

**MIXING HEALTH AND GEOGRAPHY: A STUDY OF RISKS
ASSOCIATED WITH CARDIOVASCULAR DISEASE FOR THE PUNJABI
SIKH POPULATION IN THE REGIONAL MUNICIPALITY OF PEEL**

by

Gurveer Kaur Bains

A thesis submitted to the Department of Geography

In conformity with the requirements for

the degree of Master of Arts

Queen's University

Kingston, Ontario, Canada

(September, 2015)

Copyright © Gurveer Kaur Bains, 2015

Abstract

The emerging epidemic of cardiovascular disease is threatening the health and well-being of various communities around the world. The risk of cardiovascular disease is amplified for the Punjabi Sikh population of Canada originating from Punjab, India. According to Statistics Canada's National Household Survey, the Punjabi Sikh community represents approximately 115 000 or 9.3 percent of the total population within the Region of Peel, making it the second largest Punjabi Sikh community in Canada. Therefore, there is an urgent need to understand factors that contribute to the decline in cardiovascular health of this growing sub-population. The research focuses on Punjabi Sikhs who are 55 years of age or older, immigrated to Canada, live in the Region of Peel and have been diagnosed with cardiovascular disease. This age group was selected given that cardiovascular disease diagnosis occurs earlier for Sikhs compared to their ethnic European comparator groups. The Punjabi Sikh population also encompasses an important aging ethnic population in Canada. Health geography plays a vital role in connecting how factors associated with where Punjabi Sikhs live are linked to an increased risk of cardiovascular disease. Through a population health approach, semi-structured interviews were conducted using grounded theory with participants (n = 30) in the study. Analysis of the interviews suggests that factors such as genetics, lifestyle, the built environment and influences of differing cultures all create the "perfect storm" for cardiovascular disease within the study population. Understanding cardiovascular disease risk through research provides insight into how to address health needs of an increasingly multi-ethnic population in Canada.

Keywords: cardiovascular disease, health geography, gerontology, Punjabi Sikh, immigrant health, built environment, population health, Canada.

Acknowledgements

This thesis would not have been possible without the expertise, support and invaluable advice from my supervisor Dr. Mark Rosenberg. Thank you so much Dr. Rosenberg for helping me with development of this project, recruitment of participants, organizing and analyzing information and writing the final version of this thesis. My first step into health geography was taking a course titled “Geography of health and health care” during my third year of university at the University of Toronto-Mississauga. This course was taught by Dr. Kathi Wilson and both this course and Dr. Wilson inspired me to understand health through a geographical perspective. Thank you so much Dr. Wilson for everything since that day.

I have been lucky to have had the support of an amazing department at Queen’s University, thank you to everyone from fellow graduate students, to faculty and staff in the Department of Geography. I’m so thankful to have been a part of such an incredible department over the last two years.

A special thanks to the community organizations and people in the Region of Peel who worked tirelessly to help me with recruitment of research participants for this study. Thank you to the following organizations: Sur Sagar radio/television, Saucha Sauda Gurmet Parchar Society, Guru Nanak Mission of Canada, and the Ontario Sikh and Gurdwara Council, among many others. I would also like to thank the following people, among many others, who helped me with this research project: Mr. Kuldev S. Sandhu, Mr. Gian S. Mehmi and Mr. Sukhjit S. Ahluwalia. Thank you to all the research participants for taking time out of their busy day to speak to me about my research project.

Last but not least, thank you to my family and friends for encouraging me throughout my time in university and supporting any direction I took with my career. My parents are by far the most humble and hard-working people I have ever known, and I hope to become even half of the amazing people they are. My sisters Dimpy and Rajveer, and brother-in-law Goldy have supported me with every step of this research project as well as anything I have wanted to pursue in my life. My office mates Roselyn Salvador and Alyson Prabhu, Yolanda Weima (honorary member) and I created the “D309” club, named after our office door. Thanks so much for making graduate school an amazing experience! A special thank you to Kimberly Knight, Maeve Tremis, Maryann Quenet, and Nicole Di Cintio, who are some of the greatest people I have ever known. No matter where life takes me, I will always be humbled to know how lucky I am for the great support system I have.

List of Tables

Table 1.1.: Participant socio-demographic characteristics (n = 30).....	44
---	----

List of Figures

Figure 1.1.: Map of the Region of Peel.....	11
---	----

List of Abbreviations

CVD Cardiovascular disease
CHD Coronary heart disease
GTA Greater Toronto Area

Table of Contents

Abstract	ii
Acknowledgements	iii
Chapter 1 : Introduction	1
1.1 Canada’s changing demographics	3
1.2 Punjabi Sikhs as a target population for study	4
1.3 Conceptual framework	5
1.4 Research questions and goals of this research	7
1.4.1 Connecting health and geography in this study	8
1.5 Organization of thesis	9
1.6 Summary	9
Chapter 2 : Literature Review	12
2.1 Cardiovascular disease risk factors	12
2.1.1 Non-modifiable CVD risk factors	13
2.1.2 Modifiable CVD risk factors	14
2.2 Health effects related to the immigration process	18
2.2.1 The healthy immigrant effect	23
2.3 Effects on health related to the built environment	24
2.3.1 Peel as a built environment	26
2.4 Gaps in the literature	29
2.5 Summary	30
Chapter 3 : Methods	32
3.1 The research design	33
3.1.1 My position as a researcher in the study	35
3.2 Study recruitment	36
3.3 Interviews with research participants	38
3.4 Data collection	40
3.5 Analysis	41
3.6 Summary	42
Chapter 4 : Study Findings and Discussion	44
4.1 Cardiovascular disease risk factors	45
4.1.1 Knowledge of cardiovascular disease	45
4.1.2 Diet pre-CVD and dietary changes post-CVD	48

4.1.3 Exercise pre-CVD and exercise regime changes post-CVD.....	49
4.1.4 Stress experienced pre-CVD and coping mechanisms post-CVD	52
4.2 Health effects related to the immigration process.....	52
4.2.1 Opportunities in Canada.....	54
4.2.2 Resettlement challenges.....	55
4.2.3 Underemployment.....	58
4.2.4 Stress related to the immigration process.....	60
4.3 Health effects associated with the built environment	62
4.3.1 Neighbourhood variability in the Regional Municipality of Peel	63
4.3.2 Access to services	65
4.3.3 Social Inclusion.....	66
4.3.4 Community education campaigns/camps.....	69
4.4 Summary	72
Chapter 5 : Conclusion.....	74
5.2 Limitations	76
5.3 Recommendations for further research	78
5.4 Conclusion	81
Bibliography	84
Appendix A : Queen’s University GREB Research study approval letter.....	93
Appendix B : Research Poster – English version.....	94
Appendix C : Research Poster – Punjabi version.....	95
Appendix D : Letter of Information (LOI).....	96
Appendix E : Letter of Consent (LOC).....	98
Appendix F : Debriefing Letter (DL).....	99
Appendix G : List of interview questions	101

Chapter 1: Introduction

Cardiovascular disease (CVD) is the number one cause of death globally (Mathers et al., 2008). This illness, most commonly known as heart disease, is a disease pertaining to the heart and arteries (Rankin & Bhopal, 2001). Specifically, heart disease pertains to all conditions concerning the heart and circulatory systems, with a main focus on coronary heart disease (CHD), (e.g., heart attack/angina or stroke) (Lueng & Stanner, 2011). With more and more urbanized sedentary lifestyles on the rise globally, projections of cardiovascular disease are set to increase on a world scale, an emerging epidemic of the 21st century (Lopez et al., 2006; Rambihar et al., 2010). However, predisposition to cardiovascular disease varies within different populations, with one of the predisposing factors being ethnicity (Forouhi & Sattar, 2006).

South Asians have a three to five times greater chance of developing CVD than their European origin counterparts or other immigrant ethnic groups (Gladas & Kang, 2010). Risk factors for the development of cardiovascular disease can be divided into those which are non-modifiable (e.g., age) and those which are modifiable (e.g., lifestyle) (Bedi et al., 2008). South Asians have a higher prevalence of established cardiovascular disease than European and Chinese populations, for any given degree of atherosclerosis, and an excess of cardiovascular events compared to the other groups (Anand et al., 2000). In their study, Anand et al. (2000) found that ethnicity or some unmeasured factors linked to ethnicity might mediate the effect of atherosclerosis for the risk of cardiovascular disease.

Therefore, it is important to collect ethnic-specific data and develop tailored strategies for the prevention of cardiovascular disease.

The South Asian population has a higher prevalence of cardiovascular disease and a higher prevalence at younger ages when compared to other population groups (Bhopal, 2000). The South Asian population accounts for nearly 25 percent of the global population, therefore, it is crucial to understand why this higher prevalence of heart disease occurs in such a large population (Saxena et al., 2013). However, the South Asian population is not homogenous; a distinction between the general South Asian population (which includes the countries of India, Pakistan, Sri Lanka, Nepal and Bangladesh) (Gama et al., 2002; Gupta et al., 2006) and specifically the Punjabi Sikh population is made to focus on CVD within a specific population rather than general trends within populations in a cluster of countries (Fourier & Sattar, 2006). For these reasons, the focus of my Master's thesis is on the prevalence of cardiovascular disease within the Punjabi Sikh immigrant population, a subset of a larger South Asian population. Health geography plays a vital role in connecting where people live and their health status, especially with the emerging health challenge of cardiovascular disease affecting a major ethnic group in Canada.

With a higher prevalence of CVD diagnosis compared to their European counterparts, Punjabi Sikh immigrants provide an important population to analyze cardiovascular disease as a threat to the health and well-being of a growing ethnic group in several countries globally (Galdas et al., 2011). While common risk factors for cardiovascular disease are pertinent to this population, a focus entirely on these factors

does not provide a “complete picture” for an explanation for the higher prevalence of CVD in Punjabi Sikhs (Bainey & Jugdutt, 2009). Therefore, there is a need to understand and investigate other factors which might influence the higher prevalence of CVD for this population. In this project, the higher prevalence of CVD in the Punjabi Sikh population is analyzed through understanding the links among the following factors: risk factors for CVD, health effects due to the immigration process and implications on health related to the surrounding built environment.

This research project focuses on these three different areas of research to gain a comprehensive understanding of heart disease prevalence in a growing ethnic population in the Regional Municipality of Peel, one region of the Greater Toronto Area (GTA). This chapter is organized in the following way: first Canada’s demographic transition is explained, second the study’s target population of Punjabi Sikhs is described, third the three key categories of focus in this study are introduced, and fourth the organization of this thesis is outlined; this section is followed by a summary of the chapter.

1.1 Canada’s changing demographics

Canada’s population is in the midst of a demographic transition. This is largely due to an increasingly aging population alongside changes in the ethnic makeup of the population (Bourne & Rose, 2001; Moore & Rosenberg, 2001; McDaniel, 2003). With increases in life expectancy, standard of living, and medical advancements, people are living longer in all developed countries (e.g., Canada, the United States and the United Kingdom) (Kinsella & Phillips, 2005; Lutz et al., 2008; Christensen et al., 2009). Canada’s

population is aging, the median age in Canada for both genders increased from 37.2 years of age in 2001 to 38.9 years of age in 2006 to 40.0 years of age in 2011, this trend continues to rise beyond 2011 (Statistics Canada, 2013). The percentage of seniors who were 65 years of age and over in Canada's national population increased 14.1% between 2006 and 2011, to nearly 5 million people (Statistics Canada, 2011).

With cardiovascular disease the number one cause of death globally, coupled with an older population and higher prevalence of the disease in the South Asian population, and in this study, specifically in the Punjabi Sikh population; there is a need to understand what factors lead to this disease diagnosis and how to minimize these risks. South Asians were the second largest ethnic minority in Canada in 2001 and future projections have determined that by 2017 South Asians will be the largest ethnic minority within Canada (Gupta et al., 2006). Therefore, it is important to understand how to address the health needs of this growing population in Canada, through a focus on one of many subsets clustered in this population.

1.2 Punjabi Sikhs as a target population for study

While cardiovascular disease risks are substantially higher for those of South Asian descent (Turin et al., 2013); this study focuses on heart disease risk specifically pertaining to Punjabi Sikhs. As a subset of the South Asian population, general trends depicted in the South Asian population are also described when information is not available specifically for the Punjabi Sikh subgroup. There is existence of marked genetic variability among South Asians communities; with differences in cultures, languages, castes, physical

appearance, and diet, the South Asian community is not homogenous (Saexna et al., 2013). Punjabi Sikhs are at significantly higher risk of mortality from myocardial infarction compared with those of European descent (Gladas & Kang, 2010). Individuals of Punjabi Sikh ethnic origin, those originating from the northern state of Punjab in India and who practice Sikhism, experience CVD at a significantly younger age on average and have a higher morbidity rate compared with persons of European origin (Gladas & Kang, 2010).

1.3 Conceptual framework

The conceptual framework of this research project is to combine the determinants of CVD risk factors, health effects due to the immigration process and health effects related to living in the Regional Municipality of Peel to understand why there is a higher prevalence of cardiovascular disease in the Punjabi Sikh population in this municipality. The CVD risk factors, health effects due to immigration and health effects due to living in Peel were identified because of the need to understand this health problem through an encompassing framework such as a population health approach. By asking participants which factors they feel led to their CVD diagnosis, this research approaches different determinants of CVD through the perspectives of those who have experienced a CVD diagnosis.

Conceptually, immigration and health also come together in the debate over the “healthy immigrant effect” (Newbold & Danforth, 2003). The healthy immigrant effect (HIE) refers to the converging of health levels of immigrants, which at the time of immigration had a “healthy advantage”, to those of the Canadian-born population over time

(McDonald & Kennedy, 2004; Newbold, 2005). Using the healthy immigrant effect as a lens, CVD risk factors, immigration, and the built environment, provide an over-arching framework for what follows.

This project specifically focuses on immigrants of Punjabi Sikh ethnic origin as the target population. Punjabi Sikhs originate from the state of Punjab (Galdas et al., 2011). There is a drastic difference in regards to sedentary lifestyles many Punjabi Sikhs, alongside other South Asian populations, experience in western countries compared to India and surrounding South Asian countries (Daniel et al., 2013). At the time of immigration to Canada in the post-war period, Punjab was primarily rooted in the traditional and largely economically under-developed villages of India (Nayar & Sandhu, 2006). While beyond the scope of this research project, expanding urbanization within India has also led to increasingly sedentary lifestyles and has resulted in higher levels of cardiovascular disease (Pais et al., 1996; Nair & Prabhakaran, 2012). However, the levels of CVD are not as prevalent as those for South Asian immigrants in western countries (Forouhi & Sattar, 2006).

Within a Canadian context, the highest concentrations of Punjabi Sikhs are in the provinces of British Columbia and Ontario (Statistics Canada, 2011). While both of these provinces encompass growing numbers of Punjabi Sikhs, the immigration history of Sikhs to these provinces is quite different (Weber, 1996; Nayar, 2004; Smythe & Toohey, 2009). Specifically immigration of Sikhs to British Columbia dates back to the turn of the 20th century; the influx of immigrants largely comprised of male Sikhs in search of economic

prospects and employment in the province's logging and paper mill industries and railroad construction (Galdas et al., 2011). Immigration of Sikhs to Canada increased after changes in Canada's immigration policies, specifically with the passing of the Immigration Act of 1967 (Esses & Gardener, 1996). According to Statistics Canada's National Household Survey, currently the Punjabi Sikh population account for 115 000 residents or 9.3 percent of the population in Peel Region (Statistics Canada, 2011). This is the second highest concentration of Punjabi Sikhs in Canada; the first is located in Surrey, British Columbia (Statistics Canada, 2011). Therefore, with personal connections to the Punjabi Sikh community in the municipality and familiarity with the built environment, coinciding with a large and growing concentration of Punjabi Sikhs in Canada, Peel Region was selected as the research site for this project.

1.4 Research questions and goals of this research

The following are the four main research questions of this Master's thesis:

1. How do risk factors for CVD, effects due to the immigration process and effects on health related to the built environment contribute to an increase of CVD prevalence in the Punjabi Sikh population in the Region of Peel?
2. What changes did participants implement in their lifestyle between pre- and post-CVD diagnosis?
3. How does research on the Punjabi Sikh population in the Region of Peel contribute to the debate on the healthy immigrant effect?
4. What would participants like to see or recommend on the community-level to decrease prevalence of CVD in the Punjabi Sikh population?

Through understanding the answers to the questions above, it is the overall goal of this project to understand the inter- and intra-relationships among various factors which contribute to the higher CVD prevalence in the Punjabi Sikh population. A second goal of this project is to provide a starting point for developing an encompassing, culturally-tailored community intervention in the Punjabi Sikh community in Peel as part of my proposed Ph.D. research.

1.4.1 Connecting health and geography in this study

While the focus of this project is on the Punjabi Sikh population, this project provides insight into cardiovascular disease experiences and impacts of the immigration process and the built environment, potentially benefiting other populations and the Canadian population as a whole. Migration patterns and the geography of where people move to and the surrounding environment are important factors to consider for health and health status. In particular, this project focuses on moving from mainly the state of Punjab to primarily the Region of Peel. Especially with an increasingly urbanized setting on a global scale (Moore et al., 2003), it is of crucial importance to understand the effects on health due to the transition between rural to urban living on different populations as well as understanding the effects on health due to the immigration process. Added to this rural to urban transition, the geography of where people live and specifically their interactions within their built environment (within the Region of Peel) are also explored largely on a neighborhood scale in this study. Therefore, my thesis analyzes different geographic processes to understand the prevalence of cardiovascular disease in the Punjabi Sikh population through the scope of health geography.

1.5 Organization of thesis

This thesis is organized into five chapters, the chapters include the following: first the introduction chapter introduced my research project and goals of the project, followed by the literature review, which provides background information to the research area and research study in chapter two. The third chapter is the methods chapter, which describes the methods used in my Master's research. Chapter four describes the results and a discussion of the results based on the following themes: cardiovascular disease risks, health effects due to immigration, and health effects related to the built environment. The final chapter is a discussion of the main conclusions and addresses limitations of the project and areas of further research. This chapter is followed by the bibliography and appendices which includes all research material pertaining to this thesis.

