KNOWLEDGE, BEHAVIORS, AND BELIEFS RELATED TO ISCHEMIC HEART DISEASE: A COMPARATIVE STUDY OF INDOCANADIANS AND EUROCANADIANS

by

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Abstract

Background and Purpose: The increased mortality from ischemic heart disease (IHD) observed in East Indians who emigrate to the west is due to genetic susceptibility in combination with lifestyle-related risk factors. Lifestyle factors, ingrained in cultural values, are influenced by environmental factors encountered in the host country. An understanding of the factors that influence health behaviors that predispose to IHD is essential for effective prevention strategies targeted towards this group. The primary purpose of this study was to examine the impact of culture on IHD-related knowledge, behaviors, and beliefs of the immigrant IndoCanadian (IC) and the dominant EuroCanadian (EC) ethnic groups.

Design: Descriptive comparative study using a structured self-administered questionnaire.

Subjects and Methods: 102 first-generation ICs and 102 ECs, recruited via convenience sampling from community centers across the British Columbia lower mainland, completed and returned the questionnaires which were designed to obtain information about the IHD-related knowledge, behaviors, and beliefs.

Results: ICs had lower knowledge of IHD risk factors, and were less likely to exercise, or have healthful dietary practices compared with ECs. Barriers and motivating factors for health behaviors identified by the two groups reflected their cultural orientations. Duration of residence in Canada (for IC immigrants) had no effect on knowledge scores, physical activity levels, or health beliefs although dietary practices had improved in the long-term immigrants.

Discussion and Conclusions: In accordance with cultural theory, these findings describe differences between the East Indian and European Canadian cultures with respect to health behaviors and beliefs. Although the findings support that ICs were less likely to practice positive health behaviors compared with ECs, there is no evidence to suggest deterioration in health practices following immigration to explain the increased IHD

mortality in this group. Similar high rates of IHD mortality among urban dwelling East Indians in India compared with migrant ICs suggest the role of the westernized environment in risk factor determination. The present study demonstrates that IC cultural values augment the effect of the Canadian environment in influencing their health behaviors. Recommendations are provided for the design and dissemination of health education and health promotion strategies targeted toward these groups.

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List of Abbreviations

EC – EuroCanadian

HBM – Health Belief Model

IC – IndoCanadian

ICC – Intraclass correlation coefficient

IHD – Ischemic heart disease

n – Sample size

SD – Standard deviation

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CHAPTER 1

INTRODUCTION

Background

Vascular disease, including cardiovascular and cerebrovascular disease, is the leading cause of disability and death in Canada (Heart and Stroke Foundation of Canada, 1999). Age-standardized mortality rates for ischemic heart disease (IHD) are highest among Canadians of South Asian origin (people whose ethnic origins are in India, Sri Lanka, Pakistan, and Bangladesh) (Anand et al., 2000; Sheth, Nair, Nargundkar, Anand, & Yusuf, 1999), which is consistent with reports worldwide that people of South Asian origin have the highest rates of IHD and mortality from IHD compared with other ethnic groups (McKeigue, Miller, & Marmot, 1989).

Although the exact cause of the high rates of IHD in South Asians has not been clearly established (Anand et al., 2000), various hypotheses have suggested an interplay of factors such as genetic susceptibility, metabolic predisposition, and lifestyle choices (Enas, Yusuf, & Mehta, 1992; Jolly, Pais, & Rihal, 1996; Kuppuswamy & Gupta, 2003; Nath et al., 1998). For migrant South Asians, conventional risk factors alone such as hypertension, high levels of total serum cholesterol, low levels of high-density lipoprotein, diabetes mellitus, and advancing age, fall short in explaining the excess risk of IHD. Several studies have reported a unique profile of risk factors characterized by insulin resistance syndrome, high triglyceride concentrations, low levels of high-density lipoprotein, abdominal obesity, and high levels of lipoprotein (a) to be associated with the high IHD rates in South Asians (Anand et al., 1998; Anand et al., 2000; Gupta et al., 2002; Hughes, Aw, Kuperan, & Choo, 1997; Jha, Enas, & Yusuf, 1993; McKeigue et al., 1989; McKeigue, Shah, & Marmot, 1991; Palaniappan et al., 2002; Singh, Ghosh et al., 1995). It has been suggested that the excess risk of IHD in South Asian immigrants may be a result of lifestyle-related risk factors

acquired in the western host environment in conjunction with non-conventional genetic and metabolic risk factors (Nath et al., 1998).

South Asians comprise the second largest non-European immigrant group in Canada representing 3.1% (917,100) of Canada's total population and 23% of the minority ethnic population (Statistics Canada, 2003). In the province of British Columbia (BC), South Asians approximate 26% of the minority ethnic population (BC Stats, 2003). According to reports from BC Stats, immigrants arriving from India are older compared with immigrants arriving from all other countries. In the period between 2000 and 2003, the proportion of these East Indians immigrants entering BC who were over 50 years of age was 24%, compared with 12% of immigrants from all countries (BC Stats, 2004). Given the high prevalence of IHD in South Asians, the increasing South Asian immigrant population, and the greater proportion of older individuals in this group, the burden of this disease in terms of mortality, quality of life, and health care cost could be considerably disproportionate in this group.

It has been well established that prevention and control of lifestyle-related modifiable risk factors such as unhealthy dietary practices, being overweight, physical inactivity, and smoking can significantly reduce the incidence and recurrence of IHD (Aldana et al., 2004; Assmann et al., 1999). Population-wide primary prevention is being propagated as the most efficient and cost-effective method for controlling the economic burden of this and other vascular diseases worldwide (World Health Organization, 2005). Rather than focus on one-on-one interventions among people at medium risk, the World Health Organization recommends that resources be directed toward those at elevated risk for IHD and other vascular diseases while simultaneously introducing population-wide efforts to reduce modifiable risk factors, mainly

unhealthy diets and physical inactivity through economic and educational policies and programs (World Health Organization, 2004, 2005).

Among South Asians, lifestyle choices related to diet and physical activity are ingrained in cultural values and expectations (Kalra, Srinivasan, Ivey, & Greenlund, 2004), and are often compounded by a host of environmental factors encountered following migration (Choudhry, 1998; Lawton, Ahmad, Hanna, Douglas, & Hallowell, 2005). Given the important role of culture on an individuals' health behaviors and beliefs (Daly et al., 2002), an examination of those factors that add to the understanding of the relationship between culture and prevalence of IHD in South Asian would be invaluable for designing population-based prevention strategies for IHD target toward this group. Yet, limited information exists about the relationship between culture and knowledge, behaviors, and beliefs related to IHD risk in this group, which precludes the development of such programs thus suggesting the need for further study in the interest of an inclusive health care system in Canada (Romanow, 2002).

Purpose

The primary purpose of this study was to examine the IHD-related knowledge, behaviors, and beliefs of East Indian immigrants in Canadians, and to compare these with the knowledge, behaviors, and beliefs of the dominant European Canadian population. A secondary purpose was to examine the effect of duration of residence in Canada on the knowledge, behaviors, and beliefs of East Indian immigrants.

Rationale

The increased prevalence of IHD in South Asian immigrants is due to a unique combination of intrinsic susceptibility and lifestyle related factors not observed in other ethnic groups (Nath et al., 1998; B. Williams, 1995). Lifestyle choices, mainly dietary practices and physical activity, are influenced by cultural values and expectations (Kalra et al., 2004), as well as environmental factors encountered in host country, stress related to immigration, and the process of acculturation (Uppaluri, 2002). Experiences of health and illness are culturally specific (Lustig, 1999b; Manderson, 1990), and culture influences one's health related behaviors and beliefs (Daly et al., 2002). Moreover, beliefs about health and disease influence the likelihood of participation in health related activities (Janz & Becker, 1984; Stretcher, 1997). Health promotion, behaviors, beliefs, and disease self-management have been examined in South Asians residing in the United Kingdom, the United States, and in Canada, using qualitative methodologies (Choudhry, 1998; Farooqi, Nagra, Edgar, & Khunti, 2000; Kalra et al., 2004; Stone, Pound, Pancholi, Farooqi, & Khunti, 2005) which limits generalization to the larger immigrant population. Moreover, the role of culture has not been studied from the culture theory perspective (Bhawuk, 1996) which precludes meaningful interpretation of the results.

Recognizing differences in culture, religion, and language as well as in health status and cardiovascular risk profile between the different South Asian ethnic groups (Bhopal et al., 1999) we decided to focus the study on the East Indian cultural group. East Indians comprise the majority (62%) of the South Asian population in Canada (Canadian Census Analyser, 2005). Much of the related research refers to the collective South Asian immigrant population. Where specific information on East Indians was not available, data for the collective South Asian population was used. Throughout this study East Indian immigrants in Canada will be referred to as IndoCanadians

(ICs), and the reference European Canadian group will be referred to as EuroCanadians (ECs). Since the majority of immigrants from Europe arrived prior to the 1960s (Statistics Canada, 2003), we assumed this group had assimilated and thus is indistinguishable from the dominant Canadian culture.

No previous study had been designed to examine the relationship between IHD-related knowledge, behaviors, and beliefs of East Indian immigrants in comparison with a culturally-distinct host population using objective inferential methods. The primary purpose of the study was to examine the IHD-related knowledge, behaviors, and beliefs of first-generation ICs, and to elucidate relationships between behaviors, and beliefs in this group. The use of culture theory (Bhawuk, 1996; Lustig, 1999a) as the basis to compare behaviors, and beliefs between the IC and the dominant EC group would provide a basis for meaningful comparisons and interpretations of the results. Findings will provide a rationale for the need for culture-specific prevention and management strategies for IHD in ICs and ECs, and further, will provide insights for design, development, and dissemination strategies for health education targeted toward these groups.

To our knowledge, no validated questionnaire existed for measuring IHD-related knowledge, beliefs, and behaviors. A questionnaire was constructed for the purpose of this study. The section for measuring health beliefs related to IHD risk was based on a validated instrument for assessing beliefs about osteoporosis-related preventive behaviors among women (Cadarette, Beaton, & Hawker, 2004; Kim, Horan, Gendler, & Patel, 1991). Given that reliability and validity are population specific (Portney, 2000), we decided to conduct preliminary reliability and validity evaluation of the IHD health belief scale.

Age and gender differences in health beliefs and health promoting practices have been well documented in the literature (Assaf et al., 2003; Furnham & Kirkcaldy, 1997; R. L. Johnson,

2005). Studies examining ethnicity and gender separately suggest that gender differences in health behaviors are consistent across ethnic groups (Courtenay, 2002). To learn more about the influence of age and gender, in our study we used these variables to assess differences in IHD-related knowledge, behaviors, and beliefs within the two ethnic groups of interest. Furthermore, as duration of residence in a culturally-distinct host country is accompanied by changes in health behaviors (Abraido-Lanza, Chao, & Florez, 2005), and health status (Frisbie, Cho, & Hummer, 2001), we determined whether knowledge, health behaviors, and beliefs changed among ICs based on the duration of their residence in Canada.

Objectives

1. To examine the IHD-related knowledge, behaviors, and beliefs in first-generation ICs, and to compare these with the knowledge, behaviors, and beliefs of ECs.
2. To examine the IHD-related knowledge, behaviors, and beliefs in first-generation ICs, based on duration of residence in Canada.
3. To perform preliminary tests of reliability and validity for the IHD health belief scale.
4. To make recommendations for the content and delivery of health education and lifestyle modification strategies for ICs and ECs.

Research Questions

The specific research questions of the study were:

1. Are there differences in IHD-related knowledge, behaviors, and beliefs between the ICs and ECs? Do age and gender differences exist within each ethnic group?
2. Do the IHD-related health behaviors of ICs and ECs reflect their beliefs?

3. Are there differences in IHD-related health behaviors and beliefs in the ICs based on length of residence in Canada?

Definition of Terms

Acculturation: The process by which immigrants adopt the attitudes, values, customs, beliefs, and behaviors of a new culture as a result of continuous first-hand contact with the new culture.

Culture: A shared system of values, beliefs and learned patterns of behavior that include language, thoughts, communication, actions, customs, beliefs, and values shaped by the dominant ethnic group, education, gender, and age.

Ethnic group: Groups of people that share some combination of common geographic or historical origins, family patterns, language, common values, cultural norms, Ethnicity implies a shared ancestry and history in addition to shared cultural and social characteristics.

EuroCanadian: An individual who was born and resides in Canada of European ancestry (parents, grandparents, or ancestors born in the United Kingdom, Eastern and Western Europe).

First-generation immigrants: Immigrants born outside of the host country, having foreign-born parents.

Health behaviors: Behaviors that have an impact on an individual's health such as dietary practices, physical activity, smoking, consumption of alcohol, stress management, participation in screening practices, and practice of preventative measures.

Health beliefs: Perceptions people have toward health, disease, and causes of disease.

Health Belief Model: The Health belief model (HBM) has been widely used to explain a variety of health behaviors. It is based on the value expectancy theory. According to the HBM model, individuals are more likely to undertake a health behavior if they regard themselves as

susceptible to the condition, if they believe it to have potentially serious consequences, if they believe that a course of action would be beneficial to them, and if they believe that the anticipated barriers to taking the action are outweighed by the benefits. Thus health behaviors were explained to result from the combination of attitudes related to four concepts *perceived susceptibility, perceived seriousness, perceived benefit,* and *perceived barriers.*

- *Perceived susceptibility:* the individual's view of the likelihood of experiencing a potentially harmful condition.
- *Perceived seriousness:* concerned with the seriousness of contracting the condition or leaving it untreated.
- *Perceived benefits:* the effectiveness of specific behavior in reducing the threat of the condition.
- *Perceived barriers:* negative aspects of the anticipated behavior.

The HBM model was subsequently expanded to include the concepts of health motivation, cues to action, and self-efficacy.

- *Health motivation:* The individual's tendency of the individual to engage in healthy behaviors
- *Self-efficacy:* An individual's confidence in his or her ability to perform a specific task by overcoming barriers.

IndoCanadian: A Canadian immigrant from India, born of East Indian parents, and residing in Canada.

Ischemic heart disease: Any condition in which the heart muscle is damaged or works inefficiently due to absence or relative deficiency of its blood supply; most often caused by atherosclerosis, it includes angina pectoris, acute myocardial infarction, chronic ischemic heart disease, and sudden death.

Vascular disease: All diseases of the circulatory system which include myocardial infarction, ischemic heart disease, valvular heart disease, peripheral vascular disease, dysrhythmias, high blood pressure and stroke.

CHAPTER 2

LITERATURE REVIEW

The Burden of Vascular Disease in Canada

Vascular disease, including cardiovascular and cerebrovascular disease, is the leading cause of disability and death in Canada, as well as the leading cause of hospitalizations (Heart and Stroke Foundation of Canada, 1999). In I999, IHD accounted for approximately 20% of all deaths. The growing burden of vascular disease reflects Canada's ageing population and adoption of unhealthy lifestyle choices that include smoking, unhealthy dietary practices, and physical inactivity. Health Canada estimates the annual cost of vascular disease to be $18.5 billion (Cdn), higher than that for any other disease. Ischemic heart disease alone was the major contributor to hospital care cost, and costs associated with mortality and long-term disability, accounting for approximately $7.8 billion (Cdn). High costs imposed by IHD in terms of health care dollars and quality of life coupled with the predicted increase in IHD cases over the next 20 years suggest that its contribution to the burden of disease in Canada will increase (Heart and Stroke Foundation of Canada, 2003). Investment in the prevention and reduction of risk factors to decrease the economic burden of vascular disease has become a health care priority in Canada (Public Health Agency of Canada, 2004).

Ischemic Heart Disease and Related Risk Factors

Cardiovascular disease is largely preventable. Separate reports from the United States and the United Kingdom have estimated that over half of the decline in IHD mortality between 1980 and 2000 was attributed to risk factor reduction through primary or secondary prevention (Goldman et al., 2001; Hunink et al., 1997; Unal, Critchley, & Capewell, 2004).

Ischemic heart disease refers to any condition in which the heart muscle is damaged or works inefficiently due to absence or deficiency of its blood supply. It includes angina pectoris, acute myocardial infarction, chronic ischemic heart disease, and related sudden death (International Classification of Diseases-9). Well established risk factors of IHD include cigarette smoking, hypertension, diabetes, high levels of serum cholesterol, and low levels of high density lipoprotein cholesterol (Grundy et al., 1998). Other factors that increase the likelihood of developing IHD are obesity, physical inactivity, family history of IHD, abnormalities in coagulation factors, and high levels of triglyceride, low density lipoprotein cholesterol, lipoprotein (a) (Grundy et al., 1998). According to epidemiological data, risk factors directly or indirectly related to lifestyle such as smoking, physical inactivity, and being overweight together explain the majority of new cases of vascular disease (Beaglehole & Magnus, 2002; Heart and Stroke Foundation of Canada, 2003). These lifestyle factors are modifiable, i.e., the individual has some control over and can modify in order to reduce his or her risk of developing IHD.

The need for reduction of these modifiable risk factors spawned the development of cardiac rehabilitation programs promoting dietary modifications, aerobic exercise, optimal nutrition, weigh control, smoking cessation, and stress management. A large body of literature has demonstrated the effectiveness of these lifestyle modification programs in reducing the risk of IHD, mitigating disease progression (Aldana et al., 2004; Aldana et al., 2003; Haskell et al., 1994; Koertge et al., 2003; Ornish et al., 1990; Roberts & Barnard, 2005; Schuler et al., 1992), and reversing disease (Aldana et al., 2004; Aldana et al., 2003; Ornish et al., 1998; Sdringola et al., 2003). Billions of Canadian dollars are being spent on treating vascular disease. Consequences of cardiac-related lifestyle factors contribute to three other leading non-communicable diseases: chronic obstructive pulmonary disease, diabetes, and cancer (Figure 1). Recently, in a report on the

growing burden of vascular disease in Canada, the Heart and Stroke Foundation of Canada (Heart and Stroke Foundation of Canada, 2003) emphasized that increasing the proportion of the health care dollar allocated to prevention of these risk factors would also relieve the burden imposed by other non-communicable diseases.

Primary and Secondary Prevention of IHD

Primary prevention refers to modifying risk factors with the aim of delaying or preventing the onset of IHD in persons with no known disease. For those who have the disease, secondary prevention aims at reducing the risk of recurrences and death (Grundy et al., 1998). Given the unequivocal role of modifiable risk factors, health education and measures to improve health-related behavior of the entire population constitute fundamental aspects of prevention (Assmann et al., 1999). The World Health Organization recommends population-wide prevention strategies as the most cost-effective methods to reduce the burden of IHD of a nation (World Health Organization, 2005). Primary prevention of IHD and other vascular diseases is a mutltifactorial process requiring the involvement of the entire health care team, including physicians, nurses, physical therapists, and nutritionists. Their collective role is to engage individuals at risk and those in the early stages of disease in comprehensive risk reduction programs by alleviating barriers to participation and facilitating adherence to lifestyle changes (Pearson et al., 2002). Secondary prevention of IHD involves short-term aggressive pharmacotherapy which can dramatically reduce the risk of disease recurrence (Grundy, Pasternak, Greenland, Smith, & Fuster, 1999; World Health Organization, 2005). Following this, long-term prevention strategies that aim at returning the patient to low-risk status call for sustained lifestyle modification, i.e. smoking cessation, diet low in cholesterol and cholesterol-

raising fats, weight control, and increased physical activity (Grundy et al., 1999). All direct-access health professionals, irrespective of their client's primary diagnosis, should contribute to the public health approach to primary prevention of IHD with risk factor identification, client education, and behavioral modification programs to prevent the onset or worsening of risk factors (Chartered Society of Physiotherapy, 2001; Grundy et al., 1997; Pearson et al., 2002).

Ischemic Heart Disease in South Asian Immigrants

A high prevalence of IHD among South Asian immigrants has been reported in several countries including Singapore (Chen, 1980; Danaraj, Acker, Danaraj, Wong, & Tan, 1959; Hughes, Lun, & Yeo, 1990), Uganda (Shaper & Jones, 1959), South Africa (Adelstein, 1963; Wyndham, 1982), Fiji (Collins, Dowse, Cabealawa, Ram, & Zimmet, 1996; Tuomilehto, Ram, Eseroma, Taylor, & Zimmet, 1984), and Trinidad (Beckles et al., 1986). In England and Wales, people from the Indian subcontinent have the highest IHD mortality rates compared to other immigrant groups and the local population (Balarajan, 1991; Balarajan, Bulusu, Adelstein, & Shukla, 1984; Wild & McKeigue, 1997). In the United States, East Indian immigrants have a higher prevalence of IHD (Enas et al., 1996), and higher proportional mortality from IHD compared with Caucasians (Palaniappan, Wang, & Fortmann, 2004). Proportional mortality is the mortality rate expressed as a proportion of all-cause mortality. A similar trend in Canada has been observed. Analyzing age-standardized mortality rates (for sex and ethnic group) of Canadians of European, South Asian, and Chinese descent from the Canadian Mortality Database, Sheth and colleagues (Sheth et al., 1999) reported that mortality rates for the period from 1979 to 1993 were highest among Canadians of South Asian origin.

They further reported that proportional mortality was highest among South Asian men and women (42% and 29%, respectively) compared with European Canadians (29% and 19%) and Chinese Canadians (18% and 11%) (Sheth et al., 1999). In another Canadian ethnic cohort study, Anand and colleagues (Anand et al., 2000) reported that IHD (defined by the person's history or by electrocardiographic findings) was highest among South Asians compared with Europeans and Chinese (11%, 5%, and 2%, respectively). Gupta and coworkers reported that risk factors and outcomes following acute myocardial infarction were less favorable for South Asians compared with non-South Asians (Gupta et al., 2002).

Conventional risk factors fail to explain the high prevalence of IHD observed in migrant South Asian populations (McKeigue et al., 1989). This trend is not paralleled by increased rates of hypertension (Enas et al., 1996; Knight et al., 1993), smoking (Enas et al., 1996; Knight et al., 1993; Lip, Luscombe, McCarry, Malik, & Beevers, 1996; R. Williams, Bhopal, & Hunt, 1994), or obesity (Anand et al., 2000; Gupta et al., 2002). A syndrome of metabolic factors characterized by insulin resistance (glucose intolerance, hyperinsulinemia, and overproduction of glucose by the liver), high triglyceride concentrations, low levels of high density lipoprotein, and abdominal obesity have been associated with high rates of IHD in South Asians (Anand et al., 2000; Bhatnagar et al., 1995; Enas et al., 1996; Hughes et al., 1997; Tillin et al., 2005). Although the prevalence of obesity (assessed by body mass index) is less common among East Indians, an increased tendency toward central obesity (assessed by the waist-hip ratio) (Anand & Yusuf, 1997; Lean et al., 2001) has been correlated with insulin resistance syndrome (McKeigue et al., 1991). The association of insulin resistance with central obesity is a strong risk factor of IHD in South Asians (Pais et al., 1996; Singh, Niaz et al., 1995). Additionally, higher levels of lipoprotein (a), a genetically-determined risk factor, have

been observed in South Asians compared with Caucasians and Chinese people (Anand et al., 1998; Bhatnagar et al., 1995; Hoogeveen et al., 2001; Jha et al., 1993; Palaniappan et al., 2002; Sandholzer et al., 1991).

Recent attention has been focused on adverse gene-environment interactions to explain the increased prevalence of IHD in immigrant South Asians. The increased mortality in these immigrants has been attributed to lifestyle-related risk factors acquired in a western environment, in conjunction with genetic and metabolic risk factors as previously discussed (Hakeem, Thomas, & Badruddin, 2001; Nath et al., 1998; B. Williams, 1995). Further, migration and acculturation are believed to be important independent risk factors for IHD in South Asians (Mooteri, Petersen, Dagubati, & Pai, 2004). Bhatnagar and coworkers (Bhatnagar et al., 1995) reported that migrant East Indians have a less favorable IHD risk factor profile compared with their siblings in India, with higher body mass indices, fasting blood glucose levels, systolic blood pressures, and cholesterol levels, and lower levels of high density lipoprotein.

Knowledge of IHD

Knowledge and awareness of IHD causation and risk factors tend to be lower among South Asians compared with other groups. Lip and colleagues (Lip et al., 1996) studied ethnic differences in public health awareness and reported that South Asians have lower awareness about cholesterol and their dietary intake of specific foods compared with other ethnic groups. Using focus groups to examine cardiovascular risk knowledge and practices among East Indians in California, Kalra and coworkers (Kalra et al., 2004) reported that most participants became aware of cardiovascular disease only after a person they knew had been diagnosed with the condition.

Even though they recognized the role of lifestyle-related risk factors and family history, the participants expressed uncertainty and helplessness regarding disease development (Kalra et al., 2004). These participants had low awareness about the role of cholesterol in disease causation. Similarly, Farooqi and colleagues (Farooqi et al., 2000) observed that even though South Asians were aware of risk factors such as family history, unhealthy diet, and physical inactivity, they were not aware of the link between smoking and alcohol consumption and heart disease. Interviewing East Indians patients with myocardial infarction Webster and colleagues (Webster, Thompson, & Mayou, 2002) observed that in addition to poor knowledge of IHD risk factors, these individuals did not know what to expect in terms of recovery. They anticipated long-term and permanent activity restrictions would be an inevitable part of the disease process. Interestingly, in both focus groups psychological stress was identified as a major cause of heart disease (Farooqi et al., 2000; Webster et al., 2002).

Health Behaviors of East Indians Immigrants

Similar high rates of IHD in urban East Indians living in India as those observed in migrant East Indians living in the west support the central role of urban lifestyle in risk factor determination (Enas, 2000). The acculturation hypothesis posits that health behaviors become riskier as a result of acculturation leading to greater chronic disease prevalence (Abraido-Lanza et al., 2005). Acculturation refers to the process by which immigrants adopt attitudes, values, customs, beliefs, and behaviors of a new culture. Acculturation influences the health behaviors of immigrants through the adoption of dietary habits and lifestyle practices more typical of the host country. Whether the acculturation hypothesis applies to migrant South Asians group has not been clearly established as analysis of this group in isolation is lacking (Frisbie et al.,

2001). There is mixed evidence for this hypothesis among East Indians. Nonetheless, cultural and environmental factors interwoven in a complex and as yet undetermined manner have been reported to influence East Indians' health behaviors and health status in host countries, and therefore have implications for health education strategies for risk modification (Kalra et al., 2004; Pardhan & Mahomed, 2004).

Physical Activity

That regular physical activity reduces IHD risk by counteracting low levels of high density lipoprotein, abdominal obesity, and insulin resistance, has been well established. Several studies have demonstrated that South Asians have lower physical activity levels compared with other immigrant groups and indigenous host populations (Dhawan & Bray, 1997; Hayes et al., 2002; Health Survey for England 1999, 2000; Kamath et al., 1999; Lean et al., 2001; Lip et al., 1996; Palaniappan et al., 2002). South Asians have also reported less participation in sport and recreational activities compared with reference populations in the United Kingdom and the United States (Hayes et al., 2002; Kamath et al., 1999; Knight et al., 1993; Lean et al., 2001; R. Williams et al., 1994). Examining the role of culture and religion in the management of diabetes, Naeem (Naeem, 2003) interviewed 106 East Indian men, and observed that only 14% of the group reported participating in occasional exercise. He concluded that lack of exercise participation was a 'cultural phenomenon'.

Reports on the physical activity levels of East Indian immigrants in comparison with people residing in India are inconsistent. Evaluating the relationship between physical activity and risk factors for IHD in a cohort with moderate to severe coronary stenosis, Dhawan and Bray (Dhawan & Bray, 1997), reported that British East Indians had a higher proportion of sedentary

individuals (79%), compared with the group residing in India (40%). That the Indian group was recruited from an urban setting in India (probably less active than their rural counterparts) could have influenced these findings. In contrast, examining the risk factors for IHD in two healthy East Indian populations, one residing in India and the other in Australia, Mahajan and Bermingham (Mahajan & Bermingham, 2004) observed that both men and women living in India exercised more vigorously and more frequently compared with their relatives in Sydney. The groups consisted mainly of urban dwelling individuals in business or professional communities (Mahajan & Bermingham, 2004).

Generally, it is believed that people living in rural areas in India are more physically active as a result of occupational-related activities and lack of access to labor-saving technology (Jajoo, Kalantri, Gupta, Jain, & Gupta, 1988). On migration, these individuals experience a reduction in occupation-related physical activity and are not accustomed to participating in formal exercise sessions (Choudhry, 1998). Recently, Kandula and Lauderdale hypothesized that the lower levels of sports and leisure time physical activity in immigrant South Asians may be a reflection of their socioeconomic status (Kandula & Lauderdale, 2005). Viewing leisure time physical activity as a luxury, lower income and education classes have less time and money and limited access to community resources. They also may have less knowledge of the health benefits of exercise (Kandula & Lauderdale, 2005). Further, with increased duration of residence in the western country, increased socioeconomic status, access to labor-saving technology, and sedentary occupations contribute to the lower rates of occupational-related physical activity in these immigrants (Goel, McCarthy, Phillips, & Wee, 2004), but an increase in leisure time physical activity (Kandula & Lauderdale, 2005). Studies examining urban-rural differences in coronary heart

disease prevalence and risk factors however have failed to report on physical activity levels (Chadha, Gopinath, & Shekhawat, 1997; Singh, Sharma et al., 1997).

Dietary Practices

Dietary habits among East Indians are complex in that they are regionally varied, and strongly influenced by religion, caste, economic status, and physical environment (Jambunathan, 2003; Jonnalagadda et al., 2002). Despite these variations, traditional East Indian diets are high in carbohydrate and saturated fat, and deficient in high-quality protein and antioxidants (Park, 2004; Raj, Ganganna, & Bowering, 1999). Diets high in cholesterol, saturated fats, and *trans* fats increase the risk for IHD by increasing low density lipoprotein levels (US Food and Drug Administration, 2004). Migrant South Asians have a higher than optimal fat intake due to greater consumption of butter, margarine, *ghee*, eggs, and milk compared with other ethnic groups (Kamath et al., 1999; Lean et al., 2001; Lip et al., 1996; Naeem, 2003; Yagalla, Hoerr, Song, Enas, & Garg, 1996). *Ghee*, a clarified form of butter, common in traditional Indian cooking, is high in cholesterol and has been implicated in atherosclerosis (Jacobson, 1987). Investigating whether the higher mortality from IHD in East Indians was related to differences in fat intake, Lip and colleagues (Lip, Malik, Luscombe, McCarry, & Beevers, 1995) observed higher quantities of fat in foods purchased per capita per week by East Indians who were also more likely to fry their food (as opposed to grilling, boiling, or poaching) compared with Caucasians and Afro-Carribeans.

Change in food habits following migration is viewed as a measure of acculturation. Several investigations have documented changes in East Indian dietary practices following migration to western countries (Karim, 1986; Raj et al., 1999; Varghese & Moore-Orr, 2002). Recent studies have demonstrated that East Indian dietary changes occur in relation to length of

residence in the host country, in both positive and negative ways. For example, Raj and colleagues (Raj et al., 1999) observed a reduction in the consumption of *ghee*, butter, and milk in long-term immigrants in the United States compared with recent immigrants. Varghese and Moore-Orr (Varghese & Moore-Orr, 2002) similarly observed that as length of stay in Canada increases, a decline in the practice of vegetarianism was accompanied by an increase in the consumption of convenience foods and an increased likelihood lowering their dietary fat content in accordance with Canada's Food Guide to Healthy Eating recommendations (Varghese & Moore-Orr, 2002). The extent of dietary acculturation was reported to be related to the familiarity with the new culture and length of stay in the host country (Raj et al., 1999; Varghese & Moore-Orr, 2002).

Barriers to Health Promoting Behaviors in South Asian Immigrants

Motivation and self-image are well established determinants of physical activity behavior (Biddle & Wang, 2003; Lees et al., 2005; Wilcox, Bopp, Oberrecht, Kammermann, & McElmurray, 2003). In addition to the general reasons given for not being physically active, certain distinctive cultural factors serve as barriers to limit the participation of East Indians in sports and exercise (M. Johnson, 2000). Modesty and avoidance of mixed-sex activity are barriers for some East Indians to attending communal fitness facilities (Farooqi et al., 2000; Lawton et al., 2005; Naeem, 2003). The attitude that it is too late in life to make changes in their lifestyle may be a barrier for older South Asians (Farooqi et al., 2000; Naeem, 2003). Viewing exercise as a formal activity rather than part of their everyday activities acts as a limiting factor as it represents something they are unfamiliar with (Choudhry, 1998; Farooqi et al., 2000; Naeem, 2003). Additionally, individuals moving from rural areas in India experience a reduction in occupation-related physical activity and are not accustomed to participating in formal exercise

sessions (Choudhry, 1998). Even though the effect of years since immigration on level of physical activity has not been systematically studied in East Indians, the likelihood of exercising has been reported to be greater among those who have lived in Canada longer and those who are more integrated within the Canadian society (i.e., students and the employed) (Varghese & Moore-Orr, 2002). Climatic conditions, language barriers, lack of time, and family obligations often limit the participation in sports and leisure time activities (Choudhry, 1998; Lawton et al., 2005).

Lack of availability of traditional dietary ingredients has led to a tendency to eat foods that are more readily available (Varghese & Moore-Orr, 2002). Inadequate knowledge about the nutritional value of traditional Indian foods has been cited as an important health concern for East Indian immigrants (Kalra et al., 2004; Varghese & Moore-Orr, 2002). Knowledge, education, English proficiency, length of residence in Canada, and familiarity with the Canadian culture are important determinants of the extent of participation in health promotion practices (Choudhry, Srivastava, & Fitch, 1998).

