Health, Health Service Use and Informal Caregiver Distress among Older Korean Home Care Clients in Canada and Korea

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Background

Immigration results in many different changes to life: diet, culture, lifestyle, and language (Hynie *et al.*, 2011; Kim, 2006; Lee Kim, 2001). Immigration later in life is a stressful process for older adults as they are uprooted from their native society and need to readjust to a culturally different society (Hynie *et al.*, 2011; Kim, 2006; Mui, 1996; Mui, 2001; Yoo, 2014). Challenges such as discrimination, language barriers, lack of social resources, and feelings of detachment from the new society may arise especially for elderly Asian immigrants when adapting to host environments (Bernstein *et al.*, 2011; Hossen, 2012; Kiefer *et al.*, 1985; Kim, 2006; Kim, 2010; Lai & Chau, 2007; Mui, 2001; Noh, 2008; Noh & Kaspar, 2003; Noh *et al.*, 2007; Yoo, 2014).

Elderly Asian immigrants often lack the information and resources to adjust to major differences between Asian and Western cultural norms and social expectations (Mui, 1996; Mui, 2001). Difficulties coping with the new society and the inappropriate use of resources can increase social isolation, depression, and other health concerns (Kang *et al.*, 2013), which can in turn affect the lives and health of other family members as they become more dependent on these informal caregivers (Chung, 2013; Han *et al.*, 2008; Kim & Knight, 2008; Kwak & Lai, 2012; Lee & Farran, 2004; Yoo, 2014; Wong *et al.*, 2005). However, these struggles are often overlooked as a major issue or concern of immigration policies. Therefore, more studies are required on these Asian immigrants with limited official language proficiency.

Koreans have been one of the fastest growing groups of immigrants in Canada, with a growth rate of 42% from year 2001 to 2006 (Statistics Canada, 2006; Statistics Canada, 2007). Of this group, it is estimated that approximately 6% of Korean immigrants are aged 65 and older (Kwak & Hiebert, 2010; Statistics Canada, 2006). In order to examine the possible health disparities faced by minority groups, such as Korean Canadians, an investigation into the quality of care and health service use is vital. However, only a limited amount of research on Korean immigrants has been done in Canada, and fewer than a dozen studies focused on older Korean Canadians.

Purpose

This dissertation examined the health disparities in older Korean Canadian home care clients by investigating their health and health service use, informal caregiver distress, and quality of care. More specifically, it compared (1) health and health service use of Korean Canadians, native Koreans, Chinese Canadians, and other Canadians; (2) the risk and protective factors related to the onset of and improvement in caregiver distress; and (3) quality of care using the Home Care Quality Indicators (HCQIs) in Korean Canadians, Chinese Canadians, and other Canadians.

Methods

This research was based on secondary data analysis of health information from two different datasets, one from Ontario and the other from Korea. The Ontario health information was based on the Resident Assessment Instrument-Home Care (RAI-HC), an assessment tool used to identify a person's functioning and quality of life that addresses needs, strengths, and preferences in a broad range of domains (Canadian Home Care Association, 2013; Morris *et al.*, 1997; Morris *et al.*, 2009). This health information is managed by the Canadian Institute for Health Information (CIHI) and was made available through the partnership between CIHI and the University of Waterloo. The health information from Korea was obtained using the interRAI Home Care (interRAI HC) assessment tool. The interRAI HC is the updated version of RAI-HC but data from both can be compared with only modest adjustments (Gray *et al.*, 2009; Hirdes *et al.*, 2008a).

The research sample was drawn from the population of all long-stay home care clients admitted during the study period between January 2002 and March 2015 in Ontario and between February 2011 and October 2012 in the Republic of Korea. Long-stay home care clients were defined as clients who require more than 60 uninterrupted days of service through a home care agency. The sample only consisted of long-stay home care clients aged 65 and older. Using a variable for primary language, Korean and Chinese home care clients in Ontario were identified. As a result, primary languages other than Korean and Chinese were grouped as ‘others’, referring to other Canadians. For the analyses and results, Korean home care clients in Ontario were referred to as ‘Korean Canadians’, Korean home care clients in Korea were referred to as ‘native Koreans’, Chinese home care clients in Ontario were referred to as ‘Chinese Canadians’, and other Canadian home care clients in Ontario were referred to as ‘other Canadians’.

Chapter 5 examined the descriptive profile of the health of older Korean Canadians compared to native Koreans, Chinese Canadians, and other Canadians, by obtaining the descriptive statistics with percentages and frequencies. Chapter 6 investigated the risk and protective factors for caregiver distress accounting for Korean Canadians, Chinese Canadians and other Canadians using bivariate and multivariate logistic regression models, and generalized estimating equations (GEE). Lastly, Chapter 7 used the second-generation HCQIs to explore quality of care by ethnicity in Ontario.

Results and Discussions

This dissertation is the first cross-cultural study to examine the health disparities and caregiver distress of Korean older adults in Ontario and in Korea using the RAI-HC/interRAI HC. It is also the first study to use the second-generation HCQIs to explore quality of care by ethnicity.

Health disparities were evident from the overall findings in Chapter 5 where both Korean Canadians and native Koreans generally exhibited higher impairments compared with Chinese Canadians and other Canadians. In addition, high caregiver distress was present in the three Asian groups compared to other Canadians. Upon further examination of caregiver distress, results in Chapter 6 demonstrated that being a Korean or Chinese Canadian was associated with lower odds of an improvement in caregiver distress and higher odds of an onset of caregiver distress over time. However, language barriers based on need for an interpreter appeared to be the main explanation for this effect rather than the ethnicity alone. Lastly, Chapter 7 examined quality of care using the second-generation HCQIs and identified different areas where service providers for different groups have opportunities to improve quality. For Korean Canadians, such initiatives should focus on cognitive and psychosocial factors, whereas Chinese Canadians need interventions to target pain, and other Canadians need to improve on the use of hospital, emergency department or emergent care**.** Most importantly, all groups exhibited an increase in continued caregiver distress over time, though the two Asian groups’ rates seemed to increase more steeply.

Overall, the older Korean Canadian home care clients demonstrated substantial health needs and family caregivers had a dire need for additional supports from formal services. However, this clients tended to have a lower use of home care services (i.e., personal support/ homemaking services, and the use of hospital, emergency department or emergent care), and higher levels of caregiver distress indicated that their informal caregivers were struggling. Thus, more practical interventions or resources need to be devoted to this population.

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Dedication

For my fiancée.

“Always be joyful. Never stop praying. Be thankful in all circumstances, for this is God’s will for you who belong to Christ Jesus.”

1 Thessalonians 5:16-18.

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List of Abbreviations

ADL	Activities of Daily Living
ADLH	Activities of Daily Living Hierarchy
CAP	Clinical Assessment Protocol
CCAC	Community Care Access Centre
CHESS	Changes in Health, End-Stage disease and Signs and Symptoms
CI	Confidence Interval
CIHI	Canadian Institute for Health Information
COPD	Chronic Obstructive Pulmonary Disease
CPS	Cognitive Performance Scale
DRS	Depression Rating Scale
ED	Emergency Department
GEE	Generalized Estimating Equations
HCQI	Home Care Quality Indicators
IADL	Instrumental Activities of Daily Living
interRAI HC	interRAI Home Care Assessment System
MAPLe	Method for Assigning Priority Levels
MeSH	Medical Subject Headings
OACCAC	Ontario Association of Community Care Access Centres
OR	Odds Ratio
QI	Quality Indicators
RAI-HC	Resident Assessment Instrument – Home Care
SD	Standard Deviation
SE	Standard Error

1. Introduction and Overview

Canada, a nation of immigrants, is ethnically diverse. In 2006, approximately 21% of the Canadian population were foreign-born (Statistics Canada, 2006). Immigration brings many different changes to life for immigrants: lifestyle, diet, culture, and language. A language difference is one of the most important barriers when adapting to these changes. Usually, immigrants are better acculturated to a host culture with longer exposure, but only when it happens at a young age (Cheung *et al.*, 2011). Better language acquisition among young immigrants is an important contributor to this adaptation (Hakuta *et al.*, 2003).

In contrast to younger immigrants, immigration later in life is often stressful as immigrants are uprooted from their native society and the cultural adjustments and language barriers are likely to be more severe (Hynie *et al.*, 2011; Kim, 2006; Kim *et al.*, 2014; Mui, 1996; Mui, 2001; Yoo, 2014). Challenges such as discrimination, language barriers, lack of social resources, and feelings of detachment from the new society may arise when adapting to the host environment, especially for elderly Asian immigrants (Bernstein *et al.*, 2011; Hossen, 2012; Kiefer *et al.*, 1985; Kim, 2006; Lai & Chau, 2007; Mui, 2001; Noh, 2008; Noh & Kaspar, 2003; Noh *et al.*, 2007; Yoo, 2014).