1.6 Summary

The Punjabi Sikh population and the larger South Asian population are growing populations in Canada. Coupled with a higher prevalence of CVD alongside an increasingly aging population, it is of high importance to understand factors which contribute to a CVD diagnosis. It is also important to understand health challenges affecting the Punjabi Sikh population as well as an increasingly growing global health concern in the 21st century, cardiovascular disease. This project also provides insight into the lived experience of the Punjabi Sikh population, taking into consideration not just CVD risk factors but also how immigration and the development of the built environment have played and currently play a role in the diagnoses of heart disease. Lastly, this project

provides a starting point to continue research on the Punjabi Sikh population and contribute to research in the area of understanding the links between ethnicity and health.



Figure 1.1.: Map of the Greater Toronto Area (GTA), the Regional Municipality of Peel is outlined in black (Immigration Peel, 2013).

Chapter 2: Literature Review

Chapter two discusses the literature pertaining to the three main areas of focus in this project, cardiovascular disease risk factors, health effects due to the immigration process and health effects related to the built environment. These sections are followed by gaps indentified in the literature and how these gaps connect to the research carried out in my Master's project. Last, there is a summary of the main findings.

2.1 Cardiovascular disease risk factors

Cardiovascular disease pertains to the accumulation of plaque on the walls of arteries which decreases the flow of blood to the heart, resulting in the depletion of oxygen flow to a vital organ in the body (Rankin & Bhopal, 2001). When the heart does not get a steady supply of blood due to blocked arteries, angina (chest pain) and/or a myocardial infarction, commonly known as a heart attack, occurs (Rankin & Bhopal, 2001). The onset of cardiovascular disease is the accumulation of several factors which leads to a diagnosis and may alter the quality of life post-diagnosis, if the condition is not fatal (National Heart, Lung and Blood Institute, 2012). Blood vessels which accumulate plaque and deplete blood flow to the brain cause a stroke; this health condition has the possibility to impact both physical and neurological capabilities (National Heart, Lung and Blood Institute, 2012). The accumulation of plaque within the walls of arteries and blood vessels is a process which takes years to form, hence the need to identify risk factors and health behaviours which promote plaque accumulation early. Through early identification, efforts can be made on a proactive approach towards CVD rather than a reactive approach.

2.1.1 Non-modifiable CVD risk factors

South Asians have the highest prevalence of cardiovascular disease among all ethnic groups studied who reside in Canada (King et al., 2006). South Asians also showed an increased risk of atherosclerosis, the highest mortality rates from CVD compared to any other ethnic group, and the highest prevalence and worse outcomes as confirmed in a recent study among Canadians of different ethnic origins (Bainey & Jugdutt, 2009). Several factors including genetics and family history have resulted in ethnicities such as those of South Asian descent to be considered a risk factor in of itself for cardiovascular disease (Bainey & Jugdutt, 2009).

Metabolic syndrome has a higher prevalence within the South Asian community, which includes the Sikh Punjabi population in the United Kingdom (Zaman & Bhopal, 2013). There are five factors related to metabolic syndrome, these factors include the following: higher prevalence of diabetes mellitus type 2, insulin resistance, the distribution of adipose tissue concentrated on the abdomen (leading to abdominal obesity), hypertension, and dyslipidemia (Eckel et al., 2005; Forouhi & Sattar, 2006; Zaman & Bhopal, 2013). The development of metabolic syndrome and cardiovascular disease in the South Asian population can be linked to: urbanization and economic growth; inconsistent meal times; and the westernization of diets (Eapen et al., 2009). South Asian men also have higher body mass index and waist-hip-ratios when compared to European men; this ratio can be used as an indicator of obesity, hypertension and cardiovascular disease (Tillin et al., 2008).

2.1.2 Modifiable CVD risk factors

In terms of knowledge of what cardiovascular disease is and signs and symptoms of the disease in the Punjabi Sikh community, King et al. (2006), found that there was no widespread mechanism for information for community members on how to modify their diets and little access to information on heart-healthy diets which were culturally-tailored. Also in this study, over 35 percent of those surveyed did not understand what heart disease meant. This partial awareness of heart disease was also indicated in a study conducted by Bedi et al. (2008), which found that there was limited knowledge of heart disease in this community and many did not recognize the source of the chest pain and the urgency of the matter.

There are several risk factors for cardiovascular disease which affect different populations: smoking, physical inactivity, unhealthy diet, obesity, hypertension, types of cholesterol levels present, diabetes, genetic pre-disposition, high alcohol consumption, and stress (Tanuseputro et al., 2003; Nair & Prabhakaran, 2012). Lifestyle factors including lack of physical activity, hypertension and smoking tobacco are major risk factors for CVD; however, South Asians are less likely to smoke and usually have lower ambulatory blood pressures (Bailey et al., 2011).

In a survey conducted in Illinois, Daniel et al. (2013) found that physical activity levels among South Asians were lower compared to their Caucasian counterparts. A Canadian study on physical activity conducted by Tremblay et al. (2006) concluded that moderate physical activity levels among South Asians (34%) were lower when compared

to their Caucasian counterparts (49%). In another Canadian study conducted by Oliffe et al. (2009) age-related musculoskeletal impairment and Canada's colder climate were main restrictors of men's physical activity. Other barriers to exercising included: little/no time, commitments to others, language barriers and lack of access to culturally tailored facilities (Oliffe et al., 2009).

Older people may not see the benefits of physical activity for themselves and/or may be unaware of opportunities for keeping active (Horne & Teiry, 2012). Family members also played an important role in facilitating a healthy lifestyle; this includes providing transportation and translation services when accessing services such as health care. It is also believed by many that becoming less active is a normal part of aging, and therefore some people reported vigorous exercise as unnecessary as they get older (Horne & Teiry, 2012). Walking outdoors was a preferred form of physical activity, as it was an accessible and feasible form of exercise and walking with company was considered as a way to strengthen social bonds, especially within the community (Horne & Teiry, 2012). There is a need to increase physical activity rates in this population, as physical activity (and controlling obesity levels) may be the most important measure for the prevention of cardiovascular disease in South Asians (McKeigue et al., 1991).

Alongside lower levels of physical activity, an unhealthy diet, with large proportions of saturated and trans-fats and low levels of fruits and vegetables, (popular within South Asian diets) is a risk factor for the development of CVD (Bhupathiraju & Tucker, 2011). Diet, a modifiable risk, contributes to the CVD burden in South Asians, and

there is a need for health promotion and nutrition education services in this group (Bhupathiraju & Tucker, 2011; Chapman et al., 2011). There is a cultural connection to specific foods which cannot easily be adapted to create dietary restrictions necessary to limit the risk of CVD (Ristovski-Slijepcevic et al., 2008). For example, a Punjabi diet consists of relatively large proportions of melted butter (*Ghee*), high sugar-intake (e.g., Indian sweets), fried foods (e.g., *Pakorras*) and carbohydrates (e.g., *Naan*) (Pais et al., 1996; Bedi et al., 2008).

Religion also played an important role in influencing health behaviours. Within the Sikh religion (Sikhism), alcohol, smoking and consumption of meat are prohibited (Labun & Emblen, 2007; Bedi et al., 2008). The degree of devotion to Sikhism and Sikh faith practices may impact health behaviours and different risks for cardiovascular disease (Bedi et al., 2008). The interrelationship of health, illness and spirituality for Punjabi Sikhs living in Canada was very important to their overall health status (Labun & Emblem, 2007). This included becoming vegetarian, as well as many participants acknowledging that the “family environment” in which a person lives in, contributed to their health status (Labun & Emblen, 2007). Therefore, the South Asian population represents an extremely heterogeneous group of people, with wide variations in the consumption of alcohol, use of tobacco and meat products, as well as differing cultural approaches to health, diet and exercise.

Cholesterol levels, specifically higher low-density lipoprotein (LDL) levels and lower high-density lipoprotein (HDL) levels have been linked to increased rates of

cardiovascular disease (Gama & Anderson, 2002; Deedwania et al., 2007). The “trio” of increased rates of hypertension (high blood pressure), diabetes and hypercholesterolemia, which frequently exists within the South Asian population, amplifies the risk of CVD (Rajeshwari et al., 2005). In the *Study of Health Assessment and Risk in Ethnic Groups* (SHARE) conducted in the cities of Hamilton, Toronto and Edmonton, South Asians had the highest levels of total cholesterol, LDL cholesterol and triglycerides when compared to other major ethnicities in Canada, predominately Black, Chinese and Caucasian populations in Canada (Anand et al., 2000).

The onset of diabetes mellitus type 2 is highest among the South Asian population and is considered to be a predisposing risk factor for the development of premature CVD within Asian Indian immigrants (Diwan & Jonnalagadda, 2007). Based on the results of a national health survey in the United States, people from India had higher rates of diabetes compared to their European counterparts, even with lower levels of obesity compared to the latter population (Ye et al., 2009). Insulin resistance, a plausible explanation for the rate of diabetes, is a prominent health condition in the South Asian population (Misra et al., 2009). While Punjabi Sikhs develop diabetes mellitus type 2 at an earlier age compared to their European counterparts, many factors play a role in the diagnosis (e.g., food and physical inactivity) (Forouhi & Sattar, 2006). The high rate of type 2 diabetes among South Asians may also be due to the distribution of fat on the body, specifically central body fat deposition (Lueng & Stanner, 2011).

In a study conducted by Darr et al. (2008), stress and lifestyle factors were described as CVD causative factors by South Asian (defined in this study as Pakistani-Muslims, Indian-Hindus & Indian-Sikhs) patients who suffered coronary heart disease in the United Kingdom as a cause of illness, when compared to their European origin counterparts. In a study conducted by Mather et al. (2007), older Sikh immigrant women in Calgary, Alberta, acknowledged stress (specifically family stress) as a main cause of CVD. High alcohol consumption and high levels of stress over a long-term basis also result in higher rates of CVD amongst the Punjabi Sikh population (Galdas & Kang, 2010).

2.2 Health effects related to the immigration process

Migration has led to rapid demographic changes across the globe and as a result, the world's population is likely to become increasingly integrated in the new millennium (Dassanayake et al., 2010). Many immigrants are moving from Asia, Africa, Central and South America and Middle East countries to the United States, Australia, United Kingdom and Canada (Dassanayake et al., 2010). With differences in lifestyle in their new homeland including: increased modernization, urbanization, more sedentary and stressful lifestyles, these changes may act to increase risk factors for CVD (Eapen et al., 2009; Turin et al., 2013). Immigrant health relates to both genetic and environmental factors; however, the relative contribution of each is unclear (Dassanayake et al., 2010).

While immigration particularly to Canada is not a new phenomenon, immigration from non-European countries largely took place in the latter half of the 20th century; concurrent with changes in national immigration policies beginning in the 1950s and

implementation of multicultural immigration policies in the 1960s and 1970s (Esses & Gardener, 1996; Smythe & Toohey, 2009). In 1962, Canada's immigration policy was based on the point system, which included education, training and skills (King et al., 2006). The Immigration Act of 1967 no longer restricted immigrants from primarily European countries and many people from different countries began to immigrate to Canada (Esses & Gardener, 1996). This immigration policy included family reunification admittance in addition to the point system (Aggarwal & Gupta, 2012). The first official multiculturalism policy was entitled "Multiculturalism within a Bilingual Framework" in 1971 (Esses & Gardener, 1996). With these changes in immigration policy, there was an influx of mostly young males from Punjab to Canada in the early 1970s (Chadney, 1980; Nayar, 2004).

One of the impacts of immigrating on the point system is underemployment, whereby many immigrants gain employment below their qualifications and/or outside of their area of expertise. In a study completed by Dean & Wilson (2009), many immigrants within the city of Mississauga felt that their employment did not reflect their educational background credentials and as a result felt underemployed. Many parents in a Canadian study conducted by Smythe & Toohey (2009) worked jobs which under-utilized these participants' previous education and experiences (e.g., janitors, taxi drivers, restaurant workers etc.). In a study conducted by Grewal et al. (2005), South Asian women held the dual role of homemaker and paid worker, with more often than not experiencing long hours and low rates of pay.

Many South Asians adopt sedentary lifestyle following immigration to western countries. There are a number of factors that may influence the health behaviours of South Asians including: acculturative changes (e.g., in values, customs etc.), racial discrimination, limited sense of community due to differences in languages, cultural practices, religious observances and limited availability of family for social support (Daniel et al., 2013). Many immigrants who came to Canada may not necessarily understand the official languages, this creates several difficulties for the immigrant, especially when coupled with illiteracy, as navigating within the new environment may be difficult and coupled with information written in another language which cannot be comprehended (Choudhry, 1998). Unfamiliarity with official languages impacts the level of access to health services the immigrants receive. Since there is a need for culturally-sensitive health care services, this limits availability and accessibility to services (Jones et al., 2011).

People experience challenges largely due to their age, lack of social networks, unfamiliarity with cultural norms, language barriers, and dependence on their children who themselves are struggling to settle down (Grewal et al., 2005; Nayar & Sandhu, 2006; Smythe & Toohey, 2009; Dassanayake et al., 2010). In a study conducted by Aggarwal & Gupta (2013), Punjabi families rarely if at all utilize childcare centers; many Punjabi mothers first raise their own children, help them settle in new countries, and then take care of their grandchildren. Before coming to Canada, these women lived very differently in mainly rural areas and where for social/economic reasons, and spent their time in and around the house, doing household tasks, taking care of children and socializing with neighbours (Aggarwal & Gupta, 2013). The process of immigrating presents several effects

on health, both positive and negative, which are largely dependent on the experiences of immigrating (Diwan & Jonnalagadda, 2002).

The type of immigration sought also affects health (Lear et al., 2009). Many Punjabi Sikhs who immigrate through family sponsorship face difficulties of changing power dynamics within the family household and adapting to an unfamiliar environment (Olliffe et al., 2010). As head of the household within their family structure in India, many male Punjabi Sikhs are no longer seen as the main patriarchal figure and instead take a more peripheral role within the family structure (Olliffe et al., 2010). Older immigrants are no longer self-supporting and rely on son(s)/daughter(s)/other children for support until they are eligible for public pensions (Nayar & Sandhu, 2006). The generation gap between older Punjab Sikh immigrants and their children and/or grandchildren may pose several effects on health (King et al., 2006). For example, changes in ways of life, gender roles and especially females working both in the home and maintaining employment outside of the house all may affect stress levels, amongst other risk factors for CVD (Mather et al., 2007).

There are also cultural differences many Punjabis feel between generations and different intergenerational communication patterns found among immigrant families (Nayar & Sandhu, 2006; Bedi et al., 2008). Many people in the older generation come to Canada to reunite with their children and make their children's and grandchildren's lives easier (e.g., provide child care for grandchildren) (Aggarwal & Gupta, 2013). These older immigrants also face increased challenges with changes within the social and physical environments in the country of immigration compared to their way of life in Punjab (Galdas

et al., 2012). In a study conducted by King et al. (2006), women felt more over-exhausted and stressed with their lifestyle in Canada when compared to their lifestyle in India due to the multiple roles fulfilled by females in the family. These women also reported factors such as isolation, lack of independence and change in social status (King et al., 2006). Thus gender does have an impact on health and prevalence of diseases due to emigrating from primarily India to western countries (Grewal et al., 2005).

Although discussing problems experienced in the collective is acceptable in the Punjabi community, many Punjabi immigrants are hesitant to open up and talk about their personal problems due to the deep-seated cultural norm of “saving face” (Nayar & Sandhu, 2006). Immigrating to Canada resulted in many older Punjabi Sikhs feeling isolated due to the change in climate, specifically long winters and the presence of snow in Calgary, Alberta (Mather et al., 2007). With little knowledge of official languages and many illiterate, older Punjabi females especially felt the loss of close connections with surrounding neighbours when they moved to suburban locations within Calgary (Mather et al., 2007). According to Diwan & Jonnalagadda (2002), individuals who feel more isolated with limited social support systems are more likely to have poorer diets and lower levels of health-promoting behaviours. All of these factors may lead to increased stress among older Punjabi Sikhs and contribute to feelings of isolation within an unfamiliar environment (King et al., 2006). Nayar & Sandhu (2006) found that many families who immigrate try to find a balance between differing values and cultures as they raise their children in a country which is different from the country they grew up in and the country to which their parents were very well adapted to.

2.2.1 The healthy immigrant effect

When immigrants initially arrive in Canada their health status levels are higher (a “healthy advantage”) when compared to the Canadian-born population (Newbold, 2006). This advantage is likely due to the selection process of immigrants to Canada, which includes a health screening check resulting in healthier individuals immigrating (Gee et al., 2004; Newbold, 2005). However, over time this initial healthier status converges to the health levels of the Canadian-born population, resulting in the “healthy immigrant effect” (Newbold, 2006). There are many plausible explanations for this decline in health status, these factors include acculturation to the lifestyles and behaviours of the host country as well as a decline in health associated with increasing age (Newbold & Danforth, 2003; Newbold, 2006). The healthy immigrant effect may be linked to changes in social norms upon immigration to Canada and/or due to higher rates of health care service utilization in the country of immigration (McDonald & Kennedy, 2004). While beyond the scope of this project, the level of access to and utilization of health services of immigrant populations in Canada depends on cultural and social practices in accordance to a study conducted by Kobayashi & Prus (2012).

In a study specifically focused on chronic conditions, Newbold (2006) concluded that immigrants in Canada for 30 years and/or more had the same prevalence of chronic conditions as that of the Canadian-born population. Findings in a study conducted by Gee et al. (2004) conclude that the healthy immigrant effect was stronger in immigrants from non-European countries to Canada (e.g., India, China etc.), which now constitutes as the majority of source countries of immigrants to Canada. These source countries may also

play a role in decline of health status in Canada, specifically as health behaviours such as rates of physical activity decrease upon immigration (Gushulak et al., 2007).