Cultural Aspects of East Indian Health Beliefs and Behaviors

Health and illness are culturally determined experiences (Lustig, 1999b; Manderson, 1990). Health-related beliefs and behaviors learnt through early childhood socialization are retained even after immigration (Choudhry, 2001; Ramakrishna & Weiss, 1992). Culture refers to a system of learned and shared behaviors, values, beliefs and customs transmitted through generations and expressed in the way people live their lives (Shusky, 1978). Culture affects every aspect of people's lives, including their beliefs about cause, prevention, and treatment of illness and, determines people's attitudes toward health and health-related behavior (Chacko, 2003; Stewart, 1994). Cultural differences affect access to health services, and determine how people receive and respond

to heath-related information. Little is known about the association between culturally-mediated health beliefs and health promotion practices in East Indians in Canada. An understanding of the traditional East Indian medical system provides some insight into the cultural underpinnings of their health related views.

The Ayurvedic Philosophy

Diversity within the East Indian society is organized by attributes such as language, religion, cultural practices, and geography. On migration, differences are further influenced by factors such as educational level, language skills, income, reasons for immigrating, and degree of acculturation (Ramakrishna & Weiss, 1992). Despite these diversities, a certain common thread underlies the East Indian view of health and illness. Ayurveda (*ayur* = life, *vedas* = knowledge) is an ancient system of medicine that has been practiced in India for over 5000 years, and continues to influence the East Indian view of health and illness. The ayurvedic approach focuses on prevention and cure of disease, as well as promotion of good health and healthy ways of living (Verma, 1995). Ayurveda is a holistic system concerned with physical, mental, and spiritual health and well being (Crawford, 1998). Consequently, good health signifies not only proper biological functioning of the individual, but also healthy relationships with the individual's physical, psychological, social, and spiritual environments. The ayurvedic philosophy influences the East Indian view of health in terms of physical, mental, and spiritual well being (Choudhry, 1998; Hilton et al., 2001). In contrast, the biomedical orientation to healthcare linked to the European American cultural pattern dominant in Canada views disease as a break down of a body part and focuses treatment on rectifying the physical problem to make the body healthy again (Lustig, 1999b). These differences in views about disease causation, prevention, and treatment affect the individual's attitudes toward health and

health-related behavior, and determine how people receive and respond to heath-related information (Chacko, 2003; Stewart, 1994).

Cultural Differences between East Indians and European Canadians

Cultural differences between East Indians and European Canadians in the context of health behaviors and beliefs may be understood on the basis of the four-dimensional model of cultural differences proposed by renowned anthropologist Geert Hofstede (Hofstede, 1980), summarized below.

Individualism-Collectivism: According to this model, in contrast with the European Canadian culture that values individualism and autonomy, East Indian culture emphasizes collectivism characterized by interdependence of group members and placing the interest of the group before that of the individual (Hofstede, 1980; Lustig, 1999a). For East Indians, family is the most important social group (Ramakrishna & Weiss, 1992). Inclusion and involvement family members in patient care is recognized and expected (Bhungalia, 2002; Jambunathan, 2003; Ramakrishna & Weiss, 1992). Webster and colleagues (Webster, Thompson, & Davidson, 2003) studied the experiences and needs of East Indian Hindu patients with myocardial infarction and reported that the family is the main source of support and encouragement during recovery. Owens and Randhawa (Owens & Randhawa, 2004) reported that health professionals viewed the preference for family and community care as an important difference in the palliative care needs between South Asian and Caucasian patients in the United Kingdom. This importance of family support among East Indians was highlighted in a study Rothstein and Rajapaksa (Rothstein & Rajapaksa, 2003) who compared the health beliefs of American college students born in the United States, China, and India. Although these students shared many western biomedical health beliefs,

the students from India attributed more importance to religious faith, and had more confidence in their families and friends in helping them recover from illness, compared with students born in China and the United States.

Power Distance: East Indian culture distinguishes itself from Canadian culture on the dimension of power distance in the extent to which it accepts unequal power distribution between individuals. In cultures ranking high on the power distance index, such as India, the need for such social inequality is viewed as essential for the smooth functioning of society (Hofstede, 1980, 1986; Lustig, 1999b). With reference to the health care context, physicians are well respected in the East Indian community and exert great influence in altering an individual's behavior (Kalra et al., 2004). Indian clients are relatively subservient in that they are less inclined to question the physician for fear of appearing disrespectful (Ramakrishna & Weiss, 1992). The status difference between patient and health care professional may stem from the religious belief that the God grants cures through the physician (Jambunathan, 2003).

Masculinity-Femininity: Masculinity as a characteristic of a culture opposes femininity (Hofstede, 1986). This dimension refers to the degree to which a culture reflects traditional gender-based attributes such as assertiveness and competitiveness (masculine) or caring for others and quality of life (feminine), that are consistent with the social and political structure of the society (Lustig, 1999a). Cultures ranked high in the masculinity index are characterized by qualities such assertiveness and achievement, and the high value placed on the individuals' success and acquisition of material wealth. These cultures strive for maximal distinction between what men are expected to do and what women are expected to do (Hofstede, 1986). Cultures low on this index (feminine cultures), are concerned less with materialistic achievement and more with enhancing the quality of life. Feminine cultures are characterized by relatively overlapping social roles for men

and women, and accept modesty, tenderness and nurturing as appropriate qualities for both men and women (Hofstede, 1986). Based on their ranking on this dimension, India is more masculine compared to Canada (Hofstede, 1980, 1986). Distinctions in roles for men and women are more evident in this culture, as seen in the running of traditional East Indian households where men are the bread winners and heads of the family, whereas the women are primarily responsible for household duties (Bhungalia, 2002). For this reason, women are considered primary decision makers when it comes to making dietary modification for the household (Kalra et al., 2004). Typical of high masculine cultures, women are expected to play the nurturing role and care for the family more so than men (Hofstede, 1986), causing them to place the needs of the family before their own, even in matters of personal health (Bottorff et al., 1998; Choudhry et al., 2002). This expectation also influences women's body image. East Indian women are more likely to equate larger body sizes with health and healthy child bearing, and are less likely to experience external pressure from others to change their body size and as a result are less likely to attempt to lose weight compared to other immigrant and British women (Bush, Williams, Lean, & Anderson, 2001).

Uncertainty Avoidance: One explanation for South Asians being less inclined to make lifestyle modification in response to disease diagnosis is a fatalistic attitude toward illness causation (Lip et al., 1996; Webster et al., 2002). Acceptance of a future that is uncertain is a consequence of a culture ranking low on the uncertainty avoidance index (India). This dimensions refers to the extent to which cultures feel threatened by situations they perceive as unclear and ambiguous and try to avoid them by establishing more structure (Hofstede, 1980). Studying the role of religion and culture in diabetes management, Naeem (Naeem, 2003) reported that 32% of the group studied believed that their having diabetes was determined by a higher power (*Allah's* will), and therefore

beyond their control. Only 14% of these men undertook occasional exercise and 27% reported regularly checking their blood glucose levels. Acceptance of a disease diagnosis with a sense of inevitability, either due to a number of family having the disease, or views that a higher power is responsible for their health or ill-health is believed to underlie the passive approach to lifestyle modification observed in South Asians. This attitude of fatalism has been used to explain their limited participation in preventive health behaviors or disease self-management (Farooqi et al., 2000; Lawton et al., 2005; Stone et al., 2005; Webster et al., 2003). Canada on the other hand ranks higher than India on this dimension, signifying less tolerance with futures that are unpredictable (Hofstede, 1986; Lustig, 1999b), and as a consequence individuals of this culture are more inclined to modify their behavior to avoid disease or ill-health.

Measuring Health Beliefs: The Health Belief Model

There is a paucity of Canadian research investigating the health beliefs of East Indians with respect to IHD. Health beliefs refer to the perceptions people have toward health, disease, and causes of disease. Knowledge and beliefs related to specific health practices such as diabetes management (Naeem, 2003), modification of cardiovascular disease risk (Farooqi et al., 2000; Kalra et al., 2004), and general health promotion behaviors (Choudhry, 1998) have been previously studied using qualitative methods. This methodology has provided important information for understanding how cultural beliefs shape East Indian perspectives and practices related to health, health care, and health-related behaviors. There is now a need to extend this knowledge base by examining the relationship between culture and health-related knowledge, beliefs, and behaviors across the East Indian population in general. Systematic study of the knowledge, beliefs and behaviors of Canadian East Indians using structured measurement methods would not only enhance

the external validity of the results by allowing generalization to the Canadian East Indian population overall, it would also permit replication studies and comparative studies across the various subgroups of this ethnic community.

The HBM was initially developed by a group of social psychologists as a value expectancy model to predict which people would or would not use screening tests, and was further modified to apply to preventive behaviors and program adherence in response to diagnosed illness (M.H. Becker, 1974). It has since been used as a conceptual framework for understanding a variety of preventive and sick-role behaviors (Stretcher, 1997). This model postulates that the likelihood of undertaking a health action depends on the individual's beliefs about their personal susceptibility to the disease, the seriousness of the condition, the efficacy of the proposed preventive measures, barriers to taking the health action, personal motivation levels, and perceived self-efficacy (Stretcher, 1997).

The applicability of the HMB across different ethnic groups other than North Americans has not been adequately established. Further, due to the failure of the model to take into account the role of the family, community, and environment in health related behaviors, important determinants of health behavior and beleifs in some ethnic groups (Airhihenbuwa, 1995; Rodriguez-Reimann, Nicassio, Reimann, Gallegos, & Olmedo, 2004), the model was not utilized for predicting health behaviors (M. H. Becker & Maiman, 1975; Janz & Becker, 1984). Rather, the purpose for using the HBM variables to measure beliefs related to IHD preventive behaviors was to provide a structured and objective method for comparing beliefs between two culturally distinct groups. A secondary purpose was to examine direct relationships between the variables and preventive behaviors, i.e., exercising and dietary practices.

Few studies have used the HBM variables to examine preventive behaviors related to IHD such as low-fat diets (Ali, 2002), and exercise performance (Al-Ali & Haddad, 2004; Mirotznik, Feldman, & Stein, 1995). A search of the literature identified two studies that used the HBM for studying health beliefs and behaviors in South Asian women (Ahmad, Cameron, & Stewart, 2005; Ananth & Koopman, 2003). Psychometric properties of the instruments were not reported. Studying beliefs about breast cancer detection practices in South Asian women, Choudhry and coworkers (Choudhry et al., 1998) reported that existing HBM instruments were not appropriate for South Asian populations. The breast self-examination health belief scales was developed and refined for measuring the HBM variables related to breast cancer preventive behavior (Champion, 1993; Champion & Scott, 1997). It has since been translated and adapted for use in other cultures (Champion & Scott, 1997; Gozum & Aydin, 2004; Lee, Kim, & Song, 2002; Mikhail & Petro-Nustas, 2001; Wu & Yu, 2003). The original breast cancer health belief scales was reported suitable for modification for use with other health conditions (Champion & Scott, 1997) and was modified to relate to osteoporosis preventive behaviors (Cadarette et al., 2004; Champion, 1993; Kim et al., 1991), from which the scale for the present study was adapted.

Purpose of the Study and Research Questions

The high prevalence of IHD mortality in East Indians migrants is due to the combination of genetic susceptibility, and lifestyle factors influenced by cultural and environmental factors in the host country (Enas, 2000; B. Williams, 1995). Certain distinctive behaviors and beliefs, potentially detrimental to heart health, observed in several East Indian communities studied, support a role for culture in shaping these health practices. Population-based primary prevention strategies tailored according to characteristics of the target population may be the most cost-effective method

for controlling the burden of IHD (Beaglehole, 2001; Hiskins, 1995; World Health Organization, 2004).

Existing data about the knowledge, behaviors, and beleifs of East Indian immigrants come from qualitative studies of diverse groups within this ethnic population, limiting its application to the general East Indian population in Canada. The purpose of this study was to examine, using structured methods, the IHD-related knowledge, behaviors, and behaviors of East Indian Canadians, and to compare these with the knowledge, behaviors, and behaviors of Canadians of European ancestry. Comparison with the culturally distinct European Canadian groups was done in order to assess the rationale for culturally specific health promotion strategies in the Canadian multicultural milieu.

Time since immigration influences the extent to which immigrants adopt the dietary and lifestyle habits of the dominant group (Abraido-Lanza et al., 2005; Raj et al., 1999; Varghese & Moore-Orr, 2002) and as a result influences their health status. For example, it has been suggested that time since immigration is an important risk factor for excess body weight (Cairney & Ostbye, 1999; Goel et al., 2004). We therefore decided to examine the effect of time since immigration on health behaviors and beliefs of ICs. Further, given the well documented influence of age and gender on health beliefs and health promoting practices (Assaf et al., 2003; Furnham & Kirkcaldy, 1997; R. L. Johnson, 2005), these variables were used to assess differences in IHD-related knowledge, behaviors, and beliefs within the two ethnic groups of interest. Another purpose of this study was to conduct preliminary reliability and validity tests of the IHD health beliefs scale.

The specific research questions were:

1) Are there differences in IHD-related knowledge, beliefs, and behaviors between the ICs and ECs? Do age and gender differences exist within each ethnic group?
2) Do the IHD-related health behaviors of ICs and ECs reflect their knowledge and beliefs?
3) Are there differences in IHD-related health beliefs and behaviors in the ICs based on length of residence in Canada?

CHAPTER 3

METHODS

Design

A cross-sectional descriptive comparative study was conducted using a structured self-administered questionnaire.

Sample

The target population was first-generation IC immigrants. First-generation IC adults residing in the lower mainland of BC comprised the accessible population from which the sample was recruited. A sample of ECs was recruited as a reference group. Based on the number of ICs living in the BC lower mainland (164,365) (Statistics Canada, 2003), a sample size of 130 was deemed adequate based on population survey sample size calculation with a 7% confidence interval at the 95% confidence level (Creative Research Systems, 2003).

Recruitment

Eligibility criteria for the IC sample were: 1) born in India, 2) immigrated to Canada as adults (after their 19th birthday), and 3) be able to read and write either English or Punjabi. Subjects were eligible for the EC sample if they 1) were born in Canada, and 2) were of European ancestry (i.e. parents, grand-parents, or ancestors born in Europe).

The study was approved by the ethics review board of the University of British Columbia. Agreement to participate in the study was taken as consent. A sample of convenience was recruited from community centers, senior centers, public libraries, places of worship, and corporate offices in Vancouver, Richmond, and Surrey from January through March 2005. Initial

contact with administrative staff was made in order to obtain permission to recruit subjects from the premises. Posters announcing the purpose of the study and eligibility criteria inviting volunteers to participate were displayed in these institutions. Volunteers who met the eligibility criteria were given a questionnaire. Participants who were unable to complete the questionnaire on site were provided with self-addressed stamped envelope and were requested to provide their contact information for tracking purposes. Confidentiality was maintained by coding the questionnaires. Only the researchers had access to the names and contact information.

For the test-retest reliability study of the IHD health belief questionnaire, 30 individuals who had consented to be contacted for a follow-up study were contacted by telephone; 27 agreed to participate and were sent a second copy of the questionnaire along with a self-addressed stamped envelope three to four weeks after their initial completion.

Questionnaire

To our knowledge, there existed no validated questionnaire for measuring IHD-related knowledge, behaviors, and beliefs.

Development

The questionnaire used in this study was developed by the researchers by adapting from existing instruments and reviewing the literature. It was a structured questionnaire with close-ended questions comprising of four sections for measuring IHD-related knowledge, behaviors, and beliefs, and socio-demographic information.

Five health related behaviors related to IHD risk factors were assessed: physical activity, diet, smoking, alcohol consumption, and stress management. Details of physical activity were obtained by modifying a questionnaire that had been previously used in a Kuwaiti population (Dean

et al, unpublished). Subjects were asked whether they exercised, the type of physical activity they performed, the frequency, intensity, and duration of physical activity, and the period for which they had been exercising at that level. Individuals were also classified as exercisers or non-exercisers based on whether or not they were meeting the requirements for sufficient levels of physical activity recommended by the Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) for the amount of physical activity required for benefits of health promotion and disease prevention (Pate et al., 1995).

Other behaviors assessed included average duration of sleep per day, number of meals eaten per day, and stress levels. Dietary practices were assessed using a 17-item questionnaire related to food consumption patterns and cooking methods used over the past month based on the questionnaire used by Liou (Liou, 2004) to assess fat-related dietary behavior in Chinese Americans. Respondents were asked to indicate the number of times per week they performed each dietary practice.

Questions from the Canadian Community Health Survey (Canadian Community Health Survey, 2003) were used to obtain information about health-related improvement made in the past 12 months, what improvements they believed they needed to make to current health behaviors, barriers that were preventing them from making these improvements, and factors that would encourage them to engage in positive health behaviors. All questions had multiple response options. Knowledge of IHD risk factors was assessed by asking subjects to respond 'True' or 'False' to ten statements related to the following IHD risk factors: previous history of heart disease, family history of heart disease, physical inactivity, smoking, alcohol consumption, high-fat diet, cholesterol, obesity, diabetes, and hypertension (Ali, 2002). Possible range of scores was 0 to 10, with higher scores representing greater knowledge of IHD-related risk factors.

Health beliefs related to IHD were assessed based on the Health Belief Model (HBM) which has been used as a conceptual framework for understanding a variety of preventive and sick-role behaviors (Janz & Becker, 1984; Stretcher, 1997). The HBM hypothesizes that individuals will undertake take a positive health action if they perceive the disease or condition to be threatening (perceived susceptibility), if they believe it to have potentially serious consequences (perceived seriousness), if they believe the recommended action to be efficacious (perceived benefits), and find barriers to practice the particular health behavior (perceived barriers) to be minimal (Stretcher, 1997). Health behaviors were explained to result from a combination of attitudes related to these four concepts. Subsequently, the model was reformulated to include the concepts of health motivation, cues to action, and self-efficacy to increase its explanatory power (M. H. Becker & Maiman, 1975; Janz & Becker, 1984; Rosenstock, Strecher, & Becker, 1988). Health motivation relates to the tendency of the individual to engage in healthy behaviors (Kim et al., 1991). Unlike the remaining constructs which relate to beliefs about behaviors, health motivation is concerned directly with positive behaviors and is not specific to any particular health condition (M. H. Becker & Maiman, 1975). Self-efficacy reflects the individual's confidence in his or her ability to perform a specific task by overcoming barriers (Bandura, 1977). According to Bandura, one's judgment of self-efficacy influences behaviors undertaken. Individuals tend to undertake tasks they know they can accomplish, and avoid those they think exceed their capabilities (Liou, 2004). A lack of self-efficacy is viewed as a barrier to pursing a recommended health action (Stretcher, 1997).

We developed the IHD health belief scale to measure the health beliefs related to IHD risk based on a validated instrument for assessing beliefs about osteoporosis-related preventive behaviors among women (Cadarette et al., 2004; Kim et al., 1991). As in the osteoporosis health

belief scale, although the concepts of susceptibility and seriousness relate to the singular threat of IHD, multiple health behaviors are associated with the concepts of perceived benefits and perceive barriers, i.e., dietary practices, weight control, physical exercise, smoking cessation, and stress management. The IHD health belief scale focuses primarily on the benefits and barriers associated with a healthy low-fat diet and physical exercise. In addition, subscales to measure self-efficacy related to following a healthy low-fat diet and exercising were included. The IHD health belief scale consisted of nine subscales to measure the following constructs: perceived susceptibility to develop IHD, perceived seriousness of IHD, perceived benefits about following a healthful low-fat diet (dietary benefits), perceived barriers to following a healthful low-fat diet (dietary barriers), perceived benefits of exercising (exercise benefits), perceived barriers to exercising (exercise barriers), general tendency to engage in health behaviors (health motivation), perceived self-efficacy about practicing a healthful low-fat diet (dietary self-efficacy), and perceived self-efficacy about exercising (exercise self-efficacy).

Items from the osteoporosis health belief scale were modified to make them relevant to IHD. Language was changed from second to first person to convey the intention to elicit personal beliefs. For example, the susceptibility item '*Because of your body build, you are more likely to develop osteoporosis*' was changed to '*Because of my current health status, I am more likely to develop heart disease*'. The seriousness item '*It would be very costly if you got osteoporosis*' was changed to '*If I had heart disease, it would interfere with my job/earning capacity*'. The calcium benefits item '*Taking enough calcium cuts down on your chances of broken bones*' was modified to '*A diet low in fat reduces my chances of getting heart disease*'. Items had a five-point Likert type response format with anchors at 1 (strongly disagree) to 5 (strongly agree). Summary scores for each susceptibility and seriousness subscales had 6 items each resulting in possible summary scores

ranging from 6 to 30. The benefits and barriers subscales, and health motivation subscales had four items each, with possible summary scores ranging from 4 to 20. Higher scores represented greater susceptibility, seriousness, benefits, barriers, and health motivation (Appendix A).

A similar five-point response format was used to rate the five-item dietary self-efficacy scale for respondents to rank their confidence in undertaking specific dietary behaviors (Liou, 2004). Possible summary scores ranged from 5 to 25. Self-efficacy for engaging in physical activity was measured by combining two scales. The first, consisting of four items, measured self-efficacy at increasing frequencies of activities over the following month (Culos-Reed & Brawley, 2000). The four items were preceded by the stem, '*How confident are you that you can engage in your favorite physical activity the following number of times each week over the next month:*'. Frequencies ranged from one to four times per week. The second scale was a validated five-item self-efficacy measure designed to measure confidence in one's ability to persist with exercising in various situations, preceded by the stem '*How confident are you that you can participate in regular exercise when:*' (Marcus, Selby, Niaura, & Rossi, 1992). We modified the original response formats such that both scales had a similar three-point response format: not at all confident, fairly confident, and extremely confident. Possible summary scores for the combined 9-item exercise self-efficacy subscale could range from 9 to 27 with higher scores reflecting greater confidence in one's ability to exercise.

General health beliefs were measured by asking how important they believed eight health behaviors were in order for them to keep healthy e.g. physical activity, maintaining optimal body weight, taking traditional herbal medicines, and having religious faith (Rothstein & Rajapaksa, 2003). The final section of the questionnaire related to socio-demographic and personal information. In an open-ended section, respondents were requested to provide comments about their

beliefs, knowledge, and behaviors related to heart health that they felt were not covered in the questionnaire.

Pre-test

The questionnaire was pre-tested on a convenience sample of seven individuals. Individuals were asked to complete the questionnaire and provide feedback on clarity and comprehension of the items, appropriateness of wordings, formatting, sequence of questions, length of time to complete, and relevancy and comprehensiveness of response options. The questionnaire took approximately 25 minutes to complete Modifications were made based on the results of the pre-test. The item '*Smoking predisposes me to develop heart disease*' was removed as it appeared to be applicable only to smokers. The item '*I am afraid I will not be able to maintain a new healthy diet*' was removed as it was found not applicable if the respondent did not intend starting a new diet. More options were added for items with multiple response options.

Translation

The questionnaire was translated to Punjabi (Appendix B). In order to avoid exclusion of subjects who were not proficient in English to ensure a representative sample, we made the questionnaire available in Punjabi as well given that this is the most widely spoken language among ICs (Statistics Canada, 2003). Further, in the period between 2000 and 2003, only 33% of immigrants from India arriving in BC reported English language abilities (BC Stats, 2004). Two bilingual individuals (one health care professional and one lay person) independently translated the questionnaire into Punjabi. Rather than a literal translation, the translators were asked to make changes in the wordings, as appropriate, to maintain cultural relevance in the translated

questionnaire. This was done in consultation with the researcher to ensure that attempts to increase cultural relevance did not affect the conceptual meaning of the translated questionnaire. The Punjabi questionnaire was tested on a sample of four bilingual women. Comprehension difficulties were noted and language was simplified to include words and phrases commonly used in conversational Punjabi. Cross-language equivalence was tested by administering both the translated and original forms of the questionnaire to three bilingual subjects. High correlation was found between individual questions in both languages indicating cross-language equivalence (Del Greco, Walop, & Eastridge, 1987).

Statistical Analyses

Statistical Package for the Social Sciences (SPSS) student version 11.0 software was used for data analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations (SDs)) were used to describe subject characteristics and IHD-related knowledge, beliefs and behaviors. Results were analyzed to distinguish between the IC and EC ethnic groups. Chi-square analyses was used to compare group differences for the categorical variables, whereas independent sample t-tests were used to determine group differences for the continuous variables, i.e., age, years lived in Canada, knowledge scores, and IHD health belief subscale summary scores. Analysis of variance was used to calculate differences between the income categories on the knowledge scores and years of residence in Canada. Within group differences were examined for gender and age for both ethnic groups, and for ICs based on a median split of number of years lived in Canada. To determine the influence of ethnicity, gender, and length of residence in Canada on the IHD health belief variables, independent sample t-tests were performed using the IHD health belief scores as the dependent variables.

Data from rating scales can be analyzed with parametric statistics so long as assumptions of normality, independence, and homogeneity of variance are met (Gaito, 1980; Streiner, 2003). Prior to performing parametric tests assumptions of equality of variance between groups was tested using Levene's test for homogeneity of variance. SPSS calculates the t-statistic and p-value for group differences with equal variances assumed, as well as with equal variances not assumed. In cases where Levene's test revealed unequal group variances, we reported the t-statistic and p-values for the calculation with equal variances not assumed. To reduce the risk of committing a type 1 error, alpha level of 0.05 was used for statistical tests.

Psychometric properties of reliability and validity of the IHD health belief scale were assessed. Two aspects of reliability were assessed: test-retest reliability and internal consistency. Test-retest reliability is the preferred method for assessing reliability of an evaluative instrument where raters are not involved and where the response variable is assumed to be stable (Portney, 2000; Streiner, 2003). We determined test-retest reliability by the intraclass correlation coefficient (ICC) using one-way analysis of variance (Armstrong, 1992). The ICC is a measure of the strength of agreement between repeated measurements. One-way analysis of variance model was selected for the ICC, as this was a simple replication study in that administration of the scale (at time 1 and time 2) was not differentiated by any characteristic (no raters involved or no 'learning effect' was anticipated) (Armstrong, 1992). An ICC of 0.70 or more is recommended for comparisons between groups and 0.90 for evaluation of individual patients (Fayers, 2000; Portney, 2000).

The second aspect of reliability assessed was internal consistency. Internal consistency reflects the extent to which items measure various aspects of the same characteristic and nothing else (Portney, 2000). Cronbach's alpha coefficients (α) were calculated to estimate the internal consistency of each subscale. Cronbach's alpha values between 0.70 and 0.90 are recommended to

reflect strong internal consistency of a scale (Fayers, 2000; Streiner, 2003). If scales have very low correlations, they are possibly measuring different traits, whereas if they have very high correlations it may reflect item redundancy (Portney, 2000). We also calculated the internal consistency for each subscale corrected for overlap (with individual items excluded) to test the effect of each item on the reliability of the scale. According to the Spearman-Browne prophecy, internal consistency of a scale will decrease if an item is excluded as there are fewer items in the scale (Nunnally, 1994). Items for which the Cronbach's alpha does not change or increases with its removal will be identified as poorly functioning items requiring change or replacement as it indicates that the scale is more homogeneous when that item is omitted. Finally, item to total correlation (correlation of the item with its subscale with the item removed) was calculated using Pearson's correlation. Items will be considered satisfactory if the corrected item to total correlation is at least 0.40 (Streiner, 2003).

Validity is the extent to which an instrument measures what it is intended to measure (Streiner, 2003). It is usually assessed by correlating a new measure with an established measure, known as criterion validity. In the absence of an established measure or 'gold standard' for measuring IHD health beliefs, construct validity of the IHD health belief scale was tested using the known groups methods. Using this technique, validity of the measure is supported if the measure successfully differentiates groups that are expected to differ on a critical attribute based on known characteristics or theory. To examine the construct validity of the IHD health belief scale, the following hypotheses were tested using independent sample t-tests: (1) Exercisers (those having sufficient amounts of physical activity recommended by CDC and ACSM) would have lower exercise barriers scores, higher exercise benefits scores, higher health motivation scores, and higher exercise self-efficacy scores compared with those who were not exercising, or were

exercising below the recommended levels (non-exercisers); (2) Individuals who reported practicing positive dietary behaviors regularly (consuming low-fat milk, low-fat cheese, and grilling food regularly) would have lower dietary barriers scores, and higher dietary benefits, higher health motivation, and higher dietary self-efficacy scores compared with those who did not report those positive dietary practices; and individuals who reported deep frying their food regularly would have higher dietary barriers scores, and lower dietary benefits, lower health motivation, and lower dietary self-efficacy scores compared with those who did not; (3) Individuals with a personal history or family history of IHD would perceived themselves to be more susceptible to heart disease, and would have higher perceived susceptibility and perceived seriousness scores compared with those with no personal history or family history; (4) ICs will have higher exercise barrier and lower health motivation scores compared with ECs. Support for the construct validity of the HBM subscales would come from results that document these predicted differences (Portney, 2000).

CHAPTER 4

RESULTS

Subject Demographic and Personal Characteristics

A total of 300 questionnaires (270 English and 30 Punjabi) were distributed. Two hundred and seventeen were returned (response rate of 72%). Of the 120 questionnaires distributed to the ECs, 106 were returned (response rate of 88%), whereas 111 questionnaires were returned from the 180 distributed to the ICs (response rate 62%). Thirteen questionnaires were discarded due to incomplete data or failure to meet the eligibility criteria resulting in a total of 204 completed questionnaires (ICs=102; ECs=102).

Table 1 presents the demographic and personal characteristics of the two groups of subjects. No difference was observed in the gender distribution across groups. Mean age of the ICs was 45 (±16) years and of the ECs was 51 (±16) years (t=-2.82; p=0.005). Compared with the ECs, the ICs were more likely to have obtained a university degree (χ^2=7.79; p=0.005) yet were more likely to have incomes below $40,000 (Cdn) per year ($\chi^2$=38.16; p=0.000). Only 5% of the ICs compared with 30% of the ECs reported annual household incomes of over $80,000 (Cdn) ($\chi^2$= 20.94; p= 0.000). The ICs reported more members per household (range: 1 to 11 people) compared with the ECs (range: 1 to 5 people) (t=6.59; p=0.000). Mean length of residence in Canada for the ICs was 10.7 (±10) years (range: 3 months to 41 years). Although no differences were detected in the various employment categories, i.e., full-time, part-time, and self-employed, more of the ICs were unemployed compared with the ECs (15% compared with 2%) (χ^2=10.99; p=0.001), and more of the ECs were retired (33% compared with 19%of the ICs) (χ^2=5.54; p=0.019). Fifty-one percent of the ICs reported being proficient in English (self-reported proficiency in speaking, reading, and writing) compared with 89% of the ECs (χ^2=34.63; p=0.000).

IHD-related Knowledge, Behaviors, and Beliefs of ICs and ECs

IHD-related Knowledge

Scores on the 10-item knowledge questionnaire were higher among the ECs (9.1±1.3) compared with the ICs (8.6±1.4) (t=-2.82; p=0.005) supporting the ECs' higher level of awareness about IHD risk factors. No differences in knowledge scores across income levels were detected within either ethnic group (IC: F=2.34; p=0.102; EC: F=0.31; p=0.734). The percent of correct responses for each of the 10 knowledge items revealed differences between the ethic groups for certain risk factor knowledge. Only 56% of the IC respondents, responded correctly to the item '*It is normal for older adults to have high blood pressure*', compared with 76% of the ECs (χ^2=8.21; p=0.004), and 82% ICs compared with 95% of the EC responded correctly to the item '*A history of heart disease in the family does not increase one's risk of heart disease*' (χ^2=7.47; p=0.006). Details of the percentage of correct responses of the two ethnic groups for the 10 knowledge items are presented in Figure 2.

No gender differences in mean knowledge scores were observed for either the ICs (t=-0.95; p=0.346) or the ECs (t=0.21; p=0.833). Similarly, when the groups were divided based on median age (ICs = 42 years; EC = 49 years), no age differences in mean knowledge scores were observed for either the ICs (t=1.26; p=0.210) or the ECs (t=-0.98; p=0.328).

IHD-related Behaviors

General health behaviors and risk factors

No group differences were observed for duration of night's sleep and prevalence of tobacco smoking (Table 2). The majority of the ICs (73.3%) were non-drinkers compared with 25% of the ECs (χ^2=46.83; p=0.000), and reported eating fewer than four meals a day

compared with ECs (χ^2=15.87; p=0.000). With respect to stress-management strategies, the ICs were less likely to walk or exercise (χ^2=38.6; p=0.000) and more likely to perform religious or spiritual activities compared with the ECs (χ^2 =14.90; p=0.000). Talking with family and friends, performing yoga, volunteering, and performing breathing exercises were reported by both the ICs and the ECs as means of reducing stress. In addition, more ECs reported having hobbies such as sewing, woodcarving, home renovations, painting, and photography (χ^2=14.97; p<0.001). In response to the item '*Do you think there is anything else you think you should do to improve your health*?' more ICs (61%) compared with ECs (42%) reported that they needed to increase their physical activity (χ^2 = 7.52; p=0.006).

The two groups differed in the factors they perceived as barriers to improving their health behaviors. Lack of will-power or self discipline was reported as a barrier by more ECs (58%) compared with ICs (35%) (χ^2=10.51; p=0.001). Weather conditions (χ^2=6.80; p=0.009), language difficulties (χ^2=4.0; p=0.043), and being too tired or too stressed (χ^2=4.48; p=0.034) were barriers for a higher proportion of the ICs. Programs offered in their language-of-choice (χ^2=7.88; p=0.005), advice from religious leaders (χ^2=6.24; p=0.012), and family support (χ^2=6.17; p=0.013) were cited as facilitating factors by a higher proportion of the ICs compared with ECs. Interestingly, only 4% of ICs compared with 28% of ECs (χ^2=22.32; p=0.000) reported that being diagnosed with heart disease would encourage them to engage in positive health behaviors.