Elderly Asian immigrants, especially immigrating by family invitation, often lack the information on the host country and other resources that could help them to adjust to Western cultural norms and social expectations (Mui, 1996; Mui, 2001). Difficulties coping with the new society, and the lack of, or inappropriate use of resources can increase social isolation, depression, and other health concerns (Kang *et al.*, 2013). These challenges may also affect the life and health of other family members as the older members of the family become more dependent on the younger informal caregivers (Chung, 2013; Han *et al.*, 2008; Kim & Knight, 2008; Kwak & Lai, 2012; Lee & Farran, 2004; Yoo, 2014; Wong *et al.*, 2005). However, these struggles have often been overlooked as a major issue of immigration policies. Promoting the health of immigrants, especially facilitating a more culturally driven health care system for older immigrants, is important in order to address social and health inequities.

Koreans have been one of the fastest growing groups of immigrants in Canada, with a growth rate of 42% from year 2001 to 2006, and it is estimated that approximately 6% of Korean immigrants are aged 65 and older (Kwak & Hiebert, 2010; Statistics Canada, 2006). As recent immigrants, Koreans have not fully integrated into the Canadian society and, thus, face various disadvantages and barriers like many other minority groups.

In order to address health disparities, examine quality of care, and promote health service use in minority groups, research on Korean Canadians is vital. However, only a limited amount of research on Korean immigrants has been done in Canada, with fewer than a dozen studies have been done on older Korean Canadians. Currently, there are no studies on quality of care in home care services for Korean Canadians.

Previous studies have suggested the considerable effects of immigration on the mental health of Korean immigrants in Canada (Bae & Park, 2010; Noh & Avison, 1996; Noh *et al.*, 1992a; Noh *et al.*, 1992b). Two studies by Noh *et al.* (1992a, 1992b) were among the first studies to examine depression in Korean immigrants in Canada. Four studies by Noh and Kaspar (2003), Noh *et al.* (2007), Kim and Noh (2014), and Kim and Noh (2015) examined the relationship between discrimination and depression as Korean immigrants faced obstacles such as unemployment, language barriers, and discrimination that may contribute to increased depression. Only two studies by Kim and Chen (2011) and Kim *et al.* (2014) investigated depression in older Korean immigrants and reported that social determinants such as socio-economic status, education, living arrangements, and English proficiency were key factors in influencing depression.

This dissertation examined the health disparities in older Korean Canadian home care clients by investigating their health and health service use, informal caregiver distress, and quality of care. More specifically, it compared (1) health and health service use of Korean Canadians, native Koreans, Chinese Canadians, and other Canadians; (2) the risk and protective factors related to the onset of and improvement in caregiver distress; and (3) quality of care using the Home Care Quality Indicators (HCQIs) in Korean Canadians, Chinese Canadians, and other Canadians. The following section describes the search strategies that were used to find studies on Korean Canadian immigrants.

1.1 Search Strategy

An exploratory review of the literature was conducted by searching the electronic databases of PubMed (Medline), PsycINFO, and Web of Science. The following MeSH (Medical Subject Headings) terms and keywords, or a combination thereof, were used in the literature search: “Korean”, “Korea”, “Emigrants and Immigrants”, “Immigrants”, “elderly”, “Aged”, “older adults” , “Ontario”, “British Columbia”, “Canada”, “Vancouver”, and “Toronto”. Reference lists of relevant articles were also reviewed to broaden the search, and new keyword searches were performed as the topics expanded. If enough results were not generated, a broader search term (e.g., “Asian Continental Ancestry Group” or “Asian”) was used. Additional materials were retrieved from books on Korean immigrants and immigrants in Canada.

The following chapter presents the literature review on the health of immigrants, Korean immigrants in Canada, a theoretical framework to explain health service use in immigrants, and definition of quality of care and quality indicators.

2. Literature Review

2.1 Health of Immigrants in Canada

Immigration brings many different changes in life: lifestyle, diet, culture, and language. These changes can influence the health of immigrants. Studies have demonstrated the “healthy immigrant effect” whereby many young healthy candidates were successfully selected for immigration (Gushulak *et al.*, 2011; Kennedy *et al.*, 2015; Kobayashi & Prus, 2012; McDonald & Kennedy, 2004; Wang & Hu, 2013).

Yet, many studies report declines in the health of immigrants (Dunn & Dyck, 2000; Fuller-Thomson *et al.*, 2011; Newbold & Danforth, 2003; Siddiqi *et al.*, 2009). Siddiqi *et al.* (2009) demonstrated that immigrants have poorer self-rated health and more unmet medical needs. Similarly, Newbold and Danforth (2003) found that immigrants experience worse health status compared to non-immigrants. Dunn and Dyck (2000) also found that immigrants have lower self-rated health and that socio-economic factors influenced immigrants more than non-immigrants; however, they found that immigrants had fewer unmet needs. Further, Islam *et al.* (2014) observed a higher prevalence of mental illnesses in South Asian immigrants compared to their Canadian-born counterparts.

Particularly, studies have shown some differences in health status by ethnicity, socio-economic status, geographical regions, and gender (Kobayashi & Prus, 2012; Singh Setia *et al.*, 2011; Singh Setia *et al.*, 2012; Wang, 2014; Wang & Hu, 2013). Then again, some studies report mixed results regarding the health of immigrants. Newbold (2005) reported similar self-rated health among immigrants and native Canadians, whereas Stafford *et al.* (2011) observed lower rates of depression among immigrants. Subedi and Rosenberg (2014) reported poorer health for immigrants who had more than 10 years of residency compared to less than 10 years in Canada.

Despite some inconsistencies in the results of the studies, there is evidence of health decline in recent immigrants, and the barriers to health service use in immigrants may explain the decline in the health of immigrants, as recent immigrants are healthier on average than the general Canadian population (Dean & Wilson, 2010; Gushulak *et al.*, 2011).

2.1.1 Barriers in Health Service Use in Canada

Although there are many barriers in health service use by immigrants, the two most important barriers are language and culture. The results of a study by Lebrun (2012) indicated that immigrants with shorter lengths of stay in Canada and limited language proficiency generally had lower rates of health service use. Similarly, Fuller-Thomson *et al.* (2011) reported that language skills and discrimination were associated with decline in the health of immigrants. Moreover, Sears *et al.* (2013) pointed out the importance of patient-physician language discordance and the negative health outcomes associated with these encounters. In addition, Kirmayer *et al.* (2011) investigated the challenges in mental health service use and addressed specific communication challenges due to language differences. A study on improving the delivery of primary health care for immigrants by Pottie *et al.* (2014) included language interpretation as one of the three most highly ranked practice strategies to address. Lastly, a survey of family physicians' perspectives on management of immigrant patients also acknowledged the communication difficulties due to language barriers; this survey noted that very few physicians used professional interpreters (Papic *et al.*, 2012).

Another main barrier to health service use is cultural differences and/or sensitivities. Some studies investigated the cultural sensitivity for maternity services in Canada and found that women's social position, cultural knowledge and beliefs, and traditional customs in health care need to be considered to promote immigrant women's health (Higginbottom *et al.*, 2014; Higginbottom *et al.*, 2015; Lee *et al.*, 2014). A lack of knowledge in Western health care system and poor language proficiency were the main impeding factors in use of prenatal care and cancer care for immigrant women (Boerleider *et al.*, 2013; Higginbottom *et al.*, 2015; Todd & Hoffman-Goetz, 2011). Culturally appropriate health care services are important, as Chow (2012) reported that the major needs of Chinese immigrants in Canada were ethnic nursing homes, senior centres, and homemaking services. Further, Lai *et al.* (2007) emphasized the need for cultural compatibility as cultural variables influenced the health status of Chinese immigrants. Lastly, Wang (2007) demonstrated some inequality in accessing culturally sensitive care for Chinese immigrants.

2.1.1.1 Health Service Use of Immigrants in Canada

Language and cultural barriers have been shown to influence health service use in Canadian immigrants (Durst, 2010b; Lavoie *et al.*, 2010; Northcott & Northcott, 2010). Kirmayer *et al.* (2007) investigated health service use related to psychological distress in immigrants and found a significantly lower use of mental health services by immigrants. Likewise, Tieu *et al.* (2010) found that older Chinese immigrants had much lower depression literacy and less knowledge, which may explain the underutilization of mental health services. Laporte *et al.* (2007) determined that the probability of an individual receiving service and the actual amount of service received decreased for recent immigrants. In addition, Shah *et al.* (2014) observed lower use of cardio-protective medication by diabetic patients who were recent immigrants. Similarly, Lasser *et al.* (2006), using multivariate analysis to predict access to care, also reported that being an immigrant (foreign-born) have lower access to care.