2.3 Effects on health related to the built environment

The built environment encompasses the human-made features of the landscape (Srinivasan et al., 2003). These features include services available as well as accessibility to these services at different scales (e.g., neighbourhood level, municipalities etc.) (Tole, 2008). Different urban planning strategies and built environments depend on a variety of issues, including the physical landscape as well as the needs of the community. The urban planning of the built environment has an influence on health (e.g., obesity rates) and therefore is an important theme to analyze for prevalence of chronic conditions such as cardiovascular disease (Gordon-Larsen et al., 2006; Papas et al., 2007). Specifically, the impact of the built environment on health needs to be understood to reduce the impacts on future communities and promote physical and mental health (Jackson, 2003).

The development of the built environment highly influences the accessibility of services and the health behaviours of persons residing within that environment (Srinivasan et al., 2003). In particular, there is a relationship between the built environment, health behaviours and chronic disease (Weyman et al., 2013). The development of low-density suburban development coincides with mass production of the automobile, which are largely car-dependent (Jackson, 2003; Tole, 2008). With an increase in car-dependent lifestyles, the “walk-ability” of neighbourhoods decreases (Tole, 2008). This decrease,

among other factors, has largely contributed to the emerging obesity epidemic within western countries in the 21st century (Papas et al., 2007).

Factors including urbanization, industrialization and globalization influence populations to adopt health behaviours such as increased alcohol and tobacco consumption, access to vehicles and lower levels of physical activity (Nair & Prabhakaran, 2012). The development of urban environments promotes isolation and sedentary lifestyles, and has social, health and economic implications (Srinivasan et al., 2003). While beyond the scope of this research study, other health related effects linked to the built environment include effects due to high traffic congestion, such as respiratory illnesses, noise disturbances etc. (Briggs et al., 2000; Frank & Engelle, 2005).

There is not only a need to focus on the effects of a built environment, but as mentioned in chapter one, Canada's population is getting older and the built environment should reflect the needs of this increasingly expanding population cohort. According to Yen et al. (2009), the effects on health of older adults might be more influenced by their neighbourhoods as a result of decreased mobility; however, research on a neighborhood's influence on older adults' health is limited. Evidence, however, consistently supports an association between more accessible neighborhood design and greater levels of walking. According to Li et al., (2008), with the aging pre-baby boom and early baby boom generations, public health officials need to address modifiable neighbourhood-level built environment characteristics in order to develop more liveable residential communities and address unhealthy behaviours.

Based on Canadian studies completed in British Columbia, Calgary and Montréal, there are high concentrations of Punjabi Sikhs within the suburbs of cities (King et al., 2006; Mather et al., 2007; Bedi et al., 2008). This poses challenges to the Sikh Punjabi community as suburbs are deemed largely car-dependent (Leyden, 2003). Consequently, sedentary lifestyles are more common among the South Asian population compared to their European counterparts (Horne & Tierney, 2012).

The concentration of Punjabi Sikhs within suburbs also increases isolation, especially if older Punjabi Sikhs are unable to drive and due to language barriers may not be able to navigate unfamiliar public transit systems (Mather et al., 2007; Bedi et al., 2008). In a qualitative study completed in Calgary, many older female Punjab Sikhs heavily relied on access across cities primarily through family members (Mather et al., 2007). Many women depended on family members to provide transportation to attend medical appointments because they were not able to drive, did not use public transportation, and/or because of lack of English language skills (Grewal et al., 2005). This reliance on children for transportation by the older generation/elders was limited largely due to employment schedules of their children (King et al., 2006).

2.3.1 Peel as a built environment

Between 40 and 50 percent of all immigrants to Canada come to the Toronto region, and most stay in the area (Wellesley Institute, 2013). Over 70 percent of the recent population growth is attributable to immigration, and most of that flows from non-European regions, notably Asia, Latin America, and Africa (Wellesley Institute, 2013).

The Region of Peel has a current population of 1.3 million, and is expected to grow to over 1.6 million by 2031 (Weyman et al., 2013). As shown in Figure 1.1, the region is comprised of the town of Caledon and the cities of Brampton and Mississauga.

Peel as a region had minimal development before the rise of the automobile in the post-WW2 era; this has led to differences in the design layout of older neighbourhoods compared to neighbourhoods adapted to the automobile in the region (Weyman et al., 2013). This change in the layout of the neighbourhood from a “traditional” or “complete neighbourhood” has led to a transition in neighbourhoods which were once walkable and residents could complete daily activities without the use of a car, to the current version of a neighbourhood comprised of suburban subdivisions which primarily contain houses (Weyman et al., 2013). As shown in Figure 1.1, Peel Region is outside the city of Toronto and the development of this region was largely due to urban sprawl, which is linked to economic prosperity and the demand from a growing population for development of this type of settlement (Tole, 2008).

Areas categorized with urban sprawl are tied to longer commuting times and higher total vehicle miles travelled per person (Canadian Medical Association, 2013). The scale of neighbourhoods is important to consider. Due to different development and settlement patterns, the Region of Peel is comprised of many differences with respect to accessibility to services in the built environment; and the effectiveness of these services specifically for the Punjabi Sikh population. For example, well-established Sikh communities in Brampton have large numbers of stores, social and religious services, and restaurants available to

residents (Weber, 1996). However, in a study conducted by Aggarwal & Gupta (2013), Afghanistan and Sikh grandmothers expressed difficulties with the transition from their neighbourhoods in the villages of south Asia to urban spaces in Canada which were sparse and did not have adequate public transportation.

The move to the Region of Peel from primarily the state of Punjab led to a transition from a largely rural area to an urbanized area. Many people, particularly men, worked in the agricultural sector as farmers (Oliffe et al., 2009). In the Oliffe et al. (2009) study, research participants felt that the hard work every day, usually in the form of physical labour, was important to one's well-being; and was largely utilized as a way to include physical activity in daily life. Upon immigration to Canada, many people were unable or did not want to continue work as farmers and this daily physical activity was replaced by a mostly sedentary lifestyle (Oliffe et al., 2009).

Chronic disease prevention efforts in Peel face significant challenges. Current diabetes rates are above the provincial average, which is in part due to the high population of immigrant residents who are of South Asian origin and are at a higher risk of developing the disease (Weyman et al., 2013). In addition, Peel Region has one of the lowest levels of walking or bicycling as a primary mode of transportation in the province (Weyman et al., 2013). In essence, Peel is the quintessential suburban environment with its concentration of Punjabi Sikh in which to carry out a study of CVD risk related factors.

2.4 Gaps in the literature

Many studies focus on the South Asian population as a single entity, while this visible minority is considered by many censuses to be a single group; it is not a homogenous population. Therefore, there is a need to understand chronic conditions such as cardiovascular disease in subsets of the populations in addition to trends identified in major population groups.

While there is a substantial amount of literature on risk factors for cardiovascular disease, effects related to immigration and influences of the built environment, further studies need to encompass all three categories together to understand CVD prevalence in the target population, specifically through a lens of the “healthy immigrant effect”. Thus, there is a specific gap in the literature to understand how all three areas of research combine to affect an aging Punjabi Sikh population through a comprehensive approach. Especially since factors and influences related to each theme are interconnected, it is necessary to use this encompassing approach rather than look at each theme separately.

There also needs to be an increase in research relating the built environment to health levels of immigrant populations, especially immigrant populations which are aging. Using a unique approach of looking at the prevalence of cardiovascular disease in the Punjabi Sikh population through a healthy immigrant effect lens provides an understanding of this problem in regards to location and migration patterns. To the best of my knowledge, there have been no previous studies which have focused on CVD risk factors and health

effects related to immigration and the built environment in the Punjabi Sikh population in the Region of Peel.

2.5 Summary

Within this literature review, factors related to cardiovascular disease risk, immigration and the built environment were analyzed as they pertain to the prevalence of cardiovascular disease within the Punjabi Sikh population. All the factors categorized in these themes in this review are largely interchangeable. This indicates that risks related to the higher prevalence of CVD within this population cannot be isolated to a single source but an overall approach to several different themes needs to be considered. Therefore, there is a need to address gaps within the research such as encompassing all three themes to address the amplified prevalence of CVD diagnosis in Punjabi Sikh communities.

Through the use of a population health approach, it is evident that factors included in this review for each theme pertain to several of the twelve determinants of health. Thus, it is imperative to consider these determinants when understanding why there is such a high prevalence of CVD among the Punjabi Sikh immigrant population. The link between health and geography in this review is necessary as cardiovascular disease rates are set to increase within the 21st century (Rambihar et al., 2010). With a previously high prevalence of CVD, larger South Asian populations within western countries and further projections of increased CVD cases, it is crucial as a next step to minimize and/or mitigate the prevalence of this chronic disease within the Punjabi Sikh population. The following chapter describes

the methods of conducting this project within the Punjabi Sikh population in the Region of Peel.

Chapter 3: Methods

This chapter describes the methods used in my Master's thesis. A qualitative analysis was conducted through the recruitment of 30 sample subjects from the Punjabi Sikh population of Peel to participate in semi-structured interviews. The interviews provided an in-depth understanding of factors and health behaviours critical to the health status of the research participants. Interviews also identified specific experiences pre- and post-CVD diagnosis from the participants' point of view, and any changes implemented by interviewees after their diagnosis. Lastly, participants provided information on what they felt needed to be done on a community-level to decrease CVD prevalence in the Punjab Sikh population of Peel.

Participants for this research study were recruited in a variety of ways including posters put up in community centers (e.g., Malton Community Center), religious centers (e.g., Ontario Khalsa Darbar), community events (e.g., Malton Neighbourhood Festival) and advertisements on Punjabi television shows (e.g., Sur Sagar radio/television) within the Regional Municipality of Peel. Posters were also distributed to local charities and businesses in the region. To accommodate the language needs of the Punjabi community, interviews were conducted in both English and Punjabi. The use of both English and Punjabi interviews facilitated a more open dialogue about cardiovascular disease in the community by eliminating any English language barriers. The semi-structured interviews were conducted to specifically understand the "lived-in" experience older Punjabi Sikhs have had since their cardiovascular disease diagnosis.

This chapter is organized in the following way: first the research design, including my position in the project, is described in detail. Secondly, the study recruitment process is explained. Thirdly, the interview process is explained, including all measures taken to ensure the privacy of participant information, and fourth the analysis of data collected during the interviews is described. The chapter concludes with a summary which is followed by the analysis of the study results and discussion of the results in chapter four.

3.1 The research design

The research design is framed by a population health approach. The key inclusion criteria was that participants must be Punjabi Sikh, over the age of 55, diagnosed with cardiovascular disease by a medical professional, immigrated to Canada and live in the Region of Peel. This research project is a qualitative project in order to understand the experiences and perspectives of different points of view of the research criteria, as per Clark et al. (1998). In addition to active direct recruitment of participants in the community, snowball-sampling was also used to recruit participants through contacting different individuals and organizations in the community. The study design was reviewed and approved by Queen's University's General Research Ethics Board (GREB) (see appendix A) and followed Queen's University's Off Campus Activity Safety Policy (OCASP).

In order to include an encompassing approach toward risk factors for cardiovascular disease, health effects due to the immigration process and health effects related to the built environment, a population health approach was selected as the most comprehensive and appropriate framework for this project. This approach combines various social

determinants of health to understand why there is a higher prevalence of cardiovascular disease within a target population, with the ultimate goal of reducing health inequities on a population scale (Robinson & Elliot, 2009). The health determinants include: the social environment; the physical environment; gender; culture; social support networks; biology and genetic endowment; health services utilization; personal health practices and coping skills; employment/working conditions; income and social status; education and healthy child development (Public Health Agency of Canada, 2013). As a framework used in numerous health research related studies, this approach combines social determinants of health and biological indicators in this case of cardiovascular disease in the Punjabi Sikh community.

While there are several different types of methods which can be used in qualitative health research (e.g., phenomenology, ethnography, grounded theory), grounded theory was selected for this project. Ground theory is a methodological approach developed in the 1960s whereby data is analyzed in a way that researchers are able to generate a theory (Walker & Myrick, 2006). Grounded theory is a method used to identify common themes (Walker & Myrick, 2006; Starks & Trinidad, 2007). This method was used largely to capture an understanding of the “lived-in experience” of each interviewee until saturation of information was reached (Corbin & Strauss, 1990). Semi-structured interviews were conducted based on a guiding set of questions (see Appendix G). The types of questions asked were geared towards the three areas of focus in this study as well as providing participants the opportunity to add more information related to the study.

According to the protocols of Walker & Myrick (2006), all transcripts were analyzed through the development of codes. This process included the coding of information, analyzing this information and verifying the codes through re-coding of the transcripts. A similar study on cardiovascular disease in the Punjabi Sikh population conducted by Bedi et al. (2008) used grounded theory and semi-structured interviews, specifically through line-by-line open coding. Privacy of all files was maintained through keeping all records locked physically in my office and electronically on my password protected laptop.

3.1.1 My position as a researcher in the study

I have strong personal connections to the Punjabi Sikh community in Peel. As a self-identified Punjabi Sikh, I thoroughly understand the cultural and religious environments where recruitment occurred (e.g., Sikh temple) as well as language requirements which were sometimes necessary during interviews. I speak both Punjabi and English fluently, have lived in the Region of Peel and the GTA for over 20 years and have dealt with cardiovascular disease of close family members in the past. These factors provided a background and acted as the starting point to develop this research project, especially to understand health effects due to immigration and the built environment in Peel. The option of interviews conducted in either language was crucial to the recruitment of participants. Over 90 percent of interviews were conducted in Punjabi, even with interviewees who were bilingual in both Punjabi and English.

3.2 Study recruitment

Recruitment of participants for this research was completed in the Regional Municipality of Peel, located in the GTA between the months of June and August 2014. Specific emphasis was placed on areas which included high concentrations of Punjabi Sikhs, specifically in the cities of Mississauga and Brampton. These areas include community centers within prominent Punjabi Sikh neighborhoods and “*Gurdwaras*”, Sikh religious centres. Prior to conducting field work for this project, I researched extensively different “hubs” in the community which were frequented by Punjabi Sikhs 55 years of age and older. These hubs included Seniors’ Clubs in the community, different libraries which were frequented by seniors and malls which were commuter and walker-friendly within different neighbourhoods in Peel. Participants for the research study were recruited through a variety of ways including advertisements on Punjabi radio shows (e.g., Sur Sagar radio/television), community centers (e.g., Malton Community Center) and religious centers (e.g., Ontario Khalsa Darbar) within the Regional Municipality of Peel. Recruitment was completed through advertisements for the study posted in key locations in addition to hand-outs to event attendees within the Punjabi Sikh community and contact via telephone to several radio/television shows within the region.

Through personal connections in the community, I was also able to conduct snow-ball sampling for the study in addition to the recruitment community-wide. In particular, I focused on neighbourhood events as well as “*melas*”, Indian events in the community. The melas included the Punjabi Community Health Services 5th Annual Senior’s Mela, the Asian Food Centre Mela, the 3rd Annual Sikh Virsa Day organized by Guru Nanak Mission

of Canada and the annual Seniors' Mela events. I also attended the Can-Sikh Kabaddi Tournament in Brampton, a sports event organized and sponsored by many local organizations in the community. At some of these events I was able to speak on stage about my research project. At all of these events I spoke to attendees, different organizations and distributed research posters in both English and Punjabi (see Appendix B and C) to people who were interested in the study and/or people who knew of someone who might be interested. Attending and recruiting participants at community events, especially in parks, provided an opportunity to recruit within participants' own neighbourhoods in close proximity to their place of residence.

Through contacting different Seniors Clubs in the Region of Peel, I was able to speak to different club members about my project and my role as a researcher in this project. I also distributed research posters and gathered research information from different people interested in the project. I attended other events including fundraisers in the community whereby I spoke about my research; these events were videotaped and streamlined on local channels. In particular, I spoke at the Sahaita, Canadian chapter of the charity, fundraiser in Mississauga, Ontario. I also contacted local organizations, in particular Seva Food Bank, which in addition to making food available to the community organizes seminars on health (e.g., Diabetes Seminar).

To recruit potential participants through Sikh Gurdwaras in the region, I contacted the Ontario Sikhs and Gurdwaras Council, where I spoke to various directors of Sikh temples in the community who agreed to put up research posters pertaining to the study in all

temples in Ontario (Scarborough to Cambridge). This method of recruitment expanded the specific geographical location of the research study.

In order to obtain a variable and representative sample for the study, I combined traditional forms of study recruitment such as attending events and distribution of posters, with the use of different media to speak about my project. I was featured in a live news talk show on Sur Sagar, a subscription-based channel which caters to a predominately Punjabi audience. During the television show, which was simultaneously aired on Sur Sagar radio, I spoke about my research, why I was conducting the research project, the study criteria and how those interested in speaking to me could contact me. Contacting several various organizations and subsequently attending events and contacting people from different media led to variety of persons sharing their experiences pre- and post- CVD diagnosis and views on the ways to mitigate the prevalence of this disease in the community.

3.3 Interviews with research participants

I contacted participants initially via telephone, introduced myself and the purpose of my research project for my Master's thesis. I described the project in detail and asked if the participants were interested in the project and being interviewed by me. I answered any questions they had regarding the study, and a location and time to meet to conduct the interviews was discussed. All interviews were conducted in participants' homes, with the exception of one interview which, due to scheduling conflicts, took place in the participant's family business. I spoke to participants about the study, why I was conducting the study, my position as a Master's student at Queen's University, and gave participants

the letter of information (see Appendix D). I went over the consent form with participants in English and/or Punjabi. I acknowledged to research participants the difficulty of speaking about their health and made sure they were comfortable addressing these questions within the interviews. Information was provided to research participants at the start of, and the end of interviews pertaining to counseling services available within the Regional Municipality of Peel (see Appendix F). The counseling services included Family Services of Peel and the Newcomer Center of Peel.