An examination of the gender differences in health behaviors revealed that the majority of the IC women (87%) did not drink alcohol compared with IC men (61%) (χ^2=8.76; p=0.003) (Appendix C). In both ethnic groups, more men ate fewer than four meals a day compared with women (IC: χ^2=4.55; p=0.03; EC: χ^2=7.03; p=0.008). Time and expense as

barriers to improving health were reported more often by EC women compared with EC men, and a higher proportion of the IC women compared with the IC men indicated that they would be encouraged to practice healthy behaviors if they received specific advice such as cooking classes and stress management programs (χ^2=4.44; p=0.035).

When the groups were divided based on median age, a higher proportion of older ICs reported that they exercised to reduce stress (χ^2=12.71; p=0.000). A higher proportion of the younger ICs indicated that lack of time was a barrier to exercising (χ^2=9.14; p=0.003); a similar trend was observed in ECs (χ^2=4.67; p=0.031). More of the younger ECs indicated that having access to specific advice would help them practice positive health behaviors (χ^2=6.75; p=0.009) whereas no such difference was observed among ICs.

Self-reported risk factors are presented in Table 3. Hypertension was the most common self-reported risk factor (21%), followed by diabetes (20%) in the IC group, whereas high levels of cholesterol (17%) was the most common risk factor among the ECs followed by hypertension (14%). A higher proportion of ICs reported having diabetes compared with ECs (χ^2=12.08; p=0.001).

Physical activity and exercise

Responses to the physical activity questionnaire are summarized in Table 4. A higher proportion of self-reported exercisers were observed in the EC group compared with the IC group (χ^2=28.43; p=0.000). A higher proportion of the ECs (74.7%) were exercising at least three times a week compared with the ICs (54.5%) (χ^2=8.38; p<0.004) and for at least 30 minutes a session (81% of ECs compared with 41% ICs) (χ^2 = 31.99; p<0.000). No differences were observed in the exercise intensities between the two groups. A majority of the ECs (90%)

reported that they had been exercising at their current level for at least 3 months (compared with 63.8% of the ICs) ($\chi^2 = 18.04$; $p<0.000$). Individuals were classified as either meeting the CDC and ACSM recommended levels of physical activity (exercisers) (i.e., if they exercised at least three times a week for at least 30 minutes at intensities that resulted in breathing at least '*a little faster than normal*'), or as non-exercisers, if they did not meet these criteria. Based on these criteria, only 16% of the ICs were classified as exercisers compared with 44% of the ECs ($\chi^2=25.42$; $p=0.000$).

Although no differences were observed for proportions participating in the free form exercises such as brisk walking, swimming, and jogging or running, more of the ECs reported performing 'other' physical activities ($\chi^2=26.34$; $p<0.000$). Almost 60% of the ECs participated in some form of sport such as field hockey, soccer, skiing, and volleyball, and exercises such as weight training, aerobics, stretching and flexibility, yoga, and attending structured fitness classes (e.g., osteofit, aquacize, aerobics, and Pilates). Comparatively, only 22% of the IC respondents reported participating in similar activities. Differences were detected in the locations where participants exercised (Figure 3). Fewer of the ICs were exercising at gyms ($\chi^2=9.61$; $p<0.002$) and recreation centers ($\chi^2=9.31$; $p<0.002$) compared with the ECs.

Based on the ACSM criteria, an examination of gender effects revealed no differences in the proportion of exercisers and non-exercisers in either the IC or the EC ethnic groups (Appendix D). More EC women chose brisk walking compared with EC men ($\chi^2=4.81$; $p=0.03$). With respect to age, although a higher proportion of older ICs (77%) reported that they exercised ($\chi^2=4.09$; $p=0.043$), this group difference was not statistically significant when individuals were classified based on the CDC and ACSM recommendations ($\chi^2=0.85$; $p=0.356$). Similarly, no

difference was observed in the proportion of exercisers among younger and older ECs (χ^2=0.61; p=0.436).

Examination of the relationship between selected demographic variables and exercise performance revealed no differences in age (t=0.07; p=0.948), duration of residence in Canada (t=-0.14; p=0.887), knowledge scores (t=-0.36; p=0.722), or body mass indices (t=0.60; p=0.553) between exercisers and non-exercisers in the IC group. Also, gender (χ^2=0.32; p=0.852), household income (χ^2=0.01; p=0.994), and proficient English language skills (χ^2=0.28; p=0.868) were not associated with exercise performance. Similarly, in the EC group, no differences were detected in the mean age (t=0.01; p=0.991), knowledge scores (t=-0.14; p=0.890), and body mass indices (t=-0.78; p=0.438) between exercisers and non-exercisers, nor were gender (χ^2=1.42; p=0.491) or annual household income associated with exercise performance (χ^2=3.50; p=0.173).

Dietary practices

Responses to the dietary questions were collapsed into two frequency categories: fewer than 3 times a week (less than once a week, once a week, twice a week) and at least 3 times a week (3 times a week, 4 or more times a week). We compared proportions of individuals engaging in specific dietary and food preparation practices at least 3 times a week (Table 5). A higher proportion of the ECs reported consuming red meat (χ^2=20.47; p=0.000), drinking milk with reduced fat (χ^2=6.59; p=0.010), eating cheese and other dairy products (χ^2=40.17; p=0.000), eating desserts (χ^2=7.84; p=005), eating snacks between meals (χ^2=9.196; p<0.002), and eating vegetables or fruit as snacks (χ^2=6.097; p<0.014) at least three times a week, compared with ICs. A higher proportion of ECs reported grilling their food (χ^2=4.67; p=0.031), whereas a higher proportion of the ICs reported deep frying their food at least three times a week (χ^2=22.95; p=0.000).

With reference to gender differences within the ethnic groups, although an equal proportion of the IC men and IC women reported drinking milk regularly, only 22% of the men compared with 45% of the women reported consuming milk with reduced fat (χ^2=5.64; p=0.018). A greater proportion of the IC women reported snacking between meals compared with IC men (χ^2=8.16; p=0.004). More of the EC women reported consuming cheese or other dairy products (χ^2=3.89; p= 0.050), low-fat cheese (χ^2=4.36; p=0.037), and fruits and vegetables as snacks (χ^2=8.45; p=004) at least three times a week compared to EC men. Details for the responses to the food questionnaire by ethnic group and gender appear in Appendix E. An examination of the effect of age on dietary practices revealed no differences between older and younger ICs, with the exception of snacking in between meals, which was more common among the younger ICs (χ^2=9.65; p=002).

IHD-related Beliefs

The IHD health belief scale consisted of nine subscales for the HBM variables: perceived susceptibility to develop IHD, perceived seriousness of IHD, dietary benefits, dietary barriers, exercise benefits, exercise barriers, health motivation, dietary self-efficacy, and exercise self-efficacy. Each subscale consisted of between four to nine items, each with a five-point response format ranging from 1 (strongly disagree) to 5 (strongly agree). Summary scores for each subscale were obtained by adding the responses to each item contained within the subscale. Subscales that were missing item responses were removed from the analysis (for that particular subscale) hence the 'n' varies across the subscales.

Missing data for the exercise self-efficacy subscale were treated differently. The exercise self-efficacy scale comprised of two sub-parts. The first part measured the individual's

perceived efficacy level of exercising at increasing frequency of days (from one to four days a week) over the following month. Respondents were required to indicate their level of confidence about exercising for each frequency of days. However, as many as 61 respondents (ICs=29 and ECs=32) selected only the highest number of days at which they were 'confident' about exercising, without indicating their level of confidence about exercising at the lower frequency of days, as we had expected them to. Hence, if a respondent answered 'very confident' about exercising three days a week, we assumed that they would be 'very confident' about their ability to exercise one day and two days a week. For the higher frequency of days (in this case, 4 days a week), we assumed that they were 'not at all confident' about their ability to exercise. In this way, exercise self-efficacy scores were computed for 88 ICs and 98 ECs.

Independent sample t-tests identified differences between ethnic groups for five of the nine IHD health belief subscales (Table 6a). The ICs had higher dietary benefits scores (t=5.80; p=0.000), higher exercise benefits scores (t=2.12; p=0.036), higher exercise barriers scores (t=5.70; p= 0.000), lower health motivation scores (t=-2.39; p=0.017), and lower exercise self-efficacy scores (t=-3.74; p=0.000) compared with the ECs.

No differences were observed in the health beliefs scores between IC men and women, however the EC men had lower scores for dietary self-efficacy compared with EC women (t=-3.31; p=0.001) (Appendix F). Similarly, the IHD health belief subscale scores did not differ between younger and older ICs, whereas exercise benefits were higher among younger ECs compared with older ECs (χ^2=3.64; p=000).

Beliefs about factors respondents considered 'very important' for keeping healthy are summarized in Table 6b. The majority of subjects in both groups believed that eating the

right kinds of food, having adequate rest and sleep, and maintaining ideal body weight were important for them to keep healthy. A higher proportion of the ECs (83%) considered adequate physical activity to be very important compared with the ICs (63%) (χ^2=10.33; p=0.001), whereas a higher proportion of the ICs (50% compared with 44% of the ECs) believed that having religious faith was very important (χ^2=19.16; p=0.000).

Although general health beliefs were the same for both men and women in the IC group, differences were observed between EC men and women (Appendix G). A higher percentage of EC women believed that adequate rest and sleep (χ^2 = 8.63; p=0.003), regular medical check-ups (χ^2=9.53; p=0.002), and taking vitamins (χ^2 = 4.00; p=0.046) were very important for keeping healthy compared with EC men. Certain beliefs varied between older and younger individuals. More of the older ICs believed that religious faith (χ^2=8.06; p=005), and traditional medicines (χ^2=6.79; p=009) were important for health whereas more of the older ECs believed in the importance of regular medical checkups (χ^2=7.41; p=006) and vitamins (t=3.81; p=051).

With respect to social support and the extent to which respondents agreed they could count on others to motivate them to practice positive health behaviors, 43% of the ICs believed they could count on their spiritual leaders compared with 10.8% of ECs (χ^2=25.50; p=0.000). No gender differences within the IC group with respect to their support system were noted, however more of the EC women (53%) compared with the EC men (32%) reported that they could count on friends to motivate them to practice positive health behaviors (χ^2 = 4.75; p=0.029). In both ethnic groups, older individuals were more reliant on their physicians to motivate them for positive health behaviors.

Age Adjusted Analyses

Age differences observed between the IC and EC groups in the original sample (t=-2.82; p=0.005), prompted us to verify whether observed differences between the ethnic groups were confounded by the effect of age. Accordingly, we adjusted the ethnic groups for age by excluding individuals below 25 years and above 75 years of age, and repeated all analyses. The resulting age-adjusted sample consisted of 93 ICs with mean age 45 (±14) years and 92 ECs with mean age 49 (± 14) years (t=-1.95; p=0.053). The majority of group differences observed originally were maintained including differences in income and education level. Additional differences were observed (Appendix H). For example, a higher proportion of the ICs reported having high levels of stress compared with the ECs (χ^2=4.35; p=0.037) and more ECs compared with ICs reported listening to music or watching TV to relieve their stress (χ^2=4.27; p=0.039), although these difference were not observed in the original groups. With respect to IHD health beliefs, perceived exercise benefits, originally observed to be higher among ICs compared with ECs, was not different between the age-adjusted groups (t=1.48; p=0.140). Differences with respect to general health beliefs, social support network, and risk factors were maintained for the groups after adjusting for age. In addition to the two knowledge items that elicited different accurate response rates from the IC and EC groups, items related to smoking and cholesterol were answered correctly by a higher proportion of ECs compared with ICs. Finally, consumption of low-fat milk at least three times a week was observed to be similar between the groups after adjusting for age, although in the original sample, this practice was observed to be different between the groups.

The Relationship Between IHD-related Behaviors and Beliefs

Relationships between IHD-related health beliefs and selected health behaviors were examined by performing t-tests, using the health behavior as the independent variable. In the EC group, exercisers had higher scores for health motivation (t=3.52; p=0.001) and exercise self-efficacy (3.59; t=0.001) compared with non-exercisers, whereas in the IC group exercisers had higher scores for exercise benefits (t=2.52; p= 0.014) and health motivation (t=2.88; p=0.005) compared with non-exercisers (Table 8). With respect to dietary practices, no differences were observed in the IHD health belief scores among individuals who grilled their food at least three times a week and those who did not. IC respondents who reported deep frying their food regularly had higher perceived susceptibility scores compared with those ICs who did not use this method of food preparation as regularly (t=-2.25; p=0.027).

We assessed the relationship between perceptions of what constituted important health behaviors and actual health practices. In both IC and EC groups, individuals who indicated that exercise was very important for staying healthy were more likely to exercise compared with those individuals who did not identify this behavior as important. Of those ICs who considered exercise to be 'very important' for health, 29% actually exercised. Among those ICs who did not state that exercise was important, none were exercising at sufficient levels (χ^2=11.16; p=0.001). Similarly, 50% of the EC group who stated that exercise was important actually exercised compared to 20% of those who did not believe this behavior to be 'very important' (χ^2 = 4.62; p=0.032). However, although those identifying exercise as important were more likely to practice them, the percentages were low in general, and lower in ICs compared with ECs (29% of 63% in ICs and 50% of 83% in ECs) (χ^2=5.51; p=0.019).

No difference was observed between men and women with respect to the proportion of individuals who cited exercise was importance and actually exercised in either the IC (χ^2=0.021; p=0.884) or the EC group (χ^2 = 0.778; p=0.378). We also examined the effect of length of time lived in Canada and observed no difference between long-term and recent immigrants (χ^2=0.192; p=0.662).

With respect to healthy dietary practices, 80% of the IC and 80% of the EC respondents indicated that eating the right foods was 'very important' for them to keep healthy. Among these individuals, 19% of ICs reported deep frying their food at least three times a week compared to 24% of those ICs who did not report this behavior to be important (χ^2=0.00; p=0.956). Further, compared to the 19% of IC who deep fried their food regularly, none of the ECs who believed that eating the right foods was 'very important', reported this behavior (χ^2=16.75; p=0.000).

A higher proportion of the ICs (26%) compared with the ECs (14%) (χ^2=4.49; p=0.034) reported that feeling too tired or too stressed prevented them from engaging in positive health behaviors. Correspondingly, a smaller proportion of this group exercised to relieve their stress (49% of the ICs compared with 89% of the ECs) (χ^2=38.61; p=0.000). Thirty-nine percent of the ICs compared with 22% of the ECs indicated that family support would encourage them to engage in healthy behaviors (χ^2=6.17; p=0.013), which corresponded with the higher proportion of this group that counted on their family members to motivate them to engage in positive health behaviors (χ^2=3.66; p=0.055).

Duration of Residence in Canada

To examine the effect of duration of residence in Canada with respect to IHD-related knowledge, behaviors, and beliefs the IC group was divided based on the median number of years lived in Canada (7 years). Demographic and personal characteristics of the two groups appear in Table 8. Subjects who had lived in Canada more than 7 years were older ($t=-5.59$; $p=0.000$), less likely to have a university degree ($\chi^2=8.99$; $p=0.003$), less likely to be proficient in English ($\chi^2=5.85$; $p=0.016$), and more likely to have higher annual household incomes ($\chi^2=10.60$; $p=0.005$) compared with people who had lived in the country for less than eight years. Annual household income was related to duration residence in Canada ($F=4.66$; $p=0.002$).

General health behaviors of the two groups based on a median split of the number of years lived in Canada are presented in Table 9. A greater proportion of long-term immigrants (69%) compared with recent immigrants (32%) reported that they walked or exercised to relieve stress ($\chi^2=14.12$; $p=0.000$). Using the CDC and ACSM recommendations for adequacy of exercise levels for health, no difference was observed in the proportion of exercisers between the groups based on length of residence in Canada ($\chi^2=2.86$; $p= 0.240$), although based on self-report, a higher proportion of long-term residents reported exercising (84%) compared with newer immigrants (51%) ($\chi^2=13.16$; $p=0.000$).

Certain food habits differed between the groups (Table 9). A greater proportion of long-term IC immigrants reported consuming low-fat cheese (22% compared with 8%) ($\chi^2=4.28$; $p=0.039$). In terms of food preparation methods used, a higher proportion of the recent immigrants (30%) reported deep frying their food at least three times a week ($\chi^2=6.54$; $p=0.011$) whereas a lower proportion of this group reported baking their food ($\chi^2=7.91$;

p=0.005), compared with those who had lived in Canada for more than 7 years. No differences were observed in the cardiac risk factor profile between the two groups (Table 10).

With respect to environmental barriers and facilitators, a higher proportion of recent immigrants (20%) reported that having access to specific health-related information would help encourage them to participate in positive health behaviors compared with longer-term immigrants (2%) (χ^2=7.98; p=0.005). The IHD health belief subscales demonstrated no differences between the groups for any of the HBM variables (Table 10a). Differences were noted, however, in the general health beliefs. A higher percentage of newer residents considered physical activity (χ^2=5.3; p=0.021), and adequate rest and sleep (χ^2=4.13; p=0.042) to be 'very important' for keeping healthy compared with long-term residents (Table 10b).

Psychometric Evaluation of the IHD Health Belief Scale

Test-retest reliability

Three weeks after initial completion of the questionnaire, we contacted 30 subjects to participate in the reliability study. Twenty-seven agreed to participate, and were sent a second copy of the questionnaire; 23 were returned. One questionnaire was discarded due to missing data. Complete information was received from 22 individuals.

After examining the scatter plots and adjusting for outliers, 4-week test-retest reliabilities of the IHD health belief subscales were calculated. Intraclass correlation coefficient values ranged from 0.60 (95% Confidence Interval (CI): 0.21 - 0.83) for dietary self- efficacy to 0.90 (95% CI: 0.76 - 0.96) for susceptibility (Table 12). All of the test-retest correlation coefficients were significant ($p < 0.05$).

Internal Consistency

Internal consistency coefficients were calculated for each IHD health belief subscale and by correcting for overlap, i.e., by sequential exclusion of individual items (Table 13). Internal consistencies (Cronbach's alpha) ranged from 0.66 (health motivation) to 0.87 (perceived susceptibility). To determine how well each item fit the overall subscale, alpha was computed repeatedly, eliminating each item of the subscale from the analysis. If elimination of an item does not change or increases the alpha value of the subscale, it suggests low internal consistency of the item with the subscale. Omission of one item from the susceptibility subscale ('*My family history makes it likely that I will get heart disease*'), one item from the diet barriers subscale ('*A low-fat diet is expensive*'), and one item from the exercise self-efficacy subscale ('*I am confident that I can participate in regular exercise when I am on vacation*') increased the internal consistency of the subscale suggesting the misfit of these three items in their respective subscales. Pearson's item to total correlations were calculated between each item and subscale with the item removed. Four items (19, 28, 32 and 45) had item to total correlations of less than 0.40 between the item and the subscale score.

Construct Validity

Construct validity of the IHD health belief scale was evaluated using the entire sample (n=204). As hypothesized, exercisers had lower exercise barriers scores (t=-3.04; p=0.003), higher health motivation scores (t= 5.47; p=0.000), and higher exercise self-efficacy scores (t= 4.81; p=0.000) compared with non-exercisers (Table 13a). However, no differences were observed in exercise benefits, between the two groups (t=-0.48; p=0.633). Subjects who reported regularly consuming milk with reduced fat had lower dietary barriers scores (t=-2.04;

p=0.043) compared with those who did not (Table 13b) whereas no differences were observed in subscale scores for consumption of low-fat cheese. Those subjects who reported grilling their food at least three times a week had higher health motivation scores (t=-2.16; p=0.032) compared with those who did not, and subjects who reported deep frying their food had higher perceived susceptibility and compared with those who did not deep fry as often (t=-2.43; p=0.016). Interestingly, these subjects also had higher diet benefit scores (Table 13c-d). Subjects with a self-reported personal or family history of heart disease had higher perceived susceptibility (t=7.56; p=0.000) compared with those with no personal or family history of IHD although no differences were observed for perceived seriousness scores (t=0.69; p=0.492) (Table 13e). As hypothesized, the ICs had higher exercise barriers scores (t=5.703; p=0.035) and lower health motivation scores (t=-2.40; p=0.017) compared with the ECs (Table 6a.).

CHAPTER 5

DISCUSSION

Immigrants from the Indian subcontinent have a high mortality from IHD. Established risk factors such as high total cholesterol, smoking, and hypertension alone do not explain this high mortality. Rather, a unique profile of risk factors characterized by insulin resistance syndrome, high triglyceride concentrations, low levels of high-density lipoprotein, abdominal obesity, and high levels of lipoprotein (a), has been suggested as the underlying mechanism for this increased risk. This unique risk factor profile is believed to be a result of genetic and metabolic risk factors in conjunction with lifestyle-related risk factors acquired in a westernized environment (Hakeem et al., 2001; Nath et al., 1998; B. Williams, 1995). Similar high rates of IHD observed in Indian cities as those observed in East Indians populations abroad suggest an important role for lifestyle factors in the etiology of IHD in this group. Given the high prevalence of IHD in East Indian immigrants in Canada, the increasing East Indian immigrant population, and the greater proportion of older individuals in this group, the burden of this disease in terms of mortality, quality of life, and health care cost could be considerably disproportionate in this group which suggests a need for primary prevention strategies to reduce the burden of IHD in this group.

The present study examined the IHD-related knowledge, behaviors, and beliefs of East Indian immigrants in Canada, using a reference European Canadian group to compare, and contrast differences between these two groups having distinct cultural orientations, so that prevention strategies may be based on an understanding of their belief system which strongly influences the way people receive and respond to health information. Results of this study concur with previous work in identifying a complex interplay of environmental and cultural factors influencing the health behaviors of East Indian immigrants in the west. It further identified cultural differences

between the two ethnic groups with respect to IHD-related behaviors and beliefs which have implications for design and delivery recommendations for health education strategies. Areas for future research have been identified.

IHD-related Knowledge, Behaviors, and Beliefs of ICs and ECs

Although age, income, and education, important determinants of health and health behaviors (Furnham & Kirkcaldy, 1997; D. R. Williams & Collins, 1995) were different between the ICs and the ECs in our study, differences in income and education remained when age was held constant. This pattern parallels the demographic characteristics of immigrants in BC who possess a higher level of educational qualifications as a result of the Canadian immigration selection process for the business and skilled worker categories (BC Stats, 1993). Further, group differences in IHD-related knowledge, behaviors, and beliefs were maintained when the data were age-adjusted.

IHD-related Knowledge

Existing literature about the knowledge and awareness of IHD among South Asians consists mainly of qualitative studies with unrepresentative group sampling. One group of South Asians studied had lower than optimal awareness of risk factors of heart disease with respect to cholesterol and disease causation (Kalra et al., 2004). Another group demonstrated a limited awareness about the link between smoking and alcohol consumption and IHD (Farooqi et al., 2000). Webster and colleagues (Webster et al., 2002) reported, in a group of East Indian immigrants in the United Kingdom with cardiac disease, that they had poor knowledge about what to expect during recovery. Using an objective questionnaire and inferential methods, observation of lower levels of knowledge of IHD risk factors in ICs compared with ECs in this study were consistent

with findings reported by Pardhan and Mahomed (Pardhan & Mahomed, 2004). Such identification of specific knowledge gaps are important to identify and target when providing health education for ICs. For example, information related to normal ranges of blood pressure and the role of cholesterol as a IHD risk factor are relatively less understood by IndoCanadians and may be important to focus on. For further detail see section on Content.

IHD-related Behaviors

General health behaviors and risk factors

General health behaviors observed in the migrant IC groups were consistent with previous reports in that ICs were less likely to smoke (Bhopal et al., 2002), or consume alcohol (Kamath et al., 1999; R. Williams et al., 1994), and had a higher prevalence of self-reported diabetes compared with ECs (Anand et al., 2000; Bhopal et al., 1999; Cappuccio, Cook, Atkinson, & Strazzullo, 1997; Gupta et al., 2002; Jenum, Holme, Graff-Iversen, & Birkeland, 2005). In this study, mean body mass indices were not dissimilar between groups and were within normal range for both groups. Findings that South Asians have similar or higher prevalence of IHD compared with other ethnic groups despite lower mean body mass indices (Anand et al., 2000; Gupta et al., 2002) led to formulations of guidelines for body mass index classification specific to this group (Singh et al., 1996). For this ethnic population, a range of 19 to 23 kg/m^2 is recommended as normal, values between 23 and 25 kg/m^2 are considered overweight, and values greater than 25 kg/m^2, obese (Singh, Rastogi et al., 1997). Using these criteria, 60% of the ICs in this sample were overweight, and using the convention cut-off (greater than 25 kg/m^2), 40% of the ECs (χ^2=7.84; p=0.005) were overweight. Thus, the use of population specific risk factor identification guidelines

may detect a higher prevalence of this risk factor in the IC group that may otherwise remain undetected using conventional cut-offs (Singh et al., 1996).

Physical activity and exercise

As in our study, lower rates of participation in regular exercise and sports (Dhawan & Bray, 1997; Fischbacher, Hunt, & Alexander, 2004; Hayes et al., 2002; Health Survey for England 1999, 2000; Kamath et al., 1999; Knight et al., 1993; Lean et al., 2001) have been consistently reported in East Indian immigrant compared with indigenous populations, and has been described as a 'cultural phenomenon' (Naeem, 2003). Several hypotheses have attempted to explain the lower rates of physical activity in South Asian groups embracing environmental and cultural factors (Choudhry, 1998; Farooqi et al., 2000; Lawton et al., 2005; Naeem, 2003). Findings that a smaller proportion of ICs reported exercising to help them relax and a larger proportion reported that time constraints and being too tired or stressed prevented them from participating in healthful behaviors provide evidence that East Indians are less inclined to view exercise as an integral part of their everyday activities (Farooqi et al., 2000). Awareness of this cultural barrier among ICs implies that health professionals advising behavior change should find ways to prescribe activities that are flexible in terms or when and where they can be performed, and capitalize on activities that are already part of an individual's routine so as to integrate regular physical activity into their lifestyle. Further recommendations for addressing this cultural barrier are presented in the Delivery section of the Discussion.

IndoCanadians were less likely to attend fitness classes or use public fitness facilities compared with their EC counterparts, as was previously reported in other groups of South Asians (Choudhry, 1998; Lawton et al., 2005). Cultural expectations about modesty, and gender

segregation, a lack of socialization into sport and outdoor activities, family obligations and work commitments which are given priority over personal leisure-time pursuits, and environmental factors such as language barriers and dislike for going outdoors in bad weather may limit their ability or desire to attend such facilities (Choudhry, 1998; Farooqi et al., 2000; Lawton et al., 2005; Naeem, 2003). This may also be a reflection of the East Indian culture. According to anthropologist Edward Hall's classification of cultural patterns (Hall, 1989), an important attribute of high-context cultures, in contrast with low-context cultures, is the extent to which individuals distinguish members of their own culture (ingroup) with whom they share internalized beliefs, values, and norms, from members of another culture who do not share these common understandings (outgroup). This perceived distinction may result in the tendency for ICs to remain within their ingroup, limiting their interaction with members of the outgroup. These compact social networks among immigrants not only limit their interactions with and influence from outside the network (Bottorff et al., 1998), they also promote retention of traditional belief and possibly active resistance to new ways of thinking and behaving. Although there is no evidence to support the extent to which this occurs among ICs, it is likely to apply more to those ICs who are less integrated into the Canadian society such as older individuals, and those who do not work (Varghese & Moore-Orr, 2002).

The findings that environmental as well as cultural factors determine exercise behavior in ICs, is important for health educators and health professional to identify barriers and suggest ways in which they can be overcome in discussion with IC clients. For example, utilizing cultural or religious community centers or other popular gathering places for ICs as locations for health education and walking groups provides a familiar surrounding, and capitalizes on activities already part of their routine. Group activities at these centers may

further increase the 'fun factor' so that exercise becomes a socially rewarding experience (M. Johnson, 2000).

The pattern of barriers and facilitators identified by the ICs and ECs was distinct and reflected their respective cultural orientations. The ECs were more likely to identify factors related to the individual (i.e., lack of self-discipline, and diagnosis with a heart disease), whereas ICs more often identified factors related to their environment (i.e., weather and language), and their social support system (i.e., family members and religious persons). Dependence on family support and religious faith in matters related to illness recovery (Khan & Pillay, 2003; Webster et al., 2002) and general health behaviors (Bottorff et al., 1998; Choudhry, 1998; Lawton et al., 2005) have been reported in South Asian focus group studies. Our findings support that difference between the ethnic groups with reference to barriers and facilitators for positive health behaviors are influenced by their respective cultural orientations, in accordance with the theory of cultural differences (Hofstede, 1980). Identification of the value of social support systems has implications for designing health promotion programs. For example, emphasizing that healthful practices adopted by the individual are beneficial for the health of the entire family, targeting health education to the family as well as the individual, and enlisting the support of religious or other community leaders to endorse health promotion programs may encourage ICs to practice healthy behaviors that have been sanctioned by key members of their social support system.

The findings confirmed reports that ICs are less inclined to improve their health behaviors if they are diagnosed with a medical condition (Webster et al., 2002), pointing to the role of a fatalistic attitude toward disease causation underlying the passive approach to lifestyle modification. Empowering the client to make lifestyle changes through education focusing on

the effects of exercise and other positive health behaviors on risk factors reduction and control should be the goal of any health education or health promotion initiative targeted toward this group. Rather than simplistic messages, participatory action research, which is a group approach to learning involving creation of knowledge via stories which is then applied toward learning and facilitating action for change, has been identified as a valuable approach to empowering South Asians and other ethnic groups, and enhancing their health promoting activities (Choudhry et al., 2002; Greenhalgh, Collard, & Begum, 2005). From the health education perspective, emphasizing that improvement in health practices not only has implications for the health of the entire family but also in terms of increasing their ability to continue with their familial duties might have a role in facilitating a positive change in health behavior.

Dietary practices

South Asians have been reported to have high intake of fat in their diet as a result of traditional diets and food preparation methods (Lip et al., 1995; Park, 2004), which was observed in the present study. Despite being aware of the benefits of healthy cooking, and the detrimental effects of diets high in fat, ICs may be less likely to modify their cooking style to reduce the amount of fat due to inadequate knowledge about nutritional value of traditional diets and cultural practices that encourage the consumption of foods that are often high in fat (Farooqi et al., 2000; Kalra et al., 2004; Pardhan & Mahomed, 2004; Varghese & Moore-Orr, 2002). Health messages including specific advice about the nutritional content of traditional diets should be targeted toward mothers or other key members, typically the most senior woman, in charge of food preparation of the household. Cultural values that equate the nurturing role of a mother with the preparation of rich

foods may be addressed by educating mothers about the detrimental effects of these kinds of foods, and suggesting ways to substitute ingredients to maintain taste and nutritional value, while reducing the calorie and fat content.

IHD-related Beliefs

The HBM variables related to IHD preventive behaviors provided an objective method for comparing beliefs between the IC and EC groups. The lower levels of health motivation and exercise self-efficacy observed in the IC group compared with the ECs corroborate previous reports of a perceived lack of control and reduced sense of individual responsibility over one's health (Lawton et al., 2005; Stone et al., 2005; Webster et al., 2003). The finding that ICs perceived higher barriers to exercising is not surprising, given the cultural norms and expectations that impose barriers to participation in health promoting activities (M. Johnson, 2000). Although the ICs reported higher perceived benefits for both exercise and low-fat dietary practices, they were less likely to perform these health behaviors, a paradox that may partially be explained by the prevalence of traditional social and cultural values that limit the group's ability to make positive health choices (Kalra et al., 2004). Health education targeted toward the ICs should focus on addressing ways to increase health motivation and self-efficacy through empowerment of the individual. Details for health education implications are discussed in detail the Content section of the Discussion.

The Relationship Between IHD-related Behaviors and Beliefs

In the past, HBM variables have been used to predict heart disease preventive behavior and self-management of associated risk factors. Mirotzik and colleagues (Mirotznik et al., 1995)

reported that heath motivation and perceived seriousness of IHD risk were associated with adherence to an exercise program, whereas perceived barriers in terms of the capacity of exercise to cause health problems was not. With respect to diabetes management, Koch and colleagues (Koch, 2002) reported that perceived benefits and barriers related to exercise and glycemic control successfully differentiated 'exercisers' from 'non-exercisers'. Similarly, examining the relationship between diabetes-specific treatment barriers and self-efficacy, Aljasem and co-workers (Aljasem, Peyrot, Wissow, & Rubin, 2001) reported that perception of fewer barriers was associated with better exercise performance, and that self-efficacy was related to more positive dietary practices, medication behavior, and self-management behaviors. Recently, Al-Ali and Haddard (Al-Ali & Haddad, 2004) reported a positive correlation between health motivation and exercise participation, and a negative correlation between barriers and exercise participation in a group of Jordanians with myocardial infarction.