Various studies have found that immigrant women face many barriers in preventive medicine; for example, screening for cervical cancer. Amankwah *et al.* (2009) reported that recently immigrated visible minority women are more than twice as likely to never have had a Pap test. Also, they did not have a regular/family physician due to a lack of knowledge and/or cultural beliefs. Lofters *et al.* (2007) also demonstrated low Pap smear rates in immigrants. Similarly, Lebrun and Dubay (2010) showed that immigrants in Canada fared worse than non-immigrants regarding having a timely Pap test. Moreover, Bryant *et al.* (2002) found that immigrant women, single women, and women with less education are over represented among women who have never had a Pap test.

Nevertheless, some studies report equal access to health services, and some studies indicate higher use of primary care services for recent immigrants as they require preventative health care such as vaccination and health screening (Muggah *et al.*, 2012; Wen *et al.*, 1996). Some suggested that, due to the communication barriers, immigrants may make repeated visits for the same problem since they do not fully understand the care that they received previously (Leduc & Proulx, 2004; Muggah *et al.*, 2012). Similarly, a study accounting for the length of stay of immigrants in Canada stated that, although barriers to health services are common among immigrants, the service utilization evolves over time from isolated to regular utilization (Leduc & Proulx, 2004).

Despite the mixed findings, the majority of these studies report lower health service use due to language and cultural barriers. In accordance, perceived access, defined by whether mental health care workers can meet the needs of cultural sensitivity, language and gender preferences, was one of the main factors that influenced the attitudes towards seeking professional help among immigrants (Fung & Wong, 2007). However, health and social support services are crucial to immigrants because they are associated with lower odds of reporting mental disorders (Puyat, 2013). In particular, culturally sensitive support services for immigrant caregivers are a priority as studies have also reported barriers in accessing these services (Lai & Surood, 2010; Neufeld *et al.*, 2002). Immigrant populations are also aging, and, immigrant caregivers are three times more likely to have negative health consequences than non-immigrants (Suwal, 2010). Therefore, without appropriate services, the health of caregivers is also in danger.

Canada's health care system may be poorly adapted to the needs of immigrants, possibly leading to further marginalization and health inequities (Swinkels *et al.*, 2011). However, programs and interventions targeting immigrants are slowly emerging.

2.1.1.2 Health Programs and Interventions for Immigrants in Canada

Health service interventions have been implemented to target recent immigrants and promote health service use. Toronto's 2-1-1 health care service line is an example of how immigrants can easily access health information and other resources within Canada. This intervention is beneficial for immigrants; however, many of them do not know about this service. If introduced and used at the beginning of their settlement, this intervention represents an efficient and effective way for immigrants to gain access to information and can be a starting point for navigating health information and services (Cortinois *et al.*, 2012). Moreover, Over-the-Phone (OPI) interpretation services, a recent intervention that aims to facilitate language accessibility has shown to be a valuable resource, reducing the use of ad-hoc interpreters (Dowbor *et al.*, 2015).

An example of a culturally-based intervention is a cultural competence initiative for staff, launched at the Hospital for Sick Children, with a particular focus on new immigrants and other vulnerable populations. Basic education on health disparities and cultural competent care increased patient satisfaction with staff members' levels of cultural sensitivity (Karmali *et al.*, 2011). Moreover, guidelines are being developed for recently arrived immigrants to improve delivery of primary care in this new population (Pottie *et al.*, 2011; Swinkels *et al.*, 2011).

Canada is a multicultural society. Immigration plays a central role in Canada; therefore, the social structure and approach to health service delivery need to be adapted accordingly. Providing high quality and effective health care services that are linguistically and culturally appropriate is a key factor in reducing further marginalization and health inequities and to maintaining the health of immigrants.

2.2 Korean Immigrants in Canada

Korean Canadians are one of the fastest growing non-European ethnic groups in Canada, and they face similar difficulties and declining health (Wang & Kwak, 2014). Wang and Kwak (2014), using data from the Canadian Community Health Survey, reported that Korean immigrants in Canada have higher percentages of poor/fair self-rated health, lower percentages of health service use, and lower ratings of physician care and quality of care. Therefore, studies on Korean immigrants' experiences can be informative for understanding health and health service use and quality of care in other ethnic minorities, and may draw attention to some of the needs of recent Asian immigrants.

Canada experienced a sharp increase in Korean immigrants during the last two decades. From 2001 to 2006, the total Korean population increased from approximately 102,000 to 145,000, making Korean Canadians one of the fastest growing non-European ethnic groups in Canada (Statistics Canada, 2006; Statistics Canada, 2007). During these years, the Korean population grew by 42%, whereas the overall population grew by only 7%. Statistics Canada has also projected that, by 2031, Koreans will be one of the fastest and largest growing visible minority groups (Statistics Canada, 2010).

Korean Canadians consist of slightly more women than men (52% vs. 48%) and about 42% are married. According to the 2006 Census, 55,300 Korean Canadians resided in Ontario (49%) and 44,800 Korean Canadians resided in British Columbia (36%) (Statistics Canada, 2006). In 2006, 6% of Korean Canadians were aged 65 and older compared to 14% of all Canadians. From this older population, about 14% of Koreans lived alone compared to 28% of all Canadians. In addition, only 3.6% of Koreans aged 65 and older were born in Canada (Statistics Canada, 2006). According to the 2011 Census, 88.5% of Korean Canadians spoke at least one official language; however, 34.4% of non-institutionalized Koreans aged 65 and older spoke neither of the official languages (Statistics Canada, 2011a).

The following three sections explain the Korean cultural values that may influence the distress of informal caregivers and the patterns of health service use in older Korean home care clients.

2.2.1 Cultural Values

Koreans have some distinctive cultural traits that are somewhat different than those of their neighboring countries. The traditional Korean culture places family as a focal point of social organization and encourages family well-being and interdependence (Lai, 2007). Korean culture, based on familism, is strongly kinship-oriented, discourages individual needs and desires, and emphasizes the welfare of the family (Chun *et al.*, 2007; Kim & Lee, 2003; Kim *et al.*, 1991; Lavoie *et al.*, 2010; Youn *et al.*, 1999). In addition, Asian culture values stoicism and patience. People are encouraged to keep their feelings inside rather than expressing them. Thus, the feeling of sorrow is often experienced silently (Pang, 1995).

2.2.1.1 Confucianism

Confucianism, derived from the teachings of the Chinese philosopher Confucius (551-479.B.C.), is a system of ethics or way of life that emphasized righteousness, proper conduct, and the nature of government. It was meant to govern all the relationships within the family and the state in harmonious unity. A few main highlights of Confucianism include filial piety, devotion to family, reverence for ancestors, respect for parents and authority, and loyalty to friends (Kim, 2010; Park, 2012; Park & Cho, 1995; Roh, 2010).

Confucianism acts as an ethical foundation within the minds of most Koreans. It is one of the most pervasive and influential ways of life within Korean families and the Korean community (Kim, 2010; Park & Cho, 1995; Roh, 2010). The core principles of Confucianism put heavy emphasis on the individual obligations towards family: of the son to the father, of youngster to the elder brother, and of the wife to the husband (Park & Cho, 1995; Roh, 2010).

2.2.1.1.1 Filial piety or “Hyo”

Filial piety, a foundational Confucian value is a cultural norm in Korea and many other Asian countries. It acts as a guideline for intergenerational relationships among family members and with others. The five key aspects of filial piety include love and affection, repayment, family harmony, responsibility, and sacrifice (Kim, 2010; Kim *et al.*, 1991; Lieber *et al.*, 2004; Sung, 1995; Yoo, 2014).

In Korea, filial piety is also called "Hyo" and it is usually regarded as the expression of responsibility and respect for parents and their sacrifice for the family (Han *et al.*, 2008; Kim, 1996; Yoo & Kim, 2010). Filial piety emphasizes the reciprocity, the devotion of children to respect and provide support to their aging parents for giving birth and rearing them into adulthood (Chee, 2000; Choi, 1993; Kim, 1996; Kim & Lee, 2003, Lai, 2007). The notion of filial piety has been deeply ingrained into the social structure of the Korean society, which includes caring for parents in their old age due to a sense of indebtedness (Durst, 2010a; Kim, 1996; Lee & Farran, 2004).

Nonetheless, studies in the United States report changes in cultural obligations and expectations. Some studies demonstrate that older Korean immigrants prefer to live independently in order to have privacy and freedom (Wong *et al.*, 2006; Yoo & Sung, 1997). Some authors report lower expectations with regard to filial obligations (Kauh, 1997; Wong *et al.*, 2006; Yoo, 2014).

