ± 13.0 yr &lt;br&gt;INT: 3.4 ± 11.8</td>
</tr>
<tr>
<td>Tonnesen (1996)</td>
<td></td>
<td>NR</td>
<td>UC: 35.0 ± 10.0 yr &lt;br&gt;INT: 33.0 ± 8.0 yr</td>
<td>UC: 3.8 yr (range: 1-9)&lt;br&gt;INT: 4.1 yr (range: 1-9)</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Vetter (1990)</td>
<td>1-9 cig/day</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Wilson (1990)</td>
<td>Current regular smokers</td>
<td>NR</td>
<td>Collapsed</td>
<td>NR</td>
<td>Collapsed</td>
<td>NR</td>
</tr>
<tr>
<td>Yilmaz (2003)</td>
<td>Collapsed</td>
<td>NR</td>
<td>Collapsed</td>
<td>UC: 6.24 ± 2.53 yr &lt;br&gt;INT1: 6.57 ± 2.56 yr &lt;br&gt;INT2: 6.19 ± 2.51 yr</td>
<td>UC: 1.17 ± 0.80 yr &lt;br&gt;INT1: 1.14 ± 0.86 yr &lt;br&gt;INT2: 1.25 ± 0.84 yr</td>
<td>NR</td>
</tr>
</tbody>
</table>

UC = usual care or control; INT = intervention; NR = not reported; Collapsed: values averaged for UC and INT
## Table 4.3 Intervention - Advice/Counseling

<table>
<thead>
<tr>
<th>Reference</th>
<th>Advice/Counseling: Details of Message Conveyance</th>
</tr>
</thead>
</table>
| Bolman (2002) | - Cardiologist provided stop smoking advice to the patient  
- Nurses would follow this advice with individualized counseling including assessment of the patient’s smoking behavior, degree of addiction, motivation to quit, barriers to cessation, positive and negative consequences of quitting smoking, patient’s self-efficacy expectations, encouragement for patient to set a quit date.  
- Cardiologist – aftercare follow-up at 4-6 weeks – addressed various aspects of smoking depending on patient’s smoking behavior  
- Patient’s physician encouraged to pay attention to smoking behavior of patient if patient visited physician post-discharge  
Duration: 15-30 min  
Sessions: 3  
Total Time: NR |
| Burt (1974) | - Adverse effects of smoking related to coronary condition explained and patients advised to stop smoking.  
- Patients told not to smoke ever again; no guarantee of future health but decreased chance of recurrence of myocardial infarction if smoking cessation occurred. Prevention of another infarction and admittance to hospital emphasized.  
- Advice reinforced with pamphlets provided by the Scottish Health Education Unit and hospital advice booklet relating to coronary risk factors.  
- Advice also extended to family; value of having a smoke-free home for the health benefits of the family explained, but also in helping the patient quit smoking  
Duration: NR  
Sessions: 1 (hospital); >1 (clinic and home)  
Total Time: NR |
| Demers (1990) | - Physicians used their own intervention approach, rather than a standardized intervention.  
Duration: 3-5 min  
Sessions: 1  
Total Time: 3-5 min |
| DeVries (2006) | - Health Counseling MIS (minimal intervention strategy) protocol: Stage of change, enhance motivation, barriers for successful quitting and mobilization of social support, goal-setting and action plan, additional self-help materials, women’s preferences for aftercare, smoking post-delivery booklet, video  
Duration: 10 min  
Sessions: 2  
Total Time: 20 min |
| Groner (2000) | - Subjects informed that they were participating in a health and safety intervention and told about the effects of smoking on their own health, but not about the effects of second hand smoke on their children. Counseling was based on the Health Belief Model  
- “Freedom from Smoking for You and Your Family” Self-help manual – instructed how to use it  
- Strategies for use behaviorally based including stimulus avoidance, goal-setting and self-reward.  
- Group-specific handouts also given that included motivation to quit, strategies to cope with withdrawal symptoms and minimizing weight gain.  
- Written materials at the 4th-grade level  
- Reminder postcards at 2-weeks and 4-months, encouraging to quit smoking (if not done so), or to remain smoke-free if subjects had quit already  
Duration: 10-15 min  
Sessions: 1  
Total Time: 10-15 min |
<table>
<thead>
<tr>
<th>Reference</th>
<th>Advice/Counseling : Details of Message Conveyance</th>
</tr>
</thead>
</table>
| Haug (1994) | - Intervention designed to provide information on the health hazards of smoking, how to stop smoking and how to avoid relapse. Pregnant women were given special information about problems related to the “smoking fetus”.  
  - Patients invited to consult at 1-, 6-, 12-, and 18-months to discuss smoking habits and problems related to smoking cessation or relapse  
  Duration: 5-15 min  
  Sessions: 1  
  Total Time: 5-15 min |
| Hilberink (2005) | - Control visit that focused on symptoms, health status and treatment, smoking behavior and motivational stage to quit smoking.  
  - Unmotivated smokers received information about the advantages of quitting.  
  - Motivated smokers received self-efficacy enhancing information by discussing how to cope with barriers to quit. Additional information on NRT provided and invited to see physician in two weeks.  
  - When patients prepared to quit within a month, visit with physician scheduled to set a quit date and plan follow-up visits to physician.  
  Duration: NR  
  Sessions: 5  
  Total Time: NR |
| Jamrozik (1984) | - INT1: Verbal advice from physician + written advice in the form of the booklet “Give Up Smoking”.  
  - Warning issued from physician that patient’s progress would be reviewed  
  - INT2: Same as INT1, but CO assessment of the smoking patient, the values of which were compared to those of a non-smoker and explained to the smoking patient.  
  - INT3: Same as INT1, but a card describing how and when to contact a local health visitor working at the practice for further help and information about how to stop smoking attached to the booklet  
  Duration: NR  
  Sessions: INT1 and INT2: 1; INT3: >1  
  Total Time: NR |
| Janz (1987) | - INT1: Smoking cessation message from physician, followed by brief consultation from a nurse  
  - INT2: Same as INT1, but also received self-help manual (diary format): “Step by Step Quit Kit”: smoking awareness test, stop-smoking contract, deep breathing exercises, cigarette use monitoring system, daily advice on how to quit.  
  Duration: NR  
  Sessions: 1  
  Total Time: NR |
| McDowell (1985) | - Counseling session tailored to patient’s smoking pattern; printed material to do this: “Helping Smokers Quit Kit” (U.S. National Cancer Institute)  
  - One follow-up contact by mail that enclosed printed material designed to encourage continued attempts to quit smoking. Patients kept a smoking diary.  
  Duration: 15 min  
  Sessions: 1  
  Total Time: 15 min |
| Molyneaux (2003) | - Counseling session at the bedside; patients provided with a written advice leaflet. Patients also advised of availability and effectiveness of NRT  
  Duration: 20 min  
  Sessions: 1  
  Total Time: 20 min |
Table 4.3 (continued)  Intervention - Advice/Counseling

<table>
<thead>
<tr>
<th>Reference</th>
<th>Advice/Counseling : Details of Message Conveyance</th>
</tr>
</thead>
</table>
| Morgan (1996)     | • Praised previous quit efforts  
• Provided personalized feedback linking smoking to presenting symptoms  
• Discussed health benefits of quitting for older smokers  
• Gave a clear message to stop smoking; 1-week supply of nicotine gum supplied  
• “Clear Horizon’s” Guide:  
• Self-help smoking program for long-term heavy smokers 50+ years  
• Written at 8th Grade reading level  
• Introduces effective quit-smoking strategies using examples of smokers aged 50+  
• Addresses individuals at all stages of smoking: sections on deciding to quit, preparation, initial cessation, maintenance  
• Provides explicit information about the health consequences of continued smoking and the health benefits of quitting for older, long-term smokers  
Duration: NR  
Sessions: 1  
Total Time: NR                                                                 |
### Table 4.3 (continued)  Intervention - Advice/Counseling

<table>
<thead>
<tr>
<th>Reference</th>
<th>Advice/Counseling : Details of Message Conveyance</th>
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</thead>
</table>
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- Gave a clear message to stop smoking; 1-week supply of nicotine gum supplied  
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- Written at 8th Grade reading level  
- Introduces effective quit-smoking strategies using examples of smokers aged 50+  
- Addresses individuals at all stages of smoking: sections on deciding to quit, preparation, initial cessation, maintenance  
- Provides explicit information about the health consequences of continued smoking and the health benefits of quitting for older, long-term smokers  
Duration: NR  
Sessions: 1  
Total Time: NR |
| Pieterse (2001) | - Behavioral counseling: counseling tailored to smoker’s motivational stage (stage of change concept)  
- Assessment of nicotine dependence and motivational level  
- Reinforcement of motivation to quit – discussion of outcome expectancies with focus on positive, short-term outcomes  
- Reinforcement of perceived ability to quit smoking – discussion of expected abstinence difficulties, high-risk relapse situations and suggestions of strategies to overcome  
- Set a quit date  
- Reinforcement of self-management capabilities  
- Advisement of nicotine replacement therapy to dependent smokers  
- Follow-up meeting offered  
Duration: NR  
Sessions: 1-2  
Total Time: 10 min |
| Quist-Paulsen (2003) | - Patients advised not to smoke during hospital stay.  
- Booklet specially produced for study provided and discussed:  
- Emphasized the health benefits of quitting smoking after a coronary event  
- Advised of probability of another heart attack if smoking continued  
- Addressed how to prevent relapse, stop smoking, using nicotine replacement therapy, identify and cope with high-risk situations for relapse including action plans  
- At 6-weeks all intervention participants had consultation at outpatient clinic with cardiac nurse to discuss prevention of relapse and positive feedback, health benefits of quitting, and exposure to fear arousal message (if needed)  
Duration: NR  
Sessions: 7  
Total Time: 144 min |
<table>
<thead>
<tr>
<th>Reference</th>
<th>Advice/Counseling : Details of Message Conveyance</th>
</tr>
</thead>
</table>
| **Research Committee of British Thoracic Society (1990)** | • Advice reinforced by simple signed agreement to stop smoking by a target date within a week.  
• Two visits by a health visitor in the first 6-weeks  
• A series of letters of encouragement from the physician (4 in the first 6-months)  
Duration: NR  
Sessions: 3  
Total Time: NR |
| **INT1: Usual advice + signed agreement to stop smoking by a target date within a week  
INT2: Usual advice + encouraging letters from physician at 3-days, 2-weeks, 3-, 5- and 9-months  
INT3: Usual advice + signed agreement and encouraging letters (as in INT2)** |  
Duration: NR  
Sessions: 1  
Total Time: NR |
| **Richmond (1986)** | • Visit 1: Blood sample, spirometry, body weight, detailed questionnaire  
• Patient advised to reduce cigarette intake and record smoking consumption over next week.  
• Visit 2: Results of nicotine and lung function presented – diseases related to smoking and the effects of smoking on the body discussed.  
• Also discussed were positive outcomes of smoking balanced against risks of smoking  
• Further advice given on withdrawal, alternatives and substitutes for smoking, weight management. Proposal to the patient re: social support network  
• Patients given a book: “Become a Non-Smoker”: Self-applied exercises, information about smoking habits, strategies for maintaining non-smoking  
• Four follow-up visits at 1- and 3-weeks, 3- and 6- months: successes and problems discussed regarding overcoming urges to smoke. Physician supported and encouraged the patient to remain abstinent and encouraged the benefits of stopping smoking  
Duration: NR  
Sessions: 6  
Total Time: NR |
| **Rose (1978)** | • Initial visit included informing the patient that the reason for the appointment was regarding smoking behavior; health risks of smoking discussed  
• Emphasis in positive benefits from smoking cessation, rather than hazards associated with continued smoking, and reviewed practicalities of stopping  
• Patients urged to give matter serious thought and appointment to return after one week; if patient wanted to stop physician pleased to give advice  
• Second visit (one week after initial) included answering patient’s questions; patients given a ‘smoking record’ card to be posted back to physician in three weeks (physicians would send personal reply back by post)  
• Interviews with patients scheduled at 10 weeks and 6-months (still using record cards and personal replies)  
Duration: 15 min  
Sessions: 4  
Total Time: 60 min |
Table 4.3 (continued) Intervention - Advice/Counseling

<table>
<thead>
<tr>
<th>Reference</th>
<th>Advice/Counseling : Details of Message Conveyance</th>
</tr>
</thead>
</table>
| Russell (1979)  | - All groups: (1) Smoking habits and attitudes questionnaire (15-20 min)  
- All groups: (2) Attitude-stability check (after seeing doctor) - questions reflected changes in attitudes to smoking and motivation to stop smoking after seeing doctor  
- INT1: Questionnaires only; not advised to stop smoking  
- INT2: Advised to stop smoking  
- INT3: Advised to stop smoking and given information leaflet: “How you can give up smoking”  
- Advice to stop smoking was simple and firm. It was implemented in the doctor’s own style  
Duration: 1-2 min  
Sessions: 1  
Total Time: 1-2 min |
| Russell (1983)  | - “Smoking questionnaire”: 17 items regarding smoking habits, motivation, intention to stop smoking, and confidence in ability to give up cigarettes.  
- Advice to stop smoking was simple and firm. It was implemented in the doctor’s own style during routine consultation, the “Give Up Smoking” booklet was handed out.  
- Subjects warned that they would be followed up and invited to return for further help if wanted it.  
Duration: 1-2 min  
Sessions: 1  
Total Time: 1-2 min |
| Sanders (1989)  | - Advice + discussion of smoking cessation  
Duration: NR  
Sessions: 1  
Total Time: NR |
| Severson (1998) | - INT1: Direct advice to quit smoking – related smoking to oral health.  
- Pamphlet: “How to Stop Using Tobacco” – information on the health problems resulting from tobacco use  
- INT2: same as INT1 but patient asked to set a quit date within 2-weeks of hygiene visit; patient given motivational video: “In Good Taste”  
- Patient called within 2-weeks post-visit to inquire about if materials had been read, if video had been watched and if patient was willing to set a quit date.  
Duration: NR  
Sessions: 1  
Total Time: NR |
| Slama (1990)    | - INT1 +INT2: Questionnaire on demographics + questions regarding patient’s health beliefs and fears about the costs of smoking cessation  
- INT1: Statement of advice + three smoking cessation brochures  
- INT2: Structural behavioral change including attitude change, self-efficacy, behavioral aids, communication aids  
Duration: INT1: 1.4 ± 0.7 min; INT2: 8.8 ± 3.3 min  
Sessions: 1  
Total Time: INT1: 1.4 ± 0.7 min; INT2: 8.8 ± 3.3 min |
<table>
<thead>
<tr>
<th>Reference</th>
<th>Advice/Counseling : Details of Message Conveyance</th>
</tr>
</thead>
</table>
| Stewart (1982)  | • Discussion with physician regarding questionnaire answers  
                 • Physicians gave stop smoking advice in manner they thought was most effective for the patient  
                 • Second treatment arm also received a pamphlet titled “Excuses, Excuses”  
                 Duration: NR  
                 Sessions: 1  
                 Total Time: NR                                                                                                                                                                                      |
| Tappin (2005)   | • Received information on smoking and pregnancy as part of a health education book (“ReadySteadyBaby”)  
                 • Counseling provided using motivational interviewing techniques  
                 Duration: 30 min  
                 Sessions: 2-5  
                 Total Time: 60-150 min                                                                                                                                                                               |
| Taylor (1990)   | • Reviewed benefits of not smoking and gave out manual: “Staying Free”:  
                 • Reviews benefits of quitting smoking  
                 • Helps patients identify high-risk situations for relapse  
                 • Enables patients to develop an action plan for coping  
                 • Audio-tapes for muscle relaxation  
                 • Self-efficacy of patients to maintain cessation in 28 high-risk situations was assessed. Those with < 70% confidence given counseling to help cope  
                 • Follow-up: telephone contact by nurses 1/week for first 2-3 weeks, then monthly for next 4 months to re-assess confidence level, further instruction and support  
                 • Continuing smokers/relapsers asked to meet with nurse in outpatient clinic; patients asked to sign a contract to quit smoking and set a quit date  
                 • Nicotine replacement gum prescribed for those who desired it (n=5)  
                 Duration: NR  
                 Sessions: 8  
                 Total Time: 210 min (range: 30-585 min)                                                                                                                                                               |
| Tonnesen (1996) | • Recorded smoking habits, measured expired CO level and Fagerstrom questionnaire.  
                 • Motivational conversation to stop smoking. This entailed describing to the patient WHY she/he should stop smoking (e.g. decreased lung function, COPD, hypertension, myocardial infarction, etc.). Also described the risk of continuing to smoke. Informed the subject on the basic rules for stopping smoking.  
                 • Follow-up letter sent at 4-6 weeks asking if patient had stopped smoking and encouraging them to do so if they had not  
                 Duration: 5 min  
                 Sessions: 1  
                 Total Time: 5 min                                                                                                                                                                                    |
| Vetter (1990)   | • Health promotion approach: advice given on lifestyle in general with focus in smoking cessation.  
                 • Discussion of problems associated with smoking cessation.  
                 Duration: NR  
                 Sessions: 1  
                 Total Time: NR                                                                                                                                             |
Table 4.3 (continued)  

<table>
<thead>
<tr>
<th>Reference</th>
<th>Advice/Counseling : Details of Message Conveyance</th>
</tr>
</thead>
</table>
| Wilson (1990)  | • Related patient’s presenting conditions to smoking behavior.  
                | • Clear statement from physician that she/he wanted patient to stop smoking.  
                | • Patient told that smoking status would be monitored.  
                | Duration: NR  
                | Sessions: 1  
                | Total Time: NR |
| Yilmaz (2006)  | • INT1: (Mother Intervention) – risks of tobacco use to mother’s health explained  
                | • INT2: (Child Intervention) – risks of tobacco to child’s health explained  
                | Duration: 10 min  
                | Sessions: 1  
                | Total Time: 10 min |

INT: Intervention; NR: Not reported; NRT: Nicotine replacement therapy
Table 4.4  Usual care description and questionnaire details