Before beginning the interviews, I asked if there were any questions, let participants know their participation in the study was completely voluntary and if at any point they did want not to participate in the study they could contact me via the contact information in the letter of information. I also let participants know that if they felt uncomfortable answering any of the questions to please let me know and we would move on. I explicitly explained to participants how their information would be kept private (e.g., through the use of research IDs).

This explanation was followed by a description to participants briefly about the analysis process, indicated all responses would be developed into codes and the focus of my project was on population health and not individual health information. Before beginning the interviews, I asked participants for permission to audio-tape the interviews for research purposes, in addition to taking notes; 28 participants agreed to be audio-taped, 2 participants were uncomfortable with an audiotape recording. From this point, I administered the interviews through asking participants what happened in terms of their

experience with cardiovascular disease, specifically starting with an open-ended question pertaining to their experience with a cardiovascular disease diagnosis.

3.4 Data collection

All data were collected through audio-recordings and research notes I took during the interviews. The recordings and research notes, similar to the consent forms were physically locked with access restricted to myself and/or at the request of my supervisor. Thirty semi-structured interviews were conducted, with 25 guiding questions for the interviews. Interviews ranged in length between 30 and 90 minutes, with most 45 to 60 minutes long.

During the duration of the data collection period, 51 people were approached for the study, 21 persons were not recruited for the following reasons: many people were not comfortable with signing consent forms, especially for research studies pertaining to their health; unavailability to take part in the project during the field work period; some people were Hindu Punjabi and not Sikh Punjabi; some people lived outside of the Region of Peel but within the GTA (e.g., Etobicoke, Scarborough); and/or some people were younger than the age of 55. Two people did fit the research criteria; however, due to their health circumstances at the time, I did not feel it was appropriate to ask these individuals about participation in the study.

Due to the higher enrollment of males in the study when compared to females, I actively looked for ways to recruit female participants in this study. This was completed through

approaching females at events and contacting Indian female organizations in the community. One of the reasons to advertise my research on TV was due to generational and/or cultural norms for this population cohort, many older females do not attend community events and/or organizations. While epidemiologically the sample size cannot be characterized in a statistically meaningful way, qualitatively, saturation of information was attained as there were key similarities in answers to the questions and similar experiences of different health behaviours pre- and post-cardiovascular disease diagnosis. The gender divide is acknowledged as a limitation of the research project, which is further discussed in chapter five.

3.5 Analysis

All analyses were conducted through the use of research ID's (1-30), which were used to de-identify information from study participants. This protocol was followed in accordance with the Personal Information Protection and Electronic Documents Act (PIPEDA). I completed the translation and transcribing of interviews simultaneously from the recordings, with the additional support of field notes taken during the interview. All transcribed information was verified as the proper translation through playback of the recordings and matching transcripts to the recordings and field notes. Transcripts were line-by-line coded and re-coded, whilst common themes and similarities pertaining to the three areas of focus in the study, pre- and post-CVD diagnosis experiences and recommendations for community-level interventions were identified. The development of codes divided the information in the transcripts into organized categories which could be compared and analyzed with all 30 transcripts. This process of coding is similar to and guided by the

grounded theory approach described by Corbin & Strauss (1990). By organizing the data by codes, information was compared for consistency throughout the transcripts. Through the use of grounded theory, the codes developed from the transcripts were compared and analyzed to develop themes (Walker & Myrick, 2006). All quantitative demographic information (e.g., age when diagnosed with CVD) was organized in Microsoft Excel and is described in chapter 4.

3.6 Summary

This chapter outlines in detail the methods carried out during the course of my research project. Using a population health approach facilitated a comprehensive approach to the research and research questions. In particular, the approach incorporated the three key themes under investigation in this project: risk factors associated with cardiovascular disease, health effects due to the immigration process and health effects related to the built environment. The recruitment of research participants through several different types of media and snowball sampling resulted in a viable sample of 30 participants. The use of grounded theory facilitated a “life-experience” understanding of cardiovascular disease diagnosis and experiences pre- and post-diagnosis from research participants. The understanding of the three areas of focus was guided by the questions in the semi-structured interviews. This methodological approach was used to obtain information until saturation was met.

Data were analyzed in accordance with previous grounded theory practices and concepts were developed from the information. The analysis led to the development of

similar themes which included all three areas of research to provide a possible explanation of why there is such a high prevalence of cardiovascular disease in the Punjab Sikh population in the Region of Peel. The following chapter describes the results of the study, including common themes developed during the data analysis.

Chapter 4: Study Findings and Discussion

This chapter provides an analysis and discussion of the results of the 30 semi-structured interviews conducted in the Region of Peel. The chapter is divided into four main sections: a description of the socio-economic characteristics of research participants, followed by results regarding risk factors for cardiovascular disease, health effects related to the immigration process and health effects related to the built environment. Each of these sections includes the main patterns analyzed in the interviews and how these patterns relate to the literature reviewed in chapter two. This is followed by a summary of the main findings.

As discussed in chapter three, 30 participants were recruited for this study, 25 males and 5 females. All 30 participants were born in the state of Punjab in India and either directly immigrated to Canada or immigrated elsewhere (e.g., England) before settling in the Region of Peel. The following table describes the socio-demographic characteristics of the research study's sample size.

Table 1.1.: Participant socio-demographic characteristics (n = 30)

Gender	M: 25; F: 5
Age	~ 71 (Range: 55-91)
Languages	Punjabi only: 13 Punjabi and English: 17 English only: 0
Presence of diabetes	Yes: 7; No: 23

Highest level of education	None: 6 Primary: 8 Secondary: 9 University /college: 7
Immigration type to Canada	Worker visa permit/Skilled Worker Program: 11 Sponsored class (by child, spouse, sibling): 19
Living with family in Canada	Yes: 28; No: 2
Residence	Town of Caledon: 2 City of Brampton: 17 City of Mississauga: 11
Occupation	Unemployed /retired : 14 Self-employed: 4 Trades: 7 Other: 5

4.1 Cardiovascular disease risk factors

This section focuses on the four key patterns which emerged pertaining to cardiovascular disease risk factors: knowledge of CVD; an “unrestricted” diet before CVD diagnosis; low rates of exercise before CVD diagnosis; and high rates of stress, largely related to financial and family situations. This section also includes a comparison of changes implemented by participants before and after CVD diagnosis.

4.1.1 Knowledge of cardiovascular disease

Knowledge of CVD, what the disease meant prior to diagnosis and signs and symptoms of the disease were not widespread previous to research participants’ own experience with CVD. Of the 30 research participants who were interviewed, over 80

percent did not know what CVD was when they first experienced signs/symptoms of the disease and/or did not know it could happen to them. Similar to the study conducted by Bedi et al. (2008), there is limited knowledge of heart disease and the signs and symptoms of the disease are not always properly understood. For example, research participant #21(M), spoke of his initial reaction to chest pain and when he was diagnosed with CVD.

“First time I had a heart attack was May 1988, when I got chest pain. I was doing the lawn mowing at home, you know the lawn mower that’s old and there and then have to pull that cord again and again. And chest pain start and that didn’t [go away], that keep on getting worse and worse.” – Participant #21(M)

This statement was followed by asking the research participant how familiar he was with CVD and its risk factors at the time of his heart attack.

“Not at all. I even don’t know what was happening to me, when I had the chest pain, I didn’t know it could be a heart attack.” – Participant #21(M)

The following research participant #16(M) spoke of his experience with CVD, and not connecting the signs and symptoms of CVD to the disease. For some study participants, medical attention was sought after they had experienced pain for a substantial amount of time and/or if the intensity of pain began to increase.

“What happened was that at first my breathing was getting difficult. Breathing was difficult as I was walking back home. Then I sat on a meter box [electric box], to be more relaxed, [I walked home], then I drank some water and relaxed [laid down], then I told them [children], and went to the doctor. They checked me out, prescribed me medication, and told me to go the hospital. Then I was admitted.” – Participant #16 (M)

There was also not a realization that this could happen to the participant, many participants thought the pain was due to either something they had eaten, a result of physical work or due to aging. After a diagnosis of CVD, many participants became informed of the exact signs and symptoms of heart disease and the need to seek medical attention as soon as possible. A lot of the disbelief of what was happening to participants at the time of a CVD can also be attributed to a lack of familiarity with the disease. The disbelief of what was happening and lack of connecting signs and symptoms of CVD is similar to the findings of the Bedi et al. (2008) study, whereby researchers also found many Punjabi Sikh patients had limited knowledge of heart disease. Many participants also did not recognize the source of chest pain, and urgency of the need for timely diagnosis, in addition to the dangers in a delay in seeking medical attention (Bedi et al., 2008).

Some research participants, including the interviewee below, felt he was healthy and did not think he could have CVD. Participant #10(M) had previously been to the doctor for high cholesterol and took medication as directed by his family physician. As mentioned in chapter 2, there are several different factors which may contribute to a CVD diagnosis, including high cholesterol. The participant was vegetarian, and refrained from smoking tobacco and/or consuming alcohol, as per the requirements as a devout Sikh (Labun & Emblen, 2007). Similar to the participants in a study conducted by Bedi et al. (2008) was the disbelief of what was happening to him as he thought he was healthy.

“Then they told me you have to take care, so my diet was, I am pure vegetarian, pure vegetarian, no smoking, no drinking, no...not even eat meat or anything like that, nothing. Then its, I took the medicine and then my cholesterol was normal. So maybe that time, maybe it was that, I don’t know nothing in my

mind to get the heart attack because my health was feeling well. So then after that, I learn lots of things to do.” – Participant #10 (M)

4.1.2 Diet pre-CVD and dietary changes post-CVD

Changes in diet between pre- and post-CVD diagnosis provided research participants a chance to modify their own diets and their families' diets. Many participants understood what changes they needed to make to their diets, resulting in modifications to their Indian diets and/or replacing many foods in their diets with other foods. Many study participants (not including those who were diabetic) had diets which consisted of significant proportions of carbohydrates, fried foods and sugary foods, similar to the diet described by Pais et al. (1996) and Bedi et al. (2008), before their CVD diagnosis.

There was disconnect between the prevalence of CVD, and how important it is to understand the effects of diet as a risk factor for the disease. Several research participants, including participant #12(M), spoke about how their diet pre-diagnosis was the same diet they had always had and no problems arose before their first CVD event. This comment is similar to how little knowledge and exposure many participants had to heart disease in India as this disease is not as widespread there. These diet patterns were similar to a study conducted by Lueng & Stanner (2011), whereby older generations were more likely to eat traditional dietary foods and less likely to change their diets compared to younger generations. In particular, research participant #12(M) describes his realization of the effects of diet on his health and the change he made afterwards. Specifically, this interviewee became very strict on his diet following his CVD diagnosis, even 20 years later. Several participants spoke of their attention to their diet after their CVD diagnosis,

and as most participants lived with their family, at times the entire family changed their diet and/or modified their dietary intake of fried foods and sweets after being aware of a family history of heart disease.

“I was not, no worry about restrictions, like yes this food I am not going to eat or that, what we had we ate. Then I had the health problem, then I became really strict. Now, even still, almost 20 years since my bypass surgery, I still eat like then [after the surgery], full focus on what I eat.” - Participant #12 (M)

In this study’s sample size, many people had diabetes (n = 7), depending on when they were diagnosed with diabetes compared to when they were diagnosed with cardiovascular disease, many interviewees had altered their diets to a more health conscious diet prior to their CVD diagnosis. This was the case for participant #3(M), who modified his diet to a healthier, diabetes-friendly diet, close to a decade before being diagnosed with CVD. Therefore, CVD diagnosis has to be considered through not only understanding CVD risk factors but also understanding how different risk factors (e.g., diabetes) can complicate preventing heart disease. With a higher rate of diabetes in the Region of Peel compared to other areas in Ontario (this higher prevalence has been linked to a higher concentration of South Asians living in this region) (Weyman et al., (2013)), there is a need to prevent modifiable risk factors of CVD as much as possible.

“I changed my eating habits sometime in I want to say, 2001—no, in 2000. I started to change my eating habits, when I had been diagnosed, I had diabetes. Then after my heart attack [in 2011] I have totally restricted, to eat only a number of things, heart food only, as per required for my heart.” – Participant #3(M)

4.1.3 Exercise pre-CVD and exercise regime changes post-CVD

Rates of exercise were low pre-CVD for many of the research participants, similar to a study conducted by Daniel et al. (2013) who compared the exercise rates of South Asians to other populations in Illinois, USA. Participants began to exercise more frequently post-CVD diagnosis. The main form of exercise was walking, ideally outside with friends or alternatively inside the house on a treadmill. However, at times developing a routine for exercise was limited either by climate (e.g., many people did not walk outside due to the weather and/or fear of slipping on ice) and/or by other responsibilities (e.g., taking care of their spouse).

Participant #26(M) spoke of how he felt his lack of experience pre-CVD may have led to his diagnosis. The effect of low physical activity levels on health levels and in particular, the risk of CVD diagnosis is described in a Canadian study conducted by Tremblay et al. (2006), where South Asians had lower rates of moderate exercise (34%) compared to their Caucasian counterparts (49%).

“Actually problem was that I didn’t do the regular exercise, so that maybe that was one problem with me, I lucky only one artery was blocked otherwise all would be. Some people, people have 3-4 arteries blocked, 90%, 35%, mine was only one.”
- Participant #26 (M)

Participant #2(M) spoke of the experience he had with exercising pre-CVD diagnosis which consisted of irregular walking regimes and/or exercise at work. Walking was the most popular form of exercise in the sample, as it was considered by many participants as the easiest form of exercise, it was accessible and not as strenuous compared to other forms of physical activity. This is similar to findings of participants in Galdas et al. (2011) and Galdas et al. (2012), where walking was also identified as the main form of exercise. Also,

similar to research findings by Oliffe et al. (2009), lack of time and obligation to others were two main barriers to maintaining a regular exercise regime.

“No, later I started a little bit. After I started. Before, no, afterwards, I started walking, then I got more exercise a little bit, treadmill sometimes, we have a treadmill downstairs, sometimes. Now it’s been almost a year since my wife got sick, after that I stopped [exercise], all day helping her out. Almost treadmill somewhat, but I do walk. I still walk, a few laps, 1 or 2.”– Participant #2(M)

However, as demonstrated by participant #11(M)’s experience, after CVD diagnosis many participants began to exercise regularly, and especially with the help of rehabilitation programs were able to understand the types of exercises available and how to implement these exercises in their daily lives. This participant spoke of his effort to join a gym before his CVD diagnosis on his own and the negative experience led to injuries to his knees. After his CVD diagnosis, he attended a rehabilitation program to gain strength and felt this program helped him not only to regain strength after his diagnosis but also he gained knowledge of how to navigate different machines and which machines work out which body parts. Similar to a study conducted by Galdas et al. (2012), of Punjabi Sikhs attending rehabilitation programs after their myocardial infarction, these programs provide knowledge and support for people as they regain strength and well-being post-CVD diagnosis. Galdas et al. (2012) further elaborates how by providing community classes to some people in the Punjabi Sikh community, they served as mentors for others and slowly people were able to provide and guide a variety of exercises and types of exercises.

“I did join a fitness club, 500 dollars fee, and I was lifting my legs and I think for a week, and I damaged the cartilage in my knees, and a week later they left, the facility closed. After that I didn’t join a club, and now here, it’s been 4

months since I've been going there, two more months remain, it's the rehabilitation program, and I've joined that, and I say anyone who has heart problem, after that, they really need to join these programs, because now I know that some exercises I did were wrong, or in excess and there they tell you everything.” – Participant #11(M)

4.1.4 Stress experienced pre-CVD and coping mechanisms post-CVD

While research participants spoke of different types of stress they had felt at a point in their lives, apart from stress associated with immigration, the two main sources of stress were family associated and stress related to finances. In particular, research participant #25(F) spoke of both of these types of stresses she experienced before her heart attack in November 2012. Stress as a risk factor, and a direct causative factor, for CVD diagnosis has been demonstrated in studies conducted by Darr et al. (2008) and Farooqi et al. (2000). In particular, Mather et al. (2007) found that stress, especially family stress in the Punjabi Sikh community, was considered a factor for CVD by women interviewed in Calgary, Alberta. Stress was a main cause of distress which many participants spoke of within all three areas of interest in my project.

“Always stress, most of the time stress. The main reason for the problem is stress, extremely stressed in April for family stress, October family and financial stress. [I] never worked before in India, now different.” – Participant #25(F)

4.2 Health effects related to the immigration process

There were two major waves of immigration to Canada among the participants; the first, in the early 1970s to the Region of Peel, was largely of young men trying to settle in Canada for new opportunities for themselves and in many cases for their young children and spouses still in India. The experience of immigrating to Canada from Punjab in the

early 1970s was similar to the immigration experience of Punjabi Sikh research participants in a study conducted by Nayar & Sandhu (2006). Even men who initially emigrated from another country (e.g., England) to Canada recognized the new opportunities which would be available to their children and to themselves. Immigrating from a predominately agricultural community in Punjab to the Region of Peel also led to changes in: occupations for many of the research participants, lifestyle (e.g., moving from a rural to urban area) and environment (e.g., between a warmer climate in Punjab to the Region of Peel and the cooler Canadian climate), resulting in some difficulties upon immigrating.

The second wave of immigration was largely made up of parents of those who immigrated first and in some cases siblings of those who immigrated first and sponsored their family members. This form of chain migration was crucial to sustaining familiar networks in a new country. This wave of immigration largely took place in the late 1980s and early to mid-1990s. These research participants who were sponsored usually lived with their children upon immigration and for many of these parents, came to Canada to help support their children and provide care for their grandchildren. For many in this older generation this was the second time they faced this type of transition with the subsequent challenges associated with resettlement. The first time study participants in this group experienced resettling in a new area was during the Partition of 1947 resulting in the division of Pakistan and India. Sponsoring of siblings also provided a chance for the siblings to start their new lives in Canada. While the two waves of immigration to Canada occurred at different times, similar challenges of migration and initial settlement were faced by both groups, with the addition of generation-specific challenges.