Some Korean immigrant caregivers describe themselves as a non-traditional Confucianist as they realize that they cannot fulfill the filial duties realistically, so they have balanced cultural expectations and reality. They also report changes in traditional gender roles in caregiving (Yoo, 2014). Yoo (2014) describes the situation of the Korean immigrant children who care for their parents as becoming a "parent to their parents" because the children play a major supportive role and become a language and cultural broker for their parents. They play these roles partly due to the obligation of filial piety, but mostly due to repayment of the debt and/or sacrifice that their parents have made for them as they are the reason why their parents have immigrated.

2.2.2 Implications of Cultural Values and Korean Caregiving in Canada

As previously stated, the process of immigration exposes immigrants to various changes and stressful events such as poverty, identity crisis, social stigma, and discrimination (Kim, 2010; Noh & Moon, 2012). Immigration in later life presents complex adjustments and resettlement challenges such as adapting to new customs and values, facing language barriers, and changing lifestyle and habits (Kim, 2010; Yoo & Kim, 2010). These difficulties are especially notable for older Korean immigrants who lack cultural and linguistic skills, and have limited resources to overcome these challenges. Moreover, many older Korean immigrants face a role reversal and drop in status due to their limited situation, and rely mainly on informal support from family and friends rather than formal support and services (Kim, 2010; Kwak & Lai, 2012). As they become more dependent on informal supports, the stress of informal caregivers or supporters increases.

In addition, due to the cultural emphasis of “Hyo” and obligations, many Korean immigrants in Canada support, care, and live together with their elderly family members as long as possible and are reluctant to seek assistance (Jun, 2005; Kim, 2010; Park, 2012; Yoo & Kim, 2010). A study investigating caregiver distress of Korean immigrants by Jun (2005) has demonstrated higher caregiver distress among caregivers who were married and/or had Canadian citizenship, supporting some acculturation effect on caregiving. However, Kwak and Lai (2012) found that children were still the main source of support for older Korean immigrants, as they relied on them with regards to language, transportation, living arrangements, and financial conditions. This study also revealed that elderly Koreans expected adult children to perform filial duties partly through frequent contact by calling or by visiting rather than living together, as a sense of being a burden lowers quality of life of the elderly.

Yoon (2008) also demonstrated that living alone, a symbol of autonomy and independence, is preferable for Korean immigrant women, but the family continues to be a major source of support in their lives. Although there are services available for seniors, these services cannot be a substitute for the informal support and usually are not culturally sensitive (Kim, 2010). Nonetheless, these services reduce immediate pressures on the children so that they can maintain their responsibilities toward their immigrant parents, and also promote social involvement and reduce the feeling of being a burden for the elderly (Kwak, 2010). A combination of social support and social services are necessary for their successful adjustment to a new environment (Kwak & Lai, 2012).

2.2.3 Studies on Korean Immigrants in Canada

Only a limited number of studies on health and health service use are available on Korean immigrants in Canada. The scope of the research area included cardiovascular risk factors, menopause, osteoporosis, social anxiety, acculturative stress, caregiver distress, barriers to health care, life satisfaction, mental health, depression, and discrimination (Bae & Park, 2010; Carlsson & Johnson, 2004; Elliott *et al.*, 2002; Hong & Woody, 2007; Hsu *et al.*, 2012; Jun, 2005; Kim & Noh, 2013; Kim & Noh, 2014; Kwak & Berry, 2001; Liu *et al.*, 2010; Noh & Avison, 1996; Noh & Kaspar, 2003; Noh *et al.*, 1992a; Noh *et al.*, 1992b; Noh *et al.*, 2007; Wang & Kwak, 2014). A handful of studies focused on older Korean immigrants and examined depression, alcohol use, living arrangements, acculturative stress of women, and health experiences in retirement (Choi *et al.*, 2014a; Choi *et al.*, 2014b; Kim, 2009; Kim, 2010; Kim, 2012; Kim & Chen, 2011; Kim *et al.*, 2014).

Although, Wang and Kwak (2014) briefly examined the barriers to health care in Korean immigrants, no study is available on the quality of care in home care services that older Koreans receive in Canada. Also, there are no studies that used Ontario home care data to investigate the health, health service use, and quality of care of Korean immigrants. Previous work explored Korean informal caregiver distress in Canada as part of a dissertation; however, the study was done in 2005 and had many limitations (e.g., small sample size) (Jun, 2005).

The following section describes a theoretical framework to explain health service use in immigrants, and definition of quality of care and quality indicators that will be used to examine quality of care in Korean home care clients.

2.3 A Theoretical Framework to Explain Health Service Use in Immigrants

The Andersen and Newman Framework is a behavioural model devised to determine factors that facilitate or impede health services utilization (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973). The framework is composed of three individual level factors: predisposing factors, enabling factors, and need factors. Based on these factors, the model predicts health service utilization based on individual attributes. This framework suggests that more enabling factors lead to greater use of health services and mixture of predisposing and need factors affect equity in access (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973).

Predisposing factors are socio-cultural and biological characteristics of an individual that exist prior to their illness and which make the person more (or less) likely to use health services. Predisposing factors include social structures such as education, race and ethnicity, immigration status, and culture; health beliefs such as attitudes and values; and demographics such as age and gender (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973).

Enabling factors, measured by characteristics of personal, family, and community resources, are conditions which facilitate (or impede) access to health services by the individual. Enabling factors include personal and family resources such as the knowledge of how to access health services, language barriers, income, health insurance, and presence of family physician; and community resources such as wait time, geographical region, availability of the health professionals and facilities (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973).

Need factors or illness level, represent the most immediate cause that generate the use of health services. After accounting for both predisposing and enabling factors, the perceived or evaluated need is usually found to be the primary determinants of health service utilization. Perceived need is the subjective perception of one's illness and evaluated need is based on objective assessment of one's illness (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973).

In accordance with the Andersen and Newman Framework, Korean immigrants in Canada have many predisposing and enabling factors such as immigrant status, ethnicity, culture, health beliefs, and language barriers that may impede health services utilization. Later versions of this model include the interaction between providers and patients in the delivery of care, further illustrating the need for culturally and linguistically sensitive care that is required to improve the delivery of health care for immigrants (Andersen, 2008).

2.4 Definition of Quality of Care

Quality of care as defined by Avedis Donabedian is, "the extent to which actual care is in conformity with pre-set criteria for good care" (Donabedian, 1966; Donabedian, 1988; Reerink, 1990). Donabedian, while investigating the assessment of high quality care, proposed a framework involving three types of quality of care measures: structure, process, and outcome.

Structure measures refer to settings where care is provided. Structure measures also involve characteristics within the facilities, resources, personnel, and administration such as availability of physicians, training or specialty of the physicians, and policies related to care delivery. Structure measures are tangible and easy to assess, but these have a weak association with the two other types of measures (process and outcome) (Cleary & O'Kane, n.d.; Donabedian, 1966; Donabedian, 1988).

Process measures refer to the actual process of care such as assessing the type of care the patient received. Other examples include interpersonal experiences during the encounters with physicians and other health care professionals, accommodating patient's preferences and decisions in their care, and also providing appropriate emotional support. Although, process measures are very specific and clear to patients and providers, the processes of care are usually delivered without compelling evidence of effectiveness related to outcomes (Cleary & O'Kane, n.d.; Donabedian, 1966; Donabedian, 1988).

Outcome measures refer to consequences of care such as patient's health status or change in health status resulting from the care provided. Some examples of outcome measures include pain relief, number of complications, mammography rates, survival of patients, and surgery outcomes. Although outcome measures are good indicators of quality, these measures also have weaknesses. First, outcomes may be affected by a number of different factors that are not related to the treatment provided. Second, identifying the most powerful predictors of the outcome is very difficult. Third, rare outcomes may have low reliability. Finally, in order to detect differences, a large sample is necessary (Cleary & O'Kane, n.d.; Donabedian, 1966; Donabedian, 1988).

Many other definitions of quality of care are also available. For example, the Institute of Medicine (IOM) defines quality of care as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" and includes six specific aims: safe, effective, patient-centered, timely, efficient, and equitable (Gardner & Mazza, 2012; Institute of Medicine, 2001; Lohr & Schroeder, 1990). The following section describes the definition and use of outcome-based quality indicators to assess quality of care.

2.4.1 Definition and Use of Quality Indicators (QIs)

Quality indicators are relative estimates that "indicate either the presence or absence of potentially poor care practices or outcomes" (Frijters *et al.*, 2013) or that "measure quality by examining the structure, process, and outcomes of care" (Hirdes *et al.*, 2004). QIs may be derived from aggregated assessment records using person-level data to inform quality (Mor *et al.*, 2003b). These indicators are intended to represent the proportion of clients with a given status at a point in time or who improve or decline over time (Hirdes *et al.*, 2004; Morris *et al.*, 2013b).