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
<th>Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolman (2002)</td>
<td>No systematic attention given to smoking</td>
<td>Demographics, Intention to quit smoking, Motivational phase (stage of change), Pros, Cons to quitting, Social support for quitting, Self-efficacy expectations, Fagerstrom Test for Nicotine Dependence (FTND)CS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cigarettes per day</td>
</tr>
<tr>
<td>Burt (1974)</td>
<td>Conventional advice (not described)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No follow-up</td>
<td></td>
</tr>
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<td></td>
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</tr>
<tr>
<td>Demers (1990)</td>
<td>Brief health habits questionnaire</td>
<td>Question: “Do you currently smoke cigarette?” Demographics, Age started smoking, Number of cigarettes/day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>deVries (2006)</td>
<td>Pre-test questionnaire (socio-demographic characteristics, pregnancy and smoking items) Post-test questionnaire (smoking abstinence)</td>
<td>Socio-demographics, Smoking items: Number of cigarettes/day before pregnancy, Number of cigarettes at entry into care, Number of min to first cigarette, Age became a regular smoker, Anticipated help from partner</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Groner (2000)</td>
<td>Subjects informed that they were participating in a health and safety intervention. No smoking cessation advice; participants received age-appropriate safety advice.</td>
<td>Demographics, Smoking Status, Nicotine Dependence Questionnaire (9 questions re: automatic and dependent or addictive smoking behaviors, Stage of Change algorithm, Knowledge of the effects of ETS on children</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>Haug (1994)</td>
<td>Given a questionnaire that addressed smoking habits and history, attitude towards smoking cessation, and smoking habits of significant others. Pregnant women – ordinary control program during pregnancy No extra consultations were organized for controls; no written materials distributed</td>
<td>Age started smoking, Number of cigarettes/day, Prediction of being a non-smoker in 5 years, % of partners smoking daily, % encouraged by partners to stop smoking, % answering that their smoking “is a big problem”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Description</td>
<td>Questionnaire</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hilberink (2005)</td>
<td>Two extensive questionnaires given, otherwise NR</td>
<td>“Two extensive questionnaires” in addition to demographics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fagerstrom Test of Nicotine Dependence (FTND)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Self efficacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stage of change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ever attempted to quit smoking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COPD related symptoms</td>
</tr>
<tr>
<td>Jamrozik (1984)</td>
<td>Smokers allocated control group identified, “nothing further was done”</td>
<td>Smoking habits inquired</td>
</tr>
<tr>
<td>Janz (1987)</td>
<td>NR</td>
<td>Informed consent, but no questionnaire.</td>
</tr>
<tr>
<td>McDowell (1985)</td>
<td>Patients informed that their smoking status would be reviewed in 2-, 6- and 12-months time</td>
<td>Questionnaire:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoking history, current smoking habits and battery of questions concerning attitudes towards smoking including Smoking Typology Scale, determination to quit, and confidence to quit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Each subject kept a diary to record the number cigarettes smoked daily over one week.</td>
</tr>
<tr>
<td>Molyneaux (2003)</td>
<td>Smoking status recorded, but patients received no additional formal intervention</td>
<td>1. Fagerstrom Test of Nicotine Dependence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Glover-Nilsson smoking behavior questionnaire</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. SF-36 Quality of Life questionnaire</td>
</tr>
<tr>
<td>Morgan (1996)</td>
<td>Usual care provided, but details not reported</td>
<td>Questionnaire about smoking habits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoking-related behaviors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of cigarettes/day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of years smoked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% smoke within 30 min of waking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% quit ≥24 hours in last 12 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% seriously thinking about quitting in the next year</td>
</tr>
<tr>
<td>Pieterse (2001)</td>
<td>Controls not aware of existence of a smoking cessation program.</td>
<td>Pre-test questionnaire –separate page with informed consent that described</td>
</tr>
<tr>
<td></td>
<td>Pre-test questionnaire given.</td>
<td>General importance of developing new ways of supporting smoking cessation</td>
</tr>
<tr>
<td></td>
<td>No counseling or advice on smoking, except when indicated by the contact reason or when initiated by the patient. Advice in these cases limited to straight-forward stop-smoking advice; referral to local health organization.</td>
<td>Number of follow-up measurements</td>
</tr>
<tr>
<td></td>
<td>No motivational counseling given, no self-help manual distributed, no offer of follow-up care (17.2% of controls reported some conversation about smoking during 12-month follow-up)</td>
<td>Confidentiality of data</td>
</tr>
<tr>
<td>Reference</td>
<td>Description</td>
<td>Questionnaire</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Quist-Paulsen (2003)</td>
<td>Offered group sessions 2 times/week; importance of smoking cessation mentioned. Video shown and booklet handed out with general information on coronary heart disease and advice to quit smoking. Usual care group received no further specific information on how to quit smoking.</td>
<td>Baseline questionnaire: Years smoking, Number of cigarettes/day, Number of previous quit attempts, Smoked within 24 hours of admission</td>
</tr>
<tr>
<td>Research Committee of British Thoracic Society (1990)</td>
<td>Usual advice to stop smoking</td>
<td>NR</td>
</tr>
<tr>
<td>Richmond (1986)</td>
<td>Questionnaire on smoking habits. 10 ml blood sample for cotinine assessment. Height, weight and lung function measured. No advice given</td>
<td>NR</td>
</tr>
<tr>
<td>Rose (1978)</td>
<td>Usual care patients blinded. Reports of cardiorespiratory screening sent to attending physician only</td>
<td>Demographics, Number of cigarettes/day</td>
</tr>
<tr>
<td>Russell (1979)</td>
<td>Names taken for follow-up procedures “Smoking stability questionnaire” at one month. Reminder letters + visit by interviewer if no postal reply “Smoking survey – final follow-up” at 12-months. 7 questions about current smoking, desire to quit smoking, attempts to stop or change smoking habits</td>
<td>Smoking Stability Questionnaire – 6 questions about current smoking and attempts to stop smoking or make some other change in smoking over the month after attendance Smoking Survey (final follow-up) – 7 questions about current smoking, desire to give up smoking, attempts to stop smoking or change habits over past 4 weeks</td>
</tr>
<tr>
<td>Russell (1983)</td>
<td>No intervention from physician. Given initial “Smoking Questionnaire” and follow-up “Smoking Habits” questionnaire at 4 months and 12 months follow-up</td>
<td>Baseline: “Are you a smoker?” 17 items concerned with smoking habits, motivation and intention to stop, and confidence to give up cigarettes 4-month and 12-month surveys: Current smoking habits Attempts to give up cigarettes Details on use of nicotine gum</td>
</tr>
<tr>
<td>Sanders (1989)</td>
<td>Nothing beyond usual care; physicians asked specifically not to discuss smoking beyond the requirement of routine consultation</td>
<td>Identifying details (of subjects) Demographic information Brief questions on general health, and smoking status</td>
</tr>
<tr>
<td>Reference</td>
<td>Description</td>
<td>Questionnaire</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Severson (1998)   | Usual care practices received no training. Smoking cessation (if discussed) was left to usual manner (not described) | Health Questionnaire  
Series of questions on demographics, tobacco use, alcohol use, caffeine use, tooth brushing and flossing habits |
| Slama (1990)      | No information or advice about smoking.                                      | Demographic data and smoking behavior  
Health beliefs and fears about the costs of stopping smoking                                      |
| Stewart (1982)    | Smoking habits questionnaire not discussed with patients. Patients did not receive advice about smoking unless physician felt it was unethical to withhold advice. | Questionnaire on present and past smoking habits.  
Duration of cigarette smoking  
Quit attempt previous year  
Desire to stop smoking (at time of study) |
| Tappin (2005)     | Received information on smoking and pregnancy as part of a health education book ("ReadySteadyBaby") | Demographics  
Age started smoking  
Cigarettes smoked yesterday  
Maximum smoked per day  
Time to first cigarette  
Quit attempts  
Commitment to cutting down |
| Taylor (1990)     | No specific instructions on how to stop smoking. Nicotine gum not prescribed. Stop-smoking classes offered in participating hospitals (<10% usual care patients attended) | Questionnaire determined the confidence to resist urges to smoke in 28 high-risk situations  
- Fagerstrom Tolerance Questionnaire  
- Tobacco Withdrawal Symptoms Inventory  
- Years of smoking  
- Number of cigarettes/day  
- Smokers in family  
- Friends who smoke  
- Ease of quitting  
- Previous quit attempts  
- Confidence to quit  
- Confidence to resist urges |
### Reference Description and Questionnaire Details

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
<th>Questionnaire</th>
</tr>
</thead>
</table>
| Tonnesen (1996)   | Fagerstrom questionnaire and expired carbon monoxide measurements. Patients told they would be contacted in a year to be asked about smoking habits. No advice to stop smoking was given. | Nurses completed smoking records on all subjects (pre-admission)  
CO measurements (post 15s breath-hold)  
Fagerstrom Tolerance Questionnaire  
FTND question: ‘How soon after you wake do you smoke your first cigarette?’  
Number of cigarettes/day  
Motivation to quit  
Stress intensity  
Stress frequency  
Satisfaction with life in preceding year |
| Vetter (1990)      | NR                                                                           | 1. London School of Hygiene and Tropical Medicine Questionnaire: a series of questions on measures of angina, breathlessness, bronchitis symptoms, and intermittent claudication.  
2. Questions on smoking habits based on those used in the General House Survey |
| Wilson (1990)      | Physicians continued to use their usual smoking cessation advice to patients in control group. | General Health Questionnaire  
Included questions on smoking status  
Follow-up questionnaire at 1, 3, 6, and 12 months: questions on smoking with general health questions |
| Yilmaz (2006)      | General personal health information; no smoking cessation advice.             | Demographics  
Smoking status  
Knowledge of ETS on children  
Fagerstrom Tolerance Questionnaire |

NR: Not reported; ETS: environmental tobacco smoke
### Table 4.5  Brief advice vs. usual care

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Brief Intervention</th>
<th>Usual Care</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Events</td>
<td>Total</td>
<td>Events</td>
</tr>
<tr>
<td>Demers 1990</td>
<td>15</td>
<td>292</td>
<td>4</td>
</tr>
<tr>
<td>Jamrozik 1984</td>
<td>77</td>
<td>512</td>
<td>58</td>
</tr>
<tr>
<td>Jamrozik 1984</td>
<td>69</td>
<td>521</td>
<td>58</td>
</tr>
<tr>
<td>Jamrozik 1984</td>
<td>91</td>
<td>528</td>
<td>58</td>
</tr>
<tr>
<td>Janz 1987</td>
<td>10</td>
<td>69</td>
<td>12</td>
</tr>
<tr>
<td>Pieterse 2001</td>
<td>22</td>
<td>269</td>
<td>8</td>
</tr>
<tr>
<td>RCBTS 1990</td>
<td>17</td>
<td>347</td>
<td>18</td>
</tr>
<tr>
<td>Russell 1979</td>
<td>13</td>
<td>511</td>
<td>1</td>
</tr>
<tr>
<td>Russell 1979</td>
<td>7</td>
<td>543</td>
<td>1</td>
</tr>
<tr>
<td>Russell 1979</td>
<td>21</td>
<td>520</td>
<td>1</td>
</tr>
<tr>
<td>Russell 1983</td>
<td>43</td>
<td>740</td>
<td>35</td>
</tr>
<tr>
<td>Sanders 1989</td>
<td>17</td>
<td>375</td>
<td>6</td>
</tr>
<tr>
<td>Sanders 1989</td>
<td>18</td>
<td>376</td>
<td>6</td>
</tr>
<tr>
<td>Severson 1998</td>
<td>34</td>
<td>1305</td>
<td>32</td>
</tr>
<tr>
<td>Slama 1990</td>
<td>1</td>
<td>104</td>
<td>1</td>
</tr>
<tr>
<td>Stewart 1982</td>
<td>7</td>
<td>345</td>
<td>4</td>
</tr>
<tr>
<td>Stewart 1982</td>
<td>4</td>
<td>159</td>
<td>4</td>
</tr>
<tr>
<td>Vetter 1990</td>
<td>34</td>
<td>237</td>
<td>20</td>
</tr>
<tr>
<td>Wilson 1990</td>
<td>43</td>
<td>577</td>
<td>17</td>
</tr>
</tbody>
</table>

Total (95% CI)  8330  8794  100.0%  1.74 [1.37, 2.22]

Total events  543  344

Heterogeneity: Tau² = 0.13; Chi² = 42.72, df = 18 (P = 0.0009); I² = 58%
Test for overall effect: Z = 4.53 (P < 0.00001)
### Table 4.6  Intermediate advice vs. usual care

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Intermediate Intervention</th>
<th>Usual Care</th>
<th>Event Total</th>
<th>Event Total</th>
<th>Weight</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolman 2002</td>
<td>147</td>
<td>388</td>
<td>108</td>
<td>401</td>
<td>12.6%</td>
<td>1.41 [1.15, 1.73]</td>
<td></td>
</tr>
<tr>
<td>Burt 1974</td>
<td>79</td>
<td>125</td>
<td>27</td>
<td>98</td>
<td>10.1%</td>
<td>2.29 [1.62, 3.25]</td>
<td></td>
</tr>
<tr>
<td>deVries 2006</td>
<td>17</td>
<td>141</td>
<td>5</td>
<td>177</td>
<td>3.3%</td>
<td>4.27 [1.61, 11.28]</td>
<td></td>
</tr>
<tr>
<td>Groner 2000</td>
<td>4</td>
<td>164</td>
<td>7</td>
<td>162</td>
<td>2.3%</td>
<td>0.56 [0.17, 1.89]</td>
<td></td>
</tr>
<tr>
<td>Haug 1994</td>
<td>68</td>
<td>398</td>
<td>15</td>
<td>206</td>
<td>7.2%</td>
<td>2.35 [1.38, 4.00]</td>
<td></td>
</tr>
<tr>
<td>Hilberink 2005</td>
<td>39</td>
<td>244</td>
<td>13</td>
<td>148</td>
<td>6.4%</td>
<td>1.82 [1.01, 3.29]</td>
<td></td>
</tr>
<tr>
<td>Janz 1987</td>
<td>18</td>
<td>75</td>
<td>12</td>
<td>106</td>
<td>5.6%</td>
<td>2.12 [1.09, 4.13]</td>
<td></td>
</tr>
<tr>
<td>McDowell 1985</td>
<td>13</td>
<td>90</td>
<td>11</td>
<td>93</td>
<td>4.8%</td>
<td>1.22 [0.58, 2.58]</td>
<td></td>
</tr>
<tr>
<td>Molyneaux 2003</td>
<td>4</td>
<td>91</td>
<td>7</td>
<td>92</td>
<td>2.4%</td>
<td>0.58 [0.18, 1.91]</td>
<td></td>
</tr>
<tr>
<td>Morgan 1996</td>
<td>43</td>
<td>279</td>
<td>31</td>
<td>380</td>
<td>8.7%</td>
<td>1.89 [1.22, 2.92]</td>
<td></td>
</tr>
<tr>
<td>RCBTS 1990</td>
<td>66</td>
<td>730</td>
<td>51</td>
<td>732</td>
<td>10.1%</td>
<td>1.30 [0.91, 1.84]</td>
<td></td>
</tr>
<tr>
<td>RCBTS 1990</td>
<td>31</td>
<td>351</td>
<td>18</td>
<td>343</td>
<td>6.8%</td>
<td>1.68 [0.96, 2.95]</td>
<td></td>
</tr>
<tr>
<td>RCBTS 1990</td>
<td>30</td>
<td>351</td>
<td>18</td>
<td>343</td>
<td>6.8%</td>
<td>1.63 [0.93, 2.87]</td>
<td></td>
</tr>
<tr>
<td>Richmond 1986</td>
<td>23</td>
<td>100</td>
<td>2</td>
<td>100</td>
<td>1.8%</td>
<td>11.50 [2.79, 47.49]</td>
<td></td>
</tr>
<tr>
<td>Severson 1998</td>
<td>35</td>
<td>1375</td>
<td>32</td>
<td>1350</td>
<td>8.1%</td>
<td>1.07 [0.67, 1.72]</td>
<td></td>
</tr>
<tr>
<td>Slama 1990</td>
<td>5</td>
<td>101</td>
<td>1</td>
<td>106</td>
<td>0.8%</td>
<td>5.25 [0.62, 44.14]</td>
<td></td>
</tr>
<tr>
<td>Tonnesen 1996</td>
<td>8</td>
<td>254</td>
<td>3</td>
<td>253</td>
<td>2.0%</td>
<td>2.66 [0.71, 9.90]</td>
<td></td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>5257</strong></td>
<td><strong>5090</strong></td>
<td><strong>100.0%</strong></td>
<td></td>
<td></td>
<td><strong>1.71 [1.39, 2.09]</strong></td>
<td></td>
</tr>
<tr>
<td>Total events</td>
<td>630</td>
<td></td>
<td>361</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 0.07$; $\chi^2 = 32.61$, df = 16 ($P = 0.008$); $I^2 = 51$

Test for overall effect: $Z = 5.18$ ($P < 0.00001$)
### Table 4.7  Intensive advice vs. usual care

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Intensive Intervention</th>
<th>Usual Care</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barr-Taylor 1990</td>
<td>52</td>
<td>81</td>
<td>1.82 [1.30, 2.54]</td>
<td></td>
</tr>
<tr>
<td>Quist-Paulsen 2003</td>
<td>57</td>
<td>118</td>
<td>1.34 [0.99, 1.81]</td>
<td></td>
</tr>
<tr>
<td>Rose 1978</td>
<td>167</td>
<td>714</td>
<td>2.31 [1.79, 2.98]</td>
<td></td>
</tr>
<tr>
<td>Tappin 2005</td>
<td>14</td>
<td>348</td>
<td>0.87 [0.44, 1.71]</td>
<td></td>
</tr>
</tbody>
</table>

Total (95% CI)  1261  1346  100.0%  1.60 [1.13, 2.27]  

Total events  290  166  

Heterogeneity: $\text{Tau}^2 = 0.09; \text{Chi}^2 = 11.92, \text{df} = 3 \ (P = 0.008); I^2 = 75\%$

Test for overall effect: $Z = 2.64 \ (P = 0.008)$
Table 4.8  Written self-help materials vs. usual care

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Usual Care</th>
<th>Intervention</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burt 1974</td>
<td>79 125 27</td>
<td>98</td>
<td>2.29 [1.62, 3.25]</td>
</tr>
<tr>
<td>devVries 2006</td>
<td>17 141 5</td>
<td>177</td>
<td>4.27 [1.61, 11.28]</td>
</tr>
<tr>
<td>Groner 2000</td>
<td>4 164 7</td>
<td>162</td>
<td>0.56 [0.17, 1.89]</td>
</tr>
<tr>
<td>Jamrozik 1984</td>
<td>77 512 58</td>
<td>549</td>
<td>1.42 [1.03, 1.96]</td>
</tr>
<tr>
<td>Janz 1987</td>
<td>18 75 12</td>
<td>106</td>
<td>2.12 [1.09, 4.13]</td>
</tr>
<tr>
<td>McDowell 1985</td>
<td>13 90 11</td>
<td>93</td>
<td>1.22 [0.58, 2.58]</td>
</tr>
<tr>
<td>Morgan 1996</td>
<td>43 279 31</td>
<td>380</td>
<td>1.89 [1.22, 2.92]</td>
</tr>
<tr>
<td>Richmond 1986</td>
<td>23 100 2</td>
<td>100</td>
<td>11.50 [2.79, 47.49]</td>
</tr>
<tr>
<td>Russell 1983</td>
<td>43 740 35</td>
<td>637</td>
<td>1.06 [0.69, 1.63]</td>
</tr>
<tr>
<td>Severson 1998</td>
<td>35 1375 32</td>
<td>1350</td>
<td>1.07 [0.67, 1.72]</td>
</tr>
<tr>
<td>Tappin 2005</td>
<td>16 407 17</td>
<td>349</td>
<td>0.81 [0.41, 1.57]</td>
</tr>
<tr>
<td>Taylor 1990</td>
<td>52 81 29</td>
<td>82</td>
<td>1.82 [1.30, 2.54]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>4089</strong></td>
<td><strong>4083</strong></td>
<td><strong>1.59 [1.22, 2.07]</strong></td>
</tr>
</tbody>
</table>

Total events 420 266

Heterogeneity: Tau² = 0.12; Chi² = 31.38, df = 11 (P = 0.0010); I² = 65%
Test for overall effect: Z = 3.47 (P = 0.0005)
Table 4.9    Studies using psychological motivation vs. usual care

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Usual Care</th>
<th>Intervention</th>
<th>Weight</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolman 2002</td>
<td>147</td>
<td>108</td>
<td>26.6%</td>
<td>1.41 [1.15, 1.73]</td>
</tr>
<tr>
<td>devVries 2006</td>
<td>17</td>
<td>5</td>
<td>5.8%</td>
<td>4.27 [1.61, 11.28]</td>
</tr>
<tr>
<td>Hilberink 2005</td>
<td>39</td>
<td>13</td>
<td>11.9%</td>
<td>1.82 [1.01, 3.29]</td>
</tr>
<tr>
<td>Morgan 1996</td>
<td>43</td>
<td>31</td>
<td>16.8%</td>
<td>1.89 [1.22, 2.92]</td>
</tr>
<tr>
<td>Pieterse 2001</td>
<td>22</td>
<td>8</td>
<td>8.0%</td>
<td>2.67 [1.21, 5.89]</td>
</tr>
<tr>
<td>Tappin 2005</td>
<td>16</td>
<td>17</td>
<td>10.2%</td>
<td>0.81 [0.41, 1.57]</td>
</tr>
<tr>
<td>Taylor 1990</td>
<td>52</td>
<td>29</td>
<td>20.8%</td>
<td>1.82 [1.30, 2.54]</td>
</tr>
</tbody>
</table>