The following analysis of the results and discussion is divided up to take into account the two major waves of immigration, to reflect the similar yet different experiences study participants felt upon their migration to a new country, as well as coping strategies and experiences post-settlement in Canada. The analysis also examines the four major patterns which emerged connected to the immigration experience and health effects related to the immigration process of research participants in the study.

4.2.1 Opportunities in Canada

The main reason for immigration to Canada includes the opportunities available in Canada, for participants as well as participants' children; and for the older generation to support their children and/or grandchildren in Canada. Participants found better educational and employment opportunities in Canada, similar to experiences of Punjabi Sikhs in a study conducted by Smythe & Toohey (2009). The older generation immigrants came to Canada to reunite with their families, provide childcare for their grandchildren and support their own children in a new country. The role of grandparents providing child care for their grandchildren is similar to findings in a study conducted by Aggarwal & Grewal (2013).

In particular, participant #2(M) spoke of lifestyle changes between India and Canada, acknowledging the vast opportunities present in Canada were not without costs. These costs were largely associated with giving up comforts familiar in India, and instead had to do everything on their own. Similar to studies conducted by Nayar & Sandhu

(2006) and Dassanayake et al. (2010), immigrating and the process of immigration presented several challenges to those migrating from one country to another.

“Here, there is such a big difference between life there [India] and here. Over there we couldn’t get everything, some things you just had to forgo, here anything we need we have, here you have to do everything though. There, we had people to do certain jobs, cleaners, field workers, we didn’t know neither myself nor her [wife], nor others, we had certain people who did all the farm work, the system there was different.” – Participant #2(M)

4.2.2 Resettlement challenges

Changes in the physical environment were also stark, in particular the changes in climate between India and Canada. These changes were also further complicated by changes in the social environment, in particular different cultural and societal norms. For participant #25(F), the move to Canada led to a difficult transition, specifically taking on several different roles both inside and outside of the home, coupled with family problems. The experience of women taking on several different roles upon immigration is similar to the experiences of older Punjabi women in a Canadian study conducted by King et al. (2006). The effects on health due to the challenges of immigrating include cold climate shock, similar to the experience of Punjabi women in a study conducted in Calgary, Alberta by Mather et al. (2007).

“When [I]first came to Canada, felt trapped. Came in October- winter, snow started. Didn’t know anyone, no care, the culture here was different, different accents, dress, lifestyle, coupled with family problems. With immigration came a lot of changes, a lot of stress, and a lot of responsibilities, including child raising.” – Participant #25(F)

Several people spoke about certain “trade-offs” between the life in India and life in Canada. In particular these tradeoffs included more opportunities in Canada. For older people, the trade-offs included reuniting with family, usually their children and grandchildren in Canada, without the life they were accustomed to for so many decades in India, as is the case for participant #8(M). Resettlement did become easier as more family ties continued in Canada and with chain migration and sponsorship of family members, many people began to regain the support system they initially established in India prior to immigration.

For many participants who did not know English, regaining these ties and support systems were crucial to decreasing feelings of isolation in Canada. Language barriers upon immigrating to another country were also a source of distress many felt in a study conducted by Choudhry (1998). Participant #8(M) spoke of his difficulty in adjusting to life in Canada upon immigration largely due to a language barrier and changes in his network of family and friends and in the community. A language barrier upon immigration to Canada was a key research finding in a study conducted by Choudhry (1998). A lack of social networks upon immigrating to Canada was also a difficulty faced by research participants in a study conducted by Grewal et al. (2005).

“Before I did [have difficulty adjusting], but majority now that there are people [elderly people in this generation], the stay in our community, but before like anyone it was new. At first there is a language barrier in the beginning, English and Punjabi, but now, I go to relatives’ house, on the weekend, or here with the Punjabi community. But at first it’s hard when you come from India, and accept this environment.” – Participant #8(M)

In particular, research participant# 5(F) spoke of how her life changed with not only responsibilities at home, such as raising children, but also the need to find work outside of the house. Similar to the increase in roles and responsibilities acknowledged previously by participant #25(F), this interviewee also had to deal with a divorce from her husband and therefore dealt with challenges associated with her immigration experience to Canada on her own. The cultural distaste especially for divorce in a family so early on is similar to cultural expectations and the increase in pressures put on females in a study conducted by Aggarwal & Gupta (2013), as well as the deep-seated cultural norm of “saving face” and internalizing these personal problems (Nayar & Sandhu, 2006).

“It was not well-planned [immigrating to Canada], destroyed. In 2000 filed for divorce from husband, no money, no place to go, things got really bad in Canada, stressed, children stressed. Life in Canada different from India, family life here not stable, things changed, open society, different from the society pressures in India.” – Participant #5(F)

The change in status and position are experiences which are similar to those identified in studies conducted by Oliffe et al. (2010). Participant #21(M) spoke of the changes in the atmosphere between India and Canada, and how this had effects on their resettlement in Canada. Participant #21(M) also felt the transition as he describes the change from something to nothing upon immigrating, and having to resettle in an unfamiliar environment.

“That was beginning, first immigration to Canada...at first you get a big culture shock, when you go out [in India], people say “Sat Sri Akal’ (Hello), everywhere you are something. Here, it’s just you’re nothing, you can

say...everything there is a difference, food problem, cultural problem, the differences in “sitting and eating” in society, circles very small.”
– Participant #21(M)

4.2.3 Underemployment

One of the main challenges faced by participants upon immigrating to Canada was getting their educational credentials recognized in order to apply for employment in their fields of specialization. This challenge was largely faced by those who immigrated to Canada via the point system, as many of those who immigrated through sponsorship were older and they immigrated to Canada to help support their children and grandchildren. In particular, participant#13(M) spoke of the difficulty in getting recognition of educational credentials as a challenge in the past and at times still a challenge.

“First off, our education they didn’t recognize it, then those that came with a BA, they gave them grade 12, now it’s pretty even, but that depends.”
– Participant #13(M)

Research participant #18(M) spoke of his difficulty in finding a job, especially a job which was already below his qualifications, the repercussions on his health associated with trying to settle in Canada, and thoughts of leaving Canada; even with the opportunities it would have presented for his children (the main reason for immigrating) and move back to England to be with his family. While this interviewee had initially immigrated to Canada to settle down and bring his children to the country as well, the difficulty in initially settling down coupled with feelings of loneliness were acknowledged as a very difficult time for this person. Poor working conditions similar to that described by participant #18(M) was a

factor many immigrants to Canada felt led to a decline in their health status (Newbold, 2005). Specifically, many research participants in this study spoke of difficulties faced related to immigrating and settling in Canada, coupled with missing their families and livelihoods in the country they emigrated from. The descriptions of the difficulties in not only obtaining and sustaining employment but also experiences of attaining employment below their credentials is similar to jobs many Punjabi Sikhs possessed (e.g., taxi drivers, janitors) in a study conducted by Smythe & Toohey (2009) in British Columbia, Canada.

“And then there is my second cousin in Cambridge, and he said go there, at least meet them before you go back. I came here, and in the afternoon they took my driving, and it looked like Punjab. It was in April/May, no snow at that time, and cob plants were beginning to sprout, and it looked like to me as I was in Punjab. Then I, the next week I tried to get a job and I got a job, and then I did that job for one week and I, when I compared the money I made there and England, it was less, and I said there [in England], I have my family, children, everything, then what I am doing here? Then I tried somewhere else, that job was a little better than the first, in terms of ...pain, and then it was the long weekend and after the long weekend I began going back to work, it was a factory, and after three-four days, I went to work and I had just taken a shower and from my nose came out soot at that time. I said, going to work is like going to death.” – Participant #18(M)

Some research participants went on to pursue further education in Canada in their field of specialization, however, as participant #27(F) describes even with Canadian credentials, the competition for jobs in the market put her at a disadvantage at times, as an older graduate, compared to her younger counterparts in the same program. Feelings of under-employment and unemployment among participants in my study are similar to the feelings expressed by immigrants to Mississauga, Ontario in a study by Dean & Wilson (2009).

“When you’ve got young graduates not getting a job, who is going to hire a middle-aged Auntie?” - Participant #27(F)

4.2.4 Stress related to the immigration process

Many participants spoke of the stress associated with immigration, associated with resettlement and in particular finding a job, sponsoring family, and raising children in a new environment. In particular, of the 30 participants recruited for this study, 12 participants immigrated as young men in the 1970s and early 1980s, these men predominately spoke of how immigrating at that time was a different time, with many difficulties and stresses associated with re-settlement. In a study conducted by King et al. (2006), Punjabi Sikh women experienced stress related to immigration largely due to feelings of isolation, changes in social status and lack of autonomy. Research participant #24(M) spoke of his experience with immigrating to Canada and the challenges associated with resettling with particular emphasis on raising children in an unfamiliar environment. The stress of child raising in a new environment is similar to the worries of South Asians in a study conducted in Leicester, United Kingdom for family and children by Farooqui et al. (2000).

“Stress? Yes. Stress was always there. When I first came here, income wasn’t very much, kids came afterwards, didn’t have money, almost, stress was always here. I brought condominium, the re-payments (and interest), plus groceries...and kids and day care and this and that, a lot of stress anyways. Plus job stresses....until you don’t get a job, you are stressed for a job, stress was always there.” – Participant #24(M)

Similar to “job stress”, some participants found that living in Canada also meant everyone had to work, whereas not everyone had to find employment to supplement their

income and livelihoods in India; this stress was coupled with successfully settling in Canada as acknowledged by participant #7(M). Older Punjabi Sikhs in a study conducted by Bedi et al. (2008), also indicated that stress increased the risk of CVD and with immigration comes stress during the resettlement process in a new country.

“Normal stress, everyday stress. Stress with immigration, own new house in Canada, how to resettle in Canada. “Migrate, find new house, new things” and there [India] work or not work, here you have to work for a living.” - Participant # 7(M)

Many participants spoke of how they combat stress and what coping strategies they use to decrease different stressors in their lives. Participant# 1(M) spoke of the need to adjust oneself to his current environment as a way to decrease stress and to adapt to changes, mainly referring back to his prior experience of travelling and adjusting to different countries before finally settling with his family in Canada. While this participant used a coping strategy when dealing with stress, coping strategies such as relaxation techniques are not well utilized as a stress management tool; rates of utilizing relaxation tapes were lower in the South Asian population when compared to their European origin counterparts in a study conducted by Darr et al. (2008).

***“Not really [difficult to get used to living in Canada], because I travelled world-wide and I adjust myself, I adjust myself. Wherever I go I adjust myself, according to the circumstances and that is why I always feel happy, I have no complaint wherever I went, I try to adjust myself and I know when you are happy then you lead your life well. And that was always my motto, to keep myself happy, so I should not have stress or anything, I don't worry.”
– Participant #1(M)***

4.3 Health effects associated with the built environment

Where study participants' lived in the Region of Peel had an effect on their interaction levels with the built-environment of this region. In particular, research participants who lived in older more "traditional" neighbourhoods such as Malton had higher levels of interactions with their built environment and walking within their neighbourhood compared to residents living in other parts of the region, most notably the comparatively more car-dependant neighbourhoods in northern Brampton. These differences of interactions within the region demonstrate the need to understand built environment interactions, especially for an older population on a neighbourhood scale.

Many research participants in my study acknowledged that while there are facilities and areas to walk to especially in the summer, walking gets difficult in the colder months, more interaction with the built environment especially in the winter months is needed, specifically in areas which are largely comprised of housing subdivisions. The need to increase interaction with the built environment is important as many people in the study as well as in the literature reviewed discussed walking as the main exercise most interviewees participated in and were comfortable with (Bedi et al., 2008; Oliffe et al., 2010). In addition to what is available in the built environment, the effectiveness of the human landscape also poses a need to understand how residents in the Region of Peel interact within their environment.

In the Region of Peel, there are several organizations which provide Punjabi language services in addition to English and French languages. Those who did not speak English

were older and were usually accompanied by their children and/or grandchildren to appointments for translation purposes. If participants did not drive a vehicle or did not have access to a vehicle they were also accompanied by children/grandchildren to appointments.

This section of the chapter is organized into the following themes based on built environment interactions in the Region of Peel: first the neighbourhood variability is described followed by access to services. Thirdly social inclusion is identified, specifically how participants spend their time within the built environment of their neighbourhoods. This is followed by the last sub-section which includes what participants would like to see in their community to decrease CVD prevalence; this includes an increase in community education campaigns and/or camps.

4.3.1 Neighbourhood variability in the Regional Municipality of Peel

In most areas of Peel, you need a car to go places. A large exception is the neighbourhood of Malton, where there are stores/temples/community centers close to each other. Six participants in my study were interviewed from the neighbourhood of Malton, other than one, five of these participants spoke of interacting with the built environment more than in other parts of Peel. The interaction was largely due to the close proximity of participants' residences to malls (e.g., Westwood Mall), community centres (e.g., Malton Community Center) and religious centers (e.g., Malton Gurdwara). The interaction is in stark contrast to participants' interaction with the built environment in other parts of Peel. In particular, in neighbourhoods located in northern Brampton, many participants spoke of vehicles as their main mode of transportation when interacting with the built environment.

There is a need to understand the interactions of people in a fast growing suburban community like Peel in order to build age friendly communities which will provide the facilities and resources for an older population.

As a resident of Malton, participant #30(M) spoke of the closeness of all facilities in his neighbourhood. The proximity of different facilities within a walkable distance in older, “traditional” neighbourhoods such as Malton, provided residents with the opportunity to walk/socialize in different places without dependency on cars and/or dependency on others for transportation. The interactions with the built environment of old, more traditional neighbourhoods where facilities are close by is similar to the findings in a study conducted by Weyman et al. (2013).

“[How participant felt about living in the Region of Peel] good, towards the north there is less traffic [near the Brampton/Caledon border], close to the farms. Here everything is close-by, banks, stores, grocery all close.” – Participant #30 (M)

Research participant #27(F) spoke of her difficulties living in an area of Peel which is largely characterized by housing developments, resulting in few or no places with other services. Similar to a study conducted by Weyman et al. (2013), the Region of Peel is a highly car-dependent area which is largely composed of subdivisions. As this woman does not drive, she relies on her family (mostly her children) to provide transportation for her and at times this frustrates her. This finding is similar to the experiences of utilizing public transportation in a study conducted by Aggrawal & Gupta (2013), where participants from the Albion/Kipling area (Toronto) noted that public transportation was better compared to transportation particularly in Brampton.

“It is good [living in Peel], but facilities are not close at all. In Toronto [I can] go walk, here nothing in walking distance. In the Bramalea/Sandalwood area long stretch of houses, no bank, no stores, nothing.” - Participant #27(F)

In particular, the following research participant #25(F) spoke of her frustration with the lack of facilities in Brampton and the stresses associated with car ownership in the region. While Weber (1996) found that well-established Sikh communities in Brampton have a number of stores, religious and social services and restaurants available to the community, they may not always be accessible within the community, especially for older populations who may or may not have access to a vehicle or afford a vehicle, and largely rely on walking or taking public transportation (if they are familiar with the transit system) as a mode of transportation.

“So my area in Brampton, no stores, transit system too long, increase but people don’t have access to every place need to go, can’t go. And car insurance too high, cause stress, too much money.” – Participant # 25(F)

4.3.2 Access to services

Since 28 participants lived with their children in this study, regardless of whether they drove a vehicle or not; transportation was provided to and from medical appointments by family members. If study participants did not know English they were taken to medical appointments either by their children and/or grandchildren for translation between the health care provider and study participant and/or to provide support to participants at their appointments. The two participants who did not live with any other family members knew English and Punjabi fluently and were able to drive a vehicle to medical appointments.

The following interviewee illustrates the point of the availability of transportation through one or both of their children and also illustrates the importance of family ties and close networks with family for this increasingly older population. Similar to the transportation arrangements of participant #23(F), family members also provided transportation and translation services in studies conducted by Grewal et al. (2005) and Mather et al. (2007).

“No no, car. I go with my son or daughter-in-law when I need to go somewhere. Or my other son takes me.” – Participant #23(F)

Many participants who did not speak English also acknowledged that their families sought medical professionals, especially family physicians, who spoke Punjabi to avoid language barriers and also to increase the comfort level of participants to speak directly to their doctor about their health in a way that the doctor understood both medically and culturally their patient. However, participants who had appointments with specialist, often outside of the Region of Peel (e.g., the Discovery District in downtown Toronto) required the help of family members to translate information.

4.3.3 Social Inclusion

Many research participants engaged to some degree with their built environment, largely depending on the general well-being of the person, the time they had available to engage in community activities (e.g., retired versus working), and the climate, in particular weather and temperature. In this research study, social inclusion refers to how the research participant utilized the built environment and/or how they spent their day engaged in activities on a voluntary basis. General health status (e.g., severe arthritis) also limited how

much participants interacted with their built environment, not wanting to risk tripping or falling outside during a walk. Many people walked at home instead or would call family/friends and/or read the newspaper for enjoyment instead of going outside. These people only went outside when they had to, or for a formal occasion or appointments. Some people interacted with the built environment during the summer months, and then went to India for the winter months (usually leaving in November/December and coming back to Canada in March/April).

Study participant #29(M), joined a Seniors' Club in Peel; however due to a decrease in his own general well-being, he ceased to attend and spends most of his time indoors and/or attending events or family functions when his children provide transportation and support. This participant also ceased to attend the Seniors' Club because of his commitment to provide company and to take care of his wife. The Seniors' Club provides a social environment and depending on the club some activities are arranged to provide outings for older participants. In a study conducted by Diwan & Jonnalagadda (2002), social integration of Asian Indian immigrants in the United States had positive effects on their health. This form of social integration included interactions with family, friends and other groups such as social, religious and cultural networks (Diwan & Jonnalagadda, 2002).