The purpose of QIs is to influence agency-wide quality improvement by identifying areas in which an organization needs improvement (Hirdes *et al.*, 2004). QIs can identify opportunities for improved care by monitoring quality performance over time and can be used to benchmark, internally, and/or externally. QIs can be a starting point and a guide for an organization to improve quality of care, and also accreditation agencies can use them to evaluate health quality and verify results across health providers. These indicators can be also used to support a variety of quality applications including internal quality management initiatives and public report cards (e.g., http://yourhealthsystem.cihi.ca/) (Hirdes *et al.*, 2004).

When QIs are being calculated, setting the criteria for numerators and denominators is essential as numerators can influence the detection of the quality problems and denominators can influence the generalizability of QIs. Moreover, QIs use the risk adjustment method to account for the client-level or agency-level differences so that a fair comparison among agencies is possible. The risk adjustment method can control for selection biases among organizations (Dalby *et al.*, 2005; Hirdes *et al.*, 2004). More details on the risk adjustment will be discussed in the risk adjustment section. The following three sections introduce a specific set of QIs developed for use in home care.

2.4.1.1 Home Care Quality Indicators (HCQIs)

Home Care Quality Indicators are specifically designed to measure quality in home care services. Defined by the Canadian Home Care Association, home care is "an array of services for people of all ages, provided in the home and community setting, that encompasses health promotion and teaching, curative intervention, end-of-life care, rehabilitation, support and maintenance, social adaptation and integration, and support for family caregiver" (Canadian Home Care Association, 2013). HCQIs assess quality of care by evaluating consequences of care such as patient's health status or change in health status.

Home care, a rapidly growing and an essential part of the Canadian health care system, aims to support clients to maintain health and independence at home. It also provides short term care to those who are discharged from hospital and are recovering from acute medical conditions. Therefore, home care is an important bridge among different health care sectors (Canadian Institute for Health Information, 2014).

Home care is unique compared to other sectors of health care due to the involvement of family, clients' greater autonomy, and less monitoring by health professionals (Hirdes *et al.*, 2004). The role of family is crucial in home care. Therefore, an indicator measuring informal caregiver distress is included in the second-generation HCQIs.

2.4.1.1.1 First-Generation HCQIs

The first generation of HCQIs was developed in 2004 by Hirdes and other researchers, clinicians, and policy makers from Canada, the United States, and Japan. Focus groups with health professionals from six Canadian provinces and Michigan, and the perspectives of older adults on quality in home care were incorporated to develop the first-generation HCQIs (Hirdes *et al.*, 2004).

The purpose of the development of the first generation of HCQIs was to measure and calculate quality of care in home care services that used the Resident Assessment Instrument Home Care (RAI-HC). The RAI-HC, first introduced in 1997, is a person-centered assessment system. Developed for use with clients in home and community-based settings, the RAI-HC contains 21 sections including personal information and over 350 items across a wide range of domains, such as socio-demographics, health, functional status, and resources and service use (Morris *et al.*, 1997). The RAI-HC can be used to support a variety of functions, including outcome measurement based on scales, which measure clients' clinical status over time, and Clinical Assessment Protocols (CAPs), which provide guidelines for further assessment and person-centered care planning (Hirdes *et al.*, 1999).

The first generation of HCQIs includes two types of HCQIs: prevalence HCQIs and incidence HCQIs. Prevalence HCQIs, based on one point in time, are easy to construct, but may be not fully reflect the effects of interventions. On the other hand, incidence HCQIs are based on two points in time, and they can be used to measure outcomes due to care (Dalby *et al.*, 2005; Hirdes *et al.*, 2004).

The first-generation HCQIs include 22 indicators: a) 16 are prevalence HCQIs (inadequate meals, weight loss, dehydration, no medication review by physician, difficulty in locomotion and no assistive device, Activities of Daily Living (ADL)/ rehabilitation potential and no therapies, falls, social isolation with stress, delirium, negative mood, disruptive/intense daily pain, inadequate pain control, neglect or abuse, any injuries, no flu vaccination, and hospitalization); and b) six are incidence HCQIs (bladder incontinence, skin ulcers, ADL impairment, impairment locomotion in home, cognitive function, and difficulty in communication) (Hirdes *et al.*, 2004).

For the first-generation HCQIs, the client-level covariates for HCQIs are co-morbid conditions, and the covariates for incidence HCQIs are the same co-morbid conditions based on the baseline assessment. Specifically, these covariates include age, gender, baseline physical and cognitive functioning, and clinical complexity based on the Changes in Health, End-stage disease and Signs and Symptoms (CHESS) scales (Armstrong *et al.*, 2010; Hirdes *et al.*, 2003; Hirdes *et al.*, 2014). The agency-level covariates were based on either a prevalence rate for categorical variables or a mean score for continuous scales from initial assessments (Dalby *et al.*, 2005; Hirdes *et al.*, 2004).

2.4.1.1.2 Second-Generation HCQIs

A second generation of HCQIs was recently developed by Morris *et al.* (2013b) as more data and technology were available to compute advanced models with larger set of covariates. Moreover, this HCQI was developed to better integrate with the new suite of interRAI assessments including the interRAI Home Care assessment (interRAI HC). The interRAI HC is the updated version of RAI-HC but data from both can be compared with only modest adjustments (Gray *et al.*, 2009; Hirdes *et al.*, 2008a).

The updated HCQIs have been refined, unclear description of HCQIs were simplified, and new measures related to home care (e.g., caregiver distress HCQI) have been added. Further, the covariates for the risk adjustment were expanded and updated. Also, the calculation methods for the risk adjustment were upgraded to a two-step adjustment with direct stratification for better cross-site comparison (Morris *et al.*, 2013b).

There are four sub-groups of the second-generation HCQIs with a total of 23 indicators. The first group deals with functional abilities, including ADL, IADL, cognition, and communication. The second group deals with clinical characteristics, including bladder continence, falls, weight loss, injuries, mood, pain, severe daily pain, and pain not being controlled. The third group involves social aspects, including caregiver distress, being alone and distressed, and being homebound. The last group examines health service use, including no influenza vaccination, and use of hospital, emergency department (ED) or emergent care (Morris *et al.*, 2013b).

In the second generation of HCQIs, sentinel events with HCQI prevalence of less than 3% were excluded because there was a lack of clients who demonstrated the problem. The covariates for the risk adjustment were expanded, with an average of 10 covariates per HCQI (ranging from 5 to 14 variables), and included the time between assessments. Some examples of covariates included one or more measures of time between baseline and follow-up, one or both of two age dichotomies (65+ and 85+), indicator of ADL status, clinical complexity scale, prior hospitalization, a specific IADL task, cognitive status, difficulty understanding others, difficulty doing cognitive IADLs, pain, ADL decline, unsteady gait, depression or sadness, Alzheimer’s and other related dementia, and judged to be at risk of institutional placement on the Institutional Risk CAP (Morris *et al.*, 2013b).

Direct stratification, process of categorizing the sample into three different levels, was done with three standardization strata based on the levels of the most influential covariates. Four types of composite scales were used to stratify: an IADL summary score, the Cognitive Performance Scale, a clinical risk summary scale, and ADL Long summary scale (Morris *et al.*, 2013b). The updates on the risk adjustment will be dealt at the risk adjustment section.

In this dissertation, the second-generation HCQIs was used to compare the quality of care for older Korean Canadians, Chinese Canadians, and other Canadians. All HCQIs discussed and used in the method section refer to the second-generation HCQIs. The next two sections describe the different QIs developed for use in other settings, and explain the risk adjustment process used to calculate the HCQIs.

2.4.1.2 Other interRAI Quality Indicators

Different versions of QIs are available for use across different jurisdictions. Similar to HCQIs, QIs in other jurisdiction have somewhat different measures that are appropriate to that specific setting. Mental Health QIs, first developed in 2000, include a total of 27 indicators measuring the prevalence QIs on adverse events as well as incidence QIs based on improvement, incidence, or failure to improve in clinical domains (Hirdes *et al.*, 2000; Perlman *et al.*, 2013).

Long-Term Care QIs, first developed in 1995 have been revised and now include a total of 39 indicators measuring mental and physical functions, treatments and procedures, and health problems (Estabrooks *et al.*, 2013; Frijters *et al.*, 2013; Jones *et al.*, 2010b; Mor *et al.*, 2003a; Mor, 2005; Mor, 2006; Rantz & Connolly, 2004; Sales *et al.*, 2011; Zimmerman *et al.*, 1995).