Total (95% CI)     | 1809       | 1798         | 100.0% | 1.70 [1.32, 2.21]             |

Total events       | 336        | 211          |        |                               |

Heterogeneity: Tau² = 0.05; Chi² = 12.39, df = 6 (P = 0.05); I² = 52%
Test for overall effect: Z = 4.05 (P < 0.0001)
### Table 4.10  Studies using follow-ups vs. usual care

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Intervention</th>
<th>Usual Care</th>
<th>Risk Ratio</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Events</td>
<td>Total</td>
<td>Events</td>
<td>Total</td>
</tr>
<tr>
<td>Bolman 2002</td>
<td>147</td>
<td>388</td>
<td>108</td>
<td>401</td>
</tr>
<tr>
<td>Groner 2000</td>
<td>4</td>
<td>164</td>
<td>7</td>
<td>162</td>
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<td>McDowell 1985</td>
<td>13</td>
<td>90</td>
<td>11</td>
<td>93</td>
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<td>Morgan 1996</td>
<td>43</td>
<td>279</td>
<td>31</td>
<td>380</td>
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<td>Quist-Paulsen 2003</td>
<td>57</td>
<td>118</td>
<td>44</td>
<td>122</td>
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<td>RCBTS 1990</td>
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<td>RCBTS 1990</td>
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<td>Richmond 1986</td>
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<td>Rose 1978</td>
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<td>714</td>
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<td>Severson 1998</td>
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<td>Taylor 1990</td>
<td>52</td>
<td>81</td>
<td>29</td>
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<td>Tonnesen 1996</td>
<td>8</td>
<td>254</td>
<td>3</td>
<td>253</td>
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<tr>
<td><strong>Total (95% CI)</strong></td>
<td>5272</td>
<td>5435</td>
<td>100.0%</td>
<td>1.55 [1.29, 1.86]</td>
</tr>
</tbody>
</table>

Total events: 692

Heterogeneity: Tau² = 0.06; Chi² = 29.93, df = 13 (P = 0.005); I² = 57%

Test for overall effect: Z = 4.62 (P < 0.00001)
4.8 References


5.1 Introduction

Lifestyle conditions are prevalent in high-income countries and contribute to their being leading causes of morbidity and death (Mokdad, Marks, Stroup & Gerberding, 2004; Yach 2004). Health risk factors can occur singly, but most often present in clusters. Such risk factors include smoking, poor dietary practices, physical inactivity, risky alcohol consumption, and undue stress (Berrigan, Dodd, Troiano, Krebs-Smith & Ballad Barbash, 2003; Bunker et al., 2003;Dimsdale, 2008; Coups, Gaba & Orleans, 2004; Fine, Philogene, Gramling, Coups, & Sinha, 2004; Klein-Geltnik, Choi & Fry 2006; Laaksonen, Prattala & Karisto, 2001; Mokdad et al., 2004; Schuit, van Loon, Tijhius & Ocke, 2002).

Over the past 35 years, smoking, poor nutrition, lack of physical fitness, and alcohol abuse have been recognized as ‘national health problems’ in Canada resulting in illness, disability, and death (Lalonde, 1974; Romanow, 2002). These lifestyle behaviors are responsible for increased health care costs due to costs to individuals and society, workplace absenteeism, loss of work years and productivity, lives lost, and economic burden on the health care system (Single, Robson, Rehm & Rehm, 1998; Birmingham, Muller, Palepu, Spinelli & Anis, 1999; Katzmarzyk, Gledhill & Shephard, 2000; Colman, 2001; Bridge & Turpin, 2004; Colman, 2004; Rehm et al., 2006). Thus, health researchers have recommended that smoking cessation, optimal nutrition and physical activity be high priorities in public health and the health care system overall (Goldstein, Whitlock & De Pue, 2004; Mokdad et al., 2004).
Primary care has been proposed as an optimal vehicle for the promotion of healthy lifestyle behaviors (Goldstein et al., 2004). There is evidence of a modest but variable effect on lifestyle change of physician-driven health programs (Ashenden, Silagy & Weller, 2003). The extent to which health care professionals incorporate health promotion is far from optimal, and its systematic incorporation can be described as inconsistent at best (Kushner, 1995; Makni et al., 2002; Centers for Disease Control and Prevention, 2002b; Rea, Marshak, Neish & Davis, 2004; Brotons et al., 2005). For example, a sample of general practitioners in the Midlands of England reported that they advised or educated their patients about health or lifestyle risks all the time (24%) or most of the time (55%) (McAvoy, Kaner, Lock, Heather & Gilvarry, 1999). In the United States, less than half of 12,835 adults over the age of 17 years who were classified as obese (BMI \(\geq 30\) kg/m\(^2\)), reported that a health care professional advised them to lose weight during the course of a routine check-up over a 12 month timeframe (Galuska, Will, Serdula & Ford, 1999). Further, many smokers do not receive smoking cessation advice from their health care providers during routine visits (Livaudais et al., 2005).

The curricula for health care professions have evolved from multiple factors including historical precedence, political factors, and economic factors as well as health care trends. Based on the example of Canada, the need for greater responsiveness of the health care delivery system to the needs of society was a predominant theme in the health care white paper titled “Building on Values: the Future of Health Care in Canada” (Romanow, 2002). This paper identified gaps in health care between what is needed and what is provided. Health, and health promotion were identified as health care priorities. However, these are areas in which health professionals may feel least competent compared with biomedical clinical skills that focus on impairment (Chapter 1). Health promotion and disease prevention could be considered as distinct competencies. Together, they benefit the health of people and augment management outcomes overall.
With specific reference to entry level physical therapy curricula, there is little information about the degree to which health promotion is addressed including whether health promotion is actually taught as a clinical competency (Rea et al., 2004). For purposes of comparison across other health professions, e.g., dentistry, medicine, nursing, pharmacy, we found similarly little comprehensive information regarding the attention to health promotion in their academic curricula (Garry, Diamond & Whitely, 2001; Lenz, Monaghan & Hettermann, 2007). The exception to this was the singular topic of smoking cessation (Ferry, Grissino & Runfola, 1999; Roddy, Rubin & Britton, 2004; Heath, Andrews, Thomas, Kelley & Friedman, 2002).

A case can be made for physical therapists as ideal promoters of health, and catalysts for improved health behavior in their patients. The practice of physical therapy is characterized by multiple interactions between physical therapist and patient, i.e., prolonged visits over prolonged periods of time (Balfour, 1993; Fruth, Ryan & Gahimer, 1998; Lorish & Gale, 1999; Guilmette, Motta, Shadel, Mukland & Niaura, 2001). This practice pattern may enable physical therapists to build rapport and trust with their clients and patients. For example, visits to the physical therapist include assessments and therapeutic interventions, and incorporate ‘teachable moments’ such that educational content can be imparted to the patient that directly influence and are complementary to the therapeutic management of the presenting condition (Balfour, 1993; Fruth et al., 1998). During such ‘teachable moments’ the physical therapist can address unhealthy lifestyle behaviors that may compromise a patient’s outcomes as well as those that jeopardize the patient’s general health.

Both the American Physical Therapy Association (APTA) and Canadian Physiotherapy Association (CPA) advocate health promotion and disease prevention as part of the contemporary physical therapists’ scope of practice (American Physical Therapy Association, 2001; Canadian Physiotherapy Association, 2005). Given the pandemic of lifestyle conditions...
this century and the call for health professionals to assign these a high priority irrespective of a patient’s primary diagnosis, an examination of health promotion as part of the curricula in physical therapy academic programs is both justified and timely.

We argue that health promotion as it relates to the topics of smoking cessation, optimal nutrition, weight management, being physically active on a regular basis, moderate alcohol consumption, and stress management are not emphasized in the curricula of physical therapy programs in high-income countries commensurate with the indicators for their being priorities for the physical therapist.

The purpose of this study was to describe and establish the existence and scope of health promotion content with special reference to lifestyle behavior risk factors, i.e., tobacco use, poor nutrition, being overweight, physical inactivity, risky drinking, and being unduly stressed within entry level curricula of accredited physical therapy programs in six high-income English speaking countries, namely, Australia, Canada, Ireland, New Zealand, the United Kingdom (UK), and the United States (US).

With respect to physical therapy curricula in six English-speaking high-income countries in which lifestyle conditions are prevalent, we posed the following primary questions:

1. Is health promotion viewed as a pillar of the curriculum?
2. What proportion of programs incorporates health promotion as an independent course?
3. What is the content of health promotion curriculum content and methods used (including clinical competency) to teach health promotion?
4. What is the concordance between the need for clinical competence in health behavior change implemented by physical therapists and entry level curriculum content?

Finally, we believed the commitment to student health was an index of a physical therapy program’s commitment to and value of health and its corollaries for health promotion. Thus, we posed a secondary question:
5. In what ways, if any, do entry level physical therapy programs promote the health of their students?

5.2 Methods

5.2.1 Study Design

A cross-sectional population-based survey study of accredited physical therapy programs in the commonwealths or republics of Australia, Canada, Ireland, New Zealand, the UK, and the US was conducted. Canada, the UK, and the US represent the naissance of physical therapy and its curriculum development that has influenced entry-level curricula worldwide (Moffat, 2003). Further, the countries we selected were categorized as high-income and were characterized as having lifestyle conditions as their leading causes of morbidity, disability and death, and happened to be English speaking (Berrigan et al., 2003; Katzmarzyk, 2002; Mokdad et al., 2004; Patterson, Haines & Popkin, 1994; Schuit et al., 2002; Tanuseputro, Manuel, Leung, Nguyen & Johansen, 2003).

5.2.2 Survey Construction

In this survey, we defined health promotion as maximizing positive health behaviors related to lifestyle conditions and minimizing negative health behaviors (Chapter One). We defined lifestyle conditions as those contributing to the leading causes of morbidity and mortality, namely, ischemic heart disease, cancer, smoking-related conditions, hypertension and stroke, diabetes, and obesity. In this survey, positive health behaviors included not smoking, healthy balanced nutrition, regular physical activity and exercise, avoidance of excessive stress, whereas negative health behaviors included smoking, physical inactivity, risky drinking behavior (alcohol), poor nutrition, unhealthy body weight, and excessive stress (Berrigan et al., 2003; Bunker et al., 2003; Coups et al., 2004; Dimsdale, 2008; Fine et al., 2004; Klein-Geltner et al., 2006; Laaksonen et al., 2001; Mokdad et al., 2004; Patterson et al., 1994; Schuit et al., 2002).
Five sources of evidence and support were used as a foundation from which to build a survey pertaining to topics on health promotion and disease prevention, and the extent to which these were incorporated into the physical therapy curricula of each survey respondent’s academic program within the surveyed countries.

The first source of evidence was based on current health care trends and the prevalence of chronic conditions associated with unhealthy lifestyles (Patterson et al., 1994; Laaksonen et al., 2001; Romanow, 2002; Centers for Disease Control and Prevention, 2002a; Berrigan et al., 2003; Manson, Skerrett, Greenland & VanItallie, 2004; Mokdad et al., 2004; Klein-Geltnik et al., 2006). The second evolved from contemporary definitions of physical therapy that include reference to health and health promotion as priorities of care (American Physical Therapy Association, 2001; Canadian Physiotherapy Association, 2005). The third was the fact that physical therapists exploit non invasive interventions in their practices (i.e., non pharmacological), and unequivocal evidence supports the efficacy and effectiveness of positive health behavior change (a non-invasive practice) and reversing or modifying the effects of lifestyle conditions (Dean, 2009; Canadian Physiotherapy Association, 2005; Guilmette et al., 2001). The fourth was based on the literature related to barriers perceived by health professionals in general to implementing health behavior change programs with their clients or patients (Kushner, 1995; McKenna, Naylor & McDowell, 1998; Burns, Camaione & Chatterton, 2000; McCarty, Zander, Hennrikus & Lando 2001; Brotons et al., 2005). And, the fifth was based on the literature supporting the beneficial role modeling effects that health care professionals can have on their patients’ lifestyle choices and health behaviors (McKenna et al.,1998; Nardini, Bertoletti, Rastelli & Donner, 1998; Cornuz, Ghali, Di Carlantonio, Pecoud & Paccaud, 2000; Frank, Breyan & Elon, 2000).
With respect to topical areas, survey questions were restricted to the unhealthy behaviors of smoking, sub-optimal nutrition, physical inactivity and risky alcohol consumption. Additionally, topics of weight management and stress management were included. Physical therapists’ clientele include people with functional disabilities who are more likely to report stress, worry and anxiety than people without; as such, stress may be implicated in unhealthy lifestyle choices such as smoking among persons with disabilities (Brawarsky, Brooks, Wilber, Gertz & Klein Walker 2002; Parrot, 1993). Questions pertaining to how health promotion is incorporated into curricula were also included. Each topic area was assessed for educational method, i.e., theoretical information only, practical competencies described within the curriculum, as well as clinical competencies and the extent of coverage (i.e., hours allocated to each topic). Finally, we asked about the length of time health promotion had been part of each program, and how each program promoted and supported the health of their students. Space was provided for comments after each question. The survey can found in Appendix B-3.

The survey was tested for face-validity on a convenience sample of international physical therapy directors and faculty (n=5). Survey questions were assessed for clarity, comprehensibility and interpretation. The final survey consisted of 20 questions over nine web pages and required approximately 15 minutes to complete.

5.2.3 Sampling Frame

Academic institutions that grant degrees in physical therapy (minimum bachelor level) in accredited programs, departments and schools of physical therapy defined the sampling frame. Hereafter, the term program is used to refer to the range of academic units surveyed, i.e., programs, departments and schools. Program leaders, chairs, deans, department heads and directors were the primary points of contact across academic programs. In cases where these individuals were unable to answer the survey questions sufficiently, they were asked to forward the survey to the faculty member who would best able to do so. Collaboration with other faculty
members in their programs was encouraged if necessary however we requested that only one person be responsible for submitting the survey.

5.2.4 Survey Distribution

At the time this study was conducted, there were 258 accredited entry-level physical therapy programs in Australia (n=13), Canada (n=13), Ireland (n=4), New Zealand (n=2), the UK (n=28), and the US (n=198). The ability to obtain electronic contact information via the websites of academic physical therapy programs allowed for a census survey to be conducted based on an internet-based survey system.

The survey and study procedures were approved by the ethics review board of the University of British Columbia (UBC), Canada. All correspondence was on the UBC letterhead. To maintain anonymity and confidentiality, each program was identified using a unique identifier code.

The survey was distributed electronically through the internet survey service, SurveyMonkey™. For our study, each respondent was first contacted by email. Contact emails were obtained from the webpage of each physical therapy program. Phone contact with 18 programs was required to verify the appropriate contact person. We used a modified survey distribution methodology based on the tailored design method to maximize the response rate (Dillman, 2000). This method incorporates a series of sequential contacts. In our study, we adhered accordingly using the following steps:

1. A ‘pre-notice’ email was sent to the appropriate leaders, heads and directors, or designated faculty member (respondents), that provided details of the study and survey content, and informed the respondents that an email embedded within a link to the curriculum survey would be arriving within seven days.

2. Within seven days of the pre-notices, the cover letter email was sent that described the study purposes in detail. The cover letter contained a link to the survey. Upon opening the link,
respondents were directed to the consent form which detailed components of the study and the survey including issues related to confidentiality and anonymity of respondents, and security of responses. Informed consent was made available via a separate weblink. Upon consent, respondents were asked to complete the online curriculum survey. Completion of the survey implied consent. Respondents could log back into Surveymonkey™ at any time to complete the survey.

3. At three weeks and six weeks after the cover letter email was sent, reminder emails were sent to the non-respondents. Each reminder email contained links to the survey. This schedule was adhered to as closely as possible. Faculty members other than the initial contact were sometimes designated as the appropriate respondent. Therefore, the scheduling of reminder emails varied. Data were collected between April and July 2009.

5.2.5 Data Analysis

Raw data were downloaded from the Surveymonkey™ website into a Microsoft Excel™ spreadsheet. Data retained in the Microsoft Excel™ spreadsheet were then imported to the statistical software package SPSS version 12.0 for statistical analysis. The statistical analysis was descriptive. Frequencies were used to express the proportion of programs that incorporated specific health promotion topics, instructional methods and hours of instruction. Cross-tabulations of hours by instructional methods were used to further detail these proportions, specifically health promotion topic by instructional method, and instructional methods by hours of instruction. Chi square ($\chi^2$) was used to assess the differences of interest. Alpha was set at 0.05.

5.3 Results

A total of 258 physical therapy entry level education programs constituted the sampling frame. Emails were sent to a total of 242 programs requesting their participation in the survey; sixteen programs were unable to be contacted because they had restricted communication from
Surveymonkey™. This reduced the sampling frame to 93.8%. A total of 121 survey responses were collected. Of the total number of responses, 118 (96.7%) reported that health promotion was part of their curricula. Overall, two respondents declined to participate and no data were received from three programs, thus, these could not be included in the analysis. One program responded that health promotion was not part of its curriculum; however, its survey was retained for analysis because the program respondent provided data and reported that his or her program was transitioning towards incorporating health promotion. This left a total of 116 programs, hence a 47.9% response rate. Frequencies of responses by country appear in Table 5.1.

There was variability in the entry level degrees of the programs we surveyed. Doctoral degrees were offered in 77 programs (66.4%), master’s degrees in 23 programs (19.8%) and bachelor’s degrees in 23 programs (19.8%). The academic positions of the survey respondents appear in Table 5.2.

Compared with other subject areas in their curricula, 82.8% of programs considered health promotion just as important, while 17.2% of programs reported that it was not as important (n=116). Health promotion in the physical therapy programs we surveyed is implemented within curricula in a variety of ways, with most programs (57.7%) using more than one method. The majority of programs (75.0%) integrated health promotion was integrated as needed within various courses covered in the curriculum (31.9%, n=37), or incorporated health promotion as a mandatory course or section of a course (24.1%, n=28), with 43.1% (n=50) of programs integrating both methods. Clinical education was a mode used for addressing health promotion in 35.3% of physical therapy programs. Self study and electives related to health promotion within the program were reported in 9.5% and 4.3% of programs, respectively, and only one program designated health promotion as an elective course outside the formal physical therapy curriculum. Table 5.3 shows the length of time health promotion has been included in the curriculum in each program, if at all.
Theory-based education was the primary means by which health promotion topics were integrated into curricula. With the exception of the topic of moderate alcohol consumption, a large proportion (81.0-100%) of programs incorporated theory as an instructional method for health promotion content. Practical methods however were used to less often. With the exception of the topic of exercise prescription, and to a lesser extent the topic of stress management, the proportion of respondents reporting that they used practical methods to integrate health promotion into the curriculum, were few (range: 15.5-46.6%). Again, with the exception of exercise prescription, the proportion of respondents who reported using clinical competencies for health promotion topics was even less than that of practical methods (range: 6.0-26.7%). A similar proportion of respondents was less certain whether theory was used as the instructional method for each topic (range: 0-10.3%) as for practical applications (3.5-15.5%). A greater proportion of respondents was less sure regarding the inclusion of clinical competencies (range: 12.1-28.4%). The proportion of programs that incorporated health promotion using theory, practical methods, and evaluation of their students’ clinical competencies for each health promotion topic appears in Table 5.4.

When groupings of instructional methods are considered, a small proportion of programs (range 6.0-24.1%) combined three instructional methods, i.e., theory, practical application and clinical competencies, to address the topics of smoking cessation, basic nutritional counseling, weight management, moderate alcohol consumption and stress management. The exception was exercise prescription wherein 71.6% of programs combined all three methods. The proportion of programs that incorporated theory only and combinations of instructional paradigms, i.e., theory plus practical application, and theory plus practical plus clinical competence, appears in Table 5.5.