In this study, association between beliefs and health behaviors differed between two groups. Health motivation and exercise self-efficacy were associated with exercise performance in the EC group, whereas perceptions of the benefits of exercise and health motivation were associated with exercise performance in the IC group. These cross-cultural comparisons must be made with caution because the original HBM constructs may interact differently across groups culturally distinct from the North American population for which it was originally designed (Airhihenbuwa, 1995; Rodriguez-Reimann et al., 2004). Although health motivation was identified as an important factor in determining exercise performance in both groups, ways to address this in health education programs would differ. The association between self-efficacy and exercise performance in the EC group and findings that more ECs identified lack of self-discipline as a barrier to exercise performance support that Canadians tend to be individualistic in their orientation toward health and

illness (Hofstede, 1980, 1986). Therefore, health education targeted toward this group should focus on increasing intrinsic health motivation by overcoming barriers related to the individual's lack of self-discipline and increasing his or her self-confidence.

In relation to dietary behaviors, perceived risk (Winkleby, Flora, & Kraemer, 1994) and self-efficacy (Aljasem et al., 2001; Smith, Baghurst, & Owen, 1995) have been reported to be related to positive dietary behaviors. In contrast, perceived susceptibility toward IHD was related to negative dietary practices among ICs which suggests that despite feeling vulnerable to heart disease ICs were not likely to avoid this dietary practice. As previously, mentioned strategies to improve the nutritional content of food by education and specific advice in the form of modified recipes may be helpful in effecting change in their diets without affecting their traditional role of nurturer.

Even though respondents in general recognized the importance of exercise and a healthy diet, their beliefs about ways to keep healthy did not correspond with their actual reported behavior and further, ICs were less likely than ECs to practice health behaviors they perceived as important. Cultural and environmental factors influencing their decisions to participate in healthy behaviors were common among ICs irrespective of their age and gender which confirms the view of a common East Indian perspective about health and health promotion (Ramakrishna & Weiss, 1992).

Similar observations of passive attitudes to lifestyle modification whether for health promotion or risk factor control, as in other South Asian migrant groups (Farooqi et al., 2000; Lawton et al., 2005; Naeem, 2003) concur with views that perceptions of lack of control over the future are associated with spirituality and are important in understanding the East Indian perspective on health and disease. This also provides support for the theory of cultural patterns (Hofstede, 1980) that describes the East Indian culture as more tolerant with regard to futures perceived as unpredictable and not under their control. Although Hofstede's cultural patterns were

originally defined in relation to work-related values, these findings suggests that the four-dimensional cultural model is applicable to cultural values in the health care context.

In summary, simplistic messages emphasizing the importance of positive health behaviors on the individual's health may be ineffectual in facilitating change among ICs. Health education focusing on the potential of positive health choices to improve health of the family as much as that of the individual, and the potential to enhance a person's ability to fulfill their social and familial obligations (Lawton et al., 2005) may address concern people may have about their interest in personal health improvement being viewed negatively as not conforming with cultural expectations (Choudhry et al., 2002). In addition, given their apparent impassivity toward health improvement initiatives, strategies that incorporate immediate rewards and elements of social competitiveness may fit within the cultural orientation (high masculine cultures) (Hofstede, 1980) to motivate ICs to practice healthful behaviors.

Duration of Residence in Canada

According to the healthy immigrant hypothesis, immigrants have more favorable health behaviors and risk factor profiles when they first enter the host county which results in their relative health advantage (Frisbie et al., 2001; Robertson et al., 1977). This is complementary to the acculturation hypothesis which posits that health behaviors become riskier with greater acculturation (Abraido-Lanza et al., 2005). In support, several studies have documented a decline in health status and risk profile of immigrants in relation to duration of residence in the United States (Frisbie et al., 2001; Goel et al., 2004; Robertson et al., 1977). Whether these hypotheses apply to the South Asian immigrant population in particular has yet to be established (Frisbie et al., 2001).

Reports on the changes in physical activity of East Indian immigrants based on length of residence in the host country are conflicting. For example, Varghese and Morre-Orr (Varghese & Moore-Orr, 2002) observed that the likelihood of exercising was higher in those who had lived in Canada longer, and those who were more integrated within Canadian society (i.e., students, and the employed), whereas Mooteri and colleagues (Mooteri et al., 2004) reported that levels of physical activity were inversely related to duration of residence in the United States. Neither of these studies addressed the amount, type, and intensity of physical activity, nor examined the confounding influence of age, which concomitantly increases as duration of residence increases. Consistent with the report by Kandula and Lauderlade (Kandula & Lauderdale, 2005), leisure time physical activity increased with length of time since immigration evidenced by the higher proportion of the long-term ICs who reported exercising as a means to reduce stress. That recent immigrants were less likely to meet the CDC and ACSM recommendations compared with longer-term immigrants (Kandula & Lauderdale, 2005) however was not supported by our findings. In their study, Kandula and Lauderdale did not separate the different Asian American ethnic groups so it is possible that a similar trend may not be observed if South Asians were analyzed in isolation.

Possibly, with increasing years lived in Canada, individuals acquire a higher socioeconomic status and are more likely to have access to labor saving technology at work and at home. With increasing age (long-term immigrants were also older) individuals are more likely to be retired (seen in our group of older ICs), and as a result have more free time to participate in leisure time physical activity. Future studies isolating the effects of age and duration or residence in Canada on physical activity participation are needed.

The nutrition literature suggests that acculturation is associated with both positive and negative dietary changes (Raj et al., 1999; Varghese & Moore-Orr, 2002). For example, greater

duration of residence is related to reduced dietary fat consumption, and an increase in consumption of non-traditional foods identified as risk factors for chronic disease (Karim, 1986; Raj et al., 1999; Varghese & Moore-Orr, 2002). Our findings document only positive dietary changes in accordance with Canada's Food Guide to Healthy Eating (Health Canada, 2005) in relation to length of stay in Canada. Immigrants who had resided in Canada longer than 7 years were more likely to consume low-fat foods and bake their food, and were less likely to deep-fry their food compared with more recent IC immigrants. An increased awareness of the detrimental effects of high-fat foods following immigration (Choudhry, 1998; Farooqi et al., 2000) and knowing someone diagnosed with a heart condition may explain this change (Kalra et al., 2004). Although increase in awareness about their dietary practices may reflect in improvements in dietary practices, possibly a result of acculturation, this trend was not paralleled by an increase in physical activity levels. Efforts to improve this health behavior in ICs may require more aggressive and conscientious approaches.

With respect to the effect of acculturation, Evenson (Evenson, Sarmiento, & Ayala, 2004) reported higher rates of self-reported physical activity levels in Latina immigrant women with better English language skills, and in those who arrived to the United States when they were younger than 25 years. Neither of these trends were observed in our study. The proportion of self-reported exercisers increased with duration of residence, although no difference was observed when individuals were classified using the CDC and ACSM recommendations; only a fraction of the individuals who reported that they exercised actually exercised at levels recommended. A parallel trend was observed when ICs were stratified based on median age. In summary, levels of physical activity based on expert recommendations (Pate et al., 1995) do not to improve over time, and are not related to English speaking abilities, or age at immigration. Although ICs may be aware of the benefits of physical activity in general, their lack of socialization into sports and outdoor activity

may explain their lower rates of exercising at recommended levels in that they may not be aware of the normal physiological responses to exercise, i.e., breathlessness, increased heart rate and sweating, and may be exercising below desirable levels in order to avoid eliciting such responses. Health care professionals need to specify exercise guidelines in terms of frequency, intensity, and duration of exercise when dealing with IC clients, rather than merely advising them to increase their physical activity when prescribing exercise for IC clients.

Although time since immigration has been known to change the health behaviors of immigrants, its influence on health-related beliefs has received little attention. Studying the beliefs and behaviors towards baby-feeding practices before and after immigration to Australia, Rossiter (Rossiter, 1992) reported that these practices of Vietnamese women were shaped by their health beliefs which in turn were influenced by the new social, cultural and economic environment in the adopted country. Such studies on health beliefs of East Indian immigrants are lacking, as are studies examining the effect of acculturation on health beliefs.

The present study revealed no difference in the knowledge and awareness of risk factors nor in the health beliefs based on length of residence in Canada. Perhaps, time since immigration is not an independent predictor of the acculturation process; generational status, primary language spoken at home, and the extent of interaction with the local population have been used as proxy measures of acculturation (Abraido-Lanza et al., 2005; Hubert, Snider, & Winkleby, 2005; Varghese & Moore-Orr, 2002). The use of multi-component scales such as the Acculturation Scale for Mexican Americans-II (Cuellar, Arnold, & Maldonado, 1995) is evidence for the complex processes involved in acculturation. Further study of the acculturation process is needed in ICs. Compact social networks of immigrant ingroups (Hall, 1989) may limit their interactions with and influence from outside the network (Bottorff et al., 1998) thereby promoting retention of traditional

belief and possibly active resistance to new ways of thinking. Studies focusing on exercise and sports between first- and second-generation ICs are also needed to identify the effect of nativity on physical activity and isolate the role of culture on this health behavior.

Psychometric Evaluation of the IHD Health Beliefs Scale

The third objective of this study was to evaluate the psychometric properties of the scale. The IHD health beliefs scale consists of 46 items in nine subscales and was designed to measure the HBM variables of perceived susceptibility and perceived seriousness of IHD risk, perceived benefits and barriers related to adopting a healthy diet and exercising, health motivation, and self-efficacy related to adopting a healthy diet and exercising.

Coefficients for test-retest reliability derived for four of the nine scales exceeded the minimum recommended value of 0.75 for group comparison (Streiner, 2003) suggesting adequate stability of the subscales for evaluating health beliefs (Portney, 2000; Streiner, 2003). The retest period of four weeks between may have lowered the reliability of the subscales. Further, the small sample size (Donner & Eliasziw, 1987), and initial exposure to the health belief items on the first test which may have influenced their attitude on the second test creating a testing effect, may have reduced the correlation between the two testing times. Replication studies with larger samples and shorter re-test periods would verify the adequacy of our statistical power to detect a difference and confirm reliability of the health belief subscales.

Internal consistency measured by Cronbach's alpha was higher than 0.7 for seven of the nine scales (range: $\alpha = 0.66$ to 0.87), representing good internal consistency (Nunnally, 1994; Streiner, 2003). These values were similar to those reported for the osteoporosis health belief scale from which the existing instrument was adapted (Cadarette et al., 2004; Kim et al., 1991), and

higher than values reported for a questionnaire used to measure HBM dimensions related to IHD preventive behaviors (Mirotznik et al., 1995). The low internal consistency ($\alpha = 0.66$) of the health motivation subscale was similar to that reported in the osteoporosis health belief scale (Cadarette et al., 2004). Seeking of health information and the intention to maintain good health (3rd and 4th item of the health motivation scale) may not be associated with actual behavior (1st and 2nd items of the health motivation scale). We suggest separating these seemingly similar but distinct concepts in the health motivation scale. The low internal consistency ($\alpha = 0.67$) of the exercise barriers scale may be due to the small number of items, given the multiple factors have been identified as barriers to exercise participation.

Internal consistency for the subscales corrected for overlap revealed that three items lowered the Cronbach's alpha of their respective subscales indicating that the subscales were more homogenous with those items deleted. The three items (one item from the susceptibility subscale: '*My family history makes it likely that I will get heart disease*'; one item from the diet barriers subscale: '*A low-fat diet is expensive*'; one item from the exercise self-efficacy subscale: '*I am confident that I can participate in regular exercise when I am on vacation*') should be removed or replaced in order to increase the internal consistency of the subscales. Item to total correlation coefficients (correlation between the item and the subscale total with the item removed) were below the acceptable standard four items (items 19, 28, 32, and 45; see Table 12). Two of these items (items 19 and 45; see Table 12) were also identified as lowering the Cronbach's alpha of their respective subscales. Removal of these two items and replacement with items that better fit the subscale dimension is recommended, which would require further analyses of the subscales.

The results provided partial support for the construct validity of the IHD health belief subscales. With respect to exercise performance, construct validity of the health beliefs scale was supported for three of the four variables (exercise barriers, health motivation, and exercise self-efficacy) that successfully differentiated exercisers from non-exercisers. Perceptions of exercise benefits were not related to exercise performance because, as we have demonstrated, awareness of the benefits of exercise does not always translate into actual practice. It is possible that exercise barriers, and intrinsic health motivation may be more important determinants of exercise performance.

Dietary barriers scores and health motivation scores differentiated individuals based on their consumption of low-fat milk and grilling food regularly. Dietary benefits scores were higher in those individuals who reported deep frying their food regularly, which was in the directing opposite to that predicted. Overall, the construct validity for the IHD health belief subscales with relation to dietary behaviors was not adequately supported. Subsequent studies using objective measures of dietary practices are necessary to establish the validity of these subscales with reference to dietary practices.

The third hypothesis was partially supported as individuals who had a personal history or family history of IHD had higher perceived susceptibility to heart disease compared with those individuals who had no history, parallel with reports from Cadarette and colleagues (Cadarette et al., 2004); no difference was observed however for perceived seriousness scores between these two groups. The concept of perceived susceptibility relates to the individual's perception of their personal predisposition to heart disease given their personal history, family history, and personal health status. In contrast, the concept of perceived seriousness of the consequences of heart disease was likely viewed as a hypothetical situation by individuals who

did not actually have the disease, and may have elicited similar responses from these individuals. Subsequent validity studies should examine the differences in perceived seriousness only between individuals with and without a personal history of heart disease. Finally differences were observed in the exercise barriers scores between the ICs and the ECs, as expected. Based on past research we hypothesized that ICs would perceive more barriers to participation in exercise compared with ECs. By confirming the hypothesized group differences using known groups technique, our results provide preliminary evidence for the construct validity of the IHD health belief scale with respect to IHD-related health behaviors, with the exception of dietary behaviors.

Designing Culturally-sensitive Health Education Material

The final objective of this study was to make recommendations for designing and implementing health education initiatives with respect to IHD prevention among ICs and ECs. As in the report by Johnson (M. Johnson, 2000), we identified general and culture-specific factors that affect the health-promoting behaviors of ICs and ECs that should be considered when developing health education strategies for these groups. Failure to address these needs may waste resources and lead to missed opportunities to improve the health of the target population (Stone et al., 2005). General barriers to health promotion are those that are common to all individuals alike, irrespective of ethnic or cultural identity. In addition, culture-specific factors that shape beliefs and influence health behaviors have been identified for both groups. With respect to the IC immigrant group, barriers also arise as a result of immigration and adjustment to Canada, such as extreme weather conditions, language barriers, and socioeconomic stress. It has been recommended that health professionals and health educators

find ways to work with rather than against cultural factors as clients respond better to interventions that are delivered in ways that are sensitive to their views and cultural background (Hawthorne, 2001; Hiskins, 1995).

Content

Overall, our findings illustrate that knowledge and awareness about the benefits of healthful diets and physical exercise do not translate into practice of these behaviors in both ICs and ECs. The goal of any health education initiative should be to increase individual's health motivation levels in ways that are culturally sensitive. Capitalizing on the motivating and encouraging factors, and finding ways to work around the limiting factors (barriers), are also an important aspect of health education. Finally, rather than superficial messages, information should be constructed in a way as to specifically meet the needs and expectations of the individuals, ideally, by tailoring the messages to address relatively homogenous groups of individuals. Below, we discuss principles based on our findings which may be applied when conceptualizing health education programs toward ICs and ECs.

Barriers to health promotion specific to the IC group such as lack of time, language barriers, dislike of going outdoors in bad weather, familial obligations, modesty, and lack of socialization into sports vary from individual to individual and from group to group. We caution that health educators and health care providers avoid stereotyping IC clients. Rather, ways in which individuals can achieve desirable levels of physical activity within these constraints need to be explored on an individual level. Culturally-sensitive health promotion advice for ICs would include ways in which the health promotion activities prescribed can be incorporated into their everyday activities, be flexible in terms of when and where they can be

done, and involve other members of their social network so that exercise becomes part of a socially rewarding experience (M. Johnson, 2000; Lawton et al., 2005). Additionally, advice for increasing physical activity levels should include guidelines about the frequency, intensity, and duration of physical activity required for health benefits to be gained, as well as the normal physiological responses to be expected. The importance of addressing and overcoming attitudes of fatalism towards disease causation by increasing knowledge, awareness, health motivation, and self-confidence through education and empowerment has been highlighted (Choudhry et al., 2002; Stone et al., 2005). Participatory action research, a group approach to learning, involving knowledge creation by way of story telling, which is then applied toward learning and action for change, has been identified as a valuable approach to empowering individuals and enhancing their participation in health promotion (Choudhry et al., 2002; Greenhalgh et al., 2005).

With respect to the ICs, information about the disease implications of high-fat diets, nutritional value of traditional foods, and practical suggestions for altering traditional diets with healthier substitutes to lower the fat content of existing diets (Kalra et al., 2004; Varghese & Moore-Orr, 2002) would be more effective in facilitating dietary change compared with simplistic message calling for drastic changes in dietary practices (Farooqi et al., 2000). Targeting specific health education messages toward individuals or groups based on their role in the family and in the community may conserve resources and facilitate delivery and uptake of information. For example, targeting nutrition information to women, especially mothers, who are more likely to utilize the information compared with IC men.

In general, health education should increase awareness about the benefits of physical exercise and healthful diets IHD prevention, risk factor reduction, general health

promotion, and stress relief. For ICs however, the reward system may need to be culturally-specific, for example, short-term rewards (e.g., use of a glucometer to monitor their blood following exercise), incorporating social benefits (e.g. exercising with a group of friends in their neighborhood) and emphasizing the health benefits for the entire family (e.g., health benefits by reducing the fat content in meal preparation). Emphasizing the positive implications of the individual's health behavior for the entire family, targeting health education to the family members, and enlisting their support to encourage the individual fosters the interdependent nature of the relationship between individual and family and ensures the support and encouragement of entire family. Given the importance attached to cultural and societal norms, health educators have suggested programs that receive community endorsement, and those that are incorporated into existing community activities may be useful to alleviate concerns that their participation is being viewed as an act of self-centeredness (Lawton et al., 2005). Another way to overcome barriers of time constraints would be by introducing physical activity into already existing social activities, and address ways in which prescribed activities can be done as part of their daily activities including urban planning and constructing health and activity conducive communities.

Capitalizing on religious faith and affiliations, the use of religious leaders as facilitators for the purpose of endorsing health promotion initiatives may ensure a positive response to community-based initiatives (Lawton et al., 2005). In contrast, barriers and facilitating factors identified by the ECs in our study suggest that education and interventions targeted toward this group may be more effective addressing issues related to the individual such as building self-confidence and increasing health motivation levels by teaching ways to increase self-discipline.

Delivery

Health education information should be targeted toward both the community as well as the individual. Given the diversity within any ethnic group in terms of language spoken at home, religion, and education level, ideally, health education material should be constructed to target relatively homogenous groups of people who share common cultural, religious, or language traits. Initiatives at the community level may be disseminated in the form of workshops, classes, and group meetings, and be held at community centers, senior centers, places of worship, and libraries where members of the community meet routinely. Given their limited attendance at public fitness facilities, attention should be directed toward exploring ways in which ICs may achieve the desired level of physical activity in places familiar and acceptable to them, and that are easily accessible. Health professional should advocate utilization of cultural and religious centers and other venues that are popular meeting places (e.g., senior groups) as possible fitness facilities, and mobilize communities to initiate programs to improve the health and wellness of its members.

At the individual level, health professionals who have a role in risk factor identification and lifestyle modification by exercise prescription, weight management, nutrition advice, and smoking cessation, must be aware of the underlying social and cultural norms and expectations that affect their relationship with IC clients and determine how their advice is received and responded to. For example, in consultation with IC clients, health professionals need to explore activities that are flexible in terms of when and where they can be performed. Dietary modifications should be conducted in collaboration with family members, and preferably with the most senior women of the household. Given the important role of family in times of health and illness, it is important that the family be educated and enlisted to

encourage, support, and monitor the patient's activities and to help foster an environment conducive to positive lifestyle choices whether for health promotion or disease management.

Study Limitations

This study has three important limitations. First, although the sample size was adequate, non-random sampling resulted in the age, education, and income differences between the groups, all of which are known to influence health beliefs and behaviors. After adjusting for age however differences in income and education persisted, which paralleled the demographic characteristics of immigrants in BC who generally tend to be younger and possess a higher level of education qualifications as a result of the Canadian immigration selection process for the business and skilled worker categories (BC Stats, 1993). Additionally, a sample from the BC lower mainland may not be representative of the population of ICs and ECs across Canada. Second, although the overall response rate was high (71%), almost 30% of the questionnaires were not returned which may have contributed to a self-selection bias. Further, the response rate was higher for the ECs compared with the ICs, which may have further inflated any bias. As with all self-report measures, it is possible that the responses were subject to social bias rather than a true reflection of a participant's beliefs and behaviors, which is compounded when comparing the two culturally distinct groups (Bhawuk, 1996). Cultural and linguistic differences may have resulted in differential reporting of physical activity and dietary practices between the ICs and the ECs. Use of a self-administered questionnaire was intended to minimize this social desirability bias. A final limitation concerns the items of the IHD health belief scale. Three items demonstrated low internal consistency, and four items displayed lower than optimal correlation with their

respective subscales. In future applications to comparable IC and EC groups these items need to be removed or reworded to better reflect the dimensions measured by the scale.

Future Studies

To address the limitation of this preliminary study, replication studies based on large nation-wide sample, matched by age, sex, and income are required to isolate the effect of culture on knowledge, health beliefs, and behavior. Further research is needed to confirm the validity of the IHD health belief scale to measure beliefs related to IHD preventive behaviors. Specifically, the utility of the scale for assessing beliefs related to low-fat diet needs to be established using more objective measures of dietary fat intake. Health education programs and health promotion initiatives designed on the basis of recommendation from this study need to be piloted and evaluated for effectiveness (objective measures) and client satisfaction (subjective measures). Further exploration of the relationship between the HBM variables and exercise adoption and adherence using longitudinal studies are indicated. Studies focusing on exercise and sports participation between first- and second-generation ICs are needed to identify the effect of nativity and age of immigration on physical activity and would help to isolate the role of culture and acculturation on this health behavior.

CHAPTER 6

SUMMARY AND CONCLUSIONS

Summary

New Knowledge

This study made the following new contributions to knowledge:

1) Culture is an important determinant of health behaviors: ECs are more likely to exercise at levels recommended for health promotion and disease prevention compared with ICs.

2) Culture is an important determinant of dietary practices: ECs are more likely to have healthful dietary practices compared with ICs, according to recommendations by Canada's Food Guide to Healthy Eating (Health Canada, 2005)

3) Women in general have more positive dietary behaviors compared with men.

4) Culture is an important determinant of beliefs related to IHD preventive practices: Health motivation and self-efficacy related to exercising and eating a low-fat diet, are lower among the ICs compared with the ECs. IndoCandians are more likely to count on their family and religious leaders for support in health behavior change.

5) Barriers and facilitators for positive health behaviors for ECs relate to the individual whereas those identified by the ICs relate to their environment and social support network. These findings support the culture theory that Canadians are more individualistic in their orientation compared with East Indians.

6) Perceptions about what constitutes important health behaviors do not translate into practice of these behaviors in general and further ICs are less likely compared with ECs to practice behaviors they perceived as important for keeping healthy.

7) IndoCanadians who practice unhealthful dietary practices feel more susceptible to IHD compared with those who did not.

8) Duration of residence in Canada confers positive effects on the health behaviors of IC immigrants, in contrast with the 'healthy immigrant' hypothesis.

    a) Although no change was observed in the physical activity levels, long-term ICs immigrants were more likely to perform leisure time physical activity compared with newer immigrants.

    b) IndoCanadians who have lived in Canada longer were more likely to follow positive health practices in accordance with Canada's Food Guide to Healthy Eating recommendations (Health Canada, 2005) compared with recent IC immigrants.

Evidence to Support Intuitive Knowledge

The results of the study provided evidence to support the following:

1) In general, health motivation is related to performance of exercise.

2) IndoCanadians are less likely to attend public fitness facilities compared with ECs. This finding is consistent with characteristics of high-context cultures (Hall, 1989). Perceived

distinction between ingroup and outgroup members may result in the tendency for ICs to remain within their compact social network limiting their preference for interaction with the outgroup.

3) IndoCanadians are less likely to view exercise as a leisure-time activity compared with ECs evidenced by the higher proportion of ICs who viewed tiredness and stress as barriers to exercise participation, and the smaller proportion of ICs who reported exercising to help them reduce stress.

4) Knowledge about IHD risk factors was lower among ICs compared with ECs.

5) With respect to the four-dimensional model of cultural differences and the relative position of India and Canada of these dimensions:

    a) *Power distance*: Although attributes reflecting power distance were not directly assessed, our data supported that ICs believed in more authoritarian types of education delivery which is consistent with attributes of cultures high in power distance, would be preferable for them compared with the ECs who opted for more autonomous approaches.

    b) *Uncertainty avoidance*: The lower ranking for India compared with Canada on the uncertainty avoidance index was supported by finding that ICs were less inclined to make positive changes to their health in response to a diagnosis with a heart disease supporting a more complacent approach to lifestyle modification in response to knowledge about a future health threat.

c) *Individualism-collectivism*: The relatively higher ranking for India compared with Canada on this index was supported by the greater proportion of Indians relying on family support and religious leaders to encourage them for positive health behaviors. Canadians, on the other hand reported barriers and facilitators oriented to the individual's health status and abilities.

Evidence That Does Not Support Intuitive Knowledge

The results of the study failed to support the following:

1) Duration of residence in Canada was not related to improvements in physical activity, in contrast with previous reports. This finding may be explained by the differences in measurement methods, differences in operational definition of physical activity, and also the assumption that changes in health behaviors (acculturation) occur solely as a result of time lived in the host country. A number of factors including generational status, primary language spoken at home, the extent of interaction with the local population factors, and the compactness of social networks maintained within the culture are known to influence the acculturation process, and may therefore influence health promotion behaviors.

2) Given the higher ranking for India compared with Canada on the cultural dimension of masculinity-femininity, we had expected to find more gender differences in the IC group with respect to health beliefs and behaviors. Rather, more differences between men and women were observed in the EC group.

Conclusions

The results of this preliminary study demonstrate that knowledge, beliefs and behaviors related to IHD were different between the IC and EC ethnic groups. In general, ICs had lower knowledge and awareness about IHD risk, were less likely to meet the CDC and ACSM recommendations for physical activity, and were less likely to have positive dietary practices compared with ECs. Perceptions about what constitutes important health behaviors did not correspond with reported behavior and that ICs were less likely to practice behaviors they identified as being important for health compared with ECs. Interestingly, barriers and motivating factors identified by these two ethnic groups reflected their distinct cultural orientations. Where ECs perceived a lack of self-discipline as a barrier to practicing positive health behaviors, ICs identified barriers related to their environment, their social support system. Duration of residence in Canada had no effect on knowledge scores, physical activity levels (based on CDC and ACSM recommendations), and IHD-related health beliefs, although leisure-time physical activity increased, and dietary habits improved over time. In accordance with cultural theory, these findings describe differences between the East Indian and European Canadian cultures with respect to health beliefs, perceptions of barriers and motivating factors that influence their patterns of health behaviors.

Overall, although these findings support that ICs are less likely to have positive health behaviors compared with ECs, there is no evidence of deterioration in health practices following migration to explain the increased mortality of IHD in this group. Similar high rates of IHD mortality among urban dwelling East Indian compared to those observed among immigrant East Indians suggest the role of the urban environment rather than the host country in risk factor determination. The present study does however demonstrate that in the midst of

such an environment, East Indian cultural values and expectations augment these negative health behavior choices. The role of socioeconomic stress and stress resulting from changes in the family dynamics as a result of migration may play an additional role and needs further study. These results provide guiding principles by which health education targeted toward the two groups of interest can be conceptualized, designed, and disseminated. Preliminary support for the reliability and validity of the newly constructed IHD health belief scale was demonstrated.

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HEALTH BELIEFS AND BEHAVIORS OF INDOCANADIANS AND EUROCANADIANS

The University of British Columbia

The School of Rehabilitation Sciences is conducting a study on the health beliefs and behaviors of Indian Canadians and European Canadians. Your participation in this study would be greatly appreciated.

The questionnaire takes approximately 20 minutes to complete. There are no right or wrong answers. We are only interested in YOUR opinions.

This study will help us understand differences in the health-related beliefs and practices between Indian Canadians and European Canadians. Whilst completing the questionnaire, we kindly request that you take a few moments to carefully consider your each response. The results will be used to improve the knowledge of healthcare practitioners, and the provision of healthcare services for all.

Please complete and return the questionnaire in the envelope provided.

Dr. Elizabeth Dean P.T., Ph.D.
Giselle Rodrigues P.T., M.Sc. Candidate
School of Rehabilitation Sciences, UBC
T-325, 2211 Wesbrook Mall
Vancouver, B.C. Canada V6T 2B5
Phone: (604) 822-0798
Fax: (604) 822-7624

ID: _____

START HERE

A. Please answer the following questions by checking the appropriate box √

1. On average, how many hours do you sleep per day?

[1] ☐ less than 8 hours

[2] ☐ 8 hours or more

2. If you smoke tobacco, on average, how many packs do you smoke, per day?

[1] ☐ don't smoke
[2] ☐ less than 1 pack per day
[3] ☐ 1 pack per day
[4] ☐ more than 1 pack per day

3. If you consume alcohol, how much alcohol do you consume, <u>per week</u>?

[1] ☐ don't drink
[2] ☐ 1 to 5 drinks per week
[3] ☐ 6 or more drinks per week

4. On average, how many times do you eat in a day (including meals and snacks)?

[1] ☐ Once
[2] ☐ 2 times
[3] ☐ 3 times
[4] ☐ 4 times
[5] ☐ 5 times
[6] ☐ 6 times or more

5. On average, how would you describe your level of stress and anxiety?

[1] ☐ Low
[2] ☐ Moderate
[3] ☐ High

6. What are some of the things you do to help relieve your stress and anxiety?
Please check ALL that apply

[1] ☐ Walk/exercise
[2] ☐ Listen to music/watch TV
[3] ☐ Perform religious/spiritual activities
[4] ☐ Meditate
[5] ☐ Don't do anything
[6] ☐ Other (*please specify*) _____

7. **In the past 12 months, if you have done anything to improve your health, what is the SINGLE most important change you have made:**
Check ONE

[1] ☐ Not applicable
[2] ☐ Increased exercise/physical activity
[3] ☐ Lost weight
[4] ☐ Changed diet or eating habits
[5] ☐ Quit smoking/reduced amount smoked
[6] ☐ Stopped consuming/reduced intake of alcohol
[7] ☐ Received medical treatment
[8] ☐ Other (please specify) _____

8. **Do you think there is anything else you should do to improve your health?**
Check ALL that apply

[1] ☐ Not applicable
[2] ☐ Increase exercise/physical activity
[3] ☐ Improve eating habits
[4] ☐ Lose weight
[5] ☐ Quit smoking
[6] ☐ Reduce stress
[7] ☐ Take vitamins
[8] ☐ Other (please specify) _____

9. **Is there anything stopping you from making this improvement? If yes, what is it?**
Check ALL that apply

[1] ☐ Not applicable
[2] ☐ Lack of will-power/self-discipline
[3] ☐ Lack of time
[4] ☐ Too tired/too stressed
[5] ☐ Too expensive
[6] ☐ Disability/health problem
[7] ☐ Language difficulties
[8] ☐ Too late to change habits/lifestyle
[9] ☐ Weather conditions (rain/snow/cold)
[10] ☐ Religious/cultural reasons (explain) _____
[11] ☐ Other (please specify) _____

10. What factors would encourage you to engage in healthy lifestyle behaviors?
Check ALL that apply

[1] ☐ Provision of women-only or men-only facilities at gyms/pools/fitness centers
[2] ☐ Specific advice (cooking classes, smoking-cessation, stress-management programs)
[3] ☐ Programs offered in your language-of-choice
[4] ☐ Healthcare practitioner advising you to change your lifestyle
[5] ☐ Religious person advising you to change your lifestyle
[6] ☐ Family support
[7] ☐ Friend accompanying you (to exercise, cooking class, smoking-cessation programs)
[8] ☐ If you were diagnosed with a heart condition
[9] ☐ Fitness center at work
[10] ☐ Any other (please specify) _____

B. Please tell us about your exercising habits by checking the appropriate boxes:

Do you exercise?	[1] ☐ yes	[2] ☐ no		
What type of activity do you do?	[1] ☐ brisk walk	[2] ☐ swim	[3] ☐ jog/run	[4] ☐ other _____
How many times per week do you exercise?	[1] ☐ less than 1 day per week	[2] ☐ 1 or 2 days per week	[3] ☐ 3 or 4 days per week	[4] ☐ 5 or more days per week
How would you rate your breathing at the end of your exercise session?	[1] ☐ normal	[2] ☐ a little faster than normal	[3] ☐ a lot faster than normal, but talking is possible	[4] ☐ so fast that talking is not possible
For how long do you exercise?	[1] ☐ less than 15 mins	[2] ☐ 15 to 30 mins	[3] ☐ 30 to 60 mins	[4] ☐ more than 60 mins
For how long have you been exercising at this level?	[1] ☐ less than 1 month	[2] ☐ 1 to 3 months	[3] ☐ 3 to 6 months	[4] ☐ more than 6 months
Place where you <u>usually</u> exercise:	[1] ☐ home	[2] ☐ outdoors	[3] ☐ gym	[4] ☐ recreation centre
Do you like to exercise?	[1] ☐ yes	[2] ☐ no		