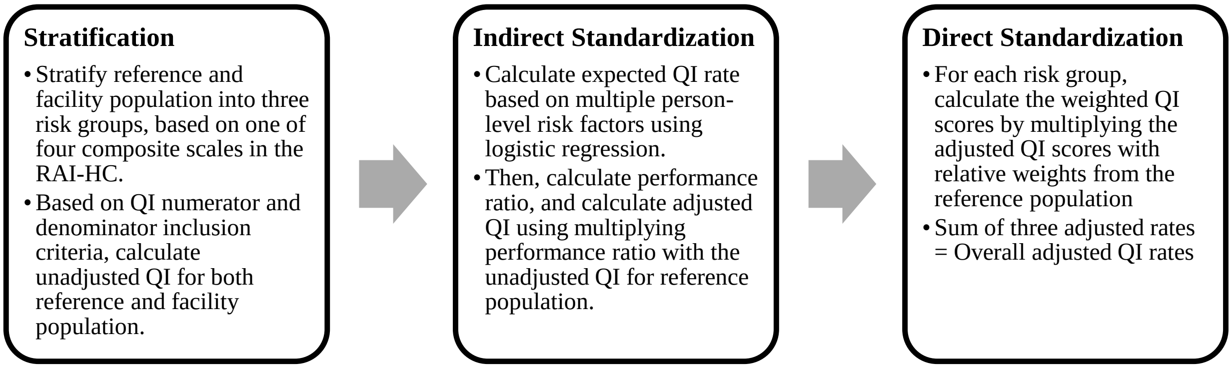
Acute Care QIs, developed in 2011, include 11 incidence QIs that investigate functional declines, falls, pressure ulcer, delirium, readmission and death in hospital (Brand *et al.*, 2011; Martin-Khan *et al.*, 2013).

2.4.1.3 Risk Adjustment

Within the context of HCQIs, the risk adjustment process, used to “level the playing field” (Zimmerman *et al.*, 1995), controls for the unequal distribution of client-level or agency-level characteristics to allow for fair comparisons among different agencies (Dalby *et al.*, 2005; Hirdes *et al.*, 2004; Jones *et al.*, 2010b). When regions or agencies are compared, client-level or agency-level differences are accounted for by incorporating different covariates into a regression model and using direct stratification, thereby reducing the effects of selection bias and different admission patterns for providers who treat more impaired or clinically complex clients (Hirdes *et al.*, 2004). Moreover, as the risk adjustment process enables fair comparisons among health providers, health care professionals and decision makers can identify opportunities for quality improvement by sharing best practices between best and worst performing providers (Jones *et al.*, 2010b).

When selecting covariates for the indirect standardization using regression models, it is better to have simpler models based on covariate with powerful effects than complex models with excessive number of covariates with subtle effects. The models need to be translatable into benchmarking systems that are practical for day-to-day use. Moreover, the risk adjustment should not include covariates that are quality issues under the control of the agency (Hirdes *et al.*, 2004). Likewise, inclusion and exclusion criteria must be clear and appropriate as these limit the targets to represent a true potential quality problem (Carpenter & Hirdes, 2013; Hirdes *et al.*, 2004).

The risk adjustment for the second-generation HCQIs was based on the two-step adjustment that was also used for developing the nursing home QIs. It involves two main techniques: stratification and an indirect standardization. Stratification involves categorizing discrete risk groups with one of the four types of composite scales. Indirect standardization involves the use of multivariate regression models to adjust for covariates that are included within the model (Jones *et al.*, 2010b).



Stratification

- Stratify reference and facility population into three risk groups, based on one of four composite scales in the RAI-HC.
- Based on QI numerator and denominator inclusion criteria, calculate unadjusted QI for both reference and facility population.

Indirect Standardization

- Calculate expected QI rate based on multiple person-level risk factors using logistic regression.
- Then, calculate performance ratio, and calculate adjusted QI using multiplying performance ratio with the unadjusted QI for reference population.

Direct Standardization

- For each risk group, calculate the weighted QI scores by multiplying the adjusted QI scores with relative weights from the reference population
- Sum of three adjusted rates = Overall adjusted QI rates

Figure 1. Schematic representation of risk adjustment strategy used for interRAI's HCQIs

2.4.1.3.1 Stratification

The first step is to stratify the reference population into three risk groups using one of the four types of composite scales from the RAI-HC/interRAI assessments: an IADL summary score, the Cognitive Performance Scale, a clinical risk summary scale, and ADL Long summary scale. Then calculate relative weights and unadjusted QI score for each risk group (Canadian Institute for Health Information, 2013).

Next, organizational populations are stratified into three risk groups using one of the four types of composite scales: an IADL summary score, the Cognitive Performance Scale, a clinical risk summary scale, and ADL Long summary scale. The number of clients in each risk group that meet the criteria for the numerator and denominator definitions are then determined. Finally, the unadjusted QI scores for each risk group are calculated (Canadian Institute for Health Information, 2013).

2.4.1.3.2 Indirect Standardization

For indirect standardization, one must calculate the expected scores for each risk group using logistic regression models per group. Then calculate performance ratio (Observed QI/Expected QI) for facility population. Then calculate the adjusted QI score for each risk group by multiplying the performance ratio with the unadjusted QI scores for reference population (Canadian Institute for Health Information, 2013).

2.4.1.3.3 Direct Standardization

Finally, the weighted QI scores are multiplied by the adjusted QI scores for each risk group with relative weights from the reference population. The sum of the three weighted adjusted scores is obtained to get the overall adjusted QI for the organization (Canadian Institute for Health Information, 2013).

2.4.1.4 Studies Using Home Care Quality Indicators

Several studies have used the first-generation HCQIs to investigate the effects of the risk adjustment on identifying the quality practices across different settings and in different programs within home care (Bos *et al.*, 2007; Dalby *et al.*, 2005; Fries *et al.*, 2003; Mofina & Guthrie, 2014; Sales *et al.*, 2011). Dalby and Hirdes (2008) used HCQIs to examine the relationship between agency characteristics and quality of home care, and they discovered that the summary measure of quality was negatively correlated with the size of the population, suggesting a lower quality of home care with a larger population. Bos *et al.* (2007) also examined the variability of HCQIs by comparing the home care quality among 11 countries and detected variances across countries. Similarly, Sales *et al.* (2011) used HCQIs to identify and prioritize the indicators for quality improvement within continuing care. Lastly, Mofina and Guthrie (2014) applied HCQIs to compare quality in Ontario and Manitoba, and found significant levels of functional and cognitive impairment, health instability, and daily pain in home care clients from these two regions.

Due to its recent development, there is only one study by Foebel *et al.* (2015) that used the second-generation HCQIs to assess the quality of home care services in six European countries. However, there are no studies that used the second-generation HCQIs to investigate the disparities in quality of home care for immigrants and the general population in Canada. The following two chapters present the rationale and methods for this dissertation.

3. Study Rationale

3.1 Proposed Research

This dissertation attempts to examine the health disparities in older Korean Canadian home care clients by investigating their health and health service use, informal caregiver distress, and quality of care by comparing four groups: Korean Canadians, native Koreans, Chinese Canadians, and other Canadians. This is the first study to cross-culturally examine the community-residing Korean older adults in Ontario and in Korea using the RAI-HC/interRAI HC and the second-generation HCQIs. The results of this dissertation may promote the health status of older Koreans, highlight the services that they need, determine the quality of care that they receive, and also suggest better policies to address social and health inequities that may arise from immigration. Ethics clearance for secondary analysis of the data was provided by the Office of Research Ethics at the University of Waterloo (certificate #20652).

3.1.1 A Health Profile of Older Korean Canadians, Native Koreans, Chinese Canadians, and Other Canadians

Chapter 5 provides a foundation for understanding health disparities in community-residing older Korean immigrants in Ontario. Through cross-cultural comparisons of socio-demographic, and clinical characteristics, as well as health service use among Korean Canadians, native Koreans, Chinese Canadians, and other Canadians; this chapter offers comprehensive evidence of health disparities affecting Korean Canadians.

3.1.2 Informal Caregiver Distress among Older Korean Canadians, Chinese Canadians, and Other Canadians

Chapter 6 investigates informal caregiver distress in older Korean Canadian home care clients. The influence of cultural traditions of “Hyo” will be examined using cross-cultural comparisons among Korean Canadians, Chinese Canadians, and other Canadians in Ontario using bivariate and multivariate logistic regression models, and generalized estimating equations (GEE). This chapter offers the risk and protective factors associated with informal caregiver distress that can be used to prioritize caregivers for programs.

3.1.3 Home Care Quality Indicators in Older Korean Canadians, Chinese Canadians, and Other Canadians

Chapter 7 examines the quality of care that Korean older home clients receive in Ontario. The second-generation HCQIs will be used to inform quality gaps that may exist in the care that different ethnic groups may receive, and to identify areas for improvement.