In terms of the total time devoted to each topic, irrespective of instructional method used (single method or combined methods), exercise prescription received the greatest attention with
42.2% of programs allotting at least 15 hours. The topics of smoking cessation counseling, basic nutritional counseling, weight management, moderate alcohol consumption and stress management received the least coverage, with more than 54% of programs allotting 1-5 hours of instruction. Of these topics, moderate alcohol consumption received the least attention with 28.4% of programs reporting no coverage. The proportion of time within the physical therapy program curricula devoted to each health promotion topic in their curricula appears in Table 5.6.

When hours of instruction were cross-tabulated with the instructional method of theory only, findings showed that 39.6%, 37.9%, 32.8%, 37.9%, and 22.4% of programs provided 1-5 hours of instruction for the health promotion topics of smoking cessation, basic nutritional counseling, weight management, moderate alcohol consumption and stress management, respectively. These proportions were not significantly different from one another \( \chi^2 (4, N = 198) = 6.7, p>0.05 \). When instructional methods of theory, practical, and clinical competence were considered together, 35.3% of programs provided over 15 hours of instruction for exercise prescription. However, for the topics of smoking cessation, basic nutritional counseling, weight management, moderate alcohol consumption and stress management the proportions of programs providing more than 15 hours of instruction were 0.0%, 0.9%, 3.4%, 0.0%, and 3.4%, respectively. Table 5.7 shows the proportion of programs incorporating theory only, or combined instructional methods cross-referenced with hours of instruction for each instructional method or combined methods.

With respect to this study’s secondary question of program involvement in the health promotion of their students, over 77% of programs reported that they actively encouraged their students to participate in regular exercise and extracurricular social activities. However, only 18.1% of programs provided resources to help students quit smoking and 30.2% to help students who abuse alcohol. Table 5.8 shows the approaches reported by physical therapy programs to encourage and support healthy behaviors in students.
5.4 Discussion

The purpose of this study was to examine the inclusion of health promotion content with a specific focus on lifestyle behavior risk factors in the curricula of accredited physical therapy programs in six high-income English speaking countries. To the best of our knowledge, this is the first study to examine health promotion curriculum content and provides an emerging baseline of this content across selected entry level physical therapy programs. Primarily, we were interested in whether or not health promotion was viewed as a pillar of the curriculum by physical therapy programs, and what proportion of physical therapy programs incorporated health promotion as an independent course. Further, we assessed the instructional methods used to address health promotion. Secondarily, we assessed the ways in which physical therapy programs supported the health of their students, if at all.

First, a key finding of our study is that close to half (45%) of accredited entry level physical therapy programs in the high-income, English-speaking countries of Australia, Canada, Ireland, New Zealand, the UK, and the US incorporated health promotion, defined as “maximizing positive health behaviors related to lifestyle conditions and minimizing negative health behaviors”, into their curricula. This inclusion represented a broad range of health promotion topics related to lifestyle behaviors. As expected in programs of physical therapy, exercise prescription for health benefits was pre-eminent with respect to both the extent of instructional methods used and hours of instruction, whereas the topic of alcohol consumption was the health behavior that was least well addressed.

The temporal characteristics related to when health promotion was included into curricula varied across programs, but inclusion appeared to be a relatively recent event (i.e., within the last decade) for the majority of programs, with one program incorporating such content at the time of this study. The inclusion of health promotion into the curricula of physical therapy programs represents an alignment of curriculum goals with the goals and position statements of each
program’s respective national physical therapy associations regarding health promotion, and as reported by two programs in the UK, harmonization with national health and government directives.

Our second key finding was that health promotion was viewed as just as important as other subject areas in the curricula by the majority of physical therapy programs (>85%) surveyed. These views are somewhat congruent with those of other health professional programs. According to 93.5% of directors of 215 health professional schools representing 36 health disciplines in the US (including physical therapy), health promotion was rated very or somewhat important to the academic goals of the program (Wilson, Milligan & Hernandez, 2000). Health promotion/disease prevention content was reported to be a requisite for accreditation by 56% of directors (Wilson et al., 2000). Additionally, 48.3% of academic deans of 85 allopathic medical schools selected health promotion/disease prevention as the most important curriculum topic pertaining to adequate preparation for practice in contemporary health care systems (Graber, Bellack, Musham & O'Neill, 1997).

Purported professional values or goals and the ideal type and degree of instruction leading to their achievement appeared not to be entirely congruent, however. For example, comprehensive surveys of curriculum content related to tobacco use in medical schools in the UK and the US showed that nicotine addiction and smoking cessation intervention training are under represented, suggesting that medical students as well as qualified physicians lack the training to manage nicotine dependence (Ferry et al., 1999; Roddy et al., 2004). However, as a respondent from one physical therapy program commented (data not shown), best attempts were made for ample consideration of health promotion within its curriculum, but space within the curriculum is constrained by the requirements of professional and regulatory bodies. Although this opinion cannot be generalized to other physical therapy programs, findings from a survey of directors of nurse practitioner programs in the US showed that a crowded curriculum was a
major barrier to achieving the ideal curriculum, one that included a greater representation of health promotion/disease prevention (Bellack, Graber, O’Neil, Musham & Lancaster, 1999). Similarly, academic deans of US schools affiliated with the Association of American Medical Colleges (n=126) reported that a crowded curriculum was the highest rated barrier for changes made to curriculum (Graber et al., 1997). Curricula with little margin for additional courses and competencies provide a cogent explanation for why, in the present study, the majority of physical therapy programs integrated health promotion across various courses.

The present study showed that health promotion was viewed as an important pillar in the curriculum in most physical therapy programs surveyed. However, it also showed that the practical components of health promotion including those related to clinical competencies were not widely represented across health promotion topics with the exception of exercise prescription. This was evidenced in that 44.0-49.1% of programs reported using theory as the sole instructional means for health promotion education for all health promotion topics, except for exercise prescription and stress management, where the proportions were reported to be lower.

When the hours for each health promotion topic were enumerated, the majority of programs reported a range of one to five hours. This is similar to that reported at least for the topic of smoking cessation in acute care nurse practitioner programs (Heath et al., 2002). However, these investigators suggested more than five hours of instruction to be adequate for overall tobacco content. It was beyond the scope of our study to recommend a minimum number of hours to adequately prepare practitioners to counsel for health promotion. However, even if less than five hours are sufficient our findings showed that most programs in physical therapy incorporated only theoretical methods only to address health promotion, with the exception of the topic of exercise prescription.
Few programs incorporated all instructional and participatory components of theory, practical skills and clinical competencies as part of their instructional methods. Although the majority of the programs professional views were amenable to the importance of health promotion and its inclusion into the curricula, discordance appears to exist between such views and the instructional methods consistent with evidence-informed practice (i.e., as informed by epidemiological indicators). Thus, gaps in curricula exist, most notably in the areas of practical application and clinical competencies.

Because contemporary physical therapy is committed to health promotion which is consistent with epidemiological indicators, clinical competencies preventing and reducing risk factors such as smoking, poor nutritional habits, being overweight, physical inactivity, and undue stress, are priorities (Dean, 2009). Limitations in the education of health professionals and their clinical competencies including, for example, self efficacy related to the promotion of health, have been attributed to both the barriers perceived to implement health promotion strategies and actually engaging in health promotion (Chapter 3; Lichtenstein et al., 1996; McKenna et al., 1998). The self efficacy of a health professional to address lifestyle behavior risk factors in the care of her or his patients is an important determinant of whether she or he promotes health, and if so, its frequency (Kushner, 1995; Eckstrom, Hickham, Lessler & Buchner, 1999; Makni et al., 2002; Rea et al., 2004; Hudmon, Prokhorov & Corelli, 2006). Thus, activities that increase the self efficacy of health professionals to address the health risks associated with adverse lifestyle behaviors in their patients should be included as part of the preparation of health care professionals to deliver health promotion interventions. As important as the acquisition of other practical and clinical skills is, the ability to assess the need for and successfully implement health behavior change strategies is contingent on health professionals’ self efficacy in counseling, and their capacity and motivation to effect behavior change. Martin & Fell (1999), for example, recommended that health professionals be grounded in health behavior change theories to enable
them to apply health promotion interventions effectively in practice. Finally, for optimal commitment to health behavior change and encouragement of positive health outcomes, consideration needs to be given to the practitioner’s motivation to effect health promotion and health behavior change.

Some physical therapy students enter their entry level professional training with some exposure to health promotion (Rea et al., 2004). Qualitative comments by some respondents in this study described their experiences with this, including one respondent who estimated that one quarter of his or her students had backgrounds in the health sciences (data not shown). This can be validated in part, from the findings of a survey of physical therapists in the US, twenty percent of whom reported that they had obtained a degree in health education/promotion in addition to their physical therapy degree. However, these degrees were mostly related to exercise science and physiology (Rea et al., 2004). Whether students transfer this training to their physical therapy training and practice accordingly would be of interest to explore in future studies.

Finally, we were interested in whether and, if so, how physical therapy programs encouraged healthy living in their students, for two reasons. First, we believed that the promotion of student health is an index of a program’s commitment to and value of health and, second, that the personal health habits of health professionals influence their clinical practices (Cornuz et al., 2000; Frank et al., 2000; McKenna et al., 1998).

In our study, healthy lifestyles were reported to be promoted more often by the university than individual academic programs. A large proportion of physical therapy programs however reported fostering healthy lifestyle behaviors in their students, most notably in socialization, exercise and stress management. After graduating, the personal health habits of health professionals are influential factors in disseminating health promotion advice and the receptiveness of that advice by patients (Lichtenstein et al., 1996; McKenna et al., 1998).
Physicians, for example, who regularly exercised were more than three times as likely to promote physical activity to their patients (McKenna et al., 1998). Conversely, Cornuz (2000) reported that physicians who did not engage in healthy lifestyles were less attentive to their patients’ health needs. Consistent with this finding, health professionals who smoke are less likely to address health promotion with their patients (Nardini et al., 1998). Patients whose physicians practice healthy lifestyles and share their personal health habits appear more motivated to change their health behaviors and view the advice of such physicians as more credible (Frank et al., 2000).

Moderate alcohol consumption was one of the least addressed topics in the curricula of the physical therapy programs surveyed. The consequences of heavy drinking are not only major societal concerns but are among the significant health issues facing universities and colleges, at least in North America (Gliksman, Adlaf, Demers & Newton-Taylor, 2003). Binge or heavy drinking is highly embedded in the culture of many university students with prevalence rates of heavy alcohol consumption in Canadian college and university students greater than 30% (Gliksman et al., 2003; Meichun, Adlaf, Lee, Gliksman, Demers & Wechsler, 2002). In addition to contributing to mortality, heavy drinking including binge drinking contributes to negative consequences such as injuries, and other untoward health and social consequences (Wechsler, Davenport, Dowdall, Moeykens & Castillo 1994). To date the health habits of physical therapy students and physical therapists are largely unknown and warrant study to examine to what degree their personal positive health behaviors can be used to promote the health of their patients (or conversely, may undermine their effects).

While the findings of this work are novel, there is unfortunately little, if any, comparative data that refer to or assess the curricula of entry level physical therapy programs with respect to content and competencies specifically related to health promotion and disease prevention.
5.5 Limitations

Limitations of this work include the limitations of survey research, e.g., the validity of the responses. In addition, we sampled from English programs in selected high-income countries that are not necessarily representative of programs in other high-income countries. Further, there are no studies that enabled us to compare our results with those of other physical therapy programs in high-income countries that are non-English speaking.

The overall response rate from the programs we studied was 47.9%. Our survey data represented approximately 45% of our sampling frame, and likely reflects some volunteer bias. Proportionally, responses from Canada, Ireland and New Zealand were high (69.2-100% of programs); however, the proportion of responses from these countries represented only 12.1% of the total number of programs surveyed. Because response rates from the remaining countries were much lower (<50%), the generalizability of the study findings to all programs within the sampling frame cannot be assumed and may be limited by non-response bias. Nonetheless, valuable information regarding health promotion in physical therapy curricula has been obtained from the programs that did respond, and has established an emerging baseline of health promotion content.

Because the present survey required a single respondent to represent the views and content of curricula in the physical therapy programs we surveyed, views regarding the importance of health promotion may be biased. As well, there are inherent challenges with extracting detailed information from the curriculum when curricula are fluid and dynamic, but also if the nature of health promotion integration within contemporary curricula (as in many programs) is problem oriented and case based. Although the respondents may have an influence on the direction of their programs’ curricula, the full responsibility for curriculum development is unlikely to rest with them alone (Graber et al., 1997). We encouraged consultation with other faculty members for this reason.
Our study was limited in terms of the detail in the information gathered. In an effort to increase adherence to completion of the survey, the survey was constructed to be completed in minimal time and included general questions. Finally, this study is based on the knowledge that the literature on health risk and lifestyle behaviors has been well established, and that the high prevalence of lifestyle conditions has been documented in national and international health reports of the sampled countries for several decades. Thus, this information has had an opportunity to impact curricula. The field of knowledge transfer, translation and implementation has emerged to help align professional education with the literature as well as clinical practice. This initiative coupled with epidemiological data and the results of this preliminary study will help inform contemporary curricula development in entry level physical therapy programs.

5.6 Implications

Unless health professionals, including physical therapists who are particularly well suited to embrace health behavior change as a clinical competency, become proficient in health behavior change assessment and prescription of interventions for sustained health behavior change as part of a collective effort to improve societal health, the capacity of such professionals to affect the prevalence of lifestyle risk factors and conditions will be undermined.

Collaborative and complementary approaches involving all health professionals as adjuncts for the delivery of health promotion and disease prevention is both an encouraging and promising model (Yarnall, Pollak, Ostbye, Krause & Michener, 2003). Such collaboration will help reduce the well documented social and economic burdens of lifestyle conditions. Accrediting bodies of and entry level programs in physical therapy need to examine this evidence to inform curriculum regarding the scope and the appropriate number hours for proficiency in health behavior change which is contingent upon the adequacy of the progression from theory to practice, and practice to clinical competencies.
Finally, this study provides the basis for extension studies related to the congruence of physical therapy curricula with the health promotion and disease prevention priorities of middle- and low-income countries as they technologically advance and lifestyle conditions become correspondingly more prevalent. The optimal type and amount of health and health promotion and disease prevention content remain to be established and are likely to vary across high-, medium-, and low-income countries.

5.7 Conclusion

As the fifth largest established health care profession and as the quintessential non invasive health care profession (non pharmacologic), physical therapy is uniquely positioned to advance the health agenda by incorporating health promotion as a discrete focus or pillar into its entry-level curricula. Thus, in addition, physical therapy could lead within the established health professions in incorporating health behavior change as a clinical competency. Competencies for health behavior change are unequivocally indicated given the prevalence of lifestyle conditions and their social and economic burdens. The need to promote health as well as address impairments in patients as part of professional training within physical therapy programs is particularly justified this century. The health benefits of physical activity are addressed to the greatest extent within physical therapy curricula, but this is only one component of health promotion. Smoking cessation counseling, basic nutritional counseling, weight control, the advocacy of moderate alcohol consumption, and stress management also need to be considered (individually or collectively) to guide patient assessment and concomitant intervention, that may, in some cases, include referral to another health professional.
Table 5.1  Proportion of physical therapy programs (%) responding to the curriculum survey by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of programs that responded</th>
<th>Proportion of total programs that responded (%)</th>
<th>Proportion of physical therapy programs in country that responded (%)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>85</td>
<td>73.3</td>
<td>42.9</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>11</td>
<td>9.5</td>
<td>39.2</td>
</tr>
<tr>
<td>Canada</td>
<td>9</td>
<td>7.8</td>
<td>69.2</td>
</tr>
<tr>
<td>Australia</td>
<td>6</td>
<td>5.2</td>
<td>46.2</td>
</tr>
<tr>
<td>New Zealand</td>
<td>2</td>
<td>1.7</td>
<td>100</td>
</tr>
<tr>
<td>Ireland</td>
<td>3</td>
<td>2.6</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

*Proportion of all programs that returned surveys.
†Proportion of physical therapy programs in that country that returned surveys.
Table 5.2  Academic positions of the respondents to the curriculum survey (n=108)

<table>
<thead>
<tr>
<th>Academic position</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td>43</td>
</tr>
<tr>
<td>Head</td>
<td>23</td>
</tr>
<tr>
<td>Dean</td>
<td>4</td>
</tr>
<tr>
<td>Acting Dean</td>
<td>1</td>
</tr>
<tr>
<td>Curriculum Co-ordinator</td>
<td>6</td>
</tr>
<tr>
<td>Program Administrator</td>
<td>7</td>
</tr>
<tr>
<td>Program Co-ordinator</td>
<td>1</td>
</tr>
<tr>
<td>Program Leader</td>
<td>7</td>
</tr>
<tr>
<td>Faculty member</td>
<td>16</td>
</tr>
</tbody>
</table>
Table 5.3  Time over which health promotion has been part of entry-level physical therapy curricula (n=116)

<table>
<thead>
<tr>
<th>Time (years)</th>
<th>Number of programs</th>
<th>Proportion of total programs that responded (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4</td>
<td>14</td>
<td>12.1</td>
</tr>
<tr>
<td>4-6</td>
<td>36</td>
<td>31.0</td>
</tr>
<tr>
<td>7-10</td>
<td>24</td>
<td>20.7</td>
</tr>
<tr>
<td>&gt;10</td>
<td>33</td>
<td>28.4</td>
</tr>
<tr>
<td>Not sure</td>
<td>9</td>
<td>7.8</td>
</tr>
</tbody>
</table>
Table 5.4  Proportion of programs (%) in which health promotion topics were integrated within entry-level physical therapy curricula characterized by instructional approach (i.e., theory or practical) and assessment (i.e., clinical competence)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory</td>
<td>98</td>
<td>84.5</td>
<td>9</td>
</tr>
<tr>
<td>Practical</td>
<td>40</td>
<td>34.5</td>
<td>52</td>
</tr>
<tr>
<td>Clinical Competence</td>
<td>17</td>
<td>14.7</td>
<td>68</td>
</tr>
<tr>
<td>Basic nutritional counseling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory</td>
<td>94</td>
<td>81.0</td>
<td>12</td>
</tr>
<tr>
<td>Practical</td>
<td>35</td>
<td>30.2</td>
<td>60</td>
</tr>
<tr>
<td>Clinical Competence</td>
<td>12</td>
<td>10.3</td>
<td>73</td>
</tr>
<tr>
<td>Exercise prescription for health benefits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory</td>
<td>116</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td>Practical</td>
<td>110</td>
<td>94.8</td>
<td>2</td>
</tr>
<tr>
<td>Clinical Competence</td>
<td>83</td>
<td>71.6</td>
<td>17</td>
</tr>
<tr>
<td>Weight management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory</td>
<td>107</td>
<td>92.2</td>
<td>3</td>
</tr>
<tr>
<td>Practical</td>
<td>54</td>
<td>46.6</td>
<td>44</td>
</tr>
<tr>
<td>Clinical Competence</td>
<td>25</td>
<td>21.6</td>
<td>50</td>
</tr>
<tr>
<td>Moderate alcohol consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory</td>
<td>74</td>
<td>63.8</td>
<td>29</td>
</tr>
<tr>
<td>Practical</td>
<td>18</td>
<td>15.5</td>
<td>77</td>
</tr>
<tr>
<td>Clinical Competence</td>
<td>7</td>
<td>6.0</td>
<td>84</td>
</tr>
<tr>
<td>Stress management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory</td>
<td>107</td>
<td>92.2</td>
<td>3</td>
</tr>
<tr>
<td>Practical</td>
<td>69</td>
<td>59.5</td>
<td>30</td>
</tr>
<tr>
<td>Clinical Competence</td>
<td>31</td>
<td>26.7</td>
<td>42</td>
</tr>
</tbody>
</table>