C. Please circle the response that best describes your food intake in an <u>average week</u>:

		None	Once a week	2 times a week	3 times a week	4 times or more
1	How often do you eat red meat (beef/ pork/ lamb)	0	1	2	3	4
2	How often do you eat fish or other seafood	0	1	2	3	4
3	How often do you drink milk	0	1	2	3	4
4	How often do you drink milk with reduced fat (1%, low-fat, or skim milk)	0	1	2	3	4
5	How often do you eat cheese or other dairy products	0	1	2	3	4
6	How often do you choose low-fat cheese	0	1	2	3	4
7	How often do you have desserts	0	1	2	3	4
8	How often do you choose low-fat desserts	0	1	2	3	4
9	How often do you eat fruit for dessert	0	1	2	3	4
10	How often do you snack between meals	0	1	2	3	4
11	How often do you eat raw vegetables or fruit as a snack	0	1	2	3	4
12	How often do you eat at fast-food restaurants (Burger King, McDonald's, KFC, Wendy's, etc)	0	1	2	3	4
13	How often do you grill your food	0	1	2	3	4
14	How often do you boil your food	0	1	2	3	4
15	How often do you deep fry your food	0	1	2	3	4
16	How often do you stir fry your food	0	1	2	3	4
17	How often do you bake your food	0	1	2	3	4

D. Please indicate your response by circling either 'TRUE' or 'FALSE' to each of the following statements below:

1	Olive oil is better for the heart than hydrogenated vegetable shortening (butter, *ghee*)	**TRUE**	**FALSE**
2	It is normal for older adults to have high blood pressure	**TRUE**	**FALSE**
3	Diabetics are at an increased risk of getting heart disease compared to non-diabetics	**TRUE**	**FALSE**
4	Smoking a few cigarettes does not affect the heart	**TRUE**	**FALSE**
5	People with high levels of cholesterol are not at risk of developing heart disease	**TRUE**	**FALSE**
6	People with average weight are at a reduced risk of developing heart disease compared to people who are overweight	**TRUE**	**FALSE**
7	Regular physical exercise decreases one's risk of heart disease	**TRUE**	**FALSE**
8	Anxiety and psychological stress increase one's risk of heart disease	**TRUE**	**FALSE**
9	A previous heart attack does not increase one's risk of a getting a second heart attack	**TRUE**	**FALSE**
10	A history of heart disease in the family does not increase one's risk of heart disease	**TRUE**	**FALSE**

E. For each of the following statements, please circle the response that best describes your opinion, based on your personal habits:
Select ONE response per statement.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	My chances of getting heart disease are high	**1**	**2**	**3**	**4**	**5**
2.	My dietary habits make it likely that I will get heart disease in the future	**1**	**2**	**3**	**4**	**5**
3.	My physical activity levels make it likely that I will get heart disease in the future	**1**	**2**	**3**	**4**	**5**
4.	I am more likely than the average person to get heart disease	**1**	**2**	**3**	**4**	**5**
5.	My family history make it likely that I will get heart disease	**1**	**2**	**3**	**4**	**5**
6.	Because of my current health status, I am more likely to develop heart disease	**1**	**2**	**3**	**4**	**5**
7.	If I had heart disease my whole life will change	**1**	**2**	**3**	**4**	**5**
8.	Having heart disease can be disabling	**1**	**2**	**3**	**4**	**5**
9.	The thought of having heart disease scares me	**1**	**2**	**3**	**4**	**5**
10.	If I had heart disease it would interfere with my job/earning capacity	**1**	**2**	**3**	**4**	**5**
11.	If I had heart disease, it would burden my family/spouse	**1**	**2**	**3**	**4**	**5**
12.	Heart disease can have dangerous consequences	**1**	**2**	**3**	**4**	**5**

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
13.	I would not worry about getting heart disease if I had a low-fat diet	**1**	**2**	**3**	**4**	**5**
14.	A low-fat diet prevents future problems from heart disease	**1**	**2**	**3**	**4**	**5**
15.	A diet low in fat reduces my chances of getting heart disease	**1**	**2**	**3**	**4**	**5**
16.	There are many health benefits from eating a low-fat diet	**1**	**2**	**3**	**4**	**5**
17.	Eating low-fat food requires changing my regular diet, which is hard to do	**1**	**2**	**3**	**4**	**5**
18.	In order to have a low-fat diet I have to give up other foods that I like	**1**	**2**	**3**	**4**	**5**
19.	A low-fat diet is expensive	**1**	**2**	**3**	**4**	**5**
20.	I do not like low-fat food	**1**	**2**	**3**	**4**	**5**
21.	Regular exercise reduces the risk for heart disease	**1**	**2**	**3**	**4**	**5**
22.	I feel good about myself when I exercise	**1**	**2**	**3**	**4**	**5**
23.	Regular aerobic exercise also improves the way my body looks	**1**	**2**	**3**	**4**	**5**
24.	Exercising regularly prevents future problems from heart disease	**1**	**2**	**3**	**4**	**5**
25.	Exercising regularly interferes with my daily activities	**1**	**2**	**3**	**4**	**5**
26.	Exercising regularly can be time consuming	**1**	**2**	**3**	**4**	**5**
27.	Exercising regularly would mean starting a new habit, which is hard for me to do	**1**	**2**	**3**	**4**	**5**

		Strongly Strongly Disagree	Disagree	Neutral	Agree	Agree
28.	I have no place where I can exercise	**1**	**2**	**3**	**4**	**5**
29.	I eat a healthy well-balanced diet	**1**	**2**	**3**	**4**	**5**
30.	I exercise regularly—at least 3 times a week	**1**	**2**	**3**	**4**	**5**
31.	I seek new information related to my health	**1**	**2**	**3**	**4**	**5**
32.	Keeping good health is important to me	**1**	**2**	**3**	**4**	**5**
33.	I can count on my family/spouse to motivate me to practice healthy behaviors	**1**	**2**	**3**	**4**	**5**
34.	I can count on my friends to motivate me to practice healthy behaviors	**1**	**2**	**3**	**4**	**5**
35.	I can count on my physician/healthcare practitioner to motivate me to practice healthy behaviors	**1**	**2**	**3**	**4**	**5**
36.	I can count on my spiritual leader to motivate me to practice healthy behaviors	**1**	**2**	**3**	**4**	**5**
37.	I am confident that if I wanted I could regularly prepare low-fat meals	**1**	**2**	**3**	**4**	**5**
38.	I am confident about my ability to buy foods that are low in fat	**1**	**2**	**3**	**4**	**5**
39.	I am confident about my ability to choose fresh fruit for dessert instead of ice-cream or other sweets	**1**	**2**	**3**	**4**	**5**
40.	If I were given a recipe for one of my favorites foods, I am confident that I can change the ingredients to reduce the amount of fat	**1**	**2**	**3**	**4**	**5**
41.	I am confident that I can cook low-fat dishes that are tasty	**1**	**2**	**3**	**4**	**5**

F. How confident are you that you can engage in your favorite physical activity the following number of times <u>each week</u> over the next one month:
Physical activity is any activity that increase you heart rate and makes you get out of breath

		Not at all Confident	Fairly Confident	Very Confident
1	Once a week	1	2	3
2	Twice a week	1	2	3
3	Three times a week	1	2	3
4	Four times a week or more	1	2	3

G. How confident are you that you can participate in regular exercise when:

		Not at all Confident	Fairly Confident	Very Confident
1	You are tired	1	2	3
2	You are in a bad mood	1	2	3
3	You feel you don't have the time	1	2	3
4	You are on vacation	1	2	3
5	It is raining or snowing	1	2	3

H. In order for you personally to keep healthy, how important is it to do the following:

		Not Important	Fairly	Very Important
1	Eat proper kinds of food	1	2	3
2	Have enough physical exercise	1	2	3
3	Have enough rest and sleep	1	2	3
4	Maintain proper body weight	1	2	3
5	Have regular checkups by a doctor	1	2	3
6	Take vitamins	1	2	3
7	Take traditional herbal medicines	1	2	3
8	Have religious faith	1	2	3

I. We'd like some general information about you.

Are you:

[1]☐ Male [2]☐ Female

Age: _____ Height: _____ Weight: _____

Country you were born: _____ State/Province: _____

Country you grew up in: _____

Country your father was born: _____

Country your mother was born: _____

If you were born in India, how long have you lived in Canada: _____

What is your marital status?

[1]☐ Single [2]☐ Married [3]☐ Divorced
[4]☐ Widowed [5]☐ Common-law

What, if any, is your religious preference?

[1]☐ Christianity [2]☐ Hinduism [3]☐ Islam
[4]☐ Sikhism [5]☐ None [6]☐ Other

What language do you speak at home?

[1]☐ English [2]☐ French [3]☐ Hindi
[4]☐ Punjabi [5]☐ Other (*please specify*) _____

Please indicate your proficiency in English:

	High	Moderate	Basic	None
Speak	[1]☐	[2]☐	[3]☐	[4]☐
Read	[1]☐	[2]☐	[3]☐	[4]☐
Write	[1]☐	[2]☐	[3]☐	[4]☐

Please indicate the highest level of education you have completed:

[1] ☐ Grade school [2] ☐ High school [3] ☐ Technical/trade school
[4] ☐ University [5] ☐ Other (*please specify*) _____

Please indicate your employment status:

[1] ☐ Employed full-time [2] ☐ Employed part-time [3] ☐ Homemaker
[4] ☐ Not employed [5] ☐ Retired [6] ☐ Self-employed
[7] ☐ Student

Questions about household income are sensitive to some people. We ask this question because health may be related to economic status. Considering all sources, what was your approximate annual household income last year?

[1] ☐ Less than $20,000 [2] ☐ $20,001 to $40,000 [3] ☐ $40,001 to $60,000
[4] ☐ $60,000 to $80,000 [5] ☐ More than $80,000

If gainfully employed, what is your present occupation?

[1] ☐ Not applicable [2] ☐ Business [3] ☐ Farming
[4] ☐ Management [5] ☐ Office worker [6] ☐ Professional
[7] ☐ Technical/trade

How many members live in your household? _____

Do you have any of the following: (*Please check all that apply*)

[1] ☐ Past history of heart disease (heart attack, angina)
[2] ☐ Past history of stroke (paralysis, paresis)
[3] ☐ Family history of heart disease
[4] ☐ Diabetes Mellitus
[5] ☐ Hypertension
[6] ☐ High blood cholesterol
[7] ☐ Depression
[8] ☐ Any other medical condition (*please specify*) _____

In the space provided below, please provide any additional comments about your beliefs/knowledge/behaviors related to heart disease.

_____

_____

_____

_____

_____

WE ARE GRATEFUL FOR YOUR COOPERATION

THANK YOU

Providing us with your name and contact information is optional.

Name: _____

Address: _____

_____

_____

Telephone: _____

Please indicate if we may contact you later to fill out the same questionnaire for an extended study:

☐ Yes ☐ No

ਇੰਡੋ-ਕਨੇਡਿਅਨਜ਼ ਅਤੇ ਯੂਰੋਪੀਅਨਜ਼ ਦੇ ਸਿਹਤ ਸੰਬੰਧੀ ਵਿਸ਼ਵਾਸ ਅਤੇ ਵਿਹਾਰ

ਯੂਨੀਵਰਸਿਟੀ ਔਫ਼ ਬ੍ਰਿਟਿਸ਼ ਕੋਲੰਬੀਆ

ਸਕੂਲ ਔਫ਼ ਰੀਹੈਬਲੀਟੇਸ਼ਨ ਸਾਇੰਸਿਜ਼ ਇੰਡੀਅਨ ਕਨੇਡੀਅਨਜ਼ ਅਤੇ ਯੂਰੋਪੀਅਨਜ਼ ਦੇ ਸਿਹਤ ਸੰਬੰਧੀ ਵਿਸ਼ਵਾਸ ਅਤੇ ਵਿਹਾਰ ਦਾ ਇੱਕ ਅਧਿਐਨ ਕਰ ਰਿਹਾ ਹੈ, ਇਸ ਅਧਿਐਨ ਵਿਚ ਤੁਹਾਡੀ ਸਾਂਝਦਾਰੀ ਦੀ ਬਹੁਤ ਕਦਰ ਕੀਤੀ ਜਾਵੇ ਗੀ।

ਇਸ ਪ੍ਰਸ਼ਨਾਵਲੀ ਨੂੰ ਪੂਰਾ ਕਰਨ ਵਿਚ ਤਕਰੀਬਨ 20 ਮਿੰਟ ਲੱਗਣਗੇ। ਉੱਤਰ ਠੀਕ ਜਾਂ ਗ਼ਲਤ ਨਹੀਂ ਹੋਣੇ,ਅਸੀਂ ਕੇਵਲ ਤੁਹਾਡੀ ਰਾਇ ਵਿਚ ਰੁਚੀ ਰੱਖਦੇ ਹਾਂ।

ਇਹ ਅਧਿਐਨ ਸਾਨੂੰ ਇੰਡੀਅਨ ਕਨੇਡੀਅਨਜ਼ ਅਤੇ ਯੂਰੋਪੀਅਨਜ਼ ਦੇ ਸਿਹਤ ਸੰਬੰਧੀ ਵਿਸ਼ਵਾਸ ਅਤੇ ਵਿਹਾਰ ਦੇ ਫ਼ਰਕ ਨੂੰ ਸਮਝਣ ਵਿਚ ਮਦਦ ਕਰੇਗਾ।ਇਸ ਪ੍ਰਸ਼ਨਾਵਲੀ ਨੂੰ ਪੂਰਾ ਕਰਨ ਸਮੇਂ ਅਸੀਂ ਨਿਮਰਤਾ ਪੂਰਵਕ ਬੇਨਤੀ ਕਰਦੇ ਹਾਂ ਕਿ ਤੁਸੀਂ ਥੋੜਾ ਸਮਾਂ ਲੈਕੇ ਹਰ ਇੱਕ ਉੱਤਰ ਵਲ ਧਿਆਨ ਦੇਵੋਂ, ਇਸ ਦੇ ਪਰਿਣਾਮਾ ਨੂੰ ਹੈਲਥਕੇਅਰ ਪ੍ਰੈਕਟੀਸ਼ਨਰਜ਼ ਦੇ ਗਿਆਨ ਦੇ ਸੁਧਾਰ ਲਈ ਅਤੇ ਸਾਰਿਆਂ ਲਈ ਹੈਲਥ ਕੇਅਰ ਸੇਵਾ ਪ੍ਰਦਾਨ ਕਰਨ ਲਈ ਵਰਤਿਆ ਜਾਵੇਗਾ।

ਇਸ ਪ੍ਰਸ਼ਨਾਵਲੀ ਨੂੰ ਪੂਰਾ ਕਰਕੇ ਦਿੱਤੇ ਲਫ਼ਾਫ਼ੇ ਵਿਚ ਭੇਜਣ ਦੀ ਕਿਰਪਾ ਕਰੋ

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ID: _____

ਇੱਥੋਂ ਸ਼ੁਰੂ ਕਰੋ

A. ਕਿਰਪਾ ਕਰਕੇ ਹੇਠ ਲਿਖੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇਣ ਲਈ ਢੁੱਕਵੇਂ ਬੌਕਸ ਚੈਕ ਕਰੋ √

1. ਹਰ ਰੋਜ਼ ਤੁਸੀਂ ਔਸਤਨ ਕਿੰਨੇ ਘੰਟੇ ਸੌਂਦੇ ਹੋ ?

1 ☐ 8 ਘੰਟੇ ਤੋਂ ਘੱਟ

2 ☐ 8 ਘੰਟੇ ਜਾਂ ਵੱਧ

2. ਜੇ ਤੁਸੀਂ ਤਮਾਕੂ ਪੀਂਦੇ ਹੋ, ਇੱਕ ਦਿਨ ਵਿਚ ਔਸਤਨ ਕਿੰਨੇ ਕੁ ਪੈਕ ਪੀਂਦੇ ਹੋ ?

1 ☐ ਨਹੀਂ ਪੀਂਦਾ
2 ☐ 1 ਪੈਕ ਪ੍ਰਤੀ ਦਿਨ ਤੋਂ ਘੱਟ
3 ☐ 1 ਪੈਕ ਪ੍ਰਤੀ ਦਿਨ
4 ☐ 1 ਪੈਕ ਪ੍ਰਤੀ ਦਿਨ ਤੋਂ ਵੱਧ

3. ਜੇ ਤੁਸੀਂ ਸ਼ਰਾਬ ਪੀਂਦੇ ਹੋ, ਇੱਕ ਹਫ਼ਤੇ ਵਿਚ ਕਿੰਨੀ ਪੀਂਦੇ ਹੋ ?

1 ☐ ਨਹੀਂ ਪੀਂਦਾ
2 ☐ 1 ਤੋਂ 5 ਪੈਗ ਹਰ ਹਫ਼ਤੇ
3 ☐ 6 ਜਾਂ ਵੱਧ ਪੈਗ ਹਰ ਹਫ਼ਤੇ

4. ਔਸਤਨ, ਤੁਸੀਂ ਇੱਕ ਦਿਨ ਵਿਚ ਕਿੰਨੀ ਵਾਰ ਖਾਂਦੇ ਹੋ (ਖਾਂਣੇ ਅਤੇ ਸਨੈਕਸ ਨੂੰ ਮਿਲਾ ਕੇ)?

1 ☐ ਇੱਕ ਵਾਰ
2 ☐ 2 ਵਾਰ
3 ☐ 3 ਵਾਰ
4 ☐ 4 ਵਾਰ
5 ☐ 5 ਵਾਰ
6 ☐ 6 ਵਾਰ ਜਾਂ ਵੱਧ

5. ਔਸਤਨ, ਤੁਸੀਂ ਆਪਣੇ ਤਨਾਉ ਅਤੇ ਪਰੇਸ਼ਾਨੀ ਦੇ ਪੱਧਰ ਨੂੰ ਕਿਸ ਤਰ੍ਹਾਂ ਦੱਸੋ ਗੇ ?

1 ☐ ਮੱਧਮ
2 ☐ ਔਸਤ ਦਰਜੇ ਦਾ
3 ☐ ਤੀਬਰ

6. ਆਪਣੇ ਤਨਾਉ ਅਤੇ ਪਰੇਸ਼ਾਨੀ ਤੋਂ ਰਾਹਤ ਪਾਉਣ ਲਈ ਤੁਸੀਂ ਕੀ ਕੁਝ ਕਰਦੇ ਹੋ?

*ਕਿਰਪਾ ਕਰਕੇ ਉਹ **ਸਾਰੇ** ਬੌਕਸ ਚੈਕ ਕਰੋ ਜੋ ਲਾਗੂ ਹੁੰਦੇ ਹਨ*

1 ☐ ਸੈਰ ਤੇ ਕਸਰਤ ਕਰਨਾ
2 ☐ ਸੰਗੀਤ ਸੁਣਨਾ / ਟੀਵੀ ਦੇਖਣਾ
3 ☐ ਧਾਰਮਿਕ ਅਤੇ ਅਧਿਆਤਮਕ ਕਿਰਿਆਵਾਂ ਕਰਨੀਆਂ
4 ☐ ਧਿਆਨ ਲਾਉਣਾ
5 ☐ ਕੁਝ ਨਾ ਕਰਨਾ
6 ☐ ਹੋਰ ਕੁਝ ਹੈ (ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ)_____

7. ਜੇਕਰ ਪਿਛਲੇ 12 ਮਹੀਨਿਆਂ ਵਿਚ ਆਪਣੀ ਸਿਹਤ ਵਿਚ ਸੁਧਾਰ ਕਰਨ ਲਈ ਕੁਝ ਕੀਤਾ ਹੈ,ਉਹ ਕਿਹੜਾ ਇਕ ਸਭ ਤੋਂ ਮਹੱਤਵਪੂਰਨ ਪਰਿਵਰਤਨ ਕੀਤਾ ਹੈ

ਇੱਕ ਨੂੰ ਚੈਕ ਕਰੋ

1 ☐ ਲਾਗੂ ਨਹੀਂ ਹੁੰਦਾ
2 ☐ ਕਸਰਤ ਵਿਚ / ਸਰੀਰਕ ਸਰਗਰਮੀਆਂ ਵਿਚ ਵਾਧਾ
3 ☐ ਭਾਰ ਘਟਾਇਆ
4 ☐ ਭੋਜਨ ਜਾਂ ਖਾਣ ਦੀਆਂ ਆਦਤਾਂ ਵਿਚ ਬਦਲ
5 ☐ ਸਿਗਰਟ ਪੀਣਾ ਛੱਡਿਆ / ਕਮੀ ਕੀਤੀ
6 ☐ ਸ਼ਰਾਬ ਪੀਣੀ ਛੱਡੀ / ਪੀਣ ਦੀ ਮਾਤਰਾ ਵਿਚ ਕਮੀ ਕੀਤੀ
7 ☐ ਡਾਕਟਰੀ ਇਲਾਜ ਕਰਵਾਇਆ
8 ☐ ਹੋਰ ਕੁਝ ਹੈ (ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ)_____

8. ਕੀ ਤੁਸੀਂ ਸੋਚਦੇ ਹੋ ਕਿ ਤੁਹਾਨੂੰ ਸਿਹਤ ਦੇ ਸੁਧਾਰ ਲਈ ਕੁਝ ਹੋਰ ਕਰਨਾ ਚਾਹੀਦਾ ਹੈ ?

*ਉਨ੍ਹਾਂ **ਸਾਰਿਆਂ** ਨੂੰ ਚੈਕ ਕਰੋ ਜੋ ਲਾਗੂ ਹੁੰਦੇ ਹਨ*

1 ☐ ਲਾਗੂ ਨਹੀਂ ਹੁੰਦਾ
2 ☐ ਕਸਰਤ ਵਿਚ / ਸਰੀਰਕ ਸਰਗਰਮੀਆਂ ਵਿਚ ਵਾਧਾ
3 ☐ ਖਾਣ ਦੀਆਂ ਆਦਤਾਂ ਵਿਚ ਸੁਧਾਰ
4 ☐ ਭਾਰ ਘਟਾਇਆ
5 ☐ ਸਿਗਰਟ ਪੀਣਾ ਛੱਡ ਦਿੱਤਾ
6 ☐ ਤਨਾਉ ਘੱਟ ਕੀਤਾ
7 ☐ ਵਿਟਾਮਿਨਜ਼ ਲੈਣਾ
8 ☐ ਹੋਰ ਕੁਝ ਹੈ (ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ _____

9.ਕੀ ਤੁਹਾਨੂੰ ਇਹ ਸੁਧਾਰ ਕਰਨ ਵਿਚ ਕੋਈ ਚੀਜ਼ ਰੋਕ ਰਹੀ ਹੈ? ਜੇ ਹਾਂ ਹੈ,ਤਾਂ ਇਹ ਕੀ ਹੈ ?

ਉਨ੍ਹਾਂ ਸਾਰਿਆਂ ਨੂੰ ਚੈਕ ਕਰੋ ਜੋ ਲਾਗੂ ਹੁੰਦੇ ਹਨ

1 ☐ ਲਾਗੂ ਨਹੀਂ ਹੁੰਦਾ
2 ☐ ਨਿਸ਼ਚਾ ਸ਼ਕਤੀ ਵਿਚ ਕਮੀ / ਆਤਮ ਅਨੁਸ਼ਾਸਨ
3 ☐ ਵਕਤ ਦੀ ਕਮੀ
4 ☐ ਅਧਿਕ ਥਕੇਵਾਂ / ਬਹੁਤ ਹੀ ਤਨਾਉ
5 ☐ ਬਹੁਤ ਮਹਿੰਗਾ
6 ☐ ਅੰਗਹੀਨਤਾ (ਡਿਸਅਬਿਲਿਟੀ) / ਸਿਹਤ ਸੰਬਧੀ ਸਮੱਸਿਆ
7 ☐ ਭਾਸ਼ਾਈ ਸਮੱਸਿਆ
8 ☐ ਆਦਤਾਂ ,ਜੀਵਨ ਸ਼ੈਲੀ ਬਦਲਣ ਲਈ ਬਹੁਤ ਦੇਰ ਹੋ ਚੁੱਕੀ ਹੈ
9 ☐ ਮੌਸਮੀ ਹਾਲਾਤ (ਬਾਰਸ਼ / ਬਰਫ਼ / ਠੰਡ)
10 ☐ ਧਾਰਮਿਕ / ਸਭਿਆਚਾਰਕ ਕਾਰਨ (ਵਿਆਖਿਆ ਕਰੋ) _____
11 ☐ ਹੋਰ ਕੁਝ ਹੈ (ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ _____

10. ਕਿਹੜੀਆਂ ਗੱਲਾਂ ਤੁਹਾਨੂੰ ਸਿਹਤਮੰਦ ਜੀਵਨ ਸ਼ੈਲੀ ਵਿਹਾਰ ਅਪਣਾਉਣ ਵਿਚ ਪ੍ਰੇਰਤ ਕਰਨਗੀਆਂ?
ਉਨ੍ਹਾਂ ਸਾਰਿਆਂ ਨੂੰ ਚੈਕ ਕਰੋ ਜੋ ਲਾਗੂ ਹੁੰਦੇ ਹਨ

[1] ☐ ਕੇਵਲ-ਪੁਰਸ਼ਾਂ ਲਈ ਜਾਂ ਕੇਵਲ ਇਸਤਰੀਆਂ ਲਈ ,ਜਿਮਜ਼ / ਪੂਲਜ਼ / ਫ਼ਿਟਨੇਸ ਸੈਂਟਰਜ਼ ਵਿਚ ਸਹੂਲਤਾਂ ਪ੍ਰਦਾਨ ਹੋਣ
[2] ☐ ਵਿਸ਼ੇਸ਼ ਨਸੀਹਤ (ਜਿਵੇਂ ਕੁਕਿੰਗ ਦੀਆਂ ਕਲਾਸਾਂ, ਸਿਗਰਟ ਪੀਣਾ ਛਡਾਉਣਾ, ਤਨਾਉ ਦੀ ਰੋਕਥਾਮ ਸੰਬਧੀ ਪ੍ਰੋਗਰਾਮ
[3] ☐ ਪ੍ਰੋਗਰਾਮ ਜੋ ਤੁਹਾਡੀ ਆਪਣੀ ਚੋਣਵੀਂ ਭਾਸ਼ਾ ਵਿਚ ਹੋ ਰਿਹਾ ਹੈ
[4] ☐ ਹੈਲਥਕੇਅਰ ਕਰਮਚਾਰੀ ਤੁਹਾਨੂੰ ਆਪਣੀ ਜੀਵਨ ਸ਼ੈਲੀ ਬਦਲਣ ਲਈ ਸਲਾਹ ਦੇਣ
[5] ☐ ਧਾਰਮਿਕ ਵਿਅਕਤੀ ਤੁਹਾਨੂੰ ਆਪਣੀ ਜੀਵਨ ਸ਼ੈਲੀ ਬਦਲਣ ਲਈ ਸਲਾਹ ਦੇਣ
[6] ☐ ਪਰਿਵਾਰਕ ਸਮਰਥਨ
[7] ☐ ਤੁਹਾਡੇ ਮਿੱਤਰ (ਕਸਰਤ ਕਰਨ, ਕੁਕਿੰਗ ਕਲਾਸਾਂ / ਸਿਗਰਟ ਪੀਣਾ ਛਡਾਉਣ ਦੇ ਪ੍ਰੋਗਰਾਮਾਂ ਵਿਚ) ਨਾਲ ਜਾਣ
[8] ☐ ਜੇ ਤੁਹਾਡੇ ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਦੀ ਅਲਾਮਤ ਜਾਂਚੀ ਗਈ ਹੈ
[9] ☐ ਕੰਮ (ਦੀ ਥਾਂ) ਤੇ ਫ਼ਿਟਨੈਸ ਸੈਂਟਰ
[10] ☐ ਹੋਰ ਕੁਝ ਹੈ (ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ)_____

B. ਕਿਰਪਾ ਕਰਕੇ ਢੁਕਵੇਂ ਬੌਕਸ ਚੈਕ ਕਰਕੇ ਆਪਣੀਆਂ ਕਸਰਤ ਕਰਨ ਦੀਆਂ ਆਦਤਾਂ ਬਾਰੇ ਦੱਸੋ:

ਕੀ ਤੁਸੀਂ ਕਸਰਤ ਕਰਦੇ ਹੋ ?	[1] ☐ ਹਾਂ	[2] ☐ ਨਹੀਂ		
ਤੁਸੀਂ ਕਿਸ ਕਿਸਮ ਦੀ ਕਿਰਿਆ ਕਰਦੇ ਹੋ ?	[1] ☐ ਤੇਜ਼ ਸੈਰ	[2] ☐ ਤੈਰਨਾ	[3] ☐ ਜੌਗ /ਦੌੜਨਾ	[4] ☐ ਹੋਰ _____
ਤੁਸੀਂ ਹਰ ਹਫ਼ਤੇ ਕਿੰਨੀ ਵਾਰ ਕਸਰਤ ਕਰਦੇ ਹੋ?	[1] ☐ ਹਰ ਹਫ਼ਤੇ 1 ਦਿਨ ਤੋਂ ਘੱਟ	[2] ☐ ਹਰ ਹਫ਼ਤੇ 1 ਜਾਂ 2 ਦਿਨ	[3] ☐ ਹਰ ਹਫ਼ਤੇ 3 ਜਾਂ 4 ਦਿਨ	[4] ☐ ਹਰ ਹਫ਼ਤੇ 5 ਜਾਂ ਵੱਧ ਦਿਨ
ਕਸਰਤ ਕਰਨ ਦੇ ਸੈਸ਼ਨ ਤੋਂ ਬਾਅਦ ਤੁਸੀਂ ਆਪਣੇ ਸਾਹ ਦੀ ਗਤੀ ਨੂੰ ਕਿਵੇਂ ਜਾਂਚੋ ?	[1] ☐ ਆਮ ਵਾਂਗ	[2] ☐ ਆਮ ਨਲੋਂ ਥੋੜਾ ਤੇਜ਼	[3] ☐ ਆਮ ਨਲੋਂ ਬਹੁਤ ਤੇਜ਼,ਪਰ ਸਾਹ ਲੈਣਾ ਸੰਭਵ	[4] ☐ ਇੰਨਾਂ ਤੇਜ਼ ਕਿ ਸਾਹ ਲੈਣਾ ਅਸੰਭਵ
ਤੁਸੀਂ ਕਿੰਨੀਂ ਦੇਰ ਕਸਰਤ ਕਰਦੇ ਹੋ?	[1] ☐ 15 ਮਿੰਟ ਤੋਂ ਘੱਟ	[2] ☐ 15 ਤੋਂ 30 ਮਿੰਟ	[3] ☐ 30 ਤੋਂ 60 ਮਿੰਟ	[4] ☐ 60 ਮਿੰਟ ਤੋਂ ਵੱਧ
ਇਸ ਪੱਧਰ ਦੀ ਕਸਰਤ ਤੁਸੀਂ ਕਦੋਂ ਤੋਂ ਕਰਦੇ ਆ ਰਹੇ ਹੋ ?	[1] ☐ 1 ਮਹੀਨੇ ਤੋਂ ਘੱਟ	[2] ☐ 1 ਤੋਂ 3 ਮਹੀਨੇ	[3] ☐ 3 ਤੋਂ 6 ਮਹੀਨੇ	[4] ☐ 6 ਮਹੀਨੇ ਤੋਂ ਵੱਧ
ਥਾਂ ਜਿੱਥੇ ਤੁਸੀਂ ਕਸਰਤ ਕਰਦੇ ਹੋ:	[1] ☐ ਘਰ	[2] ☐ ਘਰੋਂ ਬਾਹਰ	[3] ☐ ਜਿਮ ਵਿਚ	[4] ☐ ਰੈਕਰੀਏਸ਼ਨ ਸੈਂਟਰ ਵਿਚ
ਕੀ ਤੁਸੀਂ ਕਸਰਤ ਪਸੰਦ ਕਰਦੇ ਹੋ ?	[1] ☐ ਹਾਂ	[2] ☐ ਨਹੀਂ		