3.2 Research Goals

Canada is a multicultural society. Immigration plays a central role in Canada, thus the social structure and approaches to health service delivery need to be adapted accordingly. However, Canada’s health care system may be poorly adapted to the needs of immigrants, possibly leading to further marginalization and health inequities (Swinkels *et al.*, 2011).

Korean Canadians are one of the fastest growing non-European ethnic groups in Canada; however, there is limited research on this minority group. The present research is the first cross-cultural study that investigates the health and health service use, informal caregiver distress, and quality of care of older Korean home care clients using the RAI-HC and the second-generation HCQIs. Through this research, there is a great potential for the development of evidence to emphasize the health of immigrants and the quality of care that they receive. Further, the cross-cultural comparison among Korean Canadians, native Koreans, Chinese Canadians, and other Canadians will also inform policy makers of the challenges and needs that arise due to immigration.

4. Methods

4.1 Data Sources and Linkages

This research was based on secondary data analysis of health information from two different datasets, one from Ontario and the other from Korea. The Ontario health information was based on the Resident Assessment Instrument-Home Care (RAI-HC), an assessment tool used to identify the person's functioning and quality of life that addresses needs, strengths, and preferences in a broad range of domains (Canadian Home Care Association, 2013; Morris *et al.*, 1997; Morris *et al.*, 2009). This health information is managed by the Canadian Institute for Health Information (CIHI) and was made available through the partnership between CIHI and the University of Waterloo. The health information from Korea was obtained using the interRAI Home Care (interRAI HC) assessment tool. The interRAI HC is the updated version of RAI-HC but data from both can be compared with only modest adjustments (Gray *et al.*, 2009; Hirdes *et al.*, 2008a).

The personal identifiers in the RAI-HC, such as name and health card number, have been stripped from the record or encrypted in a way that prevents identification prior to the transmission of the data to a secure server at the University of Waterloo.

4.1.1 The Resident Assessment Instrument Home Care (RAI-HC)

The Resident Assessment Instrument Home Care (RAI-HC), first introduced in 1997, is a person-centered assessment system. Developed for use with clients in home and community-based settings, the RAI-HC contains 21 sections including personal information and over 350 items across a wide range of domains, such as socio-demographics, health, functional status, and resources and service use (Morris *et al.,* 1997). The RAI-HC can be used to support a variety of functions, including outcome measurement based on scales, which measure clients' clinical status over time, and Clinical Assessment Protocols (CAPs), which provide guidelines for further assessment and person-centered care planning (Hirdes *et al.*, 1999).

All assessments are performed and completed by trained health professionals, mostly nurses, as part of the standard clinical assessment done for all home care clients within 14 days of contacting the Community Care Access Centre (CCAC). These organizations coordinate the home care services and are reassessed every six months thereafter or upon a significant change in their health status (Canadian Home Care Association, 2013).

The assessment, automated and integrated with the CCAC care management information system, is done in-person using a laptop in the client's environment, mostly his/her home. It takes approximately 40 minutes to an hour to complete all the items, with flexible order of completion of sections, based on direct interviews of clients and their caregivers, as well as reviews of available records and information gained from other formal caregivers (Carpenter & Hirdes, 2013). This process requires synthesis of all credible information using professional judgement by the assessor. After completion of the assessment, the automated tool generates measures that assist the case manager to develop a client tailored plan of service that addresses the client's identified needs (Canadian Home Care Association, 2013). The interRAI Home Care (HC) assessment form and user's manual has further instructions and includes details about the interRAI HC assessment system, item-by-item guide, and a sample form (Morris et al., 2009).The RAI-HC has been shown to have sound psychometric properties, and the items and scales in the assessment have demonstrated good validity, inter-rater reliability and internal consistency (Hirdes *et al.*, 2008a; Landi *et al.*, 2000; Morris *et al.*, 1997; Poss *et al.*, 2008b).

Morris *et al.* (1997) reported a substantial reliability of Minimum Data Set - Home Care (MDS-HC) with an average weighted kappa value of 0.74 ranging from 0.36-0.91. Landi *et al.* (2000) tested the agreement between the MDS-HC scales and various widely used rating scales (e.g., Mini Mental State Examination) using the Pearson's correlation coefficient and found excellent agreements with coefficients ranging from 0.74 to 0.81. Further, Hirdes *et al.* (2008a) reported a substantial overall reliability of the interRAI HC with a mean kappa value of 0.69. Another review by Poss *et al.* (2008b) on the RAI 2.0 for nursing homes reported acceptable to high inter-rater reliability and excellent predictive and criterion validity in most of the clinical domains and scales.

The RAI-HC has been mandated for use in eight Canadian provinces and territories, including Ontario (Canadian Home Care Association, 2013). It has been used extensively in other countries such as Denmark, Finland, Iceland, Norway, Sweden, Czech Republic, France, Germany, Italy, Netherlands, and England (Carpenter *et al.*, 2004; Carpenter & Hirdes, 2013; Sørbye *et al.*, 2009). In addition to its clinical applications, the RAI-HC can be used for case-mix classification (Björkgren *et al.*, 2000; Poss *et al.*, 2008a) and quality measurement (Dalby *et al.*, 2005; Bos *et al.*, 2007; Hirdes *et al.*, 2004; Morris *et al.*, 2013b; Perlman *et al.*, 2013).

4.1.1.1 Clinical Scales in the RAI-HC

A number of scales representing different clinical and risk domains can be calculated using the items in the RAI-HC. When used longitudinally, these scales may be used for outcome measurement. The Activities of Daily Living Hierarchy (ADLH) scale measures physical disability, with scores ranging from 0 (no impairment) to 6 (total dependence) by considering performance in early loss (e.g., dressing) to late loss (e.g., eating) areas of function (Landi *et al.*, 2000; Morris *et al.*, 1997; Morris *et al.*, 1999). The Instrumental Activities of Daily Living (IADL) Hierarchy scale, which ranges from 0 to 6, considers meal preparation, housework, shopping, finances and medications, with higher scores indicating greater difficulty in IADL (Morris *et al.*, 2013a). The interRAI IADL-ADL Functional Hierarchy Scale was created in 2013 through a combination of both the ADL Hierarchy and IADL Hierarchy Scales and it ranges from 0 to 11, with higher scores indicating greater functional impairments (Morris *et al.*, 2013a). The Changes in Health, End-stage disease and Signs and Symptoms (CHESS) scale identifies individuals at risk of serious health decline, with scores ranging from 0 (not at all unstable) to 5 (highly unstable) (Armstrong *et al.*, 2010; Hirdes *et al.*, 2003; Hirdes *et al.*, 2014). The Cognitive Performance Scale (CPS) is based on memory impairment, level of consciousness, and executive function, with scores ranging from 0 (intact) to 6 (very severe impairment) (Jones *et al.*, 2010a; Landi *et al.*, 2000; Morris *et al.*, 1994; Wellens *et al.*, 2013). The Depression Rating Scale (DRS) screens for depressive symptoms, with values ranging from 0 (no depressive symptoms) to 14 (severe depressive symptoms) (Burrows *et al.*, 2000; Martin *et al.*, 2008; Szczerbińska *et al.*, 2011). The interRAI Pain scale uses frequency and intensity of pain to create a score from 0 to 3, with higher scores indicating greater pain (Fries *et al.*, 2001). Finally, the Method for Assigning Priority Levels (MAPLe) decision support algorithm, which ranges from low to very high, with higher scores indicating greater needs, has been shown to predict nursing home placement, caregiver distress, and ratings that the “client would be better off in other living environment” in many different international jurisdictions (Hirdes *et al.*, 2008b). MAPLe has also been validated as a predictor of institutionalization from acute hospital settings to nursing homes (Noro *et al.*, 2010). Hence, all scales used in this dissertation have sound psychometric properties and have been tested and used in many different studies (Morris *et al.*, 1997; Morris *et al.*, 1999; Landi *et* *al.*, 2000; Hirdes *et al.*, 2008a; Wellens *et al.*, 2013). Appendix A describes the RAI-HC scale and the categories for each level of the scale in greater detail.

4.1.1.2 Clinical Assessment Protocols (CAPs)

Clinical Assessment Protocols (CAPs) are derived from specific combinations of items from the RAI-HC assessment that are known to identify the presence or imminent presence of specific health problems that has potential for improvement or at risk of decline. Once triggered or prompted, CAPs lead to a more in-depth review of the causes of the client's identified problems or presenting risk, with the aim of developing an individualized care plan to deliver care to complex clinical problems with best-practice guidelines. There are four domains and a total of 22 problem-oriented CAPs that can also be used to monitor client's progress (Morris *et al.*, 2010).