*Due to missing values, percentages do not add up to 100%
Table 5.5 Proportion of programs (%) in which health promotion topics were integrated within entry-level physical therapy curricula characterized by instructional methods

<table>
<thead>
<tr>
<th>Topic</th>
<th>Theory only</th>
<th></th>
<th>Theory and practical only</th>
<th></th>
<th>Theory, practical, clinical competence</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>57</td>
<td>49.1</td>
<td>24</td>
<td>20.7</td>
<td>13</td>
<td>11.2</td>
</tr>
<tr>
<td>Basic nutritional counseling</td>
<td>56</td>
<td>48.3</td>
<td>27</td>
<td>23.3</td>
<td>7</td>
<td>6.0</td>
</tr>
<tr>
<td>Exercise prescription for health benefits</td>
<td>6</td>
<td>5.2</td>
<td>26</td>
<td>22.4</td>
<td>83</td>
<td>71.6</td>
</tr>
<tr>
<td>Weight management</td>
<td>51</td>
<td>44.0</td>
<td>32</td>
<td>27.6</td>
<td>21</td>
<td>18.1</td>
</tr>
<tr>
<td>Moderate alcohol consumption</td>
<td>53</td>
<td>45.7</td>
<td>15</td>
<td>12.9</td>
<td>3</td>
<td>2.6</td>
</tr>
<tr>
<td>Stress management</td>
<td>36</td>
<td>31.0</td>
<td>41</td>
<td>35.3</td>
<td>28</td>
<td>24.1</td>
</tr>
</tbody>
</table>

*Percentages do not add up to 100% due to missing values.*
Table 5.6  Proportion of physical therapy programs (%) that report dedicated time to selected health promotion topics in their curricula

<table>
<thead>
<tr>
<th>Topic</th>
<th>0 hours</th>
<th>1-5 hours</th>
<th>6-10 hours</th>
<th>11-15 hours</th>
<th>&gt;15 hours</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>11</td>
<td>9.5</td>
<td>86</td>
<td>74.1</td>
<td>5</td>
<td>4.3</td>
</tr>
<tr>
<td>Basic nutritional counseling</td>
<td>12</td>
<td>10.3</td>
<td>76</td>
<td>65.5</td>
<td>11</td>
<td>9.5</td>
</tr>
<tr>
<td>Exercise prescription for health benefits</td>
<td>0</td>
<td>0.0</td>
<td>15</td>
<td>12.9</td>
<td>28</td>
<td>24.1</td>
</tr>
<tr>
<td>Weight management</td>
<td>4</td>
<td>3.4</td>
<td>66</td>
<td>56.9</td>
<td>23</td>
<td>19.8</td>
</tr>
<tr>
<td>Moderate alcohol consumption</td>
<td>33</td>
<td>28.4</td>
<td>62</td>
<td>53.4</td>
<td>5</td>
<td>4.3</td>
</tr>
<tr>
<td>Stress management</td>
<td>3</td>
<td>2.6</td>
<td>67</td>
<td>57.8</td>
<td>25</td>
<td>21.6</td>
</tr>
</tbody>
</table>

*Percentages do not add up to 100% due to missing values.
Table 5.7  Proportion of entry-level physical therapy programs (%) that incorporate theory only, or combine instructional methods, cross-referenced with hours of instruction for each instructional or combined instructional methods

<table>
<thead>
<tr>
<th>Topic</th>
<th>0 hours</th>
<th>1-5 hours</th>
<th>6-10 hours</th>
<th>11-15 hours</th>
<th>&gt;15 hours</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory only</td>
<td>3</td>
<td>2.6</td>
<td>46</td>
<td>39.6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Theory + Practical</td>
<td>2</td>
<td>1.7</td>
<td>19</td>
<td>16.3</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Theory + Practical + Clin Comp</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>6.9</td>
<td>4</td>
<td>3.4</td>
</tr>
<tr>
<td>Basic nutritional counseling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory only</td>
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<td>0.9</td>
<td>44</td>
<td>37.9</td>
<td>3</td>
<td>2.6</td>
</tr>
<tr>
<td>Theory + Practical</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>17.2</td>
<td>4</td>
<td>3.4</td>
</tr>
<tr>
<td>Theory + Practical + Clin Comp</td>
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<td>0</td>
<td>3</td>
<td>2.6</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Exercise prescription for health benefits</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory only</td>
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<td>0</td>
<td>4</td>
<td>3.4</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Theory + Practical</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2.6</td>
<td>11</td>
<td>9.5</td>
</tr>
<tr>
<td>Theory + Practical + Clin Comp</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>6.9</td>
<td>16</td>
<td>13.8</td>
</tr>
<tr>
<td>Weight management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory only</td>
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<td>32.8</td>
<td>3</td>
<td>2.6</td>
</tr>
<tr>
<td>Theory + Practical</td>
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<td>0</td>
<td>15</td>
<td>12.9</td>
<td>10</td>
<td>8.6</td>
</tr>
<tr>
<td>Theory + Practical + Clin Comp</td>
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<td>0</td>
<td>7</td>
<td>6.0</td>
<td>7</td>
<td>6.0</td>
</tr>
<tr>
<td>Moderate alcohol consumption</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory only</td>
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<td>5.2</td>
<td>44</td>
<td>37.9</td>
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<td>10.3</td>
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<td>1.7</td>
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<td>0</td>
<td>0</td>
<td>2</td>
<td>1.7</td>
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<tr>
<td>Stress management</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory only</td>
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<td>26</td>
<td>22.4</td>
<td>7</td>
<td>6.0</td>
</tr>
<tr>
<td>Theory + Practical</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>24.1</td>
<td>7</td>
<td>6.0</td>
</tr>
<tr>
<td>Theory + Practical + Clin Comp</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>8.6</td>
<td>9</td>
<td>7.8</td>
</tr>
</tbody>
</table>

206
Table 5.8  Approaches used by entry-level physical therapy programs to encourage and support health behaviors in students (proportions expressed as %)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Proportion of programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program encourages student participation in extracurricular social activities</td>
<td>90 77.6</td>
</tr>
<tr>
<td>Program provides resources to help students minimize and manage stress</td>
<td>84 72.4</td>
</tr>
<tr>
<td>Program provides resources to help students stop smoking</td>
<td>21 18.1</td>
</tr>
<tr>
<td>Program encourages student participation in regular exercise</td>
<td>94 81.0</td>
</tr>
<tr>
<td>Program encourages healthy nutritional habits in our students</td>
<td>58 50.0</td>
</tr>
<tr>
<td>Program provides resources to help students who abuse alcohol</td>
<td>35 30.2</td>
</tr>
<tr>
<td>Our university promotes one or more of these activities</td>
<td>98 84.5</td>
</tr>
</tbody>
</table>
5.8 References


CHAPTER 6. GENERAL DISCUSSION AND CONCLUSION

6.1 General Discussion

Health professionals including physical therapists have a fundamental responsibility to be responsive to the changing needs and priorities of the people they serve. Since the shift from acute infectious disease in the first half of the 20th century to lifestyle conditions (their risk factors and their chronic manifestations) in the second half of that century and beyond, lifestyle related conditions have become leading healthcare priorities affecting adults and children. These conditions include cardiovascular disease, hypertension and cerebrovascular disease, smoking-related conditions including chronic obstructive lung disease, cancer, and type II diabetes. Smoking has been implicated as a risk factor for all these conditions.

Contemporary health white papers in Canada have drawn attention to the gap between epidemiological evidence and the need to promote health and address lifestyle risk factors, and the responsiveness of the healthcare delivery system to do so (Kirby & LeBreton, 2002; Romanow, 2002). These reports have also drawn attention to the lag time in translating and integrating the evidence supporting the effectiveness of health behavior change into healthcare with respect to prevention, in some cases cure as well as the management of lifestyle risk factors and their chronic manifestations. The prevalence of lifestyle conditions and risk factors belies, in part, the effectiveness of the health professionals to translate and effectively integrate this well established body of knowledge into practice, and in a timely manner. Collectively, these sources of evidence have directed our attention to the need to effect health promotion and health behavior change within the primary healthcare setting (Goldstein, Whitlock & De Pue, 2004) as well as through public health campaigns. This thesis was conceptualized to help reduce these gaps and discordances in mainstream healthcare with special attention to physical therapy and its potential role.
As a leading health profession, physical therapy is well positioned to lead in the assault on lifestyle conditions. First, it is the fifth largest established healthcare profession and the quintessential non invasive health profession, i.e., primarily exploits non pharmacologic and non surgical strategies. Historically, patient education which includes health education has been a key component of the practice of the physical therapist. Contemporary definitions of physical therapy include a primary focus on health including adoption of the values of the World Health Organization and its definition of health (definition of health and the International Classification of Functioning, Disability and Health) (Dean, 2009b). With respect to smoking cessation, both the Canadian Physiotherapy Association and the American Physical Therapy Association acknowledge that smoking cessation is a management focus and outcome in patients who smoke (American Physical Therapy Association, 1997; Canadian Physiotherapy Association, 2008). Thus, a rationale can be made for physical therapists to either initiate or support smoking cessation in their clients and patients (Dean 2009a). The typical practice patterns of physical therapists, i.e., frequent contact with patients creating opportunities for development of rapport and trust, and ultimately teachable moments as well as follow-ups, are also integral to effecting sustained positive health behavior and health outcomes (Balfour, 1993; Fruth, Ryan & Gahimer, 1998; Lorish & Gale, 1999; Guilmette, Motta, Shadel, Mukland & Niaura, 2001).

Based on these arguments, this thesis addressed health behavior change in the context of health promotion, defined as increasing positive health behavior and ameliorating or ceasing negative health behaviors, apportioning health education and prevention as key components (Downie, Tannahill & Tannahill, 1996; O’Donnell, 1989), and in the context of the profession of physical therapy. We focused on smoking cessation given smoking is the leading cause of preventable death (Mokdad, Marks, Stroup & Gerberding, 2004). Some of our work was informed by the literature related to other health professions, given the novelty of this research in the field of physical therapy and the paucity of directly related literature.
To elucidate our understanding of these issues and to minimize the gaps described, four interrelated studies were conducted. The first study consisted of a cross sectional survey to examine the knowledge of Canadian physical therapists about the health effects of smoking, and their views and practices about smoking cessation and smoking cessation counselling in their practices. In addition, we examined the perceived barriers reported by physical therapists to helping their patients stop smoking and the role of facilitators to help implement it systematically as well as practitioners’ self efficacy to counsel. The second study was based on secondary data analysis of the first study. We used ordinal regression modeling to identify significant factors associated with how often Canadian physical therapists counsel for smoking cessation. In the third study, we conducted a systematic review of the literature on the effectiveness of smoking cessation advice given by health professionals. The rationale for this study and the focus on advice for smoking cessation was twofold: first, smoking is the leading cause of preventable death and contributes substantially to primary and secondary pathologies that impact a range of outcomes related to health, and other physical therapy outcomes; and second, the delivery of effective advice is fundamental to patient education provided by physical therapists in general as well as related specifically to health. In the last study, we surveyed programs of entry level physical therapy education in six English speaking countries across three continents with respect to curriculum content in health promotion, specific health promotion topics covered, number of hours, and instructional methods used to impart this knowledge – theoretical, practical and clinical. The remainder of this discussion includes the summary of the findings of each study and each of their contributions. This is followed by the overall strengths and limitations of the work overall, the implications for further research, and finally, the overall conclusions.
6.1.1 Smoking Cessation Counselling: Knowledge, Views and Practices of Canadian Physical Therapists (Chapter 2)

6.1.1.1 Summary of Findings

We conducted a nationwide cross-sectional postal survey study of licensed physical therapists living and practicing in Canada to assess their knowledge regarding smoking, and their views of and practices related to smoking cessation counselling. A total of 738 physical therapists responded; a response rate of 78.1%. The proportional response by province was consistent with proportions obtained from contemporary health professional census statistics (Canadian Institute for Health Information, 2008).

Although the physical therapists surveyed were generally knowledgeable regarding the direct negative health effects related to smoking, a small but critical proportion reported being somewhat less sure about the negative health effects due to environmental tobacco smoke. Over one third of the respondents disagreed or were unsure that smoking cessation advice given by a health professional to a patient increased the patient’s chance of quitting. Over 65% of respondents agreed that the physical therapy profession should become more involved with smoking cessation counselling. Canadian physical therapists appear to counsel for smoking cessation; however, few physical therapists reported counselling most or all of the time (75-100% of the time). Overall, adherence to all of the recommended 5 A’s guidelines to effect health behavior change (i.e., ask, advise, assist, assess, and arrange for follow-up) for smoking cessation was weak; few physical therapists (1.6%) incorporated all 5 A’s when they counseled for smoking cessation.

Lack of resources and lack of time were perceived by the physical therapists surveyed as general barriers for them for smoking cessation counselling. Patient related barriers were reported to be lack of compliance to smoking cessation interventions, emotional/psychological issues, and lack of long-term commitment to quitting.
Finally, few physical therapists reported receiving formal structured training for smoking cessation counselling yet over 60% were interested in receiving such training. Generally, self efficacy, considered integral for effecting behavior change, of the physical therapists to counsel specifically for smoking cessation was low and few physical therapists reported feeling prepared to counsel effectively for smoking cessation.

6.1.1.2 Contributions

To our knowledge, this is the first national descriptive cross-sectional survey of Canadian physical therapists to be conducted with respect to their knowledge of the health hazards of smoking, and their professional views toward and their practices with respect smoking cessation intervention. A primary contribution of this study was that it has provided a benchmark for physical therapists, in Canada in particular, with respect to the status of smoking cessation counselling instituted in their practices, and those factors that serve as barriers to and facilitators for smoking cessation counselling. This information has practical implications for targeting training with respect to the health risks of smoking, self efficacy to counsel in order to facilitate physical therapist participation in smoking cessation counselling comparable to any other clinical competency.

Further, this work describes the first survey designed to examine how physical therapists specifically view their professional roles in addressing smoking cessation as part of their practices and the alignment between these views and the position statements of physical therapy associations such as the Canadian Physiotherapy Association regarding smoking cessation as a component of contemporary physical therapy practice.

There are two other spin offs of this study. First, this study provides a basis for comparison of its findings with respect to the knowledge and professional practices of other health professions with respect to knowledge of smoking hazards, and views and practices regarding smoking cessation counselling. Such a baseline could be important given smokers are
more apt to quit if they receive consistent messages from their health care providers, and that smoking-related health threats are likely to be a healthcare priority for the foreseeable future. Second, although smoking cessation was selected as the focus of this particular study because of its justified priority in healthcare, the survey provides a template for the study of physical therapists related to their knowledge, views and practices vis à vis counselling for other health behaviors such as diet and nutrition, physical activity and exercise, alcohol use, sleep adequacy, and stress management (Dean, 2009a). With a systematic approach to addressing lifestyle risk factors in clients and patients at the professional as well as the clinical level, physical therapists could help to mitigate the impact of injurious lifestyle behaviors on the health of Canadians by promoting positive lifestyle behaviors.

6.1.2 Factors Associated With Smoking Cessation Counselling by Canadian Physical Therapists (Chapter 3)

6.1.2.1 Summary of Findings

In our companion study ‘Smoking Cessation Counselling: Knowledge, Views and Practices of Canadian Physical Therapists’ (Chapter 2), findings showed that physical therapists counsel for smoking cessation, but not all the time. This study extended the findings of Chapter 2 by exploring specifically the factors associated with how often physical therapists counselled for smoking cessation. Ordinal logistic regression modeling (n=640 respondents) demonstrated that self efficacy related to smoking cessation counselling and physical therapists’ perceptions of their preparedness to counsel were the principal factors underpinning the extent to which physical therapists counsel for smoking cessation. Based on the psychology literature on behavior change, the role of self efficacy as a factor for smoking cessation counselling was of interest to us. Physical therapists with higher self efficacy, specifically related to ‘knowledge and skills’ and ‘education and support’ necessary to counsel for smoking cessation counselled more often by a factor greater than two compared to physical therapists with lower self efficacy.
Similarly, physical therapists who perceived themselves as prepared to counsel did so more often by a factor greater than two compared to physical therapists who did not perceive themselves as prepared to counsel.

Two additional factors were significant in the model, namely, physical therapists’ professional views with respect to smoking cessation counseling, and if smoking cessation counselling was conducted by other health professionals in the physical therapists’ workplaces.

The ‘professional view’ factor was obtained using principal axis factor analysis applied to a series of items that described physical therapists’ views regarding smoking cessation counselling. Based on the wording of the questions asked, the implication was that physical therapists counselled for smoking cessation because they viewed it as part of their professional role and responsibilities. Finally, in workplaces where other healthcare professionals also counselled for smoking cessation, the likelihood that physical therapists would also counsel for smoking cessation was increased by 76%.

6.1.2.2 Contributions

To our knowledge, this is the first study of its kind to examine the factors that explain how often Canadian physical therapists counsel for smoking cessation. This information extends the descriptive findings reported in Chapter 2. Elucidating the factors of smoking cessation counselling by physical therapists, in turn, would help clarify the perceived barriers to such counselling as well as facilitators. This knowledge is fundamental to effectively incorporate health behavior change as a clinical competency in physical therapy practice.

The analysis of key factors of smoking cessation counselling by physical therapists, in particular self efficacy, provides further insights into the sociocognitive underpinnings of effecting health behavior change in patients, and provides a benchmark for comparison with other health professionals and physical therapists in other countries.
Knowledge that physical therapists are more likely to: 1. counsel for smoking cessation when it is viewed as integral to their role and responsibilities, and 2. when others in their workplace counsel, is valuable. Although the effect of these factors was less than that of either self efficacy or preparedness, provincial and national professional bodies may be able to use the evidence from these findings as a rationale for health promotion through smoking cessation being professional values, and can then target recommendations for initiating and supporting the process, and to promote health behavior change including smoking cessation counseling as components of entry level physical therapy education programs. Our findings support that smokers would benefit from the physical therapy profession working in partnership with other health professionals to augment their outcomes related to smoking cessation.

6.1.3 Advice as a Smoking Cessation Strategy: A Systematic Review and Implications for Physical Therapists (Chapter 4)

6.1.3.1 Summary of Findings

We conducted a systematic review and meta-analysis of a range of literature related to smoking cessation counselling that specifically investigated the effectiveness of smoking cessation advice provided by health professionals to help their patients who smoke, to quit. We showed that brief, intermediate and intensive advice administered to patients face to face by a range of health professionals was more effective for both the initiation of smoking cessation in patients, and the maintenance of cessation for a minimum of six months or longer, compared to patients receiving usual care. Moderate levels of heterogeneity were observed with brief and intermediate advice, with large heterogeneity for methods used in intensive advice.

There was a large variation with respect to how advice was communicated to patients, including personal factors. The addition of self help materials to advice sessions, the inclusion of follow-ups, and advice interventions underpinned by motivational or psychological frameworks were especially effective components for intermediate and intensive advice interventions. The
findings of this study indicate that smoking cessation advice is effective at helping smokers quit and can be effectively integrated into the practice pattern of physical therapists.