“I used to go there, [Seniors' Club], very close to the, I don't know the name of the street there. But now, lately with my knee problem and [taking care of] my wife, so now I don't go as often. But before I used to go, Seniors Club.” – Participant # 29(M)

Similarly, research participant #20(F) spoke of attending a temple for religious purposes as well as meeting others there as well. Temples in the Region of Peel have many purposes for attendees, including religious observances as well as an environment to meet others, and take part in community service (*Seva*). While beyond the scope of this research project, a study conducted by Labun & Emblen (2007), investigated the strong relationships among illness, health and spirituality in the Punjabi Sikh population in Canada.

“Yes, I meet my friends (laughs). There is a temple here close by, Nanaksar, there are many friends I meet there.” – Participant #20(F)

Several research participants in my study were grandparents, and most spent much of their free time with their grandchildren and especially in the summer months, interacting with different facilities in the built environment such as parks; this was the experience of Participant #5(F) when interacting with the surrounding environment in Peel. The role grandparents played in the care of their grandchildren is similar to studies conducted by Aggarwal & Gupta (2013), where grandparents took an active role in raising their grandchildren and providing assistance to their children upon immigrating to Canada, in particular the Greater Toronto Area. The role of grandparents as care providers for their grandchildren and assisting their children is also evident in a study conducted by Smythe & Toohey (2009) in Vancouver, British Columbia.

“Time? With the kids [grandchildren], first drop them off, then pick them up, now we’re going to the park. First drop them off, walk around, then pick them up, this is what I do.” – Participant #5(F)

4.3.4 Community education campaigns/camps

After discussing the three areas of interest in the research study, interviewees were asked what they would like to see in the community to decrease the prevalence of cardiovascular disease in the Punjabi Sikh community. Many participants spoke of the need to increase awareness on a community level but also provide information in a way such that individuals would want to change and realize the need to change and/or modify different CVD risk factors at a preventative stage rather than as a reaction to CVD diagnosis.

Research participant #10(M) spoke of what needs to happen in the community to decrease CVD prevalence through increased efforts with more awareness campaigns, specifically with increasing awareness campaigns in Sikh temples, and to continue to educate people in the community. The research participant acknowledges that steps have already been taken towards providing the public with information about different diseases, (e.g., diabetes, a risk factor for CVD), which impacts the South Asian community as a whole. However, the participant feels that more needs to be done and that people should become more informed about diseases such as CVD earlier rather than later (e.g., before a CVD diagnosis compared to dealing with the effects of CVD on their health).

“...our community to have some camps, awareness to people, what they should eat, what they should do exercise, do these are my recommendations, to avoid heart disease because lack of education, lack of communication, those things. We do the camp for eating problems, do the diabetes camp, coming and check awareness we do, that stuff but still we need more, lots people not aware about it.” –Participant #10(M)

According to Jones et al. (2013), community interventions such as camps in the South Asian communities are feasible and provide culturally-tailored information to participants. For example, a community intervention to determine cardiovascular disease risk was developed at South Asian religious organizations/centres in the neighbourhoods of Queens and Brooklyn, New York (Gany et al., 2012). In Peel, the centers might develop similar interventions with a focus on prevention through adapting modifiable risk factors for CVD in a positive and familiar environment.

The need for more awareness of heart disease and its risk factors is similar to findings of a Canadian study conducted by King et al. (2006), where no widespread mechanisms was found in the community in particular for modifying diet and little access was available to culturally appropriate and language appropriate information on a heart healthy diet and ways of reinforcement of this diet. Chapman et al. (2011) also found that there is a need for health promotion and nutrition education specifically focused on diet services for these Punjabi Sikhs. However, while population-level information is important and necessary, information focused on the need for individuals to change modifiable risks for CVD is also important.

Participant #11(M) spoke about the need to change individual lifestyles and especially diets to healthy ones which would decrease the prevalence of various diseases, not just cardiovascular disease but also other chronic illnesses which are also risk factors for CVD. The participant spoke further about the need to understand how diet not only relates to CVD prevalence but also other diseases and how it is easier to make choices about lifestyle changes at the preventative stage compared to after being diagnosed with a

disease. The focus on the individual to change their lifestyle in order to decrease their CVD risk is similar to advice participants who experienced CVD spoke of in a study conducted by Galdas & King (2011).

“It’s because, we need to change our lifestyle, our diet (sweets, samosas), we need to minimize these as much as possible, this is the reason for diabetes in our community, this is the reason for cholesterol and this is the reason for many illnesses. Another problem in our community is that exercise rates are very low, and we need to exercise” – Participant #11(M)

The need for early preventative measures and lifestyle changes were also echoed by research participant#16(M), who indicated that after being diagnosed with coronary heart disease and having bypass surgery, his life was not the same. He is now comparatively weaker compared to before his surgery (not including aging itself as this person’s surgery occurred in 2013). He also spoke of the need to prevent disease, and while there are risk factors which cannot be changed, to focus on those that can be changed. In a study conducted in Alberta, Canada by Bainey et al. (2011), South Asians had worse health status a year after their diagnosis of myocardial infarction when compared to their European origin Canadian counterparts.

Lastly, there is a need to prevent CVD before diagnosis as much as possible instead of dealing with after effects post-diagnosis. While it is possible to live a full and independent life post-diagnosis, many research participants felt, based on their own experiences with CVD, changes in the body and changes in their lifestyles, other than aging, that is they were significantly weaker. In particular, research participant #16(M)

expressed his thoughts on the decreased likelihood of living a longer life post-bypass surgery and the need to prevent having this type of surgery. Even though this interviewee's bypass surgery was a success and his arteries were no longer blocked, he still felt weaker than before the surgery. He also felt it was better to prevent CVD than to deal with the repercussions and the changes to the body as a heart patient, the need to change, and to focus on prevention, and similar to what is written in literature review, to focus on modifiable risks while acknowledging the presence of non-modifiable risks. The need for prevention is similar to the advice of a British Columbia-based South Asian Men's Group (SAMG) group leader when describing what South Asian men should do to decrease the prevalence of CVD and/or diabetes (Olfiffe et al., 2009).

“Even with an operation done, age decreases, doesn't increase. Living until 90 not after operation. Better to prevent than to deal with after effects.”
– Participant #16(M)

4.4 Summary

Similar patterns emerged in the three areas of research of this study: cardiovascular disease risk factors, health effects related to the immigration process and health effects related to the built environment. When asked about what participants felt led to their diagnosis, many participants spoke of diets, exercise regimes, stress largely associated with family, financial and immigration adjustments. The immigration process presented several difficulties which were largely generation-specific (i.e., when participants immigrated to Canada). While decline in health status is seen as part of the aging process, other factors in the built environment of the Region of Peel are also seen as playing a role in the decline of health status. Many people spoke of driving or being driven to appointments or where they

want to go, and some associated their driving patterns with organizations and places, largely within the proximity of their neighbourhoods. Differences were associated with the built environment and neighbourhoods such as Malton having a large variety of spaces where many research participants socialized and in contrast to other parts of Peel where there were fewer facilities and centres.

Chapter 5: Conclusion

5.1 Summary of findings and contributions to the literature

This chapter concludes with the findings of the research study, acknowledges the limitations of the study and suggests areas of further research. Through an analysis of cardiovascular disease risk factors, the impacts on health related to the immigration process and the influences on health due to the surrounding built environment, key patterns were developed from the points of view of Punjabi Sikhs in the Region of Peel. The common themes for CVD risk factors included: firstly, not being completely aware about heart disease and signs and/or symptoms of the disease; secondly, how to develop a culturally sensitive diet towards decreasing risk for CVD before diagnosis; thirdly, lack of exercise and/or little exercise before diagnosis; and fourthly, the impact of stress on CVD diagnosis.

The impact of immigration on health varied depending on several factors, including the following: why a person immigrated; when and from where the research participant immigrated; gender; immigration directly from India to Canada or other parts of the world than Canada; exposure to different cultures; and stress related to migration to another country. Lastly, the health effects due to the Region of Peel's built environment depended on where participants lived in Peel, involvement in the community, access to a vehicle or alternative transportation options and general healthy well-being. While study participants who did not know English brought family members along with them to medical appointments and/or had Punjabi speaking medical personnel, knowledge of English was important when navigating some services in some parts of Peel.

Through interviewing research participants who had been diagnosed with heart disease, comparisons were made in changes implemented and/or specific events which led to diagnosis. The comparisons provided a platform to initiate changes in the community to decrease the prevalence of the disease through understanding the experiences from Punjabi Sikhs living in the Region of Peel. Their experiences were also acknowledged when asked what they would like to see in the community to decrease CVD prevalence in the community. While answers to this question during the interviews varied, common themes analyzed during the interviews indicated that participants would like to see more education on the topic of CVD in the community, particularly CVD signs and symptoms, information on culturally sensitive diet and exercises, and more walk-able areas in their neighborhoods. Participants further noted that they would like to see more camps and awareness campaigns which provide culturally-tailored information on cardiovascular disease in the community. Many participants expressed the need for people to take preventative measure to decrease intake of heavily fried and sugary foods, and reduce stress levels to decrease the impact of these factors on their health.

Through understanding the experiences from the participants' points of view with being previously diagnosed with cardiovascular disease, comparisons made between health behaviours before and after diagnosis denote the important changes implemented to diet and exercise regime, as well as coping strategies to deal with stress. The changes were implemented largely due to knowledge gained about risk factors for cardiovascular disease and awareness of dealing with the disease directly. Participants in my study largely agreed that immigrating to Canada provided a higher quality of life and brought more

opportunities and benefits to their children and/or grandchildren. However, participants also acknowledged several hardships and challenges upon initial immigration to Canada, these challenges were largely generation-specific, and also depended on when participants immigrated to Canada, where they immigrated to in the country, and how they initially began to settle in the country and develop their livelihoods. Many residents who immigrated to Canada directly from India found stark contrast in the way and pace of life in Canada. Within the Region of Peel there are differences in levels of built environment interactions on a neighbourhood scale, with a high level of interactions with the environment in neighbourhoods such as Malton and decreases in built environment interactions in neighborhoods in northern areas in Brampton.

Finally, this research contributes to a more nuanced view of the healthy immigrant effect in that CVD in the older Punjabi Sikh community, and is partly explained by the maintenance of diet similar to the one eaten in India. Factors related to the immigration process (e.g., underemployment, stress) and interactions within the built of environment of Peel (e.g., social inclusion) also contribute to declining health status. In other words, research needs to go beyond the generalities of the statistical analyses of the healthy immigrant effect and examine specific age and ethnic groups and the cultural values they bring with them to Canada and maintain as well as the behaviours that change over time.

5.2 Limitations

While this research project provided in-depth interviews with 30 participants of the Punjab Sikh community in the Region of Peel, with key insights into the prevalence of

cardiovascular disease in this population; there were several limitations to the study. The limitations include the following: the research site; ethnicity and age criteria: eligibility criteria and sample size; the recruitment techniques for the project; and the ratio between males and females recruited.

The Region of Peel includes the second largest concentration of Punjabi Sikhs in Canada. There are, however, Punjabi Sikhs who live in other parts of the GTA and Punjabi Sikhs who live in Peel travel to other parts of the GTA. Taking into account Punjabi Sikhs living in other parts of the GTA and the activities of Punjabi Sikhs in other parts of the built environment of the GTA might provide other insights into built environment interactions, including different services available to participants, especially in a car-dependant society. This is of particular importance for service ability and walkability of the built environment in regions which border other regions/cities in the GTA (e.g., the neighborhood of Malton borders the former city of Etobicoke). There is also the additional limitation to acknowledge that the findings in this study cannot be generalized beyond older Punjabi Sikhs from Peel.

Overall, the project was based on the experiences of CVD pre- and post-diagnosis and what factors under the themes of CVD risk factors, the immigration experience and the effect on health related to the built environment research participants felt led to their diagnosis. While the project focused on research participants who self-identified as Punjabi Sikh, this population does not necessarily include all Sikhs and/or all Punjabis. For example, those who identify as being from the state of Punjab in India but were not Sikh

were excluded from the study. Likewise, those who identify as Sikhs but do not indentify as being from the state of Punjab were excluded from this study. While the age criteria for the project focused on the older population, the criteria of 55 years of age or older excluded those in the population who were diagnosed with cardiovascular disease at a younger age. While this project included interviews with 30 participants and information was retrieved until saturation was met as per grounded theory, this sample size is still a small qualitative sample of the 115 000 Punjabi Sikhs in the Region of Peel (Statistics Canada, 2011).

While the recruitment techniques for this project included a combination of snowball sampling and recruitment of the public at events, these techniques may not have captured potentially all possible life experiences as related to this project and may have provided a bias during study recruitment. A further limitation of the project was the ratio between males and females recruited. While attempts were made to recruit more females for this project (e.g., contacting female South Asian organizations, approaching females at different community events about the study), the recruitment of study participants was still five females to 25 males in the study. While keeping these limitations in mind, there are several recommendations for further research made in the next section.

5.3 Recommendations for further research

More information is necessary to further analyze heart disease and prevalence of this disease within the target population of Punjabi Sikhs. Therefore, this section includes recommendations of three different areas for further research. These recommendations include: similar research conducted in different populations whose origins were in South

Asia rather than clustering all these populations as the South Asian population. Analysis of established and emerging Punjabi Sikh settlements; and conducting studies on the development of age-friendly communities on a neighbourhood scale in the Region of Peel is needed.

While there is substantial information on cardiovascular disease risk within the South Asian population in the literature, further research needs to focus on specific populations within this larger clustering of populations. Information on South Asians as a single entity provides information on a concentration of people; however, this information does not account for the differences within the populations in this entity (Forouhi & Sattar, 2006). With different nationalities, religions and languages, treating several populations as a single “South Asian population” entity does not account for this heterogeneity (Bedi et al., 2008; Horne et al., 2013). Focusing on specific populations from South Asia, such as the Punjabi Sikh population, provides more insight on how specific influences and factors relate to a higher prevalence of cardiovascular disease.

While there is a substantial amount of literature on risk factors for cardiovascular disease, effects related to immigration and influences of the built environment, further studies need to encompass all of these categories together to understand CVD prevalence. Thus, there is gap in the literature to specifically understand how all three themes combine to affect aging Punjabi Sikh populations through a comprehensive approach. Especially since factors and influences related to each theme are interchangeable it is necessary to use an encompassing approach rather than look at each theme separately. There also needs to

be an increase in research relating the built environment to health levels of immigrant populations.

With increasing concentrations of Punjabi Sikhs within several communities in western countries (e.g., Canada, United States of America and United Kingdom), there is a need to understand how prevalence of even a large concentration of Punjabi Sikhs within an area still results in a higher prevalence of CVD. The rationale behind this research area is that as Punjabi Sikhs, among the South Asian population, increasingly immigrate to countries such as Canada, there will be more concentrations of this population (Gupta et al., 2006). Therefore, studies related to CVD risk within the Punjabi Sikh population should be conducted in established Punjabi Sikh settlements such as the city of Surrey, British Columbia (largest concentration of Punjabi Sikhs in Canada) and also emerging settlements in other parts of Canada, for example the cities of Saskatoon and Winnipeg (Statistics Canada, 2011).

Further studies should explore how communities are aging in the Region of Peel, and how the built environment can be modified to adapt to the changes in Peel Region's demographics. Regionally, planning for an aging population has begun with the development of the *Official Plan Review Peel 2041* in 2014. However, on a neighbourhood scale, comparisons can be made between environments and social inclusion in different neighbourhoods in the region. With a population which considers walking a form of exercising and as a way to develop and maintain social bonds, this scale takes into consideration this form of exercise as well as many people who may not necessarily drive

or have access to a vehicle. Looking at not only what is available in the community in terms of the built environment but also how effective the built environment is in addressing aging in place for this community is a critical next step.

5.4 Conclusion

This research project provides an analysis of three different areas of research and the links among these themes and CVD prevalence within the Punjabi Sikh immigrant population. Through the use of interviews with members of the Punjabi Sikh community in the Regional Municipality of Peel, this project provides information on these key factors and influences on CVD prevalence using a population health approach. Using this approach as the framework for this project provided the opportunity to explore cardiovascular disease in this population through biological, social and geographical determinants. The use of grounded theory as the method of analysis facilitated a “lived-in” experience of CVD diagnosis between myself the interviewer, and the interviewees. Through my fluency of Punjabi in addition to English, I was able to translate and transcribe all interviews and verify the accuracy of the interviews. Coding the information and developing key similar concepts among the interviews provided a chance to understand the information at the individual level as well as the implications on a population health scale.

The results of this research study indicate that participants’ experiences with CVD diagnosis are the results of several factors, spanning all three areas of focus in the study. In particular, many research participants had little or no knowledge of CVD before their diagnosis, as many had diets which consisted of large quantities of carbohydrates, sugar,

“ghee”, etc. Many research participants felt stressed and at times overwhelmed by changes, including culture when they first immigrated to Canada. Underemployment stress, irregular hours of jobs, as well as feelings of isolation and loneliness were prevalent during the initial years after immigration, particularly for participants who immigrated to Canada on the point system. As most of these participants were the first in their families to immigrate to Canada, this process brought on associated pressures such as sponsoring other family members and developing a chain migration of familial ties to Canada. Participants who were sponsored, usually by their sons or daughters, felt a difference in culture and especially the built environment in Canada, when compared mainly to India.

Of particular interest regarding the built environment is the difference within neighborhoods and cities in the Region of Peel. Neighborhoods such as Malton (located within the city of Mississauga), were considered to provide more age-friendly built environments to older populations when compared to other neighbourhoods within northern areas in the city of Brampton and some other areas in Mississauga. Since the response rate of participants from the town of Caledon was much less ($n = 2$) compared to Brampton and Mississauga, this town was not considered as much in determining the age-friendliness of the built environment.