C. ਕਿਰਪਾ ਕਰਕੇ ਉਸ ਉੱਤਰ ਨੂੰ ਚੱਕਰ ਲਾਓ ਜੋ ਪ੍ਰਤੀ ਹਫ਼ਤੇ ਤਹਾਡੀ ਔਸਤਨ ਭੋਜਨ ਕਰਨ ਦੀ ਮਾਤਰਾ ਨੂੰ ਦਰਸਾਵੇ :

		ਕਦੇ ਨਹੀਂ	ਹਫ਼ਤੇ'ਚ 1 ਵਾਰ	ਹਫ਼ਤੇ'ਚ 2 ਵਾਰ	ਹਫ਼ਤੇ'ਚ 3 ਵਾਰ	ਚਾਰ ਵਾਰ ਜਾਂ ਵਧ
1	ਤੁਸੀਂ ਰੈਡ ਮੀਟ (ਬੀਫ / ਪੋਰਕ / ਲੈਂਬ) ਕਿੰਨੀਂ ਵਾਰ ਖਾਦੇ ਹੋ	0	1	2	3	4
2	ਤੁਸੀਂ ਮੱਛੀ ਜਾਂ ਹੋਰ ਕੋਈ ਸੀਅ ਫੂਡ (sea food) ਕਿੰਨੀਂ ਵਾਰ ਖਾਂਦੇ ਹੋ	0	1	2	3	4
3	ਤੁਸੀਂ ਦੁਧ ਕਿੰਨੀਂ ਵਾਰ ਪੀਂਦੇ ਹੋ	0	1	2	3	4
4	ਤੁਸੀਂ ਦੁੱਧ ਜਿਸ ਦੀ ਚਰਬੀ ਘੱਟ ਕੀਤੀ ਹੈ (1%,ਘੱਟ ਕੀਤੀ ਚਰਬੀ ਜਾਂ ਸਪਰੇਟਾ ਦੁੱਧ (skim milk) ਕਿੰਨੀਂ ਵਾਰ ਪੀਂਦੇ ਹੋ	0	1	2	3	4
5	ਤੁਸੀਂ ਪਨੀਰ ਜਾਂ ਹੋਰ ਦੁੱਧ ਦੇ ਪਦਾਰਥ ਕਿੰਨੀਂ ਵਾਰ ਖਾਂਦੇ ਹੋ	0	1	2	3	4
6	ਤੁਸੀਂ ਘੱਟ ਚਰਬੀ ਵਾਲਾ ਪਨੀਰ ਕਿੰਨੀਂ ਵਾਰ ਚੁਣਦੇ ਹੋ	0	1	2	3	4
7	ਤੁਸੀਂ ਡਿਜ਼ਰਟ ਕਿੰਨੀਂ ਵਾਰ ਲੈਂਦੇ ਹੋ	0	1	2	3	4
8	ਤੁਸੀਂ ਘੱਟ ਚਰਬੀ ਵਾਲਾ ਡਿਜ਼ਰਟ ਕਿੰਨੀਂ ਵਾਰ ਚੁਣਦੇ ਹੋ	0	1	2	3	4
9	ਤੁਸੀਂ ਡਿਜ਼ਰਟ ਦੇ ਰੂਪ ਵਿਚ ਫਲ ਕਿੰਨੀਂ ਵਾਰ ਖਾਂਦੇ ਹੋ	0	1	2	3	4
10	ਤੁਸੀਂ ਖਾਣਿਆਂ ਦੇ ਵਿਚਕਾਰ ਸਨੈਕ ਕਿੰਨੀਂ ਵਾਰ ਖਾਂਦੇ ਹੋ	0	1	2	3	4
11	ਤੁਸੀਂ ਸਨੈਕ ਦੇ ਰੂਪ ਵਿਚ ਕੱਚੀਆਂ ਸਬਜ਼ੀਆਂ ਜਾਂ ਫਲ ਕਿੰਨੀਂ ਵਾਰ ਖਾਂਦੇ ਹੋ	0	1	2	3	4
12	ਤੁਸੀਂ ਫ਼ਾਸਟ ਫੂਡ ਰੈਸਟੋਰੈਂਟਸ (ਬਰਗਰ ਕਿੰਗ, ਮੈਕਡੋਨਲਡਜ਼, ਕੇ ਐਫ਼ ਸੀ, ਵੈਂਡੀਜ਼ ਆਦਿ) ਵਿਚ ਕਿੰਨੀਂ ਵਾਰ ਖਾਂਦੇ ਹੋ	0	1	2	3	4
13	ਤੁਸੀਂ ਕਿੰਨੀ ਵਾਰ ਭੋਜਨ ਨੂੰ ਭੁੰਨਦੇ ਹੋ	0	1	2	3	4
14	ਤੁਸੀਂ ਕਿੰਨੀ ਵਾਰ ਭੋਜਨ ਨੂੰ ਉਬਾਲਦੇ ਹੋ	0	1	2	3	4
15	ਤੁਸੀਂ ਕਿੰਨੀ ਵਾਰ ਭੋਜਨ ਨੂੰ ਵਧੇਰੇ ਤਲਦੇ (deep fry)ਹੋ	0	1	2	3	4
16	ਤੁਸੀਂ ਕਿੰਨੀ ਵਾਰ ਭੋਜਨ ਨੂੰ ਤੜਕਦੇ (stir fry) ਹੋ	0	1	2	3	4
17	ਤੁਸੀਂ ਕਿੰਨੀ ਵਾਰ ਭੋਜਨ ਨੂੰ ਪਕਾਉਂਦੇ ਹੋ	0	1	2	3	4

D. ਆਪਣਾ ਉੱਤਰ ਦੱਸਣ ਲਈ ,ਕਿਰਪਾ ਕਰਕੇ ਹੇਠ ਲਿਖੇ ਕਥਨਾਂ ਵਿਚੋਂ 'ਸੱਚ' ਜਾਂ 'ਝੂਠ'ਨੂੰ ਚੱਕਰ ਲਗਾਓ:

1	ਜੈਤੂਨ ਦਾ ਤੇਲ (olive oil) ਹਾਈਡਰੋਜਿਨੇਟਿਡ ਵੈਜੀਟੇਬਲ (ਮੱਖਣ,ਘੀ) ਨਾਲੋਂ ਚੰਗਾ ਹੈ	ਸੱਚ	ਝੂਠ
2	ਬੁਢੇ ਬਾਲਗਾਂ ਦਾ ਹਾਈ ਬਲੱਡ ਪਰੈਸ਼ਰ ਨਾਲ ਪੀੜਤ ਹੋਣਾ ਸਧਾਰਨ ਹੈ	ਸੱਚ	ਝੂਠ
3	ਡਾਇਬਟੀਜ਼ ਦੇ ਰੋਗੀਆਂ ਨੂੰ ਬਨਿਸਬਤ ਡਾਇਬਟੀਜ਼ ਰਹਿਤ ਵਿਅਕਤੀਆਂ ਨਾਲੋਂ ਦਿਲ ਦੇ ਰੋਗ ਦਾ ਵੱਧ ਖ਼ਤਰਾ ਹੈ	ਸੱਚ	ਝੂਠ
4	ਥੋੜੇ ਜਿਹੇ ਸਿਗਰਟ ਪੀਣ ਨਾਲ ਦਿਲ ਨੂੰ ਕੋਈ ਨੁਕਸਾਨ ਨਹੀਂ ਹੁੰਦਾ	ਸੱਚ	ਝੂਠ
5	ਜਿਨ੍ਹਾਂ ਲੋਕਾਂ ਦਾ ਕਲੈਸਟਰੌਲ ਲੈਵਲ ਉੱਚਾ ਹੈ ਉਨ੍ਹਾਂ ਨੂੰ ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਦਾ ਕੋਈ ਖ਼ਤਰਾ ਨਹੀਂ ਹੈ	ਸੱਚ	ਝੂਠ
6	ਜਿਨ੍ਹਾਂ ਲੋਕਾਂ ਦਾ ਭਾਰ ਠੀਕ ਠੀਕ (average) ਹੈ ਉਨ੍ਹਾਂ ਨੂੰ ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਦਾ ਘੱਟ ਖ਼ਤਰਾ ਹੈ ਉਨ੍ਹਾਂ ਲੋਕਾਂ ਦੀ ਤੁਲਨਾ ਵਿਚ ਜਿਨ੍ਹਾਂ ਦਾ ਭਾਰ ਵੱਧ ਹੈ	ਸੱਚ	ਝੂਠ
7	ਬਾਕਾਇਦਾ ਸਰੀਰਕ ਕਸਰਤ ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਦਾ ਖ਼ਤਰਾ ਘਟਾਉਂਦੀ ਹੈ	ਸੱਚ	ਝੂਠ
8	ਪਰੇਸ਼ਾਨੀ ਅਤੇ ਮਨੋਵਿਗਿਆਨਕ ਤਨਾਉ ਕਿਸੇ ਦੇ ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਦਾ ਖ਼ਤਰਾ ਵਧਾਉਂਦੀ ਹੈ	ਸੱਚ	ਝੂਠ
9	ਇੱਕ ਪਹਿਲਾਂ ਪਏ ਦਿਲ ਦੇ ਦੌਰੇ ਨਾਲ ਹੋਰ ਦਿਲ ਦੇ ਦੌਰੇ ਦਾ ਖ਼ਤਰਾ ਘੱਟ ਜਾਂਦਾ ਹੈ	ਸੱਚ	ਝੂਠ
10	ਪਰਿਵਾਰ ਦੇ ਪਿਛੋਕੜ ਵਿਚ ਦਿਲ ਦੇ ਰੋਗ ਹੋਣ ਨਾਲ ਦਿਲ ਦੇ ਰੋਗ ਦਾ ਖ਼ਤਰਾ ਵੱਧ ਜਾਂਦਾ ਹੈ	ਸੱਚ	ਝੂਠ

E. ਹੇਠ ਦਿੱਤੇ ਹਰੇਕ ਕਥਨਾਂ ਵਿਚੋਂ, ਕਿਰਪਾ ਕਰਕੇ ਉਸ ਉੱਤਰ ਨੂੰ ਚੱਕਰ ਲਾਓ ਜੋ ਤੁਹਾਡੀ ਆਦਤ ਦੇ ਅਧਾਰ ਤੇ ਸਭ ਤੋਂ ਚੰਗੀ ਤਰ੍ਹਾਂ ਤੁਹਾਡੀ ਰਾਇ ਦਰਸਾਉਂਦਾ ਹੈ:

ਹਰੇਕ ਕਥਨ ਵਿਚੋਂ ਇੱਕ ਉੱਤਰ ਚੁਣੋ

		ਉੱਕਾ ਹੀ ਸਹਿਮਤ ਨਹੀਂ	ਸਹਿਮਤ ਨਹੀਂ	ਨਿਰਪੱਖ	ਸਹਿਮਤ	ਪੂਰੀ ਤਰ੍ਹਾਂ ਸਹਿਮਤ
1.	ਮੇਰੇ ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਦੀ ਬਹੁਤ ਸੰਭਾਵਨਾ ਹੈ	1	2	3	4	5
2.	ਮੈਨੂੰ ਆਪਣੀਆਂ ਭੋਜਨ ਸੰਬੰਧੀ ਆਦਤਾਂ ਤੋਂ ਜਾਪਦਾ ਹੈ ਕਿ ਮੈਨੂੰ ਭਵਿੱਖ ਵਿਚ ਦਿਲ ਦਾ ਰੋਗ ਲੱਗ ਜਾਵੇਗਾ	1	2	3	4	5
3.	ਮੇਰੀਆਂ ਸਰੀਰਕ ਕਿਰਿਆਵਾਂ ਦੇ ਲੈਵਲ ਤੋਂ ਇਹ ਸੰਭਾਵਨਾ ਪੈਦਾ ਹੋ ਜਾਵੇਗੀ ਕਿ ਮੈਨੂੰ ਭਵਿੱਖ ਵਿਚ ਦਿਲ ਦਾ ਰੋਗ ਲੱਗ ਜਾਵੇਗਾ	1	2	3	4	5
4.	ਸਾਧਾਰਨ ਵਿਅਕਤੀ ਦੀ ਨਿਸਬਤ ਮੈਨੂੰ ਦਿਲ ਦਾ ਰੋਗ ਲੱਗਣ ਦੀ ਸੰਭਾਵਨਾ ਵੱਧ ਹੈ	1	2	3	4	5
5.	ਮੇਰੇ ਪਰਿਵਾਰਕ ਪਿਛੋਕੜ ਤੋਂ ਇਹ ਸੰਭਾਵਨਾ ਪੈਦਾ ਹੁੰਦੀ ਹੈ ਕਿ ਮੈਨੂੰ ਦਿਲ ਦਾ ਰੋਗ ਹੋ ਜਾਵੇ ਗਾ	1	2	3	4	5
6.	ਮੇਰੀ ਵਰਤਮਾਨ ਸਿਹਤ-ਸਥਿਤੀ ਦੇ ਕਾਰਨ ਮੈਨੂੰ ਦਿਲ ਦਾ ਰੋਗ ਲੱਗਣ ਦੀ ਸੰਭਾਵਨਾ ਵਧੇਰੇ ਹੈ	1	2	3	4	5
7.	ਜੇ ਮੈਨੂੰ ਦਿਲ ਦਾ ਰੋਗ ਲੱਗ ਜਾਵੇ, ਮੇਰਾ ਸਾਰਾ ਜੀਵਨ ਬਦਲ ਜਾਵੇਗਾ	1	2	3	4	5
8.	ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਨਾਲ ਅਪਾਹਜਪੁਣਾ ਹੋ ਸਕਦਾ ਹੈ	1	2	3	4	5
9.	ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਦੀ ਸੋਚ ਮੈਨੂੰ ਡਰਾ ਦਿੰਦੀ ਹੈ	1	2	3	4	5
10.	ਜੇ ਮੈਨੂੰ ਦਿਲ ਦਾ ਰੋਗ ਹੋ ਜਾਂਦਾ ਤਾਂ ਇਹ ਮੇਰੀ ਨੌਕਰੀ / ਕਮਾਈ ਦੀ ਸਮੱਰਥਾ ਵਿਚ ਰੁਕਾਵਟ ਪਾਉਂਦਾ	1	2	3	4	5
11.	ਜੇ ਮੈਨੂੰ ਦਿਲ ਦਾ ਰੋਗ ਹੋ ਜਾਂਦਾ ਇਸ ਨਾਲ ਮੇਰੇ ਪਰਿਵਾਰ / ਜੀਵਨ ਸਾਥੀ ਤੇ ਬੋਝ ਪੈ ਜਾਂਦਾ	1	2	3	4	5
12.	ਦਿਲ ਦੀ ਬਿਮਾਰੀ ਦੇ ਬਹੁਤ ਗੰਭੀਰ ਪਰਿਣਾਮ ਹੋ ਸਕਦੇ ਹਨ	1	2	3	4	5

		ਉੱਕਾ ਹੀ ਸਹਿਮਤ ਨਹੀਂ	ਸਹਿਮਤ ਨਹੀਂ	ਨਿਰਪੱਖ	ਸਹਿਮਤ	ਪੂਰੀ ਤਰ੍ਹਾਂ ਸਹਿਮਤ
13.	ਮੈਨੂੰ ਦਿਲ ਦੇ ਰੋਗੀ ਹੋਣ ਦੀ ਚਿੰਤਾ ਨਾ ਹੋਵੇ ਜੇਕਰ ਮੇਰਾ ਘੱਟ-ਚਰਬੀ-ਭੋਜਨ (low-fat-diet) ਹੋਵੇ	1	2	3	4	5
14.	ਇੱਕ ਘੱਟ-ਚਰਬੀ-ਭੋਜਨ (low-fat-diet) ਦਿਲ ਦੇ ਰੋਗ ਸੰਬੰਧੀ ਭਵਿੱਖ ਵਿਚ ਆਉਣ ਵਾਲੀਆਂ ਸਮੱਸਿਆਵਾਂ ਤੋਂ ਬਚਾਉਂਦਾ ਹੈ	1	2	3	4	5
15.	ਭੋਜਨ ਜਿਸ ਵਿਚ ਘੱਟ ਚਰਬੀ ਹੋਵੇ , ਮੇਰੀਆਂ ਦਿਲ ਦੇ ਰੋਗ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ ਨੂੰ ਰੋਕਦਾ ਹੈ	1	2	3	4	5
16.	ਘੱਟ-ਚਰਬੀ-ਭੋਜਨ (low-fat-diet) ਖਾਣ ਨਾਲ ਸਿਹਤ ਨੂੰ ਬਹੁਤ ਲਾਭ ਹੁੰਦੇ ਹਨ	1	2	3	4	5
17.	ਘੱਟ-ਚਰਬੀ-ਭੋਜਨ (low-fat-diet) ਖਾਣ ਲਈ ਮੈਨੂੰ ਆਪਣਾ ਨਿਯਮਕ (regular) ਭੋਜਨ ਬਦਲਨਾ ਪਵੇਗਾ, ਜੋ ਕਰਨਾ ਔਖਾ ਹੈ	1	2	3	4	5
18.	ਘੱਟ-ਚਰਬੀ-ਭੋਜਨ (low-fat-diet) ਖਾਣ ਲਈ ਮੈਨੂੰ ਹੋਰ ਭੋਜਨ ਛਡਣੇ ਪੈਣਗੇ ਜੋ ਮੈਨੂੰ ਪਸੰਦ ਹਨ	1	2	3	4	5
19.	ਘੱਟ-ਚਰਬੀ-ਭੋਜਨ (low-fat-diet) ਮਹਿੰਗਾ ਹੈ	1	2	3	4	5
20.	ਮੈਨੂੰ ਘੱਟ-ਚਰਬੀ-ਭੋਜਨ (low-fat-diet) ਖਾਣਾ ਪਸੰਦ ਨਹੀਂ ਹੈ	1	2	3	4	5
21.	ਨਿਯਮ ਅਨੁਸਾਰ ਕਸਰਤ ਦਿਲ ਦੇ ਰੋਗ ਦੇ ਖ਼ਤਰੇ ਨੂੰ ਘਟਾਉਂਦੀ ਹੈ	1	2	3	4	5
22.	ਮੈਂ ਆਪਣੇ ਆਪ ਨੂੰ ਚੰਗਾ ਮਹਿਸੂਸ ਕਰਦਾ ਹਾਂ ਜਦ ਮੈਂ ਕਸਰਤ ਕਰਦਾ ਹਾਂ	1	2	3	4	5
23.	ਬਾਕਾਇਦਾ ਏਅਰੋਬਿਕ (aerobic) ਕਸਰਤ ਕਰਨ ਨਾਲ ਭੀ ਮੇਰੇ ਸਰੀਸ ਵਿਚ ਬਦਲ ਦਿਖਾਈ ਦੇਵੇਗੀ	1	2	3	4	5
24.	ਨਿਯਮ ਅਨੁਸਾਰ ਕਸਰਤ ਕਰਨੀ ਭਵਿੱਖ ਵਿਚ ਆਉਣ ਵਾਲੇ ਹਿਰਦੇ ਰੋਗ ਤੋਂ ਬਚਾਉਂਦੀ ਹੈ	1	2	3	4	5
25.	ਨਿਯਮ ਅਨੁਸਾਰ ਕਸਰਤ ਕਰਨੀ ਮੇਰੀਆਂ ਦੈਨਿਕ ਕ੍ਰਿਆਵਾਂ ਵਿਚ ਵਿਘਨ ਪਾਉਂਦੀ ਹੈ	1	2	3	4	5
26.	ਨਿਯਮ ਅਨੁਸਾਰ ਕਸਰਤ ਕਰਨ ਨਾਲ ਸਮਾਂ ਖ਼ਰਾਬ ਹੁੰਦਾ ਹੈ	1	2	3	4	5
27.	ਨਿਯਮ ਅਨੁਸਾਰ ਕਸਰਤ ਕਰਨ ਦਾ ਅਰਥ ਹੋਵੇਗਾ ਇੱਕ ਨਵੀਂ ਆਦਤ ਸ਼ੁਰੂ ਕਰਨਾ ਜੋ ਮੇਰੇ ਲਈ ਔਖਾ ਹੈ	1	2	3	4	5

		ਉੱਕਾ ਹੀ ਸਹਿਮਤ ਨਹੀਂ	ਸਹਿਮਤ ਨਹੀਂ	ਨਿਰਪੱਖ	ਸਹਿਮਤ	ਪੂਰੀ ਤਰ੍ਹਾਂ ਸਹਿਮਤ
28.	ਮੇਰੇ ਕੋਲ ਕੋਈ ਥਾਂ ਨਹੀਂ ਜਿੱਥੇ ਮੈਂ ਕਸਰਤ ਕਰ ਸਕਾਂ	1	2	3	4	5
29.	ਮੈਂ ਸਿਹਤਮੰਦ (healthy) ਅਤੇ ਚੰਗਾ ਸੰਤੁਲਿਤ ਭੋਜਨ ਖਾਂਦਾ ਹਾਂ	1	2	3	4	5
30.	ਮੈਂ ਬਾਕਾਇਦਾ ਕਸਰਤ ਕਰਦਾ ਹਾਂ—ਘੱਟੋ ਘੱਟ ਹਫ਼ਤੇ ਵਿਚ 3 ਵਾਰ	1	2	3	4	5
31.	ਮੈਂ ਆਪਣੀ ਸਿਹਤ ਸੰਬੰਧੀ ਨਵੀਂ ਜਾਣਕਾਰੀ ਦੀ ਖੋਜ ਕਰਦਾ ਹਾਂ	1	2	3	4	5
32.	ਸਿਹਤ ਨੂੰ ਅੱਛਾ ਰੱਖਣਾ ਮੇਰੇ ਲਈ ਬਹੁਤ ਮਹੱਤਵਪੂਰਨ ਹੈ	1	2	3	4	5
33.	ਮੈਂ ਆਪਣੇ ਪਰਿਵਾਰ / ਜੀਵਨ ਸਾਥੀ ਤੇ ਭਰੋਸਾ ਕਰ ਸਕਦਾ ਹਾਂ ਕਿ ਮੈਨੂੰ ਸਿਹਤਮੰਦ ਵਿਹਾਰ ਅਪਣਾਉਣ ਲਈ ਪ੍ਰੇਰਤ ਕਰੇ	1	2	3	4	5
34.	ਮੈਂ ਆਪਣੇ ਸਾਥੀਆਂ ਤੇ ਭਰੋਸਾ ਕਰ ਸਕਦਾ ਹਾਂ ਕਿ ਮੈਨੂੰ ਸਿਹਤਮੰਦ ਵਿਹਾਰ ਅਪਣਾਉਣ ਲਈ ਪ੍ਰੇਰਤ ਕਰਨ	1	2	3	4	5
35.	ਮੈਂ ਆਪਣੇ ਡਾਕਟਰ / ਹੈਲਥਕੇਅਰ ਪ੍ਰੈਟੀਸ਼ਨਰ ਤੇ ਭਰੋਸਾ ਕਰ ਸਕਦਾ ਹਾਂ ਕਿ ਮੈਨੂੰ ਸਿਹਤਮੰਦ ਵਿਹਾਰ ਅਪਣਾਉਣ ਲਈ ਪ੍ਰੇਰਤ ਕਰਨ	1	2	3	4	5
36.	ਮੈਂ ਆਪਣੇ ਅਧਿਆਤਮਕ ਗੁਰੂ ਤੇ ਭਰੋਸਾ ਕਰ ਸਕਦਾ ਹਾਂ ਕਿ ਮੈਨੂੰ ਸਿਹਤਮੰਦ ਵਿਹਾਰ ਅਪਣਾਉਣ ਲਈ ਪ੍ਰੇਰਤ ਕਰਨ	1	2	3	4	5
37.	ਮੈਨੂੰ ਭਰੋਸਾ ਹੈ,ਜੇ ਮੈਂ ਚਾਹਾਂ ਮੈਂ ਬਾਕਾਇਦਾ ਘੱਟ-ਚਰਬੀ-ਭੋਜਨ (low-fat-diet) ਤਿਆਰ ਕਰ ਸਕਦਾ ਹਾਂ	1	2	3	4	5
38.	ਮੈਨੂੰ ਆਪਣੀ ਯੋਗਤਾ ਤੇ ਭਰੋਸਾ ਹੈ ਕਿ ਮੈਂ ਉਹ ਭੋਜਨ ਖ਼ਰੀਦਾਂ ਜੋ ਘੱਟ ਚਰਬੀ ਵਾਲਾ (low-fat)ਹੋਵੇ	1	2	3	4	5
39.	ਮੈਨੂੰ ਆਪਣੀ ਯੋਗਤਾ ਤੇ ਭਰੋਸਾ ਹੈ ਕਿ ਮੈਂ ਡਿਜ਼ਰਟ ਲਈ ਆਇਸ-ਕਰੀਮ ਜਾਂ ਹੋਰ ਮਠਿਆਇਆਂ ਦੀ ਥਾਂ ਤਾਜ਼ੇ ਫਲ ਚੁਣਾਂ	1	2	3	4	5
40.	ਜੇਕਰ ਮੈਨੂੰ ਮਨਚਾਹੇ ਭੋਜਨ ਲਈ ਇੱਕ ਰੈਸੀਪੀ (recipe) ਦਿੱਤੀ ਜਾਵੇ,ਮੈਨੂੰ ਭਰੋਸਾ ਹੈ ਕਿ ਮੈਂ ਉਸ ਦੇ ਤੱਤ (ingredients) ਬਦਲ ਕੇ ਉਸ ਦੀ ਚਰਬੀ (fat) ਘਟਾ ਸਕਾਂਗਾ	1	2	3	4	5
41.	ਮੈਨੂੰ ਭਰੋਸਾ ਹੈ ਕਿ ਮੈਂ ਘੱਟ-ਚਰਬੀ (low-fat) ਵਾਲਾ ਸੁਆਦਲਾ ਭੋਜਨ ਪਕਾ ਸਕਾਂਗਾ	1	2	3	4	5

F.ਤੁਹਾਨੂੰ ਕਿੰਨਾਂ ਕੁ ਭਰੋਸਾ ਹੈ ਕਿ ਤੁਸੀਂ ਆਪਣੀ ਮਨਭਾਉਂਦੀ ਸਰੀਰਕ ਕਿਰਿਆ ਵਿਚ <u>ਹਰ ਹਫ਼ਤੇ</u> ਆਉਣ ਵਾਲੇ ਮਹੀਨੇ ਲਈ ਹੇਠ ਲਿਖੀ ਵਾਰ ਰੁਝ ਸਕੋਗੇ:

ਸਰੀਰਕ ਕਿਰਿਆ ਉਹ ਕਿਰਿਆ ਹੈ ਜੋ ਤਹਾਡੇ ਦਿਲ ਦੀ ਗਤੀ ਨੂੰ ਵਧਾਵੇ ਅਤੇ ਤੁਹਾਡਾ ਸਾਹ ਫੁਲਾ ਦੇਵੇ

		ਉੱਕਾ ਹੀ ਭਰੋਸਾ ਨਹੀਂ	ਕਾਫ਼ੀ ਭਰੋਸਾ	ਬਹੁਤ ਭਰੋਸਾ
1	ਹਫ਼ਤੇ ਵਿਚ ਇੱਕ ਵਾਰ	1	2	3
2	ਹਫ਼ਤੇ ਵਿਚ ਦੋ ਵਾਰ	1	2	3
3	ਹਫ਼ਤੇ ਵਿਚ ਤਿੰਨ ਵਾਰ	1	2	3
4	ਹਫ਼ਤੇ ਵਿਚ ਚਾਰ ਵਾਰ ਜਾਂ ਵੱਧ	1	2	3

G. ਤੁਹਾਨੂੰ ਕਿੱਨਾਂ ਕੁ ਭਰੋਸਾ ਹੈ ਕਿ ਤੁਸੀਂ ਬਾਕਾਇਦਾ ਕਸਰਤ ਵਿਚ ਰੁਝ ਸਕੋਂਗੇ ਜਦੋਂ:

		ਉੱਕਾ ਹੀ ਭਰੋਸਾ ਨਹੀਂ	ਕਾਫ਼ੀ ਭਰੋਸਾ	ਬਹੁਤ ਭਰੋਸਾ
1	ਤੁਸੀਂ ਥੱਕੇ ਹੋਵੋਂ	1	2	3
2	ਤੁਹਾਡਾ ਮਨ (mood) ਨਾ ਕਰਦਾ ਹੋਵੇ	1	2	3
3	ਤਸੀਂ ਮਹਿਸੂਸ ਕਰਦੇ ਹੋਵੋਂ ਤੁਹਾਡੇ ਕੋਲ਼ ਵਕਤ ਨਹੀਂ ਹੈ	1	2	3
4	ਤਸੀਂ ਛੁੱਟੀਆਂ ਮਨਾ ਰਹੇ ਹੋਵੋਂ	1	2	3
5	ਬਾਰਸ ਜਾਂ ਬਰਫ਼ ਪੈ ਰਹੀ ਹੋਵੇ	1	2	3

H. ਵਿਅਕਤੀਗਤ ਰੂਪ ਵਿਚ ਆਪਣੇ ਆਪ ਨੂੰ ਸਿਹਤਮੰਦ ਰੱਖਣ ਲਈ ਹੇਠ ਲਿੱਖੀਆਂ ਕਿਰਿਆਵਾਂ ਕਿੰਨੀਆਂ ਜ਼ਰੂਰੀ ਹਨ :

		ਮਹੱਤਵਪੂਰਨ ਨਹੀਂ	ਕਾਫ਼ੀ ਮਹੱਤਵਪੂਰਨ	ਬਹੁਤ ਮਹੱਤਵਪੂਰਨ
1	ਠੀਕ ਕਿਸਮ ਦਾ ਭੋਜਨ ਖਾਣਾ	1	2	3
2	ਕਾਫ਼ੀ ਕਸਰਤ ਕਰਨੀ	1	2	3
3	ਕਾਫ਼ੀ ਆਰਾਮ ਕਰਨਾ ਤੇ ਸਾਉਣਾ	1	2	3
4	ਸਰੀਰ ਦਾ ਠੀਕ ਭਾਰ ਕਾਇਮ ਰੱਖਣਾ	1	2	3
5	ਡਾਕਟਰ ਤੋਂ ਬਾਕਾਇਦਾ ਚੈਕ ਅਪ ਕਰਵਾਉਣਾ	1	2	3
6	ਵਿਟਾਮਿਨ ਲੈਣੇ	1	2	3
7	ਰਵਾਇਤੀ ਜੜੀਬੂਟੀਆ ਦੀਆਂ ਦਵਾਈਆਂ ਲੈਣੀਆਂ	1	2	3
8	ਧਾਰਮਿਕ ਵਿਸ਼ਵਾਸ ਰੱਖਣਾ	1	2	3

I. ਅਸੀਂ ਤੁਹਾਡੇ ਕੋਲ਼ੋਂ ਆਮ ਸੂਚਨਾ ਚਾਹੁੰਦੇ ਹਾਂ.

ਕੀ ਤੁਸੀਂ :

[1]☐ ਪੁਰਸ਼ (Male) [2]☐ ਇਸਤਰੀ (Female)

ਉਮਰ : _____ ਕੱਦ: _____ ਭਾਰ: _____

ਦੇਸ ਜਿਸ ਵਿਚ ਪੈਦਾ ਹੋਏ: _____ ਰਾਜ / ਪ੍ਰਾਂਤ: _____

ਦੇਸ ਜਿਥੇ ਵੱਡੇ ਹੋਏ : _____

ਦੇਸ ਜਿਸ ਵਿਚ ਤੁਹਾਡੇ ਪਿਤਾ ਜੀ ਪੈਦਾ ਹੋਏ : _____

: ਦੇਸ ਜਿਸ ਵਿਚ ਤੁਹਾਡੇ ਮਾਤਾ ਜੀ ਪੈਦਾ ਹੋਏ _____

ਜੇ ਤੁਸੀਂ ਇੰਡੀਆ ਵਿਚ ਪੈਦਾ ਹੋਏ ,ਤੁਸੀਂ ਕੈਨੇਡਾ ਵਿਚ ਕਿੰਨੇ ਚਿਰ ਤੋਂ ਰਹਿ ਰਹੇ ਹੋ : _____

ਤੁਹਾਡੀ ਵਿਵਾਹਕ ਸਥਿਤੀ ਕੀ ਹੈ?

[1]☐ ਕੰਵਾਰੇ [2]☐ ਵਿਆਹੇ ਹੋਏ [3]☐ ਤਲਾਕ ਸ਼ੁਦਾ

[4]☐ ਰੰਡੇ (Widowed) [5]☐ ਕੌਮਨ ਲਾਅ

ਤੁਹਾਡੀ ਧਾਰਮਿਕ ਪਸੰਦ ਜੇ ਹੈ ਤਾਂ ਕੀ ਹੈ ?

[1]☐ ਇਸਾਈ ਧਰਮ [2]☐ ਹਿੰਦੂ ਧਰਮ [3]☐ ਇਸਲਾਮ

[4]☐ ਸਿੱਖ ਧਰਮ [5]☐ ਕੋਈ ਨਹੀਂ [6]☐ ਹੋਰ ਕੋਈ

ਤੁਸੀਂ ਘਰ ਵਿਚ ਕਿਹੜੀ ਭਾਸ਼ਾ ਬੋਲਦੇ ਹੋ ?

[1]☐ ਇੰਗਲਿਸ਼ [2]☐ ਫ਼ਰੈਂਚ [3]☐ ਹਿੰਦੀ

[4]☐ ਪੰਜਾਬੀ [5]☐ ਹੋਰ ਕੋਈ *(ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ)* _____

ਕਿਰਪਾ ਕਰਕੇ ਆਪਣੀ ਇੰਗਲਿਸ਼ ਦੀ ਯੋਗਤਾ ਦੱਸੋ :

	ਉੱਚੀ	ਦਰਮਿਆਨੀ	ਮੁਢਲੀ	ਨਹੀਂ
ਬੋਲਣਾ	[1]☐	[2]☐	[3]☐	[4]☐
ਲਿਖਣਾ	[1]☐	[2]☐	[3]☐	[4]☐
ਪੜ੍ਹਨਾ	[1]☐	[2]☐	[3]☐	[4]☐

ਕਿਰਪਾ ਕਰਕੇ ਸਿੱਖੀਆ ਦਾ ਉੱਚਤਮ ਪੱਧਰ ਜੋ ਤੁਸੀਂ ਪੂਰਾ ਕੀਤਾ ਹੈ ਲਿਖੋ :

[1] ☐ ਸਕੂਲ ਗਰੇਡ
[2] ☐ ਹਾਈ ਸਕੂਲ
[3] ☐ ਟੈਕਨੀਕਲ /ਟ੍ਰੇਡ ਸਕੂਲ
[4] ☐ ਯੂਨੀਵਰਸਿਟੀ
[5] ☐ ਹੋਰ ਕੋਈ (*ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ*) _____

ਆਪਣੀ ਨੌਕਰੀ ਦੀ ਸਥਿਤੀ ਦੱਸੋ:

[1] ☐ ਫੁਲ-ਟਾਇਮ ਨੌਕਰੀ
[2] ☐ ਪਾਰਟ-ਟਾਇਮ ਨੌਕਰੀ
[3] ☐ ਘਰ ਬਣਾਉਂਦੇ ਹੋ
[4] ☐ ਨੌਕਰੀ ਵਿਚ ਨਹੀਂ
[5] ☐ ਰਿਟਾਇਰਡ ਹੋ
[6] ☐ ਸੈਲਫ ਇੰਪਲੋਆਇਡ ਹੋ
[7] ☐ ਸਟੂਡੈਂਟ ਹੋ

ਘਰੇਲੂ ਆਮਦਨੀ ਬਾਰੇ ਪ੍ਰਸ਼ਨ ਕੁਝ ਲੋਕਾਂ ਲਈ ਨਾਜ਼ੁਕ ਹੈ । ਅਸੀਂ ਇਹ ਪ੍ਰਸ਼ਨ ਇਸ ਲਈ ਪੁਛਦੇ ਹਾਂ ਕਿਉਂਕਿ ਸਿਹਤ ਆਰਥਿਕ ਪੱਧਰ ਨਾਲ ਸੰਬੰਧਤ ਹੈ । ਸਾਰੇ ਸਾਧਨਾਂ ਨੂੰ ਧਿਆਨ ਵਿਚ ਰੱਖਦੇ ਹੋਏ ਤੁਹਾਡੀ ਪਿਛਲੇ ਸਾਲ ਲਗ ਭਗ ਕਿੰਨੀ ਘਰੇਲੂ ਸਾਲਾਨਾ ਆਮਦਨੀ ਸੀ ?