6.1.3.2 Contributions

Systematic reviews and meta-analyses regarding the effectiveness of smoking cessation advice by health professionals have been previously reported (Gorin & Heck, 2004; Lancaster & Stead, 2004; Mojica et al, 2004). Our review however was novel in that we were interested in assessing the effectiveness of smoking cessation advice consistent with the logistical and practical needs of health professionals practicing in primary care. First, this work included a meta-analysis to assess the effectiveness of only those smoking cessation advice interventions applied to clinical and ‘real life’ situations. At the same time, based on contemporary recommendations made by smoking cessation researchers (West, Hajek, Stead & Stapleton, 2005), rigorous methodological and statistical criteria were incorporated à propos inclusion and exclusion criteria, as were well defined outcomes, and conservative effect sizes to assess the effectiveness of smoking cessation advice. Second, this review integrated a broad scope of literature stemming back to the genesis of the transition from group or clinic venues of smoking cessation counseling to more individualized one-to-one interventions (Porter & McCullough, 1972; Williams, 1969). Third, the detailed qualitative description of the intervention methods gleaned from the systematic review was paired with a quantitative assessment of advice effects based on a meta-analysis. Such combined methodological depth has not been typical of reviews on smoking cessation to date, and allowed for the juxtaposition of the statistical effects of the advice interventions with the detailed operational components of the interventions. This was a singularly important component of this study given our interest in translating health knowledge through the health professional to the patient in the real world situation to maximize health behavior change in smokers.
At the time this systematic review was conducted, the extent to which physical therapists at least in Canada counseled their patients in smoking cessation was unknown. Thus, we believe that the results of our systematic review, constitutes the first attempt to support a role for physical therapists delivering advice related to smoking cessation; a goal supported by professional associations. In particular, we emphasized and examined an approach to smoking cessation counselling, namely, advice, which is consistent with the practice pattern of physical therapists (Dean, 2009a), and can be used judiciously to either initiate or support a patient in quitting smoking.

6.1.4 Health Promotion Curriculum Content in Academic Entry-level Physical Therapy Programs (Chapter 4)

6.1.4.1 Summary of Findings

An Internet-based survey study was designed to describe health promotion content and its breadth and depth in the curricula of 116 accredited entry-level academic physical therapy programs in six English speaking countries including Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States. Health promotion for the purposes of our study referred to addressing lifestyle behavior risk factors that contribute largely to chronic lifestyle conditions and preventable death, namely, smoking, poor nutrition, physical inactivity, risky drinking behavior, obesity and stress. The inclusion of each of these topics was surveyed, and then assessed for instructional method, i.e., theoretical information, practical competencies, as well as clinical competencies and extent of coverage (i.e., hours allotted to each key topic).

Responses were received from 47.9% of the programs contacted; 96.7% of these acknowledged that health promotion was covered within their curricula and over 80% of these programs viewed health promotion as a pillar of their curricula. Some programs (28.4%) had included health promotion in their curricula for at least 10 years. Most programs integrated health promotion within pertinent courses within the curriculum, and two thirds of programs
incorporated health promotion as a dedicated section of a course or as a mandatory self standing course.

Methods to instruct the topics subsumed within health promotion varied across programs as well as the number of instructional hours assigned to each topic similarly varied. Exercise prescription for health benefits, however, and to a lesser degree, stress and stress management, were topics that received most attention across physical therapy programs vis à vis the number of hours of instruction and the use of combined instructional methods used (i.e., theory, practical application and clinical competency). Health promotion related to moderate alcohol consumption had the least hours of theoretical instruction as well as instruction related to practical and clinical competencies. Overall, with the exception of exercise prescription, most programs incorporated an estimated 1 to 5 hours of instruction and used theory-based education as the principal instructional method for all health promotion topics.

6.1.4.2 Contributions

To our knowledge, this is the first study of its kind to examine the specific curriculum content in entry-level physical therapy education programs related to primary health promotion topics including the prevention, remediation or modification of lifestyle conditions in a cross section of high-income countries.

Our preliminary findings from the present studies however do provide an emerging benchmark for the status of health promotion content within such curricula in physical therapy programs in selected high-income countries. Although this may not appear to be as relevant to programs in middle- and low-income countries, there is substantial evidence that lifestyle risk factors and their chronic manifestations have become prevalent in these countries commensurate with economic development and globalization (Ezzati et al., 2005). Thus, their importance for inclusion into physical therapy curricula is supported although this may be under acknowledged.
Although not the focus of this study per se, the proportion of a physical therapy curriculum devoted to health promotion and its components warrants being informed from regional epidemiological data and delivered in a culturally appropriate manner. These topics are the basis for future work.

At least in high-income countries, this benchmark provides some reference for the development of curriculum goals, e.g., assessment of unhealthy lifestyle behaviors and the prescription of targeted interventions. These inclusions are consistent with the World Confederation of Physical Therapy’s adoption of the WHO International Classification of Functioning, Disability and Health (World Health Organization, 2002). Further, this benchmark may be of value to physical therapy accreditation bodies and professional associations in formulating recommendations regarding health promotion and being responsive to this healthcare need. In general, our findings provide a basis for collaborative discussions among professional bodies, accreditation bodies for clinical practice, and entry-level educational programs in physical therapy with a view to harmonize the planning and operationalization of curriculum outcomes (i.e., clinical competencies) to achieve population health goals.

Lastly, this benchmark allows for comparison of health promotion curriculum content with other health professions that are addressing similar issues (e.g., medicine, nursing, pharmacy, and occupational therapy), and augment interprofessional outcomes related to optimal health behavior practices.

6.2 Synthesis of Research Findings

The rationale for this dissertation was based on a need to reconcile gaps in the healthcare system with respect to the findings of Canadian government white papers on health (Kirby & LeBreton, 2002; Romanow 2002). Two principal gaps of particular interest to us were: one, the gap between healthcare priorities based on epidemiological indicators (i.e., lifestyle risk factors
and chronic manifestations) and the responsiveness of the healthcare delivery system in particular physical therapists; and two, the gap between the need for the promotion of healthy lifestyles by health professionals and their skills and competencies to assess such need in a client or patient and, in turn, implement tailored strategies that effect sustained health behavior change. Chronic lifestyle conditions include those with major lifestyle determinants such as cardiovascular disease, hypertension, cerebrovascular disease, smoking-related conditions including chronic obstructive lung disease, cancer, and type II diabetes.

The profound unequivocal effects of healthy lifestyle behaviors on the prevention, in some cases cure, as well as the management of the risk factors for these lifestyle conditions has been well established (Dean 2009a). Despite this established body of knowledge, its translation and implementation into patient care warrants being a priority in healthcare; and furthermore, little has been documented regarding health behavior change as a clinical competency in physical therapy.

Physical therapy is the quintessential established health profession that exploits non invasive strategies (i.e., non pharmacologic and non surgical) to effect health and remediate illness and injury. Physical therapists have long been committed to health education in their clients and patients, thus, potentially are well positioned in the healthcare delivery system to assume some leadership in promoting healthy lifestyles.

We wanted to reconcile these gaps and advance our knowledge regarding physical therapy’s current status *vis à vis* health behavior change with special reference to smoking cessation in practice and in professional education. Based on these arguments, this dissertation describes a program of innovative research that has examined health promotion with a focus on health behavior change, as a primary healthcare intervention in physical therapy practice with particular attention to smoking cessation. Our results have implications for the profession of physical therapy at three levels and can be synthesized accordingly: at the practitioner level (i.e.,
the prevalence of and factors associated with smoking cessation counselling by physical therapists and their self efficacy to do so); at the professional level, (i.e., professional views towards and training related to smoking cessation counselling in the form of giving advice); and at the education level (i.e., health promotion including smoking cessation in entry-level physical therapy programs).

With respect to the practitioner level, our findings were consistent with the possibility that physical therapists are contributing to the gaps identified in the Canadian health white papers (Romanow 2002; Kirby 2002). In particular, we identified a contradiction between Canadian physical therapists’ basic knowledge regarding the health effects of smoking and their understanding of the process of quitting smoking including the effectiveness of smoking cessation advice (Chapters 2 and 3) and their reported rates of counselling for smoking cessation. Of interest, although their knowledge about the adverse effects of smoking was reasonably high, Canadian physical therapists did not score 100% across these knowledge related items.

Given that the key factors associated with smoking cessation counselling by physical therapists were their preparedness to counsel and their self efficacy, these can be addressed at the professional level and at the clinician level in the form of training (Barta & Stacy, 2005; Laschinger & Tresolini, 1999). Irrespective, a high proportion of physical therapists that we surveyed neither were sure nor agreed that physical therapists should receive training to counsel. This is somewhat perplexing, given the majority of physical therapists was knowledgeable about the negative health effects of smoking, held views that physical therapists should advise their smoking patients to stop smoking, and held views that the physical therapy profession should become more involved in helping smokers quit (Chapter 2). Furthermore, these values are consistent with those of the Canadian Physiotherapy Association and the World Confederation of Physical Therapy.
Of interest to us was that the proportion of physical therapists who correctly identified the negative health effects of smoking was not 100%. This supported that post graduate education is needed to teach smoking cessation counselling skills and related self efficacy as well as address the multisystem negative health effects of smoking. We believe that these elements would help increase practitioners’ sense of preparedness to counsel for smoking cessation given that their feeling unprepared was associated with their not initiating or supporting smoking cessation in clients and patients. Further, such focused education would benefit from being conducted and practiced in an inter-professional context given that smokers are more apt to quit when the target of a multipronged approach that is supported by the healthcare team as a whole (An et al., 2008). Education to effect health behavior change including smoking cessation needs to include theory and practical components, and importantly to be evaluated if it is to be retained as a practice competency (Anderson & Jane-Llopis, 2004; Laschinger & Tresolini, 1999).

With respect to the professional characteristics of smoking cessation counselling in the form of giving advice, Canadian physical therapists surveyed reported at least some gaps in knowledge and skills in smoking cessation (Chapter 2). For example, one third of physical therapists was not certain or disagreed that a patient’s chance of quitting smoking was greater if a health professional advised the patient to quit (Chapter 4; Bodner & Dean, 2009). This is known to be true, however. Thus, even a brief quit message, i.e., a few minutes, administered by a health professional markedly increases the likelihood of a patient’s quitting smoking. Similarly, the perceived barrier, ‘lack of time to counsel’ as reported by the majority of physical therapists reflects a gap in understanding how little time is actually needed to effect quitting based on advice to a patient and the enormous cost benefit that could result. The benefits not only include the direct effects of smoking on cardiovascular disease, the smoking-related conditions, hypertension, stroke, cancer and even type II diabetes, but the indirect musculoskeletal effects (e.g., impaired circulation and bone demineralization) which can further impair musculoskeletal
complaints (Chapter 1) which currently constitute the greatest proportion of physical therapists’ case loads.

Although physical therapists were apparently knowledgeable about the adverse effects of smoking, their views about smoking cessation as a professional role and their practice of smoking cessation counseling were equivocal. This inconsistency may be explained, in part, by how we defined smoking cessation counseling and how the physical therapist respondents perceived giving advice. Even though we did not use these terms interchangeably, this would not explain the discordance between physical therapists’ knowledge of the health effects of smoking and their views about receiving training for smoking cessation counselling.

With respect to the education level, most physical therapy programs we surveyed in English-speaking countries reported health promotion to be just as important as other topics in their curriculum (Chapter 5). This is highly consistent with the priorities outlined in the Canadian health white papers. Few programs however taught smoking cessation counselling with a practical component, and even fewer addressed smoking cessation as a clinical competency. Based on our knowledge of health behavior change theories, if health behavior change is to be a bone fide clinical competency in physical therapy, the practice of health behavior change needs to be taught as well as its theory. As a clinical competence, we would argue that health behavior change should be evaluated in students in an objective structured clinical examination or other clinical examination format.

Bridging the education gap vis à vis health promotion (e.g., smoking cessation counselling) as a clinical competency would require modification to the contemporary curricula of entry-level physical therapy programs. Modifications may include the adoption of a skills-based curriculum, for example, whereas practice-based training with educational measures suitable for post-graduate health promotion training (Anderson & Jane-Llofis, 2004). Such changes to curricula will depend on those involved in the development and modification of the
essential competencies that define the scope of physical therapy practice (Anderson & Jane-Llopis, 2004).

In summary, the synthesis of our findings related to the practice of health behavior change in physical therapy sheds new light on the gaps between documented health need and contemporary priorities, and how physical therapy as a non-invasive health profession can help reconcile these gaps by implementing the findings at three distinct levels: the practitioner level, the professional level and the educational level, with special reference to smoking cessation. Distilling the findings into these three distinct levels will facilitate their translation and implementation into practice, and clarify directions for future research.

6.3 Strengths of the Dissertation Research

The research resulting from this dissertation has several strengths. Perhaps most importantly is the novelty of its interrelated empirical studies. Their results inform the need for a reconfiguration of physical therapy practice this century that addresses gaps in the healthcare delivery system and knowledge translation and implementation with respect to health education being a clinical competency. Based on previous work, we have argued that physical therapists have a unique role in implementing health promotion through health behavior change in every client or patient. The current body of work builds on this foundation to help operationalize and implement health behavior change as a bone fide clinical competency. To achieve this, we needed to understand physical therapists’ understanding of their role in this domain in relation to that mandated by their governing professional bodies including the World Confederation of Physical Therapy. We have provided the groundwork related to the knowledge, views and practices of Canadian physical therapists with respect to addressing smoking cessation, and the discordance among these. Our findings have drawn attention to the need to align the profession’s commitment and mandate related to smoking cessation with the care of every patient who smokes. Given that smoking is a primary clinical concern we needed to understand the factors
associated with smoking cessation counseling and physical therapists’ self efficacy to effect smoking cessation. Although physical therapists advance their education post graduation through conferences, seminar and courses, we needed to understand what physical therapy students are currently learning about health promotion and health behavior change, the topics, hours and methods of instruction, and to establish whether such content is commensurate with epidemiological indicators. This work has provided a benchmark for the teaching of health promotion in the entry level programs of physical therapy in six English speaking high income countries. This provides a cross sectional baseline of the status of health promotion curriculum content in this context, and a basis for comparison of such status in non English speaking programs and in middle- and low-income countries.

Finally, although studies of the effectiveness of smoking cessation advice are numerous and have been examined as systematic reviews, the results of our systematic review focused strictly on aspects of advice amenable to being integrated into contemporary physical therapy practice. Such a systematic review has not been previously published, thus, we expect this seminal work will provide a benchmark in its own right, and serve as a basis for comparison of the effect of advice for changing other health behaviors, e.g., nutrition, body weight, physical activity and exercise, sleep habits, and stress management.

6.4 Limitations of the Dissertation Research

The limitations of the research underpinning this dissertation relate largely to the research methods. Three studies in this program of research were based on survey research methods, thus, were limited by the bias inherent to such studies, namely, response bias. Chapter 2 proposed to sample Canadian physical therapists regarding their knowledge, views and practices concerning smoking and smoking cessation. Chapter 3 consisted of secondary analysis of the data generated in the study in Chapter 2 to build a model of clinician based factors associated with smoking cessation counselling. Although the sampling frame we constructed was somewhat incomplete it
was still estimated to be 85.2% of the total sampling frame. The lack of completeness was due to the exclusion of two provinces (albeit small populations) from Atlantic Canada; two provinces provided incomplete population lists. Although our response rate was acceptable, the incomplete sampling frame may have biased the sample to some unknown extent. Although our findings from a Canadian cohort of physical therapists cannot necessarily be generalized to those from other countries, they pave the way for a range of replication and extension studies.

The self efficacy scale we used was a composite scale (Chapters 2 and 3). It merged two scales and necessitated wording changes and a single scoring system. Although the scale had high internal consistency and factor analysis was used for content validity, we did not assess the scale for test-retest reliability, nor was the scale assessed for other forms of validity (e.g., construct and convergent). Listwise deletion was used in the ordinal regression model that we constructed to assess the factors associated with smoking cessation counselling leaving 86.7% of the original sample eligible for the regression model, which constitutes a limitation.

In a systematic review and meta-analysis, we described and assessed the effective constituents of smoking cessation advice by health professionals in practice settings (Chapter 4). Publication bias is inherent in systematic reviews. Further, heterogeneity across the definitions of intensive advice studies was a limitation with respect to assessing the effectiveness of such advice.

Chapter 5 was a web-based survey designed to extract information about the health promotion content in curricula of entry-level physical therapy programs in English speaking countries. Restricting our sampling frame to six countries represents a limitation. We chose these countries that we believed represented the origins of physical therapy, however, despite an inclusion variable of the dominant profession language, we could not control for cultural zeitgeists that may have influenced the survey responses. Our survey methodology required that only one faculty member represented each physical therapy program (although consultation with
others was encouraged as needed) may have biased some information with respect to how health promotion is represented within the program, in general. Also, despite the emergence of national and international accreditation standards, curricula are variable and so this study was limited by its cross-sectional nature. Chapter 5 also retained a small response rate (47.9%), thus, volunteer bias cannot be ruled out. Hence, the generalizability of the study results must be interpreted within this context.

### 6.5 Future Research Directions

The principal areas for future research based on this work relate to further aligning documented healthcare priorities (i.e., lifestyle risk factors and their chronic manifestations) and translating and implementing the well established evidence-based knowledge related to health education and health behavior change. Further research is needed to examine how physical therapy, committed to health in every client and patient, can best mobilize itself as a profession and as individual healthcare professionals to turn the tide on lifestyle risk factors and their chronic manifestations that is now being observed in children as well as adults. These risk factors and chronic manifestations also adversely affect clients and patients when these present to the physical therapists as secondary problems or diagnoses. There is urgency around exploiting non pharmacologic and non surgical interventions this century to maximize health, reduce morbidity particularly at the end of life, and promote independence for one’s full life expectancy. This urgency reflects a not entirely effective but expensive health care delivery system whose primary expenses reflect hospital, drugs and doctor based care (Romanow, 2002).

To circumscribe our work, we focused on smoking cessation given it is the leading cause of preventable death and morbidity. Our results therefore cannot be strictly generalized to other adverse health risk factors and behaviors. Extension studies are indicated to assess physical therapists’ knowledge about the health effects of sub-optimal nutrition, obesity, sedentary lifestyles, excessive alcohol use, suboptimal sleep and undue stress; and their views and practices
regarding their role and responsibilities to address these health priorities. Given contemporary definitions of health and the commitment of the profession to the World Health Organization’s International Classification of Functioning, Disability and Health, physical therapy does have a primary role in addressing these issues in every client or patient. Reconciling the views of physical therapists about health behavior change and their capacity to effect such change needs to be addressed at the professional, clinical and education levels.

Similarly, we are unable to generalize the factors, including the self efficacy of physical therapists, to counsel and advise patients about other major health risk factors and behaviors based on findings about these factors in relation to smoking cessation counselling. There is some evidence however to support that self efficacy in one behavior, tends to generalize to other areas (Bandura, 1977; Bandura, Adams & Beyer, 1977). Extension studies are warranted to tease out those factors that predict the degree to which physical therapist counsel and advise accordingly, and their degree of preparedness to do so across a range of health behaviors in their patients.

Our systematic review needs to be extended with respect to the role of advice with respect to optimal nutrition, weight control, physical activity, exercise, optimal sleep and stress management. Delivery of advice that is effective is a fundamental component of health behavior change by physical therapists as well as being fundamental to the professional advice they give to their patients on a daily basis.

Finally, the extent of the impact of lifestyle risk factors and their chronic manifestations is not likely to be impacted by any one group or initiative, or in a short timeframe. Nonetheless, we believe it behooves each and every health profession to reflect on its mandate, its inherent practice philosophies and expertise, to help address the pandemic of lifestyle conditions. This dissertation was conceptualized to help circumscribe the role of contemporary physical therapy more clearly in this endeavor and has provided a much needed benchmark for future related research.
6.6 Potential Applications of the Research

There are three levels of potential application of our research. First, although knowledge of adverse lifestyle choices on health is fundamental to physical therapists’ effecting health behavior change in their clients and patients, knowledge alone is an insufficient condition to effect health behavior change. Rather, such knowledge may best be advanced at multiple levels, e.g., the professional body, practitioner level, and educational program. Early exposure in one’s professional education for example can facilitate aligning one’s professional views with the need for health promotion, specifically, health behavior change, compared with exposure later in one’s career.