These findings indicate that understanding the prevalence of cardiovascular disease in the community needs to be approached through understanding not only biological indicators but also different experiences individuals have faced (e.g., immigration, migration processes), and the built environment surrounding them. Understanding the

experiences of living with CVD and comparisons pre- and post-CVD diagnosis, alongside advice on a community-level to reduce CVD in the Punjabi Sikh population in Peel is crucial for the early prevention of this disease largely through education about risk factors, signs and symptoms for CVD, and awareness of how different factors increase the risk of CVD diagnosis. As this population continues to grow through an increase in immigration to Canada and continues to age, it is important to understand the reasons for a higher CVD prevalence in the Punjabi Sikh population. On a larger scale, my study contributes to understanding the link between ethnicity and health, especially in the globalized world of the 21st century.

Bibliography

- Aggarwal, P., & Das Gupta, T. (2013). Grandmothering at work: conversations with Sikh Punjabi grandmothers in Toronto. *South Asian Diaspora*, 5(1), 77-90.
- Anand, S. S., Yusuf, S., Vuksan, V., Devanesen, S., Teo, K. K., Montague, P. A., ... & McQueen, M. (2000). Differences in risk factors, atherosclerosis, and cardiovascular disease between ethnic groups in Canada: the Study of Health Assessment and Risk in Ethnic groups (SHARE). *The lancet*, 356(9226), 279-284.
- Bainey, K. R., & Jugdutt, B. I. (2009). Increased burden of coronary artery disease in South-Asians living in North America. Need for an aggressive management algorithm. *Atherosclerosis*, 204(1), 1-10.
- Bainey, K. R., Norris, C. M., Gupta, M., Southern, D., Galbraith, D., Knudtson, M. L., & Graham, M. M. (2011). Altered health status and quality of life in South Asians with coronary artery disease. *American heart journal*, 162(3), 501-506.
- Bedi, H., LeBlanc, P., McGregor, L., Mather, C., & King, K. M. (2008). Older immigrant Sikh men's perspective of the challenges of managing coronary heart disease risk. *Journal of Men's Health*, 5(3), 218-226.
- Bhopal, R. (2000). What is the risk of coronary heart disease in South Asians? A review of UK research. *Journal of Public Health*, 22(3), 375-385.
- Bhupathiraju, S. N., & Tucker, K. L. (2011). Coronary heart disease prevention: nutrients, foods, and dietary patterns. *Clinica Chimica Acta*, 412(17), 1493-1514.
- Bourne, L. S., & Rose, D. (2001). The changing face of Canada: The uneven geographies of population and social change. *Canadian Geographer*, 45(1), 105-119.
- Briggs, D. J., de Hoogh, C., Gulliver, J., Wills, J., Elliott, P., Kingham, S., & Smallbone, K. (2000). A regression-based method for mapping traffic-related air pollution: application and testing in four contrasting urban environments. *Science of the Total Environment*, 253(1), 151-167.
- Chadney, J. G. (1980). Sikh family patterns and ethnic adaptation in Vancouver. *Amerasia journal*, 7(1), 31-50.
- Chapman, G. E., Ristovski-Slijepcevic, S., & Beagan, B. L. (2011). Meanings of food, eating and health in Punjabi families living in Vancouver, Canada. *Health Education Journal*, 70(1), 102-112.
- Choudhry, U. K. (1998). Health promotion among immigrant women from India living in Canada. *Journal of Nursing Scholarship*, 30(3), 269-274.

- Christensen, K., Doblhammer, G., Rau, R., & Vaupel, J. W. (2009). Ageing populations: the challenges ahead. *The Lancet*, 374(9696), 1196-1208.
- Clark, A. M., Curzio, J., Lindsay, G. M., Fleming, V. E. M., & McIntosh, J. (1998). Exploring patients' perspectives of coronary heart disease: discerning methods and a review of the qualitative literature. *Coronary Health Care*, 2(3), 118-128.
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative sociology*, 13(1), 3-21.
- Daniel, M., Wilbur, J., Fogg, L. F., & Miller, A. M. (2013). Correlates of Lifestyle: Physical Activity Among South Asian Indian Immigrants. *Journal of community health nursing*, 30(4), 185-200.
- Darr, A., Astin, F., & Atkin, K. (2008). Causal attributions, lifestyle change, and coronary heart disease: illness beliefs of patients of South Asian and European origin living in the United Kingdom. *Heart & Lung: The Journal of Acute and Critical Care*, 37(2), 91-104.
- Dassanayake, J., Gurrin, L., Payne, W. R., Sundararajan, V., & Dharmage, S. C. (2010). Cardiovascular disease risk in immigrants: What is the evidence and where are the gaps?. *Asia-Pacific Journal of Public Health*, 1010539509360572.
- Dean, J. A., & Wilson, K. (2009). 'Education? It is irrelevant to my job now. It makes me very depressed...': exploring the health impacts of under/unemployment among highly skilled recent immigrants in Canada. *Ethnicity & health*, 14(2), 185-204.
- Deedwania, P. (2013). Diabetes, Cardiovascular Disease, and Ethnicity. *Journal of the American College of Cardiology*, 61(17), 1787-1789.
- Deedwania, P. C., Gupta, M., Stein, M., Ycas, J., & Gold, A. (2007). Comparison of *Rosuvastatin* Versus *Atorvastatin* in South-Asian Patients at Risk of Coronary Heart Disease (from the IRIS Trial). *The American journal of cardiology*, 99(11), 1538-1543.
- Diwan, S., & Jonnalagadda, S. S. (2002). Social integration and health among Asian Indian immigrants in the United States. *Journal of Gerontological Social Work*, 36(1-2), 45-62.
- Eapen, D., Kalra, G. L., Merchant, N., Arora, A., & Khan, B. V. (2009). Metabolic syndrome and cardiovascular disease in South Asians. *Vascular health and risk management*, 5, 731.
- Eckel, R. H., Grundy, S. M., & Zimmet, P. Z. (2005). The metabolic syndrome. *The Lancet*, 365(9468), 1415-1428.

- Esses, V. M., & Gardner, R. C. (1996). Multiculturalism in Canada: Context and current status. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 28(3), 145.
- Farooqi, A., Nagra, D., Edgar, T., & Khunti, K. (2000). Attitudes to lifestyle risk factors for coronary heart disease amongst South Asians in Leicester: a focus group study. *Family practice*, 17(4), 293-297.
- Forouhi, N. G., & Sattar, N. (2006). CVD risk factors and ethnicity—a homogeneous relationship?. *Atherosclerosis Supplements*, 7(1), 11-19.
- Frank, L. D., & Engelke, P. (2005). Multiple impacts of the built environment on public health: walkable places and the exposure to air pollution. *International Regional Science Review*, 28(2), 193-216.
- Galdas, P. M., & Kang, H. B. K. (2010). Punjabi Sikh patients' cardiac rehabilitation experiences following myocardial infarction: a qualitative analysis. *Journal of Clinical Nursing*, 19(21-22), 3134-3142.
- Galdas, P. M., Oliffe, J. L., Kang, H. B. K., & Kelly, M. T. (2012). Punjabi Sikh patients' perceived barriers to engaging in physical exercise following myocardial infarction. *Public Health Nursing*, 29(6), 534-541.
- Galdas, P. M., Oliffe, J. L., Wong, S. T., Ratner, P. A., Johnson, J. L., & Kelly, M. T. (2011). Canadian Punjabi Sikh men's experiences of lifestyle changes following myocardial infarction: cultural connections. *Ethnicity & health*, 17(3), 253-266.
- Gama, R., Elfatih, A. B., & Anderson, N. R. (2002). Ethnic differences in total and HDL cholesterol concentrations: Caucasians compared with predominantly Punjabi Sikh Indo-Asians. *Annals of Clinical Biochemistry: An international journal of biochemistry in medicine*, 39(6), 609-611.
- Gany, F., Levy, A., Basu, P., Misra, S., Silberstein, J., Bari, S., ... & Leng, J. C. (2012). Culturally tailored health camps and cardiovascular risk among South Asian immigrants. *Journal of health care for the poor and underserved*, 23(2), 615-625.
- Gee, E. M. T., Kobayashi, K. M., & Prus, S. G. (2004). Examining the healthy immigrant effect in mid-to later life: findings from the Canadian Community Health Survey. *Canadian Journal on Aging/La Revue canadienne du vieillissement*, 23(5), S55-S63.
- Gordon-Larsen, P., Nelson, M. C., Page, P., & Popkin, B. M. (2006). Inequality in the built environment underlies key health disparities in physical activity and obesity. *Pediatrics*, 117(2), 417-424.

- Grewal, S., Botorff, J. L., & Hilton, B. A. (2005). The influence of family on immigrant South Asian women's health. *Journal of Family Nursing*, 11(3), 242-263.
- Gupta, M., Brister, S., & Verma, S. (2006). Is South Asian ethnicity an independent cardiovascular risk factor?. *Canadian Journal of Cardiology*, 22(3), 193-197.
- Gushulak, B. (2007). Healthier on arrival? Further insight into the "healthy immigrant effect". *Canadian Medical Association Journal*, 176(10), 1439-1440.
- Horne, M., Skelton, D. A., Speed, S., & Todd, C. (2013). Perceived barriers to initiating and maintaining physical activity among South Asian and White British adults in their 60s living in the United Kingdom: a qualitative study. *Ethnicity & health*, 18(6), 626-645.
- Horne, M., & Tierney, S. (2012). What are the barriers and facilitators to exercise and physical activity uptake and adherence among South Asian older adults: A systematic review of qualitative studies. *Preventive medicine*, 55(4), 276-284.
- Immigration Peel (2013) Neighbourhoods on Peel Region photo. Retrieved from <http://www.immigrationpeel.ca/housing/neighbourhoods.htm> Date Accessed: November 13th 2015.
- Jackson, R. J. (2003). The impact of the built environment on health: an emerging field. *American Journal of Public Health*, 93(9), 1382-1384.
- Jones, C. A., Mawani, S., King, K. M., Allu, S. O., Smith, M., Mohan, S., & Campbell, N. R. (2011). Tackling health literacy: adaptation of public hypertension educational materials for an Indo-Asian population in Canada. *BMC public health*, 11(1), 24.
- Jones, C. A., Nanji, A., Mawani, S., Davachi, S., Ross, L., Vollman, A., ... & Campbell, N. (2013). Feasibility of community-based screening for cardiovascular disease risk in an ethnic community: the South Asian Cardiovascular Health Assessment and Management Program (SA-CHAMP). *BMC public health*, 13(1), 160.
- Kinsella, K. G., & Phillips, D. R. (2005). *Global aging: The challenge of success* (Vol. 60, No. 1). Washington, DC, USA: Population Reference Bureau., pp.5-42.
- King, K. M., LeBlanc, P., Sanguins, J., & Mather, C. (2006). Gender-based challenges faced by older Sikh women as immigrants: recognizing and acting on the risk of coronary artery disease. *CJNR (Canadian Journal of Nursing Research)*, 38(1), 16-40.
- Kobayashi, K. M., & Prus, S. G. (2012). Examining the gender, ethnicity, and age dimensions of the healthy immigrant effect: Factors in the development of equitable health policy. *Int J Equity Health*, 11(8).
- Labun, E., & Emblen, J. D. (2007). Spirituality and health in Punjabi Sikh. *Journal of Holistic Nursing*, 25(3), 141-148.

- Lear, S. A., Humphries, K. H., Hage-Moussa, S., Chockalingam, A., & Mancini, G. B. (2009). Immigration presents a potential increased risk for atherosclerosis. *Atherosclerosis*, 205(2), 584-589.
- Leung, G., & Stanner, S. (2011). Diets of minority ethnic groups in the UK: influence on chronic disease risk and implications for prevention. *Nutrition Bulletin*, 36(2), 161-198.
- Leyden, K. M. (2003). Social capital and the built environment: the importance of walkable neighborhoods. *American journal of public health*, 93(9), 1546-1551.
- Li, F., Harmer, P. A., Cardinal, B. J., Bosworth, M., Acock, A., Johnson-Shelton, D., & Moore, J. M. (2008). Built environment, adiposity, and physical activity in adults aged 50–75. *American journal of preventive medicine*, 35(1), 38-46.
- Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. (2006). Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *The Lancet*, 367(9524), 1747-1757.
- Lutz, W., Sanderson, W., & Scherbov, S. (2008). The coming acceleration of global population ageing. *Nature*, 451(7179), 716-719.
- Mand, K. (2006). Gender, ethnicity and social relations in the narratives of elderly Sikh men and women. *Ethnic and racial studies*, 29(6), 1057-1071.
- Mathers, C. D., Fat, D. M., & Boerma, J. T. (2008). *The global burden of disease: 2004 update*. World Health Organization.
- Mather, C. M., King, K. M., & LeBlanc, P. (2007). Meanings of the heart among a group of older Sikh immigrant women with cardiovascular disease. *International Journal of Multiple Research Approaches*, 1(1), 39-51.
- McDaniel, S. A. (2003). Toward disentangling policy implications of economic and demographic changes in Canada's aging population. *Canadian Public Policy/Analyse de politiques*, 491-510.
- McDonald, J. T., & Kennedy, S. (2004). Insights into the 'healthy immigrant effect': health status and health service use of immigrants to Canada. *Social science & medicine*, 59(8), 1613-1627.
- McKeigue, P. M., Shah, B., & Marmot, M. G. (1991). Relation of central obesity and insulin resistance with high diabetes prevalence and cardiovascular risk in South Asians. *The Lancet*, 337(8738), 382-386.
- Misra, A., Khurana, L., Isharwal, S., & Bhardwaj, S. (2009). South Asian diets and insulin resistance. *British journal of nutrition*, 101(04), 465-473.

- Moore, E. G., & Rosenberg, M. W. (2001). Canada's elderly population: the challenges of diversity. *Canadian Geographer*, 45(1), 145.
- Moore, M., Gould, P., & Keary, B. S. (2003). Global urbanization and impact on health. *International journal of hygiene and environmental health*, 206(4), 269-278.
- Nair, M., & Prabhakaran, D. (2012). Why Do South Asians Have High Risk for CAD?. *Global Heart*, 7(4), 307-314.
- National Heart, Lung and Blood Institute. (2012). *What is coronary heart disease?* Retrieved from <http://www.nhlbi.nih.gov/health/health-topics/topics/cad/> Date accessed: November 12th 2014.
- Nayar, K. E. (2004). *The Sikh diaspora in Vancouver: Three generations amid tradition, modernity, and multiculturalism*. University of Toronto Press.
- Nayar, K. E., & Sandhu, J. S. (2006). Intergenerational communication in immigrant Punjabi families: implications for helping professionals. *International Journal for the Advancement of Counselling*, 28(2), 139-152.
- Newbold, K. B. (2005). Self-rated health within the Canadian immigrant population: risk and the healthy immigrant effect. *Social science & medicine*, 60(6), 1359-1370.
- Newbold, K. B. (2006). Chronic conditions and the healthy immigrant effect: evidence from Canadian immigrants. *Journal of Ethnic and Migration Studies*, 32(5), 765-784.
- Newbold, K. B., & Danforth, J. (2003). Health status and Canada's immigrant population. *Social science & medicine*, 57(10), 1981-1995.
- Oliffe, J. L., Grewal, S., Bottorff, J. L., Dhesei, J., Bindy, H., Kang, K., et al. (2010). Masculinities, diet and senior Punjabi Sikh immigrant men: food for Western thought? *Sociology of Health & Illness*, 32(5), 761-776.
- Oliffe, J. L., Grewal, S., Bottorff, J. L., Hislop, T. G., Phillips, M. J., Dhesei, J., & Kang, H. B. K. (2009). Connecting masculinities and physical activity among senior South Asian Canadian immigrant men. *Critical Public Health*, 19(3-4), 383-397.
- Pais, P., Pogue, J., Gerstein, H., Zachariah, E., Savitha, D., Jayprakash, S., ... & Yusuf, S. (1996). Risk factors for acute myocardial infarction in Indians: a case-control study. *The Lancet*, 348(9024), 358-363.
- Papas, M. A., Alberg, A. J., Ewing, R., Helzlsouer, K. J., Gary, T. L., & Klassen, A. C. (2007). The built environment and obesity. *Epidemiologic reviews*, 29(1), 129-143.

- Public Health Agency of Canada. (2013). *What is the Population Health Approach?*
Retrieved from: <http://www.phac-aspc.gc.ca/ph-sp/approach-approche/appr-eng.php>
Date accessed: October 3rd 2014.
- Rajeshwari, R., Nicklas, T. A., Pownall, H. J., & Berenson, G. S. (2005). Cardiovascular diseases—a major health risk in Asian Indians. *Nutrition Research*, 25(6), 515-533.
- Rambihar, V. S., Rambihar, S. P., & Rambihar, V. S. (2010). Race, ethnicity, and heart disease: a challenge for cardiology for the 21st century. *American heart journal*, 159(1), 1-14.
- Rankin, J., & Bhopal, R. (2001). Understanding of heart disease and diabetes in a South Asian community: cross-sectional study testing the ‘snowball’ sample method. *Public health*, 115(4), 253-260.
- Ristovski-Slijepcevic, S., Chapman, G. E., & Beagan, B. L. (2008). Engaging with healthy eating discourse (s): Ways of knowing about food and health in three ethnocultural groups in Canada. *Appetite*, 50(1), 167-178.
- Saxena, R., Saleheen, D., Been, L. F., Garavito, M. L., Braun, T., Bjornes, A., ... & Sanghera, D. K. (2013). Genome-wide association study identifies a novel locus contributing to type 2 diabetes susceptibility in Sikhs of Punjabi origin from India. *Diabetes*, 62(5), 1746-1755.
- Smythe, S., & Toohey, K. (2009). Investigating sociohistorical contexts and practices through a community scan: A Canadian Punjabi–Sikh example. *Language and Education*, 23(1), 37-57.
- Srinivasan, S., O'Fallon, L. R., & Dearry, A. (2003). Creating healthy communities, healthy homes, healthy people: initiating a research agenda on the built environment and public health. *American journal of public health*, 93(9), 1446-1450.
- Starks, H., & Trinidad, S. B. (2007). Choose your method: A comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative health research*, 17(10), 1372-1380.
- Statistics Canada (2011) 2011 National Household Survey. *Census Profile: Regional Municipality of Peel*. Retrieved from <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CD&Code1=3521&Geo2=PR&Code2=35&Data=Count&SearchText=peel&SearchType=Begins&SearchPR=01&B1=All&Custom=&TABID=1> Date accessed: June 30th 2014.
- Statistics Canada (2013). *The Canadian Population in 2011: Age and Sex*
<http://www12.statcan.gc.ca/census-recensement/2011/as-sa/98-311-x/98-311-x2011001-eng.pdf> Date accessed: February 21st 2015.