[1] ☐ $20,000 ਤੋਂ ਘੱਟ
[2] ☐ $20,001 ਤੋਂ $40,000
[3] ☐ $40,001 ਤੋਂ $60,000
[4] ☐ $60,000 ਤੋਂ $80,000
[5] ☐ $80,000 ਤੋਂ ਵੱਧ

ਜੇ ਕਿਸੇ ਆਮਦਨੀ ਵਾਲੇ ਕਿੱਤੇ ਵਿਚ ਲੱਗੇ ਹੋਏ ਹੋ,ਤੁਹਾਡਾ ਵਰਤਮਾਨ ਕੀ ਕਿੱਤਾ ਹੈ ?

[1] ☐ ਲਾਗੂ ਨਹੀਂ ਹੁੰਦਾ
[2] ☐ ਬਿਜ਼ਨਿਸ
[3] ☐ ਖੇਤੀ ਬਾੜੀ
[4] ☐ ਮੈਨਿਜਮੈਂਟ
[5] ☐ ਦਫ਼ਤਰੀ ਕੰਮ
[6] ☐ ਪ੍ਰੋਫੈਸ਼ਨਲ
[7] ☐ ਟੈਕਨੀਕਲ / ਟ੍ਰੇਡ

ਤੁਹਾਡੇ ਘਰ ਵਿਚ ਕਿੰਨੇ ਜੀਅ (member) ਰਹਿੰਦੇ ਹਨ? _____

ਕੀ ਤੁਹਾਡੇ ਤੇ ਹੇਠ ਲਿਖਿਆਂ ਵਿਚੋਂ ਕੋਈ ਲਾਗੂ ਹੁੰਦਾ ਹੈ : (*ਉਨ੍ਹਾਂ ਸਾਰਿਆਂ ਨੂੰ ਚੈਕ ਕਰੋ ਜੋ ਲਾਗੂ ਹੁੰਦੇ ਹਨ*)

[1] ☐ ਦਿਲ ਦੇ ਰੋਗ ਦਾ ਪਿਛੋਕੜ (history) (ਦਿਲ ਦਾ ਦੌਰਾ , ਐਨਜਾਇਨਾ)
[2] ☐ ਸਟ੍ਰੋਕ ਦਾ ਪਿਛੋਕੜ (ਅਧਰੰਗ , ਪੈਰੀਸਿਜ਼)
[3] ☐ ਦਿਲ ਦੇ ਰੋਗ ਦਾ ਪਰਿਵਾਰਕ ਪਿਛੋਕੜ
[4] ☐ ਡਾਇਬਟੀਜ਼ ਮੈਲੀਟਸ
[5] ☐ ਹਾਈਪਰਟੈਨਸ਼ਨ
[6] ☐ ਹਾਈ ਬਲਡ ਕਲਸਟ੍ਰੋਲ
[7] ☐ ਡਿਪਰੈਸ਼ਨ
[8] ☐ ਹੋਰ ਕੋਈ ਬਿਮਾਰੀ (*ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ*) _____

ਹੇਠ ਦਿੱਤੀ ਥਾਂ ਤੇ,ਕਿਰਪਾ ਕਰਕੇ ਆਪਣੇ ਦਿਲ ਦੇ ਰੋਗ ਸੰਬੰਧੀ ਵਿਸ਼ਵਾਸ/ ਗਿਆਨ/ ਵਿਹਾਰ ਤੇ ਆਪਣੀ ਵਾਧੂ ਟਿੱਪਣੀ ਦਿਓ।

_____

_____

_____

_____

_____

ਅਸੀਂ ਤੁਹਾਡੇ ਸਹਿਯੋਗ ਦੇ ਲਈ ਧੰਨਵਾਦੀ ਹਾਂ

ਤੁਹਾਡਾ ਧੰਨਵਾਦ

ਆਪਣਾ ਨਾਮ ਅਤੇ ਕੌਨਟੈਕਟ ਨੰਬਰ ਦੇਣਾ ਤੁਹਾਡੀ ਮਰਜ਼ੀ ਤੇ ਹੈ।

ਨਾਮ : _____

ਪਤਾ : _____

_____

_____

ਟੈਲੀਫ਼ੋਨ : _____

ਕਿਰਪਾ ਕਰਕੇ ਦੱਸੋ ਕਿ ਅਸੀਂ ਤੁਹਾਡੇ ਨਾਲ ਇਸੇ ਪ੍ਰਸ਼ਨਾਵਲੀ ਦੇ ਹੋਰ ਅਗਲੇ ਅਧਿਐਨ ਵਾਸਤੇ ਸੰਪਰਕ ਕਰ ਸਕਦੇ ਹਾਂ:

☐ ਹਾਂ ☐ ਨਹੀਂ

Appendix C. General health behaviors by ethnic group and gender

	IndoCanadians						EuroCanadians					
	Men n=54		Women n=48				Men n=44		Women n=58			
	No.	%	No.	%	χ^2	*p*	No.	%	No.	%	χ^2	*p*
Hours of sleep												
< 8 hours	32	59.3	34	70.8	1.49	0.220	28	63.6	36	63.2	0.00	0.960
≥ 8 hours	22	40.7	14	29.2			16	36.4	21	36.8		
Tobacco smoking												
Don't smoke	50	92.6	47	100	3.63	0.057	39	92.9	53	94.5	0.12	0.732
< 1 pack per day	3	5.6	0	0	2.69	0.101	1	2.4	2	3.6	0.13	0.723
≥ 1 pack per day	1	1.9	0	0	0.88	0.348	2	4.8	1	1.8	0.69	0.407
Alcohol consumed												
Don't drink	33	61.1	41	87.2	8.76	0.003**	11	25.6	14	24.6	0.01	0.907
1 - 5 drinks per week	19	35.2	6	12.8	6.78	0.009**	21	48.8	39	68.4	3.92	0.048*
≥ 6 drinks per week	2	3.7	0	0	1.78	0.183	11	25.6	4	7	6.63	0.010**
No. of meals eaten per day												
1 - 3	35	64.8	21	43.8	4.55	0.030*	18	40.9	10	17.2	7.03	0.008**
≥ 4	19	35.2	27	56.3			26	59.1	48	100		
Stress levels												
Low	16	29.6	16	34	0.23	0.634	17	38.6	16	27.6	1.40	0.237
Moderate	30	55.6	24	51.1	0.20	0.652	25	56.8	37	63.8	0.51	0.475
High	8	14.8	7	14.9	0.00	0.991	2	4.5	5	8.6	0.65	0.420

* $p<0.05$; ** $p<0.01$

Appendix C. *cont'd.* General health behaviors by ethnic group and gender

	IndoCanadians						EuroCanadians					
	Men n=54		Women n=48				Men n=44		Women n=58			
	No.	%	No.	%	χ^2	*p*	No.	%	No.	%	χ^2	*p*
Things done to relieve stress												
Walk/exercise	26	48.1	24	50	0.04	0.85	38	86.4	53	91.4	0.65	0.41
Listen to music/watch TV	33	61.1	34	70.8	1.06	0.30	34	77.3	44	75.9	0.28	0.86
Religious/spiritual activities	21	38.9	21	43.8	0.24	0.61	4	9.1	13	22.4	3.19	0.07
Meditate	10	18.5	8	16.7	0.06	0.80	3	6.8	11	19	3.11	0.07
Don't do anything	6	11.1	2	4.2	1.69	0.19	0	0	0	0	-	-
Things you should do to improve health?												
Increase physical activity	36	66.7	26	55.3	1.36	0.24	18	40.9	25	43.1	0.49	0.82
Improve eating habits	28	51.9	21	44.7	0.51	0.47	17	38.6	29	50	1.30	0.25
Lose weight	16	29.6	14	29.8	0.00	0.98	12	27.3	27	46.6	3.93	0.04*
Quit smoking	2	3.7	0	0	1.77	0.18	3	6.8	3	5.2	0.12	0.72
Reduce stress	21	38.9	17	36.2	0.07	0.77	10	22.7	18	31	0.86	0.35
Take vitamins	9	16.7	14	29.8	2.46	0.11	7	15.9	9	15.5	0.00	0.95
Barriers preventing you from making this improvement?												
Lack of self-discipline	19	35.2	17	36.2	0.01	0.910	21	48.8	38	65.5	2.82	0.090
Lack of time	24	44.4	13	27.7	3.05	0.080	7	16.3	21	36.2	4.89	0.020*
Too tired/too stressed	12	22.2	14	29.8	0.75	0.386	3	7	11	19	2.97	0.085
Too expensive	6	11.1	5	10.6	0.01	0.939	0	0	5	8.6	3.90	0.048*
Disability/health problem	1	1.9	4	8.5	2.36	0.124	1	2.3	6	10.3	2.46	0.117
Language difficulties	2	3.7	2	4.3	0.02	0.887	0	0	0	0	-	-
Too late to change lifestyle	4	7.4	2	4.3	0.45	0.504	2	4.7	2	3.4	0.09	0.759
Weather conditions	14	25.9	7	14.9	1.86	0.173	3	7	5	8.6	0.09	0.762
Religious/cultural reasons	0	0	0	0	-	-	0	0	0	0	-	-

* $p<0.05$; ** $p<0.01$

Appendix C. *cont'd.* General health behaviors by ethnic group and gender

	IndoCanadians						EuroCanadians					
	Men n=54		Women n=48				n=44		n=58			
	No.	%	No.	%	χ^2	*p*	No.	%	No.	%	χ^2	*p*
Factors that would encourage you to engage in healthy behaviors?												
Same-sex fitness facilities	3	5.6	4	8.5	0.34	0.560	0	0	6	10.3	4.83	0.028*
Specific advice	3	5.6	9	19.1	4.44	0.035*	5	11.4	13	22.4	2.10	0.147
Language-of-choice programs	4	7.4	6	12.8	0.81	0.368	0	0	0	0	0.77	0.381
Advice from health care professional	15	27.8	9	19.1	1.03	0.310	13	29.5	12	20.7	1.06	0.303
Religious person advising you	5	9.3	1	2.1	2.29	0.130	0	0	0	0	-	-
Family support	21	38.9	18	38.3	0.00	0.951	12	27.3	11	19	0.99	0.320
Friend accompanying you	18	33.3	15	31.9	0.02	0.880	12	27.3	22	37.9	1.28	0.258
Diagnosis with heart disease	3	5.6	1	2.1	0.78	0.378	13	29.5	16	27.6	0.05	0.828
Fitness center at work	13	24.1	11	23.4	0.01	0.937	7	15.9	7	12.1	0.31	0.557

* $p<0.05$; ** $p<0.01$

Appendix D. Physical activity responses by ethnic group and gender

	IndoCanadians						EuroCanadians					
	Men n=54		Women n=48				Men n=44		Women n=58			
	No.	%	No.	%	χ^2	*p*	No.	%	No.	%	χ^2	*p*
Do you exercise?												
Yes	38	70.4	26	61.9	0.76	0.383	41	93.2	56	98.2	1.67	0.196
No	16	29.6	16	38.1			3	6.8	1	1.8		
What type of activity do you do?												
Brisk walk	30	63.8	31	75.6	1.43	0.232	26	61.9	45	81.8	4.81	0.028**
Swim	6	12.8	2	4.9	1.65	0.199	1	2.4	5	9.1	1.85	0.174
Jog/run	9	19.1	6	14.6	0.32	0.574	10	23.8	14	25.5	0.04	0.852
Other	11	23.4	8	19.5	0.20	0.658	23	54.8	34	61.8	0.49	0.484
Place where you usually exercise:												
Home	14	30.4	14	36.8	0.38	0.535	4	9.3	7	12.3	0.22	0.637
Outdoors	26	58.7	24	63.2	0.17	0.677	24	55.8	38	66.7	1.23	0.268
Gym	7	15.2	3	7.9	1.06	0.302	15	34.9	16	28.1	0.53	0.466
Recreation center	6	13	3	7.9	0.58	0.448	9	20.9	20	35.1	2.39	0.122
Do you like to exercise												
Yes	48	92.3	40	93	0.02	0.894	37	86	51	89.5	0.27	0.602
No	4	7.7	3	7			6	14	6	10.5		
Sufficient levels of exercise [a]												
Yes	9	16.7	7	14.6	0.32	0.852	17	38.6	28	48.3	1.42	0.491
No	37	68.5	32	66.7			25	56.8	29	50.0		

[a] Based on CDC and ACSM recommendations;
** $p<0.01$

Appendix E. Dietary practices by ethnic group and gender

	IndoCanadians						EuroCanadians					
	Men n=54		Women n=48				Men n=44		Women n=58			
Consume the following foods ≥ 3 times in a typical week: [a]	**No.**	**%**	**No.**	**%**	χ^2	*p*	**No.**	**%**	**No.**	**%**	χ^2	*p*
Red meat (beef/ pork/ lamb)	5	10.4	3	6.4	0.50	0.479	20	45.5	16	27.6	3.50	0.061
Fish or other seafood	6	11.8	6	12.8	0.02	0.880	5	11.4	9	15.5	0.37	0.546
Milk	33	62.3	32	66.7	0.21	0.645	26	60.5	33	57.9	0.07	0.796
Milk with reduced fat	11	22.0	21	44.7	5.64	0.018*	20	45.5	32	55.2	0.95	0.331
Cheese/ dairy products	14	26.9	17	35.4	0.84	0.359	29	65.9	48	82.8	3.89	0.050*
Low-fat cheese	5	9.8	9	19.1	1.74	0.187	4	9.8	15	26.8	4.36	0.037*
Desserts	2	34.0	14	29.8	0.20	0.655	22	51.2	2	51.7	0.00	0.955
Low-fat desserts	6	12.0	4	8.3	0.36	0.549	5	12.2	14	24.1	2.21	0.137
Fruit for dessert	32	60.4	30	63.8	0.13	0.723	28	63.6	32	57.1	0.43	0.512
Snacks between meals	17	32.1	29	60.4	8.16	0.004**	26	59.1	42	72.4	2.00	0.157
Vegetables/ fruit as snack	21	40.4	20	41.7	0.02	0.896	18	41.9	41	70.7	8.45	0.004**
Eating at fast-food restaurants	6	11.5	0	0	5.89	0.015*	1	2.3	0	0	1.33	0.249
Food preparation method used ≥ 3 times in a typical week: [a]												
Grill food	4	8.2	6	12.8	0.55	0.461	9	20.5	13	22.8	0.08	0.776
Boil food	19	38.0	15	31.3	0.49	0.483	10	23.3	19	32.8	1.09	0.297
Deep fry food	12	23.5	8	17.4	0.56	0.456	0	0	0	0	-	-
Stir fry food	11	22.2	16	33.3	1.58	0.209	4	9.1	15	25.9	4.64	0.031*
Bake food	10	19.2	19	39.6	5.02	0.025*	13	29.5	19	32.8	0.12	0.729

[a] number and frequency of individuals who reported performing the practices '*3 times per week*' and '*4 or more times per week*'

* $p < 0.05$; ** $p < 0.01$

Appendix F. IHD health belief subscale scores by ethnicity and gender

	IndoCanadians						EuroCanadians					
	Men n=54[a]		Women n=48[a]				Men n=44[a]		Women n=58[a]			
	mean	SD	mean	SD	t	*p*	mean	SD	mean	SD	t	*p*
Perceived Susceptibility	14.73	5.06	14.70	4.95	-0.05	0.963	13.86	4.83	14.74	4.40	-0.95	0.346
Perceived Seriousness	22.42	3.86	22.79	4.52	-0.21	0.834	22.61	4.48	22.28	4.56	0.35	0.728
Perceived Dietary Benefits	15.62	2.36	15.61	2.21	-0.09	0.932	14.09	1.69	13.50	2.77	1.24	0.217
Perceived Dietary Barriers	12.06	3.20	11.76	2.88	0.49	0.624	11.98	2.81	10.91	2.95	1.76	0.082
Perceived Exercise Benefits	17.06	1.99	17.64	1.91	-1.56	0.123	16.93	2.08	16.65	2.13	0.74	0.462
Perceived Exercise Barriers	12.81	3.40	12.64	3.74	0.39	0.701	9.89	2.77	10.50	2.70	-1.06	0.292
Health Motivation	14.25	2.48	14.60	2.47	-0.63	0.528	14.88	2.95	15.67	2.24	-1.62	0.108
Dietary Self-efficacy	19.28	3.19	20.20	3.59	-1.35	0.179	17.74	4.18	20.02	2.72	-3.31	0.001**
Exercise Self-efficacy	17.33	4.44	16.75	3.22	0.30	0.766	19.21	4.58	19.36	3.83	-0.07	0.944

[a] n varies across the subscales
* $p<0.05$; ** $p<0.01$

Appendix G. General health beliefs by ethnic group and gender

	IndoCanadians						EuroCanadians					
	Men n=54		Women n=48				Men n=44		Women n=58			
Consider the following behaviors 'very important' to keep healthy:	**No.**	**%**	**No.**	**%**	χ^2	*p*	**No.**	**%**	**No.**	**%**	χ^2	*p*
Eat proper kinds of food	40	75.5	40	83.3	0.95	0.331	32	72.7	49	84.5	2.12	0.146
Have enough physical exercise	33	63.5	29	63.0	0.00	0.966	37	84.1	48	82.8	0.03	0.858
Have enough rest and sleep	38	73.1	32	68.1	0.30	0.586	29	65.9	52	89.7	8.63	0.003**
Maintain proper body weight	39	73.6	33	70.2	0.14	0.708	31	70.5	45	77.6	0.67	0.413
Have regular medical checkups	26	51.0	27	57.4	0.41	0.521	13	29.5	35	60.3	9.53	0.002**
Take vitamins	14	26.9	18	38.3	1.46	0.227	9	20.9	23	39.7	4.00	0.046*
Take traditional medicines	9	17.3	7	15.2	0.07	0.780	2	4.7	7	12.1	1.67	0.196
Have religious faith	24	45.3	26	55.3	1.00	0.316	4	9.1	17	29.3	6.26	0.012

* $p<0.05$; ** $p<0.01$

Appendix H1. Age adjusted demographic and personal characteristics by ethnic group

	IndoCanadians n=93		EuroCanadians n=92			
	mean	**SD**	**mean**	**SD**	**t**	***p***
Age	44.74	14.40	48.76	13.60	-1.95	0.053
BMI	24.50	7.02	25.09	4.48	-0.65	0.518
Years lived in Canada	11.09	10.65	-	-	-	-
No. of members in household	3.93	2.08	2.42	1.13	6.10	0.000
	No.	**%**	**No.**	**%**	χ^2	***p***
Sex						
Male	54	52.90	44	43.1	1.96	0.161
Education						
Grade school	4	4.3	2	2.2	0.67	0.414
High school	13	14.0	12	13.2	0.04	0.852
Technical/trade school	8	8.6	19	20.9	5.39	0.020*
College	3	3.2	8	8.7	2.47	0.116
University	65	69.9	50	54.9	4.75	0.029*
Proficient English language skills	47	50.5	84	91.3	37.19	0.000**
Employment						
Employed full-time	35	38.0	32	34.8	0.16	0.687
Employed part-time	7	7.6	13	14.1	2.09	0.148
Homemaker	5	5.4	6	6.5	0.11	0.742
Not employed	15	16.3	2	2.2	10.79	0.001**
Retired	15	16.3	26	28.3	3.95	0.047*
Self-employed	6	6.5	12	13.0	2.29	0.130
Student	9	9.8	1	1.1	6.68	0.010**
Household income						
< $40,000	68	76.4	25	30.1	37.05	0.000**
$40,000 – $80,000	17	19.1	31	37.3	7.12	0.008**
> $80,000	4	4.5	27	32.5	22.85	0.000**
Present Occupation						
Not applicable	42	47.2	23	30.3	4.92	0.027*
Business	7	7.9	5	6.6	0.10	0.751
Farming	2	2.2	0	0	1.73	0.189
Management	2	2.2	7	9.2	3.85	0.050*
Office worker	11	12.4	14	18.4	1.17	0.279
Professional	19	21.3	21	27.6	0.88	0.348
Technical/trade	6	6.7	6	7.9	0.08	0.776

* $p<0.05$; ** $p<0.01$

Appendix H2. Age adjusted general health behaviors by ethnic group

	IndoCanadians n=93		EuroCanadians n=92			
	No.	%	No.	%	χ^2	*p*
Hours of sleep						
< 8 hours	62	66.7	58	63.7	0.17	0.676
≥ 8 hours	31	33.3	33	36.3		
Tobacco smoking						
don't smoke	88	95.7	83	93.3	0.50	0.481
< 1 pack per day	3	3.3	3	3.4	0.00	0.967
≥ 1 pack per day	1	1.1	3	3.4	1.09	0.296
Alcohol consumed						
don't drink	68	73.9	23	25.6	46.84	0.000**
1 - 5 drinks per week	22	23.9	54	60.0	25.58	0.000**
≥ 6 drinks per week	2	2.2	13	14.4	11.00	0.006**
No. of meals eaten per day						
1 - 3	50	53.8	23	25.0	16.02	0.000**
≥ 4	43	46.2	69	75.0		
Stress levels						
Low	28	30.4	30	32.6	0.10	0.751
Moderate	49	53.3	56	60.9	1.09	0.297
High	15	16.3	6	6.5	4.35	0.037*
Things done to relieve stress						
Walk/exercise	46	49.5	81	88.0	31.99	0.000**
Listen to music/watch TV	60	64.5	72	78.3	4.27	0.390*
Religious/spiritual activities	39	41.9	16	17.4	13.34	0.000**
Meditate	15	16.1	13	14.1	0.14	0.710
Don't do anything	8	8.6	0	0	8.27	0.004**
Other (please specify)	16	17.2	40	43.5	16.56	0.000**
Things you should do to improve health						
Increase physical activity	57	61.3	37	40.2	8.70	0.003**
Improve eating habits	43	46.7	43	46.7	0.00	1.000
Lose weight	27	29.3	37	40.2	2.40	0.122
Quit smoking	2	2.2	6	6.5	2.09	0.148
Reduce stress	34	37.0	25	27.2	2.02	0.155
Take vitamins	22	23.9	13	14.1	2.86	0.091

* $p<0.05$; ** $p<0.01$

Appendix H2. *cont'd.* Age adjusted general health behaviors by ethnic group

	IndoCanadians n=93		EuroCanadians n=92			
	No.	%	No.	%	χ^2	*p*
Barriers preventing you from making this improvement						
Lack of self-discipline	34	37.0	56	61.5	11.06	0.001**
Lack of time	35	38.0	26	28.6	1.85	0.174
Too tired/too stressed	26	28.3	13	14.3	5.33	0.021*
Too expensive	11	12.0	5	5.5	2.39	0.122
Disability/health problem	5	5.4	6	6.6	0.11	0.742
Language difficulties	4	4.3	0	0	4.05	0.044*
Too late to change lifestyle	6	6.5	4	4.4	0.40	0.527
Weather conditions	21	22.8	7	7.7	8.09	0.004**
Religious/cultural reasons	0	0	0	0	-	-
Factors that would encourage you to engage in healthy behaviors						
Same-sex fitness facilities	7	7.6	6	6.5	0.08	0.774
Specific advice	10	10.9	18	19.6	2.70	0.101
Language-of-choice programs	8	8.7	1	1.1	5.72	0.017**
Healthcare practitioner's advice	20	21.7	20	26.1	0.48	0.489
Religious person advising you	5	5.4	0	0	5.14	0.023*
Family support	36	39.1	20	21.7	6.57	0.010*
Friend accompanying you	31	33.7	32	34.8	0.02	0.877
Diagnosis with heart disease	4	4.3	27	29.3	20.52	0.000**
Fitness center at work	22	23.9	14	15.2	2.21	0.037

* $p<0.05$; ** $p<0.01$

Appendix H3. Age adjusted physical activity and exercise habits by ethnic group

	IndoCanadians n=93		EuroCanadians n=92			
	No.	%	No.	%	χ^2	p
Do you exercise?						
Yes	58	66.7	87	95.6	24.66	0.000**
No	29	33.3	4	4.4		
What type of activity do you do?						
Brisk walk	55	69.6	63	72.4	0.16	0.692
Swim	8	10.1	6	6.9	0.56	0.455
Jog/run	14	17.7	22	25.3	1.40	0.237
Other	17	21.5	54	62.1	27.81	0.000**
Place where you usually exercise:						
Home	23	30.7	9	10.0	11.18	0.001**
Outdoors	45	60.0	57	63.3	0.19	0.661
Gym	10	13.3	29	32.2	8.09	0.004**
Recreation center	9	12.0	25	27.8	6.23	0.013*
Do you like to exercise?						
Yes	79	91.9	78	86.7	1.23	0.267
No	7	8.1	12	13.3		
Sufficient levels of exercise [a]						
Yes	15	19.7	43	48.3	14.69	0.000**
No	61	80.3	46	51.7		

[a] Based on CDC and ACSM recommendations;
** $p<0.01$

Appendix H4. Age adjusted dietary practices by ethnic group
(number and frequency of individuals who reported performing the practices '*3 times per week*' and '*4 or more times per week*')

	IndoCanadians n=93		EuroCanadians n=92			
Consume the following foods ≥ 3 times in a typical week:	**No.**	**%**	**No.**	**%**	χ^2	*p*
Red meat (beef/ pork/ lamb)	8	9.1	31	33.7	16.04	0.000**
Fish or other seafood	12	13.3	13	14.1	0.02	0.876
Milk	58	63.0	51	56.7	0.77	0.380
Milk with reduced fat	29	32.6	43	46.7	3.78	0.052*
Cheese/ dairy products	29	31.9	70	76.1	36.02	0.000**
Low-fat cheese	13	14.6	17	19.3	0.70	0.404
Desserts	29	31.9	44	48.4	5.05	0.023*
Low-fat desserts	10	11.2	15	16.7	0.20	0.298
Fruit for dessert	57	62.6	51	56.7	0.67	0.413
Snacks between meals	42	45.7	43	68.5	9.78	0.002**
Vegetables/fruit as snack	35	38.5	52	57.1	6.36	0.012*
Eating out at fast-food restaurants	5	5.5	1	1.1	2.80	0.094
Food preparation method used ≥ 3 times in a typical week:						
Grilling	8	9.0	21	23.1	6.60	0.010**
Boiling	31	34.1	26	28.6	0.64	0.424
Deep frying	17	19.1	0	0	18.99	0.000**
Stir frying	25	27.8	16	17.4	2.81	0.094
Baking	25	27.5	27	29.3	0.08	0.779

* $p<0.05$; ** $p<0.01$

Appendix H5. Age adjusted self-reported risk factors by ethnic group

	IndoCanadians n=93		EuroCanadians n=92			
	No.	%	No.	%	χ^2	*p*
Heart disease	6	6.5	6	6.5	0.00	0.985
Family history of heart disease	29	31.2	32	34.8	0.27	0.603
Diabetes	19	20.4	3	3.3	13.01	0.000 **
Hypertension	20	21.5	13	14.1	1.716	0.190
High cholesterol levels	16	17.2	16	17.4	0.00	0.973
Stroke	3	3.2	3	3.3	0.00	0.989

** $p<0.01$

Appendix H6a. Age adjusted IHD health belief scores by ethnic group

	IndoCanadians n=93[a]		EuroCanadians n=92[a]			
	mean	SD	mean	SD	t	*p*
Perceived Susceptibility	15.07	4.88	14.29	4.42	1.13	0.261
Perceived Seriousness	22.63	4.05	22.70	4.47	-0.11	0.192
Perceived Dietary Benefits	15.59	2.29	13.67	2.41	5.52	0.000**
Perceived Dietary Barriers	12.06	2.93	11.53	2.87	1.13	0.225
Perceived Exercise Benefits	17.29	1.91	16.84	2.18	1.48	0.140
Perceived Exercise Barriers	12.82	3.46	10.22	2.76	5.63	0.000**
Health Motivation	14.27	2.36	15.36	2.66	-2.92	0.004**
Dietary Self-efficacy	19.76	3.52	19.11	3.73	1.21	0.226
Exercise Self-efficacy	16.80	4.02	19.34	4.20	-4.00	0.000**

[a] n varies across the subscales
* $p<0.05$; ** $p<0.01$

Appendix H6b. Age adjusted general health beliefs by ethnic group

	IndoCanadians n=93		EuroCanadians n=92			
Consider the following behaviors 'very important' to keep healthy:	No.	%	No.	%	χ^2	*p*
Eat proper kinds of food	74	80.4	73	79.3	0.03	0.854
Have enough physical exercise	60	67.4	77	83.7	6.52	0.011*
Have enough rest and sleep	64	71.1	75	81.5	2.73	0.098
Maintain proper body weight	65	71.4	69	75.0	0.30	0.585
Have regular medical checkups	50	56.2	43	46.7	1.61	0.204
Take vitamins	30	33.3	28	30.4	0.176	0.675
Take traditional herbal medicine	15	16.9	7	7.6	3.621	0.057*
Have religious faith	48	52.7	19	20.7	20.31	0.000**

* $p<0.05$; ** $p<0.01$

Appendix H7. Age adjusted knowledge and IHD health beliefs scores, based on exercise performance by ethnic group [a]

	IndoCanadians						EuroCanadians					
	Exercisers n=15		Non-exercisers n=61				Exercisers n=43		Non-exercisers n=46			
	mean	SD	mean	SD	t	*p*	mean	SD	mean	SD	t	*p*
Perceived Susceptibility	13.27	3.60	15.24	4.93	-1.45	0.151	13.93	3.85	14.67	5.01	-0.78	0.439
Perceived Seriousness	15.24	4.93	22.24	4.01	1.54	0.127	22.80	4.1	22.50	4.73	0.32	0.750
Perceived Dietary Benefits	16.21	2.32	15.61	2.28	0.90	0.372	13.35	2.59	14.16	2.12	-1.60	0.113
Perceived Dietary Barriers	10.87	3.18	11.88	2.64	-1.27	0.209	11.00	2.71	11.96	2.96	-1.59	0.116
Perceived Exercise Benefits	18.50	1.51	17.13	1.9	2.46	0.016*	16.56	2.23	17.33	1.93	-1.74	0.086
Perceived Exercise Barriers	11.36	2.79	12.38	3.46	-1.03	0.308	9.79	2.40	10.30	2.87	-1.91	0.363
Health Motivation	15.93	1.39	14.32	2.04	2.89	0.005**	16.30	1.63	14.63	3.17	3.16	0.002**
Dietary Self-efficacy	19.20	2.37	19.93	3.54	-0.76	0.449	20.07	2.41	18.59	4.26	2.03	0.046*
Exercise Self-efficacy	18.42	3.2	17.02	3.63	1.19	0.237	20.93	2.80	18.48	4.40	3.10	0.003**

[a] Based on CDC and ACSM recommendations
* $p<0.05$; ** $p<0.01$

Table 1. Demographic and personal characteristics by ethnic group

	IndoCanadians n=102	EuroCanadians n=102		
	mean(SD)	**mean(SD)**	**t**	***p***
Age	44.98 (15.9)	51.27 (15.9)	-2.82	0.005**
BMI	24.38 (6.7)	24.99 (4.3)	-0.75	0.455
Years lived in Canada	10.72 (10.3)	-	-	-
No. of members in household	3.96 (2.1)	2.41 (1.1)	6.59	0.000**

	No.	%	No.	%	χ^2	*p*
Sex						
Male	54	52.90	44	43.1	1.96	0.161
Female	48	47.10	58	56.9		
Marital status						
Single	13	12.90	20	19.6	1.69	0.193
Married	76	75.20	61	59.8	5.52	0.019*
Divorced	5	5.00	11	10.8	2.38	0.123
Widowed	7	7.00	5	4.9	0.40	0.528
Common-law	0	0.00	5	4.9	5.08	0.024*
Religious preference						
Christianity	15	14.70	58	56.9	39.44	0.000**
Hinduism	24	23.50	0	0	27.20	0.000**
Islam	10	9.80	0	0	10.51	0.000**
Sikhism	50	49.00	0	0	66.23	0.000**
None/Other	3	2.90	44	43.1	46.47	0.000**
Language spoken at home						
English	42	41.20	102	100	85.00	0.000**
Hindi	23	22.50	0	0	25.92	0.000**
Punjabi	66	64.70	0	0	97.56	0.000**
Other	21	20.60	5	4.9	11.28	0.001**
Education						
Grade school	4	3.90	3	3	0.14	0.710
High school	15	14.70	16	15.8	0.05	0.822
Technical/trade school	8	7.80	20	19.8	6.10	0.013*
College	3	2.90	10	9.9	4.10	0.043*
University	72	70.60	52	51.5	7.79	0.005**