Physical therapists’ self efficacy was associated with how often physical therapists counselled for smoking cessation. Both an understanding of psychological theory related to self efficacy in conjunction with learning strategies for health behavior change would augment the self efficacy of physical therapy students and practitioners in effecting health behavior change in their clients and patients. Health behavior change counselling including smoking cessation should ideally be conducted in an inter-professional environment.

Advice, even when brief, can be an effective intervention or adjunct to effecting smoking cessation, one example, of an adverse health behavior. Physical therapists could augment their outcomes in general with an appreciation of the effectiveness of simple but targeted advice about health.

With respect to the broader application of our findings, they may be of interest to government, ministries of health, human resource, planners and policy makers regarding ideas about reducing gaps between government health white papers and cost effective healthcare through the exploitation of non invasive interventions including health education practiced by the physical therapy profession.
Finally, our studies highlight the relatively little attention that health receives in the current healthcare milieu compared with illness or impairment. An acknowledged ‘health pillar’ in physical therapy education and practice may be a logical spin off of this work and a compelling lens through which the profession can contribute to the alignment of healthcare practice with needs and priorities. Legitimizing a focus on the health of every person who enters the healthcare delivery system would be a major advance which could well reduce the impact of and recovery from the condition for which they are being seen as well as improve their multisystem health, thereby, minimize morbidity and premature mortality.

### 6.7 Conclusion

Contemporary health professionals including physical therapists need to be actively committed to health and its promotion. We conclude that physical therapists could better align their professional values and their expertise and practices with the recommendations of health white papers in Canada and epidemiological indicators, i.e., health behavior change related to the risk factors of lifestyle conditions, thereby, improve the health of adults and children and reduce the social and economic burdens of these conditions.

Specifically, physical therapists could benefit from increased knowledge about the adverse effects of adverse health behaviors such as smoking. Early exposure in physical therapists’ careers may increase their perception that health promotion (i.e., increasing positive and decreasing negative health behaviors) is a component of their role and responsibilities. Education (including entry level as well as post graduate) directed toward increasing the self efficacy of physical therapists related to smoking cessation counselling may not only help effect smoking cessation in clients and patient, but potentially generalize to effect other health behavior changes, e.g., those related to nutrition, weight control, activity, sleep and stress.

Given the novelty of our studies, their findings have provided several important benchmarks in the professional literature, in particular, related to the knowledge, views and
practices of physical therapists related to smoking cessation, the factors associated with smoking cessation counseling by physical therapists, and the use of advice as a simple intervention that is fundamental to health education in general, and to smoking cessation counselling, specifically. Advice, even if brief, can effect health behavior change as we demonstrated with respect to smoking cessation. Future studies are needed however to refine health education as a clinical competency in physical therapy to refine the components of advice, its administration and its evaluation. With respect to entry level physical therapy education, we propose that minimal requirements for health promotion through health behavior change need to be established, and the requirements for this being a clinical competency warrant detailing.

Given physical therapy is a leading established healthcare profession that historically has been committed to exploiting invasive interventions, i.e., non pharmacologic and non surgical interventions, of which health education is a quintessential component, advancing these lines of inquiry within the profession of physical therapy will strengthen further its unique position in helping to curb lifestyle risk factors and their associated conditions in both adults and children. With the alignment of health priorities and physical therapy priorities, outcome studies are then needed to evaluate the benefit of such a professional shift.
6.8 References


APPENDICES

Appendix A-1  Item questions for smoking cessation counselling self efficacy

Appendix A-2  National and provincial proportions of Canadian physical therapists who returned surveys

Appendix A-3  Pattern matrix from principal axis factor showing item loadings for self efficacy for smoking cessation counselling for a two factor solution (oblique rotation)

Appendix A-4  Pattern matrix from principal axis factor showing item loadings for physical therapist views towards smoking cessation for a two factor solution (oblique rotation)

Appendix A-5  Loading factors for self efficacy using direct-oblimin rotated solution

Appendix A-6  Loading factors for physical therapists’ views using direct-oblimin rotated solution

Appendix B-1  Example of changes to structure and scoring of self efficacy questions from Rea (2004) to that of Hudmon (2006)

Appendix B-2  Smoking cessation: knowledge, beliefs and practices of Canadian physical therapists and professional implications (Survey)

Appendix B-3  Health behavior change as a clinical competence in physical therapy: A survey of academic entry-level professional programs (Survey)
Appendix A-1  Item questions for smoking cessation counselling self efficacy*

Each self efficacy question began with “How confident are you that you…” coupled with the following statements:

<table>
<thead>
<tr>
<th>Self efficacy statement</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Know the appropriate questions to ask patients when providing counselling? (n=725)</td>
<td>2.30</td>
<td>.792</td>
</tr>
<tr>
<td>Have the skills needed to counsel an addiction? (n=727)</td>
<td>1.91</td>
<td>.772</td>
</tr>
<tr>
<td>Can provide motivation to patients who are trying to quit? (n=727)</td>
<td>3.03</td>
<td>.810</td>
</tr>
<tr>
<td>Have the skills to monitor and assist patients throughout their quit attempt? (n=727)</td>
<td>2.11</td>
<td>.793</td>
</tr>
<tr>
<td>Have the skills to assist patients who seem to be in a hurry? (n=715)</td>
<td>2.18</td>
<td>.809</td>
</tr>
<tr>
<td>Have sufficient therapeutic knowledge of the pharmaceutical products (e.g. nicotine</td>
<td>1.87</td>
<td>.783</td>
</tr>
<tr>
<td>replacement therapy – gum, patch, etc.) for smoking cessation? (n=729)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can create patient awareness of why physical therapists should ask questions about</td>
<td>2.87</td>
<td>.985</td>
</tr>
<tr>
<td>tobacco cessation? (n=728)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Know when a referral to a physician is necessary? (n=728)</td>
<td>3.05</td>
<td>1.004</td>
</tr>
<tr>
<td>Are able to apply sensitive methods of suggesting tobacco cessation to patients who</td>
<td>2.73</td>
<td>.925</td>
</tr>
<tr>
<td>use tobacco? (n=728)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are able to provide adequate counselling when time is limited? (n=729)</td>
<td>1.98</td>
<td>.802</td>
</tr>
<tr>
<td>Can help recent quitters learn how to cope with situations or triggers that might</td>
<td>2.10</td>
<td>.796</td>
</tr>
<tr>
<td>rekindle old tobacco use habits? (n=728)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can provide counselling to patients not interested in quitting? (n=728)</td>
<td>1.77</td>
<td>.737</td>
</tr>
<tr>
<td>Can assist your smoking patients in helping them quit smoking when the patient is</td>
<td>2.63</td>
<td>.859</td>
</tr>
<tr>
<td>aware of the problem and/or desires to improve? (n=728)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can assist your smoking patients in helping them quit smoking when significant other/</td>
<td>2.14</td>
<td>.785</td>
</tr>
<tr>
<td>family is not supportive? (n=727)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can assist your smoking patients in helping them quit smoking when you are</td>
<td>3.43</td>
<td>.864</td>
</tr>
<tr>
<td>adequately educated to address smoking cessation? (n=727)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can assist your smoking patients in helping them quit smoking when you have</td>
<td>3.26</td>
<td>.811</td>
</tr>
<tr>
<td>observed another physical therapist promote smoking cessation successfully? (n=726)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can assist your smoking patients in helping them quit smoking when you have the</td>
<td>3.46</td>
<td>.821</td>
</tr>
<tr>
<td>proper supportive materials to provide for the patient? (n=726)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can assist your smoking patients in helping them quit smoking when smoking is</td>
<td>3.60</td>
<td>.830</td>
</tr>
<tr>
<td>linked with specific diagnoses or interferes with physical therapy goals? (n=727)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can assist your smoking patients in helping them quit smoking when the patient is</td>
<td>3.34</td>
<td>.882</td>
</tr>
<tr>
<td>already seeing a professional for smoking cessation issues? (n=726)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can assist your smoking patients in helping them quit smoking when you have an</td>
<td>3.59</td>
<td>.846</td>
</tr>
<tr>
<td>appropriate source to refer the patient for additional assistance if needed? (n=727)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean score (n=701)</td>
<td>2.67</td>
<td>.56</td>
</tr>
</tbody>
</table>

*Each self efficacy question was scored using a Likert scale that ranged from 1 to 5, where 1 = not very confident to 5 = very confident.
### Appendix A-2 National and provincial proportions of Canadian physical therapists who returned surveys

<table>
<thead>
<tr>
<th>Number of respondents by province</th>
<th>Proportion of national respondents (%)*</th>
<th>Proportion of provincial respondents (%)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario (n=223)</td>
<td>30.2</td>
<td>65.4</td>
</tr>
<tr>
<td>Quebec (n=152)</td>
<td>20.6</td>
<td>77.2</td>
</tr>
<tr>
<td>Manitoba (n=40)</td>
<td>5.4</td>
<td>90.9</td>
</tr>
<tr>
<td>Nova Scotia (n=20)</td>
<td>4.3</td>
<td>62.5</td>
</tr>
<tr>
<td>Alberta (n=96)</td>
<td>13.0</td>
<td>77.4</td>
</tr>
<tr>
<td>British Columbia (n=138)</td>
<td>18.7</td>
<td>77.1</td>
</tr>
<tr>
<td>New Brunswick (n=32)</td>
<td>2.7</td>
<td>88.9</td>
</tr>
<tr>
<td>Saskatchewan (n=37)</td>
<td>5.0</td>
<td>77.1</td>
</tr>
<tr>
<td>Total (n=738)</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

*Refers to the proportion of respondents (by province) who returned surveys based on the total number of received surveys for the study. For example, 223 surveys were returned from the province of Ontario which constituted 30.2% of all surveys returned.

†Refers to the proportion of physical therapists in each province who returned surveys based on the total number of surveys sent to that province. For example, 77.1% of physical therapists in the province of British Columbia who received a survey, returned it to the authors.
**Appendix A-3  Pattern matrix from principal axis factor showing item loadings for self efficacy for smoking cessation counselling for a two factor solution (oblique rotation)**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item*</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Factor 1**</td>
</tr>
<tr>
<td>1</td>
<td>Know the appropriate questions to ask patients when providing counselling?</td>
<td>.710</td>
</tr>
<tr>
<td>2</td>
<td>Have the skills needed to counsel an addiction?</td>
<td>.847</td>
</tr>
<tr>
<td>3</td>
<td>Can provide motivation to patients who are trying to quit?</td>
<td>.473</td>
</tr>
<tr>
<td>4</td>
<td>Have the skills to monitor and assist patients throughout their quit attempt?</td>
<td>.744</td>
</tr>
<tr>
<td>5</td>
<td>Have the skills to assist patients who seem to be in a hurry?</td>
<td>.724</td>
</tr>
<tr>
<td>6</td>
<td>Have sufficient therapeutic knowledge of the pharmaceutical products (e.g. nicotine replacement therapy – gum, patch, etc.) for smoking cessation?</td>
<td>.673</td>
</tr>
<tr>
<td>7</td>
<td>Can create patient awareness of why physical therapists should ask questions about tobacco cessation?</td>
<td>.463</td>
</tr>
<tr>
<td>8</td>
<td>Know when a referral to a physician is necessary?</td>
<td>.577</td>
</tr>
<tr>
<td>9</td>
<td>Are able to apply sensitive methods of suggesting tobacco cessation to patients who use tobacco?</td>
<td>.624</td>
</tr>
<tr>
<td>10</td>
<td>Are able to provide adequate counselling when time is limited?</td>
<td>.756</td>
</tr>
<tr>
<td>11</td>
<td>Can help recent quitters learn how to cope with situations or triggers that might rekindle old tobacco use habits?</td>
<td>.774</td>
</tr>
<tr>
<td>12</td>
<td>Can provide counselling to patients not interested in quitting?</td>
<td>.703</td>
</tr>
<tr>
<td>13</td>
<td>Can assist your smoking patients in helping them quit smoking when the patient is aware of the problem and/or desires to improve?</td>
<td>.654</td>
</tr>
<tr>
<td>14</td>
<td>Can assist your smoking patients in helping them quit smoking when significant other/family is not supportive?</td>
<td>.681</td>
</tr>
<tr>
<td>15</td>
<td>Can assist your smoking patients in helping them quit smoking when you are adequately educated to address smoking cessation?</td>
<td>.740</td>
</tr>
<tr>
<td>16</td>
<td>Can assist your smoking patients in helping them quit smoking when you have observed another physical therapist promote smoking cessation successfully?</td>
<td>.798</td>
</tr>
<tr>
<td>17</td>
<td>Can assist your smoking patients in helping them quit smoking when you have the proper supportive materials to provide for the patient?</td>
<td>.848</td>
</tr>
<tr>
<td>18</td>
<td>Can assist your smoking patients in helping them quit smoking when smoking is linked with specific diagnoses or interferes with physical therapy goals?</td>
<td>.709</td>
</tr>
<tr>
<td>19</td>
<td>Can assist your smoking patients in helping them quit smoking when the patient is already seeing a professional for smoking cessation issues?</td>
<td>.713</td>
</tr>
<tr>
<td>20</td>
<td>Can assist your smoking patients in helping them quit smoking when you have an appropriate source to refer the patient for additional assistance if needed?</td>
<td>.805</td>
</tr>
</tbody>
</table>

*Each question was prefaced with “How confident are you that you…”

** Factor 1 for self efficacy = ‘skills and knowledge’

† Factor 2 for self efficacy = ‘support and education’
Appendix A-4  Pattern matrix from principal axis factor showing item loadings for physical therapist views towards smoking cessation for a two factor solution (oblique rotation)

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Factor 1* Factor 2†</td>
</tr>
<tr>
<td>1</td>
<td>Physical therapists serve as role models for clients/public</td>
<td>.681</td>
</tr>
<tr>
<td>2</td>
<td>Physical therapists should set example by not smoking</td>
<td>.874</td>
</tr>
<tr>
<td>3</td>
<td>Physical therapists should ask clients about smoking habits</td>
<td>.562</td>
</tr>
<tr>
<td>4</td>
<td>Physical therapists should advise clients to quit smoking</td>
<td>.539</td>
</tr>
<tr>
<td>5</td>
<td>Physical therapists should receive training on smoking cessation</td>
<td>.798</td>
</tr>
<tr>
<td>6</td>
<td>Physical therapists should speak to community groups about smoking</td>
<td>.716</td>
</tr>
<tr>
<td>7</td>
<td>The physical therapist profession should become more active in</td>
<td>.791</td>
</tr>
<tr>
<td></td>
<td>assisting smokers to quit smoking</td>
<td></td>
</tr>
</tbody>
</table>

* Factor 1 for physical therapists views items = ‘professional views’
† Factor 2 for physical therapists views items = ‘role modeling’
Appendix A-6 Loading factors for physical therapists' views using direct oblimin-rotated solution. Numbers in the plot correspond to numbers in Appendix A-4.
Appendix B-1  

Example of changes to structure and scoring of self efficacy questions from Rea (2004) to that of Hudmon (2006)

An example from the original structure of self efficacy questions from Rea (2004):

How sure are you that you could assist your smoking patients in reducing their smoking habits?

  a. When the patient is aware of the problem and/or desires to improve

<table>
<thead>
<tr>
<th>Very sure I could assist</th>
<th>Very sure I could NOT assist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Below is the re-structured self efficacy question retaining the core self efficacy statement from with contextual reference (Rea, Marshak, Neish & Davis, 2004) modified to be consistent with self efficacy question preface and scoring from Hudmon (2006):

How confident are you that you:

Can assist your smoking patients in helping them quit smoking when the patient is aware of the problem and/or desires to improve?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all confident</td>
<td>not very confident</td>
<td>moderately confident</td>
<td>very confident</td>
<td>extremely confident</td>
</tr>
</tbody>
</table>
SMOKING CESSATION: KNOWLEDGE, BELIEFS, AND PRACTICES
OF CANADIAN PHYSICAL THERAPISTS
AND PROFESSIONAL IMPLICATIONS: SURVEY

Identification No.________________

SECTION 1: KNOWLEDGE AND OPINIONS

This section asks questions about your knowledge of smoking-related disease and your opinions about smoking behavior and smoking cessation counselling as part of physical therapy practice.

Please circle one number for each item, using the response options shown below.

1. Smoking is harmful to your health.

1 2 3 4 5
Strongly Disagree Not sure Agree Strongly
agree agree

2. Physical therapists serve as role models for their clients/patients and the public.

1 2 3 4 5
Strongly Disagree Not sure Agree Strongly
agree agree

3. Physical therapists should set a good example by not smoking.

1 2 3 4 5
Strongly Disagree Not sure Agree Strongly
agree agree

4. A patient's chances of quitting smoking are increased if a health professional advises him or her to quit.

1 2 3 4 5
Strongly Disagree Not sure Agree Strongly
agree agree
5. Physical therapists should routinely ask about their clients/patients about their smoking habits.

1
Strongly disagree
2
Disagree
3
Not sure
4
Agree
5
Strongly agree

6. Physical therapists should routinely advise their smoking patients to quit smoking.

1
Strongly disagree
2
Disagree
3
Not sure
4
Agree
5
Strongly agree

7. Physical therapists who smoke are less likely to advise people to stop smoking.

1
Strongly disagree
2
Disagree
3
Not sure
4
Agree
5
Strongly agree

8. Physical therapists should receive training on smoking cessation strategies.

1
Strongly disagree
2
Disagree
3
Not sure
4
Agree
5
Strongly agree

9. Physical therapists should speak to community groups about smoking.

1
Strongly disagree
2
Disagree
3
Not sure
4
Agree
5
Strongly agree

10. Hospitals and health care centers should be ‘smoke free’.

1
Strongly disagree
2
Disagree
3
Not sure
4
Agree
5
Strongly agree

11. Neonatal death is associated with passive smoking (second-hand smoke).

1
Strongly disagree
2
Disagree
3
Not sure
4
Agree
5
Strongly agree

12. Maternal smoking during pregnancy increases the risk of Sudden Infant Death Syndrome.

1
Strongly disagree
2
Disagree
3
Not sure
4
Agree
5
Strongly agree
13. Passive smoking (second hand smoke) increases the risk of lung disease in non-smoking adults.

1 Strongly disagree 2 Disagree 3 Not sure 4 Agree 5 Strongly agree

14. Passive smoking (second hand smoke) increases the risk of heart disease in non-smoking adults.

1 Strongly disagree 2 Disagree 3 Not sure 4 Agree 5 Strongly agree

15. Passive smoking (second hand smoke) increases the risk of lower respiratory tract illnesses such as pneumonia in exposed children.

1 Strongly disagree 2 Disagree 3 Not sure 4 Agree 5 Strongly agree

16. The physical therapy profession should become more active in assisting smokers to quit smoking.

1 Strongly disagree 2 Disagree 3 Not sure 4 Agree 5 Strongly agree

17. I intend to help my patients who smoke to stop smoking.

1 Strongly disagree 2 Disagree 3 Not sure 4 Agree 5 Strongly agree

SECTION 2: SELF EFFICACY FOR TOBACCO CESSATION COUNSELING

This section asks questions about how confident you are to help patients to stop smoking. With specific reference to smoking cessation intervention, how much confidence do you have with respect to the following aspects of tobacco cessation counseling?

Please circle one number for each item, using the response options shown below.