- Tanuseputro, P., Manuel, D. G., Leung, M., Nguyen, K., & Johansen, H. (2003). Risk factors for cardiovascular disease in Canada. *Canadian Journal of Cardiology*, *19*(11), 1249-1260.
- The Canadian Medical Association. (2013) *“Policy on the Built Environment and Health* <https://www.cma.ca/Assets/assets-library/document/en/advocacy/PD14-05-e.pdf> Date accessed: March 12th 2015.
- Tillin, T., Dhutia, H., Chambers, J., Malik, I., Coady, E., Mayet, J., ... & Hughes, A. (2008). South Asian men have different patterns of coronary artery disease when compared with European men. *International journal of cardiology*, *129*(3), 406-413.
- Tole, L. (2008). Changes in the built vs. non-built environment in a rapidly urbanizing region: a case study of the Greater Toronto Area. *Computers, Environment and Urban Systems*, *32*(5), 355-364.
- Tremblay, M. S., Bryan, S. N., Pérez, C. E., Ardern, C. I., & Katzmarzyk, P. T. (2006). Physical activity and immigrant status: evidence from the Canadian Community Health Survey. *Canadian journal of public health*, *97*(4).
- Turin, T. C., Shahana, N., Wangchuk, L. Z., Specogna, A. V., Al Mamun, M., Khan, M. A., ... & Rumana, N. (2013). Burden of Cardio-and Cerebro-vascular Diseases and the Conventional Risk Factors in South Asian Population. *Global Heart*, *8*(2), 121-130.
- Walker, D., & Myrick, F. (2006). Grounded theory: An exploration of process and procedure. *Qualitative health research*, *16*(4), 547-559.
- Webber, S. C., Porter, M. M., & Menec, V. H. (2010). Mobility in older adults: a comprehensive framework. *The Gerontologist*, gmq013.
- Weber, T. R. (1996). The influence of acculturation on attitudes toward alcohol and alcohol use within the Punjabi community: An exploratory analysis. *Substance use & misuse*, *31*(11-12), 1715-1732.
- Weyman, J. T., Dunn, J. R., Gutmann, C., Sivanand, B., Bursey, G., & Mowat, D. L. (2013). Planning health-promoting development: creation and assessment of an evidence-based index in the Region of Peel, Canada. *Environment and Planning B: Planning and Design*, *40*(4), 707-722.
- Ye, J., Rust, G., Baltrus, P., & Daniels, E. (2009). Cardiovascular risk factors among Asian Americans: results from a National Health Survey. *Annals of Epidemiology*, *19*(10), 718-723.
- Yen, I. H., Michael, Y. L., & Perdue, L. (2009). Neighborhood environment in studies of health of older adults: a systematic review. *American journal of preventive medicine*, *37*(5), 455-463.

Zaman, M. J., & Bhopal, R. S. (2013). New answers to three questions on the epidemic of coronary mortality in south Asians: incidence or case fatality? Biology or environment? Will the next generation be affected?. *Heart*, 99(3), 154-158.

Appendix A: Queen's University GREB Research study approval letter



June 10, 2014

Miss Gurveer Bains
Master's Student
Department of Geography
Queen's University
Kingston, ON, K7L 3N6

GREB Ref #: GGEO-166-14; Romeo # 6012845

Title: "GGEO-166-14 Mixing Health and Geography: A Study of Risks Associated with Cardiovascular Disease for the Punjabi Sikh Population in the Regional Municipality of Peel"

Dear Miss Bains:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled "GGEO-166-14 Mixing Health and Geography: A Study of Risks Associated with Cardiovascular Disease for the Punjabi Sikh Population in the Regional Municipality of Peel" for ethical compliance with the Tri-Council Guidelines (TCPS) and Queen's ethics policies. In accordance with the Tri-Council Guidelines (article D.1.6) and Senate Terms of Reference (article G), your project has been cleared for one year. At the end of each year, the GREB will ask if your project has been completed and if not, what changes have occurred or will occur in the next year.

You are reminded of your obligation to advise the GREB, with a copy to your unit REB, of any adverse event(s) that occur during this one year period (access this form at https://eservices.queensu.ca/romeo_researcher/ and click Events - GREB Adverse Event Report). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To make an amendment, access the application at https://eservices.queensu.ca/romeo_researcher/ and click Events - GREB Amendment to Approved Study Form. These changes will automatically be sent to the Ethics Coordinator, Gail Irving, at the Office of Research Services or irvingg@queensu.ca for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

A handwritten signature in black ink that reads "Joan Stevenson".

Joan Stevenson, Ph.D.
Chair
General Research Ethics Board

c: Dr. Mark Rosenberg, Faculty Supervisor
Dr. Mark Rosenberg, Chair, Unit REB
Ms. Joan Knox, Dept. Admin.

Appendix B: Research Poster – English version



Mixing health and geography: A study of risks associated with cardiovascular disease for the Punjabi Sikh population in the Regional Municipality of Peel

Are you of Punjabi Sikh ethnicity, over the age of 55 and have been diagnosed with heart disease?

Would you like to speak about what factors you feel led to your heart disease diagnosis?



If so, please contact Gurveer Bains at 1-613-533-6000 ext. 77215 or 13gb10@queensu.ca to arrange an interview.

Your participation may lead to a further study to decrease and/or mitigate the effects of heart disease prevalence within the Punjabi Sikh community.

1-613-533-6000 ext. 77215
13gb10@queensu.ca

1-613-533-6000 ext. 77215
13gb10@queensu.ca

1-613-533-6000 ext. 77215
13gb10@queensu.ca

1-613-533-6000 ext. 77215
13gb10@queensu.ca

1-613-533-6000 ext. 77215
13gb10@queensu.ca

1-613-533-6000 ext. 77215
13gb10@queensu.ca

1-613-533-6000 ext. 77215
13gb10@queensu.ca

Appendix C: Research Poster – Punjabi version



ਸੂਚਨਾਂ

ਜੇਕਰ ਤੁਹਾਡੀ ਉਮਰ 55 ਸਾਲ ਤੋਂ ਵੱਧ ਹੈ ਅਤੇ ਤੁਸੀਂ ਦਿਲ ਦੇ ਮਰੀਜ਼ ਹੋ ਤੇ ਤੁਸੀਂ ਆਪਣੀ ਬੀਮਾਰੀ ਹੋਣ ਦੇ ਕਾਰਣਾਂ ਬਾਰੇ ਗੱਲ-ਬਾਤ ਕਰਨਾਂ ਚਾਹੁੰਦੇ ਹੋ ਤਾਂ ਹੇਠ ਲਿਖੇ ਨੰਬਰ ਤੇ ਫੋਨ ਕਰੋ।

ਗੁਰਵੀਰ ਬੈਂਸ

613-533-6000 Ext. 77215

emai: 13gb10@queensu.ca



Appendix D: Letter of Information (LOI)

Mixing health and geography: A study of risks associated with cardiovascular disease for the Punjabi Sikh population in the Regional Municipality of Peel

Participant Letter of Information

This study is currently being conducted by Ms. Gurveer Bains under the supervision of Dr. Mark Rosenberg, in the Department of Geography at Queen's University in Kingston, Ontario.

What is this study about?

The purpose of this research project is to understand why there is a higher prevalence of cardiovascular disease within the Punjabi Sikh population through a population health approach focusing on cardiovascular disease risk factors, health effects related to the immigration process and health effects due to the built-environment.

This research project includes the collection of quantitative data from the Canadian Community Health Survey (CCHS) and qualitative data collected through interviews with participants who meet the research criteria. The research criteria for this project include those of Punjabi Sikh ethnicity who reside in the Regional Municipality of Peel, are 55 years of age or older and have been diagnosed with cardiovascular disease by a medical professional.

What will happen to my response?

The interviews will be recorded and notes will be taken for research purposes; recordings and notes will not be accessible to anyone other than Ms. Bains and research supervisor, Dr. Rosenberg. Confidentiality of recordings and notes will be ensured through encryption of all electronic recording files on Ms. Bains' laptop (also password protected) and all physical recordings and notes taken locked within a cabinet file in Ms. Bains' office at Queen's University. All information will be kept confidential through the use of anonymous research IDs during analysis of research data. Due to the use of anonymous research IDs during analysis, individual research findings will not be available to participants. The interview and survey completion should not take longer than 60 minutes and no follow-up studies will be conducted.

Research timeline:

The months of May to September 2014 will be used to recruit participants and hold interviews, and to conduct quantitative analysis of cross-tabulations and logistic regression modelling on the CCHS. The fall term between September and December 2014 will be used to analyse the semi-structure interview transcripts. Lastly, January to April 2015 will be used to complete writing and defence of the Master's thesis.

Risks and Benefits of the study:

While interviews will deal with sensitive matters pertaining to health, all efforts will be made to make sure participants do not feel uncomfortable answering questions.

Information will be provided before and after the interview of counselling and/or support networks available within the Region of Peel to participants.

Your participating within this research study will greatly impact the development of an intervention strategy on the PhD-level to understand factors which increase the risk of cardiovascular disease among the Punjabi Sikh community in Canada.

Is my participation voluntary?

Participation in this study is completely voluntary, while it is greatly appreciated to answer all questions asked during the interview, participants should not feel obligated to answer any questions which makes them feel uncomfortable. At any point during the research study should the participant feel that they no longer want to participate in this research study, the participant may cancel involvement with the study at any time by contacting Ms. Bains through the contact information listed below. All information will be destroyed following the end of the study.

What if I have concerns?

Should you have any further questions regarding the research study and/or your participation in the research project please do not hesitate to contact Ms. Gurveer Bains at 13gb10@queensu.ca or 613-533-6000 ext. 77215 and/or Dr. Mark Rosenberg at mark.rosenberg@queensu.ca or (613) 533-6046. Any ethical concerns about the study may be directed to the Chair of the General Research Ethics Board at chair.GREB@queensu.ca or 613-533-6081.

“This study has been granted clearance according to the recommended principles of Canadian ethics guidelines, and Queen's policies.”

Thank you for your interest in participating in this research study,

Ms. Gurveer Bains, HBSc.

Dr. Mark Rosenberg, PhD.

Appendix E: Letter of Consent (LOC)

Mixing health and geography: A study of risks associated with cardiovascular disease for the Punjabi Sikh population in the Regional Municipality of Peel

Participant Consent Form

Thank you for agreeing to participate in the study entitled “Mixing health and geography: A study of risks associated with cardiovascular disease for the Punjabi Sikh population in the Regional municipality of Peel”. As part of this research study you agree to the following five (5) statements:

1. I have read and understood the Letter of Information attached regarding this research study.
2. I agree to be interviewed by Ms. Gurveer Bains regarding what factors I feel led to my diagnosis of cardiovascular disease.
3. I understand and agree to the interviews being recorded and notes being taken for research purposes and understand that recordings and notes will not be accessible to anyone other than the researcher and research supervisor, Dr. Mark Rosenberg.
4. I understand that all information will be kept confidential and will only be used for research analysis through the use of anonymous research IDs.
5. I understand my participation in this study is completely voluntary, should I feel that I no longer want to participate in this research study, I understand I am able to contact Ms. Gurveer Bains at 13gb10@queensu.ca or 613-533-6000 ext. 77215 and/or Dr. Mark Rosenberg at mark.rosenberg@queensu.ca or (613) 533-6046. I am aware that any ethical concerns about the study may be directed to the Chair of the General Research Ethics Board at chair.GREB@queensu.ca or 613-533-6081.

“This study has been granted clearance according to the recommended principles of Canadian ethics guidelines, and Queen's policies.”

I have read the above statements and freely consent to participate in this research:

_____	_____	_____
Name of research participant	Signature of research participant	Date

_____	_____	_____
Name of researcher	Signature of researcher	Date

Research ID: ____

Appendix F: Debriefing Letter (DL)

Mixing health and geography: A study of risks associated with cardiovascular disease for the Punjabi Sikh population in the Regional Municipality of Peel

Debriefing Letter

The emerging epidemic of cardiovascular disease is threatening the health and well-being of various communities around the world. This epidemic is amplified for the Sikh Punjabi population originating from Punjab, India. Factors such as genetics, lifestyle, the built-environment and influences of differing cultures all create the “perfect storm” for cardiovascular disease within this subpopulation, especially in the largest multicultural region in Canada, the Greater Toronto Area (GTA). Health geography plays a vital role in connecting where Punjabi-speaking Sikhs live and determining which factors associated with where they live are linked to an increased risk of cardiovascular disease.

This project will use a mixed methods approach, comprising of descriptive statistics, cross-tabulations and logistic regression modelling based on the Canadian Community Health Survey (CCHS Cycle 10). Thirty sample subjects will be recruited from the target population to participate in focus groups in order to provide an in depth understanding of the factors and behaviours which are critical to their health status.

In sum, this project is important and relevant to understanding the growing health challenges faced by a major ethnic group in Canada.

For more information on similar studies conducted on cardiovascular disease and the Punjabi Sikh population please refer to the following articles:

Bedi, H., LeBlanc, P., McGregor, L., Mather, C., & King, K. M. (2008). Older immigrant Sikh men's perspective of the challenges of managing coronary heart disease risk. *Journal of Men's Health*, 5(3), 218-226.

Galdas, P. M., & Kang, H. B. K. (2010). Punjabi Sikh patients' cardiac rehabilitation experiences following myocardial infarction: a qualitative analysis. *Journal of Clinical Nursing*, 19(21-22), 3134-3142.

Due to the sensitive nature of speaking about personal health issues, if you feel that you need counselling services within your local area, please refer to the following counselling services which speak several languages and are located within the Regional Municipality of Peel:

1. Family Services of Peel

Mississauga
151 City Centre Drive, Suite 501 Mississauga, ON, L5B 1M7
Tel: 905-270-2250

Brampton
7700 Hurontario Street, Suite 601, Brampton, ON, L6Y 4M3
Tel: 905-453-7890

2. Newcomer Center of Peel

Mississauga
i. Malton Newcomer Information Centre

3233 Brandon Gate Drive, Unit 7 Mississauga, ON, L4T 3V8
Tel. 905-677-0007 ext. 5

ii. Mississauga Newcomer Information Centre

Sussex Centre,
50 Burnhamthorpe Rd W., Suite 300 Mississauga, ON, L5B 3C2,
Tel. 905-279-0024 ext. 1266

Brampton
i. Brampton East Newcomer Information Centre

263 Queen St. E, Unit 14 Brampton, ON L6W 4K6
Tel: 905-595-0722 ext. 4000

ii. Brampton South Newcomer Information Centre

7700 Hurontario St., Unit 601, Suite 100 Brampton, ON L6Y 4M3
Tel: 905-457-4747 ext. 3013

Caledon

i. Caledon Community Services

Royal Courtyards,
Upper level 18 Kingston Caledon, ON L7E 1E8
Tel: 905-951-2300 or 905-584-9460

Thank you again for your participating in this research study,

Ms. Gurveer Bains, HBSc.

Dr. Mark Rosenberg, PhD.

Appendix G: List of interview questions

Mixing health and geography: A study of risks associated with cardiovascular disease for the Punjabi Sikh population in the Regional Municipality of Peel

Sample of Semi-structured Interview Questions

I. Health effects due to immigration

- a. When did you immigrate to Canada from India? What was your reason(s) for immigrating to Canada?
- b. Do you feel differences between Canadian and Indian cultures influenced your health? If so, in what ways?
- c. Are you employed in the same field as you were in India (your skilled trade)? If not, do you feel underemployed in Canada?
- d. Do you feel that immigrating to Canada influenced your health? If so, in what ways?
- e. Other than experiences related to immigration, to what extent do you feel living in Canada contributed to your CVD diagnosis?
- f. How easily do you understand/speak/read English and/or French? How has this influenced your level of access to health services?

II. Health effects related to cardiovascular disease diagnosis

- a. At what age were you diagnosed with cardiovascular disease?
- b. When you were first diagnosed with cardiovascular disease, how aware were you about this disease?
- c. What changes to your lifestyle have you made since your diagnosis with cardiovascular disease?
- d. Are there any specific health factors you feel influenced your CVD diagnosis? If so, please describe.
- e. What lifestyle habits and/or factors (other than aging) do you feel influenced your cardiovascular disease diagnosis?

III. Cardiovascular disease risks and management of risks

- a. What did your diet consist of before your CVD diagnosis? Are there any dietary changes you made after your diagnosis? If so, please describe these changes.
- b. Do you regularly exercise? If not, what are some of your reasons for not getting regular exercise? If yes, what type of exercise do you engage in?
- c. Do you feel your gender played a role in your adapted way of life in Canada and contributed to your CVD diagnosis? If so, in what ways?
- d. Do you feel the Punjabi culture influenced your CVD diagnosis? If so, in what ways?
- e. Do you smoke and/or drink? If so, how frequently (never, once a year/month/week/daily)?
- f. What are some examples of stress you have felt which have negatively influenced your health? What type of coping strategies have you used to deal with this stress?
- g. Are you diabetic, if so, type 1 or type 2? Do you have hypertension or high cholesterol levels?

IV. Health effects related to the built-environment

- a. How has living in the Region of Peel affected your health?
- b. Do you drive a vehicle? If not, what mode of transportation do you use?

V. Concluding question of semi-structured interviews

- a. Is there any other information not asked within these questions you feel contributed to your CVD diagnosis?