* $p<0.05$; ** $p<0.01$

Table 1. *cont'd.* Demographic and personal characteristics by ethnic group

	IndoCanadians n=102		EuroCanadians n=102			
	No.	%	No.	%	χ^2	*p*
Employment						
Employed full-time	36	35.60	32	31.4	0.42	0.519
Employed part-time	9	8.90	14	13.7	1.17	0.279
Homemaker	5	5.00	7	6.9	0.33	0.564
Not employed	15	14.90	2	2	10.99	0.001**
Retired	19	18.80	34	33.3	5.55	0.019*
Self-employed	6	5.90	12	11.8	2.13	0.144
Student	11	10.90	1	1.0	8.96	0.003**
Household income						
< $40,000	74	76.3	29	31.5	38.16	0.000**
$40,000 – $80,000	18	18.6	35	38.0	8.89	0.003**
> $80,000	5	5.2	28	30.4	20.94	0.000**
Present Occupation						
Not applicable	48	49.00	31	36.5	2.90	0.088
Business	7	7.10	5	5.9	0.12	0.731
Farming	2	2.00	0	0	1.75	0.185
Management	3	3.10	7	8.2	2.36	0.125
Office worker	11	11.20	15	17.6	1.54	0.215
Professional	19	19.40	21	24.7	0.75	0.385
Technical/trade	8	8.20	6	7.1	0.08	0.779
Proficient English language skills	52	51.0	89	89.0	34.63	0.000

* $p<0.05$; ** $p<0.01$

Table 2. General health behaviors by ethnic group

	IndoCanadians n=102		EuroCanadians n=102			
	No.	%	No.	%	χ^2	*p*
Hours of sleep						
< 8 hours	66	64.7	64	63.4	0.04	0.842
≥ 8 hours	36	35.3	37	35.3		
Tobacco smoking						
don't smoke	97	96	92	93.9	0.51	0.475
< 1 pack per day	3	3	3	3.1	0.00	0.960
≥ 1 pack per day	1	1	3	3.1	1.11	0.293
Alcohol consumed						
don't drink	74	73.3	25	25	46.84	0.000**
1 - 5 drinks per week	25	24.8	60	60	25.58	0.000**
≥ 6 drinks per week	2	2	15	15	11.00	0.001**
No. of meals eaten per day						
1 - 3	56	54.9	28	27.5	15.87	0.001**
≥ 4	46	45.1	74	72.5		
Stress levels						
Low	32	31.70	33	32.4	0.01	0.919
Moderate	54	53.50	62	60.8	1.11	0.292
High	15	14.90	7	6.9	0.35	0.067
Things done to relieve stress						
Walk/exercise	50	49.00	91	89.2	38.61	0.001**
Listen to music/watch TV	67	65.70	78	76.5	2.89	0.890
Religious/spiritual activities	42	41.20	17	16.7	14.90	0.001**
Meditate	18	17.60	14	13.7	0.59	0.441
Don't do anything	8	7.80	0	0	8.33	0.004**
Other (please specify)	18	17.60	42	41.2	14.97	0.001**
Things you should do to improve health						
Increase physical activity	62	61.4	43	42.2	7.52	0.006**
Improve eating habits	49	48.5	46	45.1	0.24	0.626
Lose weight	30	29.7	39	38.2	1.65	0.199
Quit smoking	2	2.0	6	5.9	2.04	0.153
Reduce stress	38	37.6	28	27.5	2.39	0.122
Take vitamins	23	22.8	16	15.7	1.64	0.200

* $p<0.05$; ** $p<0.01$

Table 2. *cont'd.* General health behaviors by ethnic group

	IndoCanadians n=102		EuroCanadians n=102			
	No.	%	No.	%	χ^2	*p*
Barriers preventing you from making this improvement						
Lack of self-discipline	36	35.60	59	58.4	10.51	0.001**
Lack of time	37	36.60	28	27.7	1.84	0.175
Too tired/too stressed	26	25.70	14	13.9	4.49	0.034*
Too expensive	11	10.90	5	5	2.44	0.188
Disability/health problem	5	5.00	7	6.9	0.35	0.552
Language difficulties	4	4.00	0	0	4.08	0.043*
Too late to change lifestyle	6	5.90	4	4	0.42	0.517
Weather conditions	21	20.80	8	7.9	6.80	0.009**
Religious/cultural reasons	0	0	0	0	-	-
Factors that would encourage you to engage in healthy behaviors						
Same-sex fitness facilities	7	6.90	6	5.9	0.09	0.760
Specific advice	12	11.90	18	17.6	1.34	0.247
Language-of-choice programs	10	9.90	0	0	7.88	0.005**
Healthcare practitioner's advice	24	23.80	25	24.5	0.02	0.901
Religious person advising you	6	5.90	0	0	6.24	0.012*
Family support	39	38.60	23	22.5	6.17	0.013*
Friend accompanying you	33	32.70	34	33.3	0.01	0.920
Diagnosis with heart disease	4	4.00	29	28.4	22.32	0.000**
Fitness center at work	24	23.80	14	13.7	3.36	0.067

* $p<0.05$; ** $p<0.01$

Table 3. Self-reported risk factors by ethnic group

	IndoCanadians n=102		EuroCanadians n=102			
	No.	**%**	**No.**	**%**	χ^2	*p*
Heart disease	6	5.9	9	8.8	0.64	0.421
Family history of heart disease	29	28.4	35	34.3	0.82	0.365
Diabetes	20	19.6	4	3.9	12.08	0.001**
Hypertension	21	20.6	14	13.7	1.69	0.194
High cholesterol levels	16	15.7	17	16.7	0.03	0.849
Stroke	3	2.9	4	3.9	0.14	0.701

** $p<0.01$

Table 4. Physical activity and exercise habits by ethnic group

	IndoCanadians n=102		EuroCanadians n=102			
	No.	**%**	**No.**	**%**	χ^2	*p*
Do you exercise?						
Yes	64	66.70	97	96	28.43	0.000**
No	32	33.30	4	4		
What type of activity do you do?						
Brisk walk	61	69.30	71	73.2	0.34	0.560
Swim	8	9.10	6	6.2	0.56	0.456
Jog/run	15	17.00	24	24.7	1.64	0.200
Other	19	21.60	57	58.8	26.34	0.000**
Place where you usually exercise:						
Home	28	33.30	11	11	13.63	0.000**
Outdoors	51	60.70	62	62	0.03	0.858
Gym	10	11.90	31	31	9.61	0.002**
Recreation center	9	10.70	29	29	9.32	0.002**
Do you like to exercise?						
Yes	88	92.60	88	88	1.19	0.276
No	7	7.40	12	12		
Sufficient levels of exercise [a]						
Yes	16	15.7	45	44.1	25.42	0.000**
No	69	67.6	54	52.9		

[a] Based on CDC and ACSM recommendations

** $p<0.01$

Table 5. Dietary practices by ethnic group

	IndoCanadians n=102		EuroCanadians n=102			
Consume the following foods ≥ 3 times in a typical week [a]:	**No.**	**%**	**No.**	**%**	χ^2	*p*
Red meat (beef/ pork/ lamb)	8	8.4	36	35.3	20.48	0.000**
Fish or other seafood	12	12.2	14	13.7	0.10	0.756
Milk	65	64.4	59	59.0	0.61	0.435
Milk with reduced fat	32	33.0	52	51.0	6.60	0.010**
Cheese/ dairy products	31	31.0	77	75.5	40.17	0.000**
Low-fat cheese	14	14.3	19	19.6	0.98	0.324
Desserts	32	32.0	52	51.5	7.84	0.005**
Low-fat desserts	10	10.2	19	19.2	3.17	0.075
Fruit for dessert	62	62.0	60	60.0	0.08	0.772
Snacks between meals	46	45.5	68	66.7	9.20	0.002**
Vegetables/fruit as snack	41	41.0	59	58.4	6.10	0.014*
Eating out at fast-food restaurants	6	6.0	1	1.0	3.80	0.051
Food preparation method used ≥ 3 times in a typical week [a]:						
Grilling	10	10.4	22	21.8	4.67	0.031*
Boiling	34	34.7	29	28.7	0.82	0.364
Deep frying	20	20.6	0	0.0	22.95	0.000**
Stir frying	27	27.6	19	18.6	2.25	0.134
Baking	29	29.0	32	31.4	0.14	0.713

[a] number and frequency of individuals who reported performing the practices '*3 times per week*' and '*4 or more times per week*'
* $p<0.05$; ** $p<0.01$

Table 6a. IHD health belief scores by ethnic group

	IndoCanadians n=102[a]	EuroCanadians n=102[a]		
	mean(SD)	mean(SD)	t	*p*
Perceived Susceptibility	14.8(4.9)	14.4(4.6)	0.58	0.560
Perceived Seriousness	22.6(4.2)	22.4(4.5)	0.18	0.855
Perceived Dietary Benefits	15.7(2.3)	13.8(2.4)	5.80	0.000**
Perceived Dietary Barriers	11.9(3.0)	11.4(2.9)	1.24	0.218
Perceived Exercise Benefits	17.4(1.9)	16.8(2.1)	2.12	0.036*
Perceived Exercise Barriers	12.7(3.5)	10.2(2.7)	5.70	0.000**
Health Motivation	14.5(2.5)	15.3(2.6)	-2.40	0.017*
Dietary Self-efficacy	19.8(3.5)	19.0(3.6)	1.56	0.121
Exercise Self-efficacy	17.0(3.9)	19.2(4.1)	-3.75	0.000**

[a] n varies across the subscales
* $p<0.05$; ** $p<0.01$

Table 6b. General health beliefs by ethnic group

	IndoCanadians n=102		EuroCanadians n=102			
Consider the following behaviors 'very important' to keep healthy:	**No.**	**%**	**No.**	**%**	χ^2	*p*
Eat proper kinds of food	80	79.2	81	79.4	0.00	0.971
Have enough physical exercise	62	63.3	85	83.3	10.33	0.001**
Have enough rest and sleep	70	70.7	81	79.4	2.04	0.154
Maintain proper body weight	72	72	76	74.5	0.16	0.687
Have regular medical checkups	53	54.1	48	47.1	0.99	0.321
Take vitamins	32	32.3	32	31.7	0.01	0.923
Take traditional herbal medicine	16	16.3	9	8.9	2.49	0.115
Have religious faith	50	50	21	20.6	19.16	0.000**

** $p<0.01$

Table 6c. Support network by ethnic group

	IndoCanadian n= 102		EuroCanadian n= 102			
Count on the following persons to motivate them to practice positive health behaviors	**No.**	**%**	**No.**	**%**	χ^2	*p*
Spouse/family member	63	62.4	50	49.0	3.67	0.055*
Friend	51	50.0	45	44.1	0.71	0.400
Physician	56	55.4	48	47.1	1.43	0.232
Spiritual leader	43	42.6	11	11.0	25.50	0.000**

* $p<0.05$; ** $p<0.01$

Table 7. Association between IHD health beliefs and exercise performance [a]

	IndoCanadians				EuroCanadians			
	Exercisers n=16	Non-exercisers n=69			Exercisers n=45	Non-exercisers n=54		
	mean(SD)	mean(SD)	t	*p*	mean(SD)	mean(SD)	t	*p*
Perceived Susceptibility	12.9(3.7)	14.9(4.9)	-1.45	0.152	13.8(3.8)	14.9(5.1)	-1.14	0.257
Perceived Seriousness	23.9(4.2)	22.2(4.1)	1.51	0.136	22.8(4.1)	22.0(4.7)	0.82	0.416
Perceived Exercise Benefits	18.6(1.5)	17.2(1.9)	2.52	0.014*	16.5(2.2)	17.2(1.8)	-1.55	0.123
Perceived Exercise Barriers	10.9(3.1)	12.4(3.4)	-1.54	0.127	9.8(2.3)	10.3(2.8)	-0.86	0.394
Health Motivation	16.2(1.6)	14.5(2.1)	2.88	0.005**	16.3(1.5)	14.6(3.0)	3.52	0.001**
Exercise Self-efficacy	18.8(3.8)	17.2(3.5)	1.46	0.149	20.9(2.7)	18.3(4.2)	3.59	0.001**

[a] Based on CDC and ACSM recommendations
* $p<0.05$; ** $p<0.01$

Table 8. Demographics and personal characteristics of ICs based on median number of years lived in Canada

	≤ 7 years in Canada n=50		> 7 years in Canada n=48			
					t	*p*
Age *mean (SD)*	37.3(12.6)		52.9 (15.1)		-5.59	0.000**
	No.	**%**	**No.**	**%**	χ^2	*p*
Sex						
Male	31	57.4	23	47.9	0.92	0.338
Language spoken at home						
English	22	40.7	20	41.7	0.01	0.924
Hindi	12	22.2	11	22.9	0.01	0.933
Punjabi	29	53.7	37	77.1	6.08	0.014*
Other	14	25.9	7	14.6	2.00	0.157
Proficient in English	32	64.0	19	39.6	5.85	0.016*
Education						
Grade school	1	1.9	3	6.3	1.31	0.253
High school	5	9.3	10	20.8	2.71	0.099
Technical/trade school	2	3.7	6	12.5	2.72	0.099
College	1	1.9	2	4.2	0.48	0.490
University	45	83.3	27	56.3	8.98	0.003**
Employment						
Employed full-time	17	32.1	19	39.6	0.62	0.431
Employed part-time	7	13.2	2	4.2	2.54	0.111
Homemaker	3	5.7	2	4.2	0.12	0.730
Not employed	11	20.8	4	8.3	3.07	0.080
Retired	3	5.7	16	33.3	12.63	0.000**
Self-employed	2	3.8	4	8.3	0.94	0.333
Student	10	18.9	1	2.1	7.31	0.007**
Household Income						
< $40,000	41	89.1	29	61.7	9.40	0.002**
$40,001 to $80,000	5	10.9	13	27.7	4.20	0.040*
> $80,000	0	0	5	10.6	5.17	0.023*
Present Occupation						
Not applicable	21	40.4	27	58.7	3.28	0.070
Business	1	1.9	6	13	4.55	0.033*
Farming	2	3.8	0	0	1.81	0.179
Management	2	3.8	1	2.2	0.23	0.632
Office worker	7	13.5	4	8.7	0.56	0.456
Professional	11	20.4	8	17.4	0.22	0.638
Technical/trade	8	15.4	0	0	7.71	0.006**

* $p<0.05$; ** $p<0.01$

Table 9. Selected health related behaviors and risk factors of ICs based on median number of years lived in Canada

	<= 7 years in Canada n=50		> 7 years in Canada n=48			
	No.	**%**	**No.**	**%**	χ^2	*p*
Physical activity						
Self-reported exercisers	25	51.0	36	83.7	10.96	0.001**
Type of activity						
Brisk walk	28	63.6	33	75	1.34	0.248
Swim	5	11.4	3	6.8	0.55	0.458
Jog/run	10	22.7	5	11.4	2.01	0.156
Other	11	25	8	18.2	0.6	0.437
Place where you usually exercise:						
Home	12	28.6	16	38.1	0.86	0.355
Outdoors	23	54.8	28	66.7	1.25	0.264
Gym	9	21.4	1	2.4	7.27	0.007**
Recreation center	4	9.5	5	11.9	0.12	0.724
Sufficient levels of exercise [a]						
Yes	9	23.1	7	16.3	2.86	0.240
No	30	60.0	7	13.5		
Walk/exercise to reduce stress	17	31.5	33	68.8	14.12	0.000**
Dietary habits						
Food preparation ≥ 3 times a week:						
Grilling	3	5.7	7	16.3	2.87	0.090
Deep frying	16	30.2	4	9.1	6.54	0.011*
Baking	9	17.0	20	42.6	7.91	0.005**
Risk factors						
Heart disease	2	3.7	4	8.3	0.98	0.321
Family history of heart disease	18	33.3	11	22.9	1.36	0.244
Diabetes	10	18.5	10	20.8	0.09	0.769
Hypertension	8	14.8	13	27.1	2.34	0.126
High cholesterol levels	8	14.8	8	16.7	0.07	0.797
Stroke	2	3.7	1	2.1	0.23	0.629

[a] Based on CDC and ACSM recommendations

* $p<0.05$; ** $p<0.01$

Table 10a. IHD health belief scores of ICs based on median number of years lived in Canada

	<= 7 years in Canada n=52[a]		> 7 years in Canada n=48[a]			
	mean	**SD**	**mean**	**SD**	**t**	***p***
Perceived Susceptibility	14.69	5.01	14.87	4.99	-0.17	0.863
Perceived Seriousness	22.70	4.10	22.47	4.28	0.27	0.788
Perceived Dietary Benefits	15.58	2.15	15.71	2.37	-0.27	0.787
Perceived Dietary Barriers	11.81	3.08	12.09	3.04	-0.44	0.665
Perceived Exercise Benefits	17.25	1.94	17.50	2.00	-0.62	0.536
Perceived Exercise Barriers	12.60	3.84	12.80	3.29	-0.28	0.781
Health Motivation	14.26	2.25	14.80	2.70	-1.08	0.285
Dietary Self-efficacy	19.57	3.16	20.06	3.86	-0.69	0.494
Exercise Self-efficacy	17.19	4.39	16.55	3.34	0.74	0.464

[a] n varies across the subscales

Table 10b. General health beliefs of ICs based on median number of years lived in Canada

	<= 7 years in Canada n=50		> 7 years in Canada n=48			
Consider the following behaviors 'very important' to keep healthy:	**No.**	**%**	**No.**	**%**	χ^2	***p***
Eat proper kinds of food	41	82.0	37	78.7	0.17	0.684
Have enough physical exercise	36	75.0	24	52.4	5.30	0.021*
Have enough rest and sleep	40	81.6	29	63.0	4.13	0.042*
Maintain proper body weight	40	81.6	30	63.8	3.85	0.050
Have regular medical checkups	25	51.0	26	57.8	0.43	0.511
Take vitamins	15	30.6	16	34.8	0.19	0.665
Take traditional herbal medicine	7	14.3	8	17.8	0.21	0.644
Have religious faith	24	48.0	23	50.0	0.04	0.845

* $p<0.05$

Table 11. Test retest reliability for the IHD health belief subscales (N=22)

Subscale[a]	Time 1 mean (SD)	Time 2 mean (SD)	ICC	95% CI	F	*p*
Susceptibility	14.05 (5.04)	13.95 (5.53)	0.898	0.76-0.96	18.59	0.000**
Seriousness	22.17 (4.82)	22.22 (3.87)	0.782	0.52-0.91	8.17	0.000**
Dietary Benefits	14.58 (1.77)	15.16 (2.03)	0.737	0.44-0.88	6.60	0.000**
Dietary Barriers	11.15 (2.41)	11.80 (2.61)	0.777	0.52-0.90	7.95	0.000**
Exercise Benefits	16.67 (1.80)	16.67 (2.06)	0.743	0.47-0.89	6.79	0.000**
Exercise Barriers	10.29 (2.45)	10.57 (2.69)	0.610	0.26-0.82	4.13	0.001**
Health Motivation	15.81 (1.97)	15.76 (1.84)	0.809	0.59-0.92	9.46	0.000**
Dietary Self-efficacy	20.17 (2.15)	20.39 (1.88)	0.602	0.21-0.83	4.02	0.003**
Exercise Self-efficacy	18.65 (3.71)	20.18 (3.24)	0.726	0.39-0.89	6.29	0.000**

[a] n varies across the subscales
ICC= Intraclass correlation coefficient
CI= Confidence interval

Table 12. Item-total correlation, internal consistency of items and overall subscales

		Item-total correlation	Cronbach's alpha
Perceived Susceptibility subscale			**0.872**
1	My chances of getting heart disease are high	0.729	0.842
2	My dietary habits make it likely that I will get heart disease in the future	0.688	0.849
3	My physical activity levels make it likely that I will get heart disease in the future	0.652	0.855
4	I am more likely than the average person to get heart disease	0.779	0.832
5	My family history make it likely that I will get heart disease	0.535	*0.877*[b]
6	Because of my current health status, I am more likely to develop heart disease	0.683	0.849
Perceived seriousness subscale			**0.802**
7	If I had heart disease my whole life will change	0.479	0.789
8	Having heart disease can be disabling	0.634	0.753
9	The thought of having heart disease scares me	0.519	0.781
10	If I had heart disease it would interfere with my job/earning capacity	0.613	0.758
11	If I had heart disease, it would burden my family/spouse	0.618	0.757
12	Heart disease can have dangerous consequences	0.500	0.786
Dietary Benefits subscale			**0.704**
13	I would not worry about getting heart disease if I had a low-fat diet	0.525	0.628
14	A low-fat diet prevents future problems from heart disease	0.540	0.610
15	A diet low in fat reduces my chances of getting heart disease	0.507	0.644
16	There are many health benefits from eating a low-fat diet	0.450	0.671
Dietary Barriers subscale			**0.719**
17	Eating low-fat food requires changing my regular diet, which is hard to do	0.586	0.607
18	In order to have a low-fat diet I have to give up other foods that I like	0.537	0.639
19	A low-fat diet is expensive	*0.379*[a]	*0.726*[b]
20	I do not like low-fat food	0.531	0.643
Exercise Benefits subscale			**0.729**
21	Regular exercise reduces the risk for heart disease	0.452	0.711
22	I feel good about myself when I exercise	0.619	0.617
23	Regular aerobic exercise also improves the way my body looks	0.564	0.642
24	Exercising regularly prevents future problems from heart disease	0.496	0.696
Exercise Barriers subscale			**0.674**
25	Exercising regularly interferes with my daily activities	0.546	0.545
26	Exercising regularly can be time consuming	0.435	0.626
27	Exercising regularly would mean starting a new habit, which is hard	0.498	0.580
28	I have no place where I can exercise	*0.358*[a]	0.666
Health Motivation subscale			**0.658**
29	I eat a healthy well-balanced diet	0.414	0.606
30	I exercise regularly at least 3 times a week	0.528	0.532
31	I seek new information related to my health	0.478	0.561
32	Keeping good health is important to me	*0.391*[a]	0.633

[a] Italized items indicate a correlation of <0.04 between the item and the subscale score with the item removed;

[b] Italized items demonstrate no change or an increase in the internal consistency of the subscale with the item removed.

Table 12. *cont'd.* Item-total correlation, internal consistency of items and overall subscales

		Item-total correlation	Cronbach's alpha
Dietary Self-efficacy subscale			**0.823**
33	I am confident that if I wanted I could regularly prepare low-fat meals	0.630	0.784
34	I am confident about my ability to buy foods that are low in fat	0.688	0.771
35	I am confident about my ability to choose fresh fruit for dessert instead of ice-cream or other sweets	0.535	0.812
36	If I were given a recipe for one of my favorites foods, I am confident that I can change the ingredients to reduce the amount of fat	0.612	0.792
37	I am confident that I can cook low-fat dishes that are tasty	0.640	0.781
Exercise self-efficacy subscale			**0.830**
You are confident that you can engage in your favorite physical activity the following number of times each week over the next one month:			
38	Once a week	0.513	0.814
39	Twice a week	0.647	0.798
40	Three times a week	0.689	0.792
41	Four times a week or more	0.552	0.809
You are confident that you can participate in regular exercise when:			
42	You are tired	0.517	0.813
43	You are in a bad mood	0.568	0.807
44	You feel you don't have the time	0.485	0.816
45	You are on vacation	*0.342* [a]	*0.835* [b]
46	It is raining or snowing	0.533	0.811

[a] Italized items indicate a correlation of <0.04 between the item and the subscale score with the item removed;

[b] Italized items demonstrate no change or an increase in the internal consistency of the subscale with the item removed.

Table 13a. Construct validity of the IHD health belief subscales; differences between exercisers and non-exercisers

	Exercisers n=61		Non-exercisers n=123			
Subscale	**mean**	**(SD)**	**mean**	**(SD)**	**t**	***p***
Perceived Susceptibility	13.57	3.81	14.87	5.06	-1.75	0.081
Perceived Seriousness	23.12	4.13	22.11	4.44	1.44	0.152
Exercise Benefits	17.03	2.23	17.19	1.94	-0.48	0.633
Exercise Barriers	10.10	2.59	11.48	3.36	-3.04	0.003**
Health Motivation	16.26	1.60	14.56	2.57	5.47	0.000**
Exercise Self-efficacy	20.44	3.17	17.72	3.94	4.81	0.000**

* $p<0.05$; ** $p<0.01$

Table 13b. Construct validity of the IHD health belief subscales: Low-fat milk consumption

	Low-fat milk ≥3 times a week n=84		Low-fat milk <3 times a week n=115			
Subscale	**mean**	**(SD)**	**mean**	**(SD)**	**t**	***p***
Perceived Susceptibility	14.63	5.19	4.41	4.31	-0.31	0.756
Perceived Seriousness	22.05	4.75	22.86	3.92	1.28	0.203
Dietary Benefits	14.77	2.61	14.61	2.47	-0.46	0.649
Dietary Barriers	11.10	3.13	11.95	2.67	2.04	0.043*
Health Motivation	15.22	2.63	14.65	2.48	-1.55	0.124
Dietary Self-efficacy	19.78	3.46	19.18	3.64	-1.16	0.246

* $p<0.05$; ** $p<0.01$

Table 13c. Construct validity of the IHD health belief subscales: Grilling food

	Grill food ≥3 times a week n=32		Grill food <3 times a week n=164			
Subscale	**mean**	**(SD)**	**mean**	**(SD)**	**t**	***p***
Perceived Susceptibility	13.77	4.01	14.83	4.89	1.13	0.259
Perceived Seriousness	22.72	4.36	22.50	4.29	-0.26	0.797
Dietary Benefits	14.48	2.53	14.66	2.51	0.36	0.717
Dietary Barriers	11.71	2.93	11.68	2.91	-0.05	0.960
Health Motivation	15.74	2.77	14.68	2.45	-2.16	0.032*
Dietary Self-efficacy	19.28	3.73	19.41	3.54	0.19	0.847

* $p<0.05$; ** $p<0.01$

Table 13d. Construct validity of the IHD health belief subscales: Frying food

	Deep fry food ≥3 times a week n=20		Deep fry food <3 times a week n=177			
Subscale	**mean**	**(SD)**	**mean**	**(SD)**	**t**	***p***
Perceived Susceptibility	17.22	6.21	14.37	4.57	-2.43	0.016*
Perceived Seriousness	23.16	4.85	22.46	4.26	-0.66	0.508
Dietary Benefits	15.78	1.69	14.56	2.59	-2.73	0.011*
Dietary Barriers	12.79	3.84	11.60	2.81	-1.68	0.095
Health Motivation	14.0	2.79	14.92	2.51	1.53	0.127
Dietary Self-efficacy	19.70	3.88	19.33	3.53	1.37	0.171

* $p<0.05$

Table 13e. Construct validity of the IHD health belief scores: Personal and family history of heart disease

	History of heart disease n=71		No history of heart disease n=133			
Subscale	**mean**	**(SD)**	**mean**	**(SD)**	**t**	***p***
Perceived Susceptibility	17.60	4.27	12.88	4.16	7.56	0.000**
Perceived Seriousness	22.78	4.35	22.33	4.34	0.69	0.492

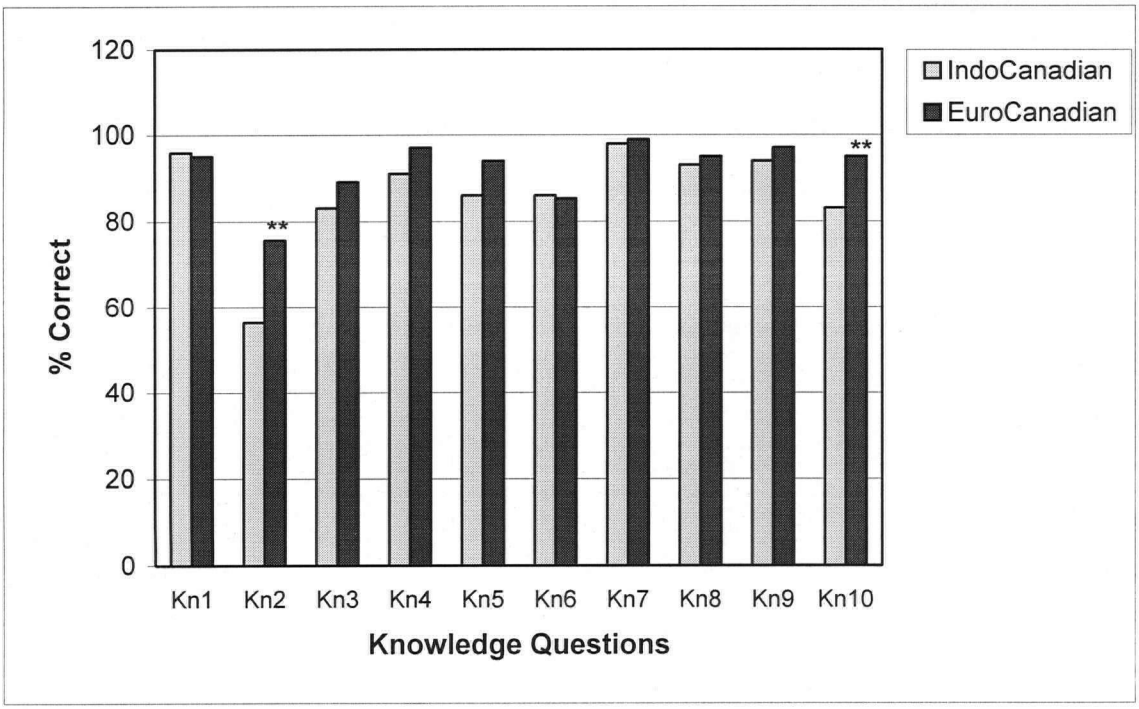
* $p<0.05$; ** $p<0.01$

Figure 1. The Eight Major Modifiable Risk Factors for Cardiovascular Diseases and Other Leading Non-communicable Diseases

Condition	**Cardiovascular disease**	**Diabetes**	**Cancer**	**Chronic obstructive pulmonary disease**
Risk factor				
Smoking	✓	✓	✓	✓
Alcohol	✓		✓	
Physical inactivity	✓	✓	✓	
Nutrition	✓	✓	✓	
Obesity	✓	✓	✓	✓
Raised blood pressure	✓	✓		
Dietary fat/blood lipids	✓	✓	✓	
Blood glucose	✓	✓	✓	

Source: World Health Organization

Figure 2. Knowledge questions: Percent of correct responses by ethnic group



** $p<0.01$

Kn1: Olive oil is better for the heart than hydrogenated vegetable shortening (butter, *ghee*);

Kn2: It is normal for older adults to have high blood pressure;

Kn3: Diabetics are at an increased risk of getting heart disease compared to non-diabetics;

Kn4: Smoking a few cigarettes does not affect the heart;

Kn5: People with high levels of cholesterol are not at risk of developing heart disease;

Kn6: People with average weight are at a reduced risk of developing heart disease compared to people who are overweight;

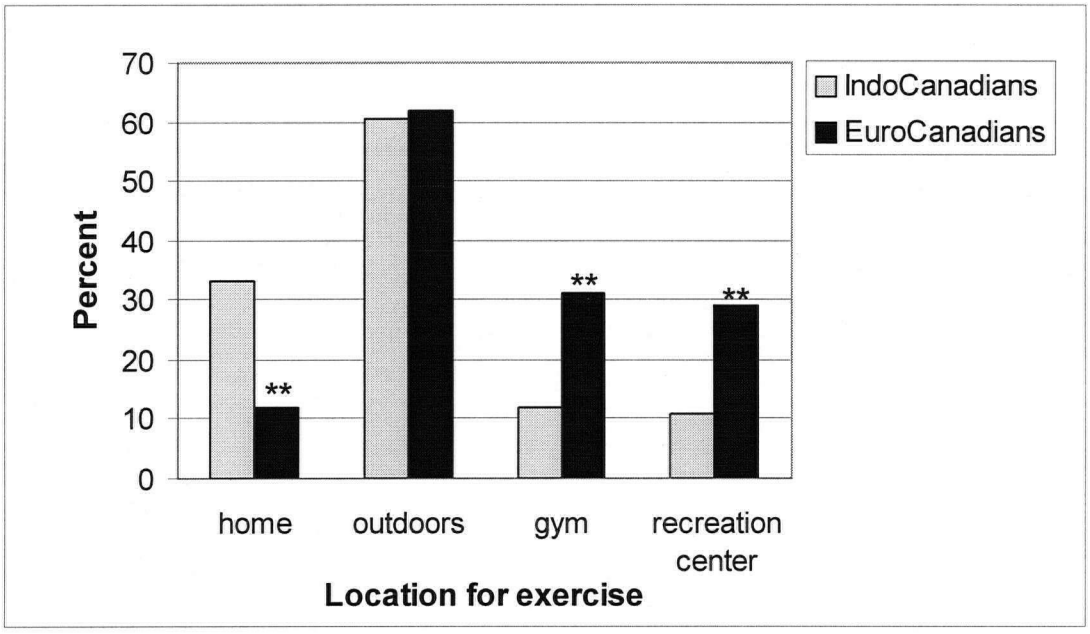
Kn7: Regular physical exercise decreases one's risk of heart disease;

Kn8: Anxiety and psychological stress increase one's risk of heart disease;

Kn9: A previous heart attack does not increase one's risk of a getting a second heart attack;

Kn10: A history of heart disease in the family does not increase one's risk of heart disease.

Figure 3. Location for exercise by ethnic group



** $p<0.01$