How confident are you that you:

18. Know the appropriate questions to ask patients when providing counseling?

1 Not at all confident 2 Not very confident 3 Moderately confident 4 Very confident 5 Extremely confident

19. Have the skills needed to counsel an addiction?

1 Not at all confident 2 Not very confident 3 Moderately confident 4 Very confident 5 Extremely confident
20. Can provide motivation to patients who are trying to quit?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

21. Have the skills to monitor and assist patients throughout their quit attempt?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

22. Have the skills to assist patients who seem to be in a hurry?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

23. Have sufficient therapeutic knowledge of the pharmaceutical products (e.g. nicotine replacement therapy – gum, patch, etc.) for smoking cessation?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

24. Can create patient awareness of why physical therapists should ask questions about tobacco cessation?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

25. Know when a referral to a physician is necessary?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

26. Are able to apply sensitive methods of suggesting tobacco cessation to patients who use tobacco?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
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</tbody>
</table>

27. Are able to provide adequate counseling when time is limited?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>5</th>
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<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

28. Can help recent quitters learn how to cope with situations or triggers that might rekindle old tobacco use habits?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>
29. Can provide counseling to patients not interested in quitting?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

30. Can assist your smoking patients in helping them quit smoking when the patient is aware of the problem and/or desires to improve?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

31. Can assist your smoking patients in helping them quit smoking when significant other/family is not supportive?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

32. Can assist your smoking patients in helping them quit smoking when you are adequately educated to address smoking cessation?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

33. Can assist your smoking patients in helping them quit smoking when you have observed another physical therapist promote smoking cessation successfully?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

34. Can assist your smoking patients in helping them quit smoking when you have the proper supportive materials to provide for the patient?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

35. Can assist your smoking patients in helping them quit smoking when smoking is linked with specific diagnoses or interferes with physical therapy goals?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

36. Can assist your smoking patients in helping them quit smoking when the patient is already seeing a professional for smoking cessation issues?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>
37. Can assist your smoking patients in helping them quit smoking when you have an appropriate source to refer the patient for additional assistance if needed?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all confident</td>
<td>Not very confident</td>
<td>Moderately confident</td>
<td>Very confident</td>
<td>Extremely confident</td>
</tr>
</tbody>
</table>

SECTION 3: BARRIERS TO SMOKING CESSATION COUNSELING

This section asks about barriers and facilitators that may influence YOU helping your clients who smoke, to stop smoking.

38. How much do you agree or disagree that the following are barriers to YOU in terms of helping smoking clients to stop smoking?

*Please circle one number for each item, using the response options below:*

<table>
<thead>
<tr>
<th>Barriers</th>
<th>1 = Strongly disagree</th>
<th>2 = Disagree</th>
<th>3 = Not sure</th>
<th>4 = Agree</th>
<th>5 = Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of adequate reimbursement</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Lack of resources</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Intrusion into client’s/patient’s privacy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Lack of motivation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Unpleasant personal experience</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Language barrier</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Lack of success</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Lack of time (assuming you are motivated to counsel for smoking cessation)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Other (please list):

__________________________________________________________________________
39. How much do you agree or disagree that the following characteristics of your clients/patients prevent YOU from helping your clients/patients who smoke, to stop smoking?

*Please circle one number for each item, using the response options where:*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>1 = Strongly disagree</th>
<th>2 = Disagree</th>
<th>3 = Not sure</th>
<th>4 = Agree</th>
<th>5 = Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of client/patient compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client/patient underlying emotional or psychological issues</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Client/patient has no long-term commitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Client/patients doubts the effectiveness of the approach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please list):</td>
<td></td>
<td></td>
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</tbody>
</table>

40. Which of the following would be beneficial to YOU to help your smoking clients/patients stop smoking?

*Please circle one number for each item, using the response options where:*

<table>
<thead>
<tr>
<th>Benefit</th>
<th>1 = Strongly disagree</th>
<th>2 = Disagree</th>
<th>3 = Not sure</th>
<th>4 = Agree</th>
<th>5 = Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free-standing seminar or workshop</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Smoking cessation counseling skills newsletter</td>
<td></td>
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<tr>
<td>Smoking cessation counseling workshop at national congress or provincial society meeting</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Home DVD demonstration tapes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehensive text on smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Other (please list):</td>
<td></td>
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</tbody>
</table>
SECTION 4: WORKSITE PRACTICE

This section asks some questions about smoking behavior and smoking cessation counseling practices in your place of work.

41. Which of the following do you do with your clients/patients who smoke with respect to helping stop smoking? Check all that apply:

☐ I ask my clients/patients if they smoke
☐ I urge and encourage my clients/patients who smoke, to stop smoking
☐ I make an assessment whether or not my clients/patients who smoke are willing to make a quit attempt
☐ I assist my clients who smoke in their attempt to quit (e.g. provide self-help materials, pharmacotherapy, referral to smoking cessation groups, etc.)
☐ I arrange a time to follow-up on my client/patient’s attempt to quit smoking

42. Where counseling is defined as encouraging and assisting clients/patients to stop smoking, how often do you counsel clients/patients who smoke, to stop smoking?

☐ All the time (100% of the time)
☐ Most times (75% of the time)
☐ Sometimes (50% of the time)
☐ Rarely (25% of the time)
☐ Never (0% of the time)

43. In my place of work, other members of my healthcare team (i.e. physicians, nurses, addictions counselors, etc.) provide smoking cessation counseling.

___1. Yes
___2. No
___3. Not applicable
___4. Don’t know

44. What sort of smoke-free policy is in place at your workplace?

___1. No policy in place SKIP TO Question 46
___2. Smoking rooms available SKIP TO Question 45
___3. No smoking allowed at all on the premises SKIP TO Question 45
___4. Don’t know

45. Is the smoke-free policy enforced?

___1. Yes: always
___2. Yes: sometimes
___3. No
___4. Don't know
46. Have you ever received any formal training in smoking cessation approaches to use with your patients?

Formal training during physical therapy school ___1. Yes ___2. No
Formal training during specialization programs ___1. Yes ___2. No
Special conferences, symposia or workshops ___1. Yes ___2. No
Other (explain): ____________________________________________

47. If you answered ‘No’ to Question 46, would you be interested in receiving formal training for smoking cessation counseling?

___1. Yes
___2. No

48. Are the following interventions AVAILABLE TO YOU to help your clients/patients stop smoking?

Traditional remedies       ___1. Yes     ___2. No     ___3. Don’t know
Self-help materials     ___1. Yes     ___2. No ___3. Don’t know
Counselling      ___1. Yes     ___2. No ___3. Don’t know
Medication (Nicotine gum, patch, buproprion)  ___1. Yes     ___2. No ___3. Don’t know
Other (specify):________________________________________________________________________

49. Which of the following interventions do you USE to help your clients/patients stop smoking?

Traditional remedies       ___1. Yes     ___2. No
Self-help materials     ___1. Yes  ___ 2. No
Counselling      ___1. Yes     ___2. No
Medication (Nicotine gum, patch, buproprion)  ___1. Yes     ___2. No
Other (please specify):__________________________________________________________________

50. How well prepared do you feel you are to counsel patients on how to stop cigarette smoking?

___1. Very well prepared
___2. Somewhat prepared
___3. Not at all prepared

SECTION 5:  CIGARETTE USE

This section asks some questions about your present or past smoking habits (if any).

51. Which of the following best describes your smoking behavior?

(Please check your answer)

___1. I have never smoked cigarettes
___2. I have quit smoking
___3. I currently smoke occasionally (some days)
___4. I currently smoke every day

SKIP TO Question 53
SKIP TO Question 53
SKIP TO Question 52
SKIP TO Question 52
52. Which of the following best describes how you feel about your smoking?

___1. I’m not ready to quit within the next 6 months
___2. I’m thinking about quitting within 6 months
___3. I’m ready to quit NOW

SECTION 6: DEMOGRAPHIC INFORMATION

53. What is your gender?

1. ___ Male
2. ___ Female

54. What is your age?

Age: _____ years

55. What country were you born in?

56. What language(s) do you speak at home?

57. What is your entry level physical therapy qualification? (check one)

□ Diploma (PT) □ BSc(PT) □ MPT □ DPT

58. Do you hold any other degrees or qualifications?

59. How many years of clinical experience do you have? _____ years

60. What has been your predominant area of practice as a physical therapist?

□ Cardiovascular/cardiopulmonary
□ Neuromuscular
□ Orthopedics/musculoskeletal
□ Pediatrics
□ Other (please list): ____________________________________________________

61. What is the approximate size of the population in the community where you work?

□ <5,000
□ 5,000 – 9,999
□ 10,000 – 49,999
□ 50,000 – 99,999
□ 100,000 – 499,999
□ 500,000 – 1 million
□ >1 million
62. Are you currently practicing as a physical therapist?

___Yes___No

If you answered “No” to Question 62, please SKIP TO SECTION 7

63. Your current practice setting as a physical therapist can be described as:

☐ Private
☐ Public
☐ I work in both private and public settings

64. Which client/patient group do you work with?

☐ In-patient
☐ Out-patient
☐ Both in-patient and out-patient groups

65. What age range is your clientele? (check all that apply)

☐ 0-6 years
☐ 7-17 years
☐ 18 to 64 years
☐ Over 64 years

66. What is your estimation of the proportion of your clients or patients who smoke? _____%

SECTION 7: RANKING LIFESTYLE BEHAVIOR RISK FACTORS

Please rank the following lifestyle behavior risk factors YOU believe pose the greatest risk to a person’s health.

Where

1 = greatest risk compared to the other risk factors
2 = high risk compared to the other risk factors
3 = some risk compared to the other risk factors
4 = least risk compared to the other risk factors

___ Physical inactivity
___ Poor nutritional habits
___ Risky drinking (including binge drinking)
___ Smoking
Thank you for completing our survey!

Please indicate if you would like a summary of our final results, and how we might best contact you with these:

- I would like a summary of the results
- Thank you, no.

Contact information:

Please use the following contact information:

- Email: ________________________________
- Mail Address: ________________________________
HEALTH BEHAVIOR CHANGE AS A CLINICAL COMPETENCE IN PHYSICAL THERAPY: A SURVEY OF ACADEMIC ENTRY-LEVEL PROFESSIONAL PROGRAMS

Thank you for taking the time to complete this survey from the Department of Physical Therapy at the University of British Columbia. The purpose of this survey is to examine the extent to which health promotion is included in the entry-level curriculum of your accredited physical therapy program. Health promotion for the purposes of this survey refers to maximizing positive health behaviors related to lifestyle conditions and minimizing negative health behaviors.

Lifestyle conditions include those contributing to the leading causes of morbidity and mortality, namely, ischemic heart disease, cancer, smoking-related conditions, hypertension and stroke, diabetes, obesity, and osteoporosis.

In this survey, positive health behaviors include not smoking, healthy balanced nutrition, regular physical activity and exercise, not excessive stress whereas negative health behaviors include smoking, physical inactivity, risky drinking behavior (alcohol), poor nutrition, unhealthy body weight, and distressing stress.

This survey should only take about 10-15 minutes of your time. Your answers will be completely anonymous. At the end of the survey there is an option to receive summary results of the survey.

SECTION A Implementation of Health Promotion in Curriculum

In this survey, positive health behaviors include not smoking, healthy balanced nutrition, regular physical activity and exercise, not excessive stress whereas negative health behaviors include smoking, physical inactivity, risky drinking behavior (alcohol), poor nutrition, unhealthy body weight, and distressing stress.

1. Is health promotion as defined above (in whole or in part) part of your curriculum?

□ Yes → Continue to Question 2 in Section A
□ No → Continue to Question 17 in Section D

Comments: ____________________________________________________________

________________________________________________________
2. Compared to other subjects in your curriculum, how does your program view health promotion?
   □ Less important than other subjects in the curriculum
   □ As important as other subjects in the curriculum
   □ More important than other subjects in the curriculum

Comments:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

3. This question queries how health promotion is implemented within your program’s curriculum. Please select ALL that apply.

In your program, health promotion is
   □ Implemented as a mandatory course/section of a course in physical therapy curriculum
   □ Implemented as an elective course inside of physical therapy curriculum
   □ Implemented as an elective course outside of physical therapy curriculum
   □ Integrated as situations arise within various courses in physical therapy curriculum
   □ Covered in clinical education
   □ Self-study
   □ Other: (please specify):
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

4. How long has health promotion been a part of your program’s curriculum?

   □ Less than 4 years
   □ 4-6 years
   □ 7-10 years
   □ More than 10 years
   □ Not sure

Comments:______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
5. Please indicate which of the following components are included as part of the education and evaluation specific for addressing **SMOKING CESSATION**, where:

<table>
<thead>
<tr>
<th>Theory</th>
<th>Provides theoretical information only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical</td>
<td>Practical competencies are described</td>
</tr>
<tr>
<td>Clinical competence</td>
<td>Students are evaluated on their competencies in the clinic</td>
</tr>
</tbody>
</table>

- Theory: □ Yes □ No □ Not sure
- Practical: □ Yes □ No □ Not sure
- Clinical competence: □ Yes □ No □ Not sure

Comments:____________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

6. Please indicate which of the following components are included as part of the education and evaluation specific for addressing **EXERCISE PRESCRIPTION FOR GENERAL HEALTH BENEFITS**, where:

<table>
<thead>
<tr>
<th>Theory</th>
<th>Provides theoretical information only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical</td>
<td>Practical competencies are described</td>
</tr>
<tr>
<td>Clinical competence</td>
<td>Students are evaluated on their competencies in the clinic</td>
</tr>
</tbody>
</table>

- Theory: □ Yes □ No □ Not sure
- Practical: □ Yes □ No □ Not sure
- Clinical competence: □ Yes □ No □ Not sure

Comments:____________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

7. Please indicate which of the following components are included as part of the education and evaluation specific for addressing **BASIC NUTRITIONAL COUNSELING**, where:

<table>
<thead>
<tr>
<th>Theory</th>
<th>Provides theoretical information only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical</td>
<td>Practical competencies are described</td>
</tr>
<tr>
<td>Clinical competence</td>
<td>Students are evaluated on their competencies in the clinic</td>
</tr>
</tbody>
</table>

- Theory: □ Yes □ No □ Not sure
- Practical: □ Yes □ No □ Not sure
- Clinical competence: □ Yes □ No □ Not sure

Comments:____________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
8. Please indicate which of the following components are included as part of the education and evaluation specific for addressing **WEIGHT MANAGEMENT**, where:

<table>
<thead>
<tr>
<th>Theory</th>
<th>Practical</th>
<th>Clinical competence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Comments:

9. Please indicate which of the following components are included as part of the education and evaluation specific for addressing **COUNSELING FOR MODERATION IN ALCOHOL CONSUMPTION**, where:

<table>
<thead>
<tr>
<th>Theory</th>
<th>Practical</th>
<th>Clinical competence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Comments:

10. Please indicate which of the following components are included as part of the education and evaluation specific for addressing **STRESS MANAGEMENT**, where:

<table>
<thead>
<tr>
<th>Theory</th>
<th>Practical</th>
<th>Clinical competence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Comments:
SECTION C

Health Promotion Topics: Estimated Instructional Hours

11. What is your best estimate of the total number of instructional hours for SMOKING CESSATION?
   □ 0 hours □ 1-5 hours □ 6-10 hours □ 11-15 hours □ >15 hours □ Not sure

12. What is your best estimate of the total number of instructional hours for EXERCISE PRESCRIPTION FOR GENERAL HEALTH BENEFITS?
   □ 0 hours □ 1-5 hours □ 6-10 hours □ 11-15 hours □ >15 hours □ Not sure

13. What is your best estimate of the total number of instructional hours for BASIC NUTRITIONAL COUNSELING?
   □ 0 hours □ 1-5 hours □ 6-10 hours □ 11-15 hours □ >15 hours □ Not sure

14. What is your best estimate of the total number of instructional hours for WEIGHT MANAGEMENT?
   □ 0 hours □ 1-5 hours □ 6-10 hours □ 11-15 hours □ >15 hours □ Not sure

15. What is your best estimate of the total number of instructional hours for MODERATE ALCOHOL CONSUMPTION?
   □ 0 hours □ 1-5 hours □ 6-10 hours □ 11-15 hours □ >15 hours □ Not sure

16. What is your best estimate of the total number of instructional hours for STRESS MANAGEMENT?
   □ 0 hours □ 1-5 hours □ 6-10 hours □ 11-15 hours □ >15 hours □ Not sure

SECTION D

Health promotion in students

17. How does your program encourage students to engage in healthy lifestyle behaviors?
    (Please select ALL that apply):
    □ Our program encourages student participation in extracurricular social activities
    □ Our program provides resources to help students minimize and manage stress
    □ Our program provides resources to help students stop smoking
    □ Our program encourages student participation in regular exercise
    □ Our program encourages healthy nutritional habits in our students
    □ Our program provides resources to help students who abuse alcohol
    □ Our university promotes one or more of these activities
    □ Other (please specify):

__________________________________________________________________
SECTION E  Demographic Information

18. Demographic data

- Department
- Faculty
- Program
- School
- Other (please specify):

19. Your academic position

- Acting Dean
- Dean
- Chair
- Head
- Curriculum Co-ordinator
- Program Administrator
- Program Co-ordinator
- Program Leader
- Faculty Member
- Other (please specify):

20. What is the terminal degree granted upon completing your physical therapy program? Please select ALL that apply:

- Diploma
- Bachelors
- Masters
- Doctorate
- Other (e.g. degree in transition):
Thank you for completing our survey!

Please indicate if you would like a summary of our final results, and how we might best contact you with these:

☐ I would like a summary of the results
☐ Thank you, no.

Contact information:

Please use the following contact information:

☐ Email:

Mail Address:

______________________________________________________________________________
______________________________________________________________________________
CERTIFICATE OF APPROVAL- MINIMAL RISK RENEWAL

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<th>DEPARTMENT:</th>
<th>UBC BREB NUMBER:</th>
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<td>Elizabeth Dean</td>
<td>UBC/Medicine, Faculty of/Physical Therapy</td>
<td>H07-00087</td>
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INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

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<th>Institution</th>
<th>Site</th>
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Other locations where the research will be conducted:
N/A
N/A

CO-INVESTIGATOR(S):
Michael Bodner
William C. Miller

SPONSORING AGENCIES:
Canadian Tobacco Control Research Initiative
Johnson and Johnson (Canada) Inc.

PROJECT TITLE:
Smoking Cessation: Knowledge, Beliefs, and Practices of Canadian Physical Therapists and Professional Implications

EXPIRY DATE OF THIS APPROVAL:  October 2, 2009

APPROVAL DATE:  October 2, 2008

The Annual Renewal for Study have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.

Approval is issued on behalf of the Behavioural Research Ethics Board

Dr. M. Judith Lynam, Chair
Dr. Ken Craig, Chair
Dr. Jim Rupert, Associate Chair
Dr. Laurie Ford, Associate Chair
Dr. Daniel Salhani, Associate Chair
Dr. Anita Ho, Associate Chair
# CERTIFICATE OF APPROVAL - MINIMAL RISK

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<td>UBC/Medicine, Faculty of/Physical Therapy</td>
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**INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:**

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<td>UBC</td>
<td>Vancouver (excludes UBC Hospital)</td>
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**CO-INVESTIGATOR(S):**

- Michael Bodner
- William C. Miller

**SPONSORING AGENCIES:**

N/A

**PROJECT TITLE:**

Health promotion as a clinical competence in physical therapy: a survey of academic entry-level professional programs.

**CERTIFICATE EXPIRY DATE:** February 26, 2010

## DOCUMENTS INCLUDED IN THIS APPROVAL:

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<tr>
<th>Document Name</th>
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<td>Consent Forms: Health Promotion Curriculum Survey_Informed Consent</td>
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**Other:**

http://www.surveymonkey.com/

The application for ethical review and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.

Approval is issued on behalf of the Behavioural Research Ethics Board
and signed electronically by one of the following:

Dr. M. Judith Lynam, Chair
Dr. Ken Craig, Chair
Dr. Jim Rupert, Associate Chair
Dr. Laurie Ford, Associate Chair
Dr. Anita Ho, Associate Chair