The functional performance domain includes physical activities promotion, instrumental activities of daily living, activities of daily living, home environment optimization, and institutional risk. The cognition/ mental health domain includes cognitive loss, delirium, communication, mood, behavior, and abusive relationships. The social life domain includes informal support and social relationships. Lastly, the clinical issues domain includes falls, pain, pressure ulcers, cardio-respiratory conditions, dehydration, feeding tube, appropriate medication, urinary incontinence, and bowel conditions (Morris *et al.*, 2010).

4.2 Study Population

The research sample was drawn from the population of all long-stay home care clients admitted during the study period between January 2002 and March 2015 in Ontario and between February 2011 and October 2012 in the Republic of Korea. Long-stay home care clients were defined as clients who require more than 60 uninterrupted days of service through a home care agency. The sample only consisted of long-stay home care clients aged 65 and older. Using a variable for primary language, Korean and Chinese clients in Ontario were identified. As a result, primary languages other than Korean and Chinese were grouped as ‘others’, referring to other Canadians. For the analyses and results, Korean home care clients in Ontario were referred to as ‘Korean Canadians’, Korean home care clients in Korea were referred to as ‘native Koreans’, Chinese home care clients in Ontario were referred to as ‘Chinese Canadians’, and other Canadian home care clients in Ontario were referred to as ‘other Canadians’. Although, most of the data came from Ontario, these home care clients were referred as Canadians rather than Ontarians for the convenience purpose.

5. A Health Profile of Older Korean Canadians, Native Koreans, Chinese Canadians, and Other Canadians

5.1 Introduction

Immigration brings many different changes to life for immigrants including lifestyle, diet, culture, and language. A language difference is one of the most important barriers to adapting to these changes. Better language acquisition among young immigrants is an important contributor to this adaptation (Hakuta *et al.*, 2003). Usually, immigrants are better acculturated to a host culture with a longer exposure, but only when it happens at young age (Cheung *et al.*, 2011).

In contrast to immigration at young age, immigration later in life is often stressful as immigrants are uprooted from their native society and the cultural adjustments and language barriers are likely to be more severe (Hynie *et al.*, 2011; Kim, 2006; Kim *et al.*, 2014; Mui, 1996; Mui, 2001; Yoo, 2014). Challenges such as discrimination, language barriers, lack of social resources, and feelings of detachment from the new society may arise when adapting to the host environment and this may be especially true for elderly Asian immigrants (Bernstein *et al.*, 2011; Hossen, 2012; Kiefer *et al.*, 1985; Kim, 2006; Lai & Chau, 2007; Mui, 2001; Noh, 2008; Noh & Kaspar, 2003; Noh *et al.*, 2007; Yoo, 2014). Difficulties coping with the new society combined with the lack or inappropriate use of the resources can increase social isolation, depression, and other health concerns (Kang *et al.*, 2013). These also affect the life and health of other family members as the older members of the family become more dependent on informal caregivers (Chung, 2013; Han *et al.*, 2008; Kim & Knight, 2008; Kwak & Lai, 2012; Lee & Farran, 2004; Yoo, 2014; Wong *et al.*, 2005). However, these struggles have often been overlooked as priorities to address in immigration policies.

Koreans have been one of the fastest growing groups of immigrants in Canada, with a growth rate of 42% from year 2001 to 2006, and it is estimated that approximately 6% of Korean immigrants are aged 65 and older (Kwak & Hiebert, 2010; Statistics Canada, 2006). However, only a limited amount of research on Korean immigrants has been done in Canada, and fewer than a dozen studies have been done on older Korean Canadians.

Past studies on older Korean immigrants in Canada include two studies by Kim and Chen (2011) and Kim *et al.* (2014) that investigated depression in older Korean immigrants and reported that social determinants and English proficiency were key factors in influencing depression. Another two studies by Kim (2009) and Kim (2012) examined alcohol use and found changes in alcohol consumption due to Canadian alcohol policies, revealed higher consumption with being married and having lower religiosity, and demonstrated a positive correlation between drinking and depression in men. Lastly, two studies on the health experiences of Korean immigrant women adjusting to Canadian society found that regularly attending Korean church and exercise helped their adjustment and enhanced their health (Choi *et al.*, 2014a, Choi *et al.*, 2014b).

Two theses exist on older Korean immigrants in Canada. Yoon (2008) studied the aging experience of elderly Korean immigrant women and found that, even though family continues to be a major source of support to the lives of the participants, Korean immigrant women preferred to live alone because it is a symbol for an autonomy and independence. Another thesis by Kwak (2010) examined how social support in older Korean immigrants promotes social involvement, relieves financial insecurity, and alleviates feelings of being a burden. An update of this thesis by Kwak and Lai (2012) concluded that a combination of social support and social services are necessary for older Korean immigrants to have successful adjustment to a new environment.

However, there are no studies that comprehensively looked at health and health service use of older Korean immigrants in Canada.

This chapter examined health disparities in older Korean immigrants by comparing health and health service use of Korean Canadians, native Koreans, Chinese Canadians, and other Canadians. This study was built on a previous study done by Chang and Hirdes (2015), which compared only Korean Canadians, Chinese Canadians and other Canadians. In order to explore the health service use, the Andersen and Newman Framework was referenced.

The Andersen and Newman Framework is a behavioural model devised to determine factors that facilitate or impede health services utilization (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973). The framework is composed of three individual level factors: predisposing factors, enabling factors, and need factors. Predisposing factors are socio-cultural and biological characteristics of an individual that include age, gender, education, race and ethnicity, immigration status, health beliefs, and culture (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973). Enabling factors are conditions or resources which facilitate (or impede) access to health services by the individual such as health literacy, language barriers, income, health insurance, and presence of family physician (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973). Need factors or illness level, where the subjective perception of one's illness and the objective assessment of one's illness, represent the most immediate cause that generate the use of health services (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973). Based on these factors, the model predicts health service utilization based on individual attributes. This framework suggests that more enabling factors lead to greater use of health services and mixture of predisposing and need factors affect equity in access (Andersen, 1995; Andersen, 2008; Andersen & Newman, 1973).

5.2 Methods

5.2.1 Data sources

This study was based on secondary data analysis of health information from two different datasets (one from Ontario and the other from Korea) using the Resident Assessment Instrument–Home Care (RAI-HC) and the interRAI Home Care (interRAI HC).

The RAI-HC, first introduced in 1997, is a person-centered assessment system, developed for use with clients in home and community-based settings. It contains 21 sections including personal information and over 350 items across a wide range of domains, such as socio-demographics, health, functional status, and resources and service use (Morris *et al.*, 1997). The RAI-HC can be used to support a variety of functions, including outcome measurement based on scales, which measure clients' clinical status over time, and Clinical Assessment Protocols (CAPs), which provide guidelines for further assessment and person-centered care planning (Hirdes *et al.*, 1999). All assessments are performed and completed by trained health professionals, mostly nurses, as part of the standard clinical assessment done for all home care clients. It usually takes 40 minutes to an hour to complete all the items based on direct interviews of clients and their caregivers as well as reviews of available records and information gained from other formal caregivers (Carpenter & Hirdes, 2013). The interRAI HC is the updated version of RAI-HC but data from both can be compared with only modest adjustments (Gray *et al.*, 2009; Hirdes *et al.*, 2008a).

5.2.2 Sample

The sample consisted of Korean Canadians aged 65 and older who were assessed with the RAI-HC between January 2002 and March 2015 (N = 1,093), Chinese Canadians aged 65 and older who were assessed with the RAI-HC between January 2002 and March 2015 (N = 13,176), native Koreans aged 65 and older who were assessed with the interRAI HC in Korea between February 2011 and October 2012 (N = 287), and other Canadians aged 65 and older who were assessed with the RAI-HC between January 2002 and March 2015 (N = 613,065). Clients' initial assessment records in the RAI-HC and interRAI HC dataset were used for these analyses.

5.2.3 Measures

A number of scales representing different clinical and risk domains can be calculated using the items in the RAI-HC. When used longitudinally, these scales may be used for outcome measurement. The Activities of Daily Living Hierarchy (ADLH) scale measures physical disability, with scores ranging from 0 (no impairment) to 6 (total dependence) by considering performance in early loss (e.g., dressing) to late loss (e.g., eating) areas of function (Landi *et al.*, 2000; Morris *et al.*, 1997; Morris *et al.*, 1999). The Instrumental Activities of Daily Living (IADL) Hierarchy scale, which ranges from 0 to 6, considers meal preparation, housework, shopping, finances and medications, with higher scores indicating greater difficulty in IADL (Morris *et al.*, 2013a). The interRAI IADL-ADL Functional Hierarchy Scale was created in 2013 through a combination of both the ADL Hierarchy and IADL Hierarchy Scales and it ranges from 0 to 11, with higher scores indicating greater functional impairments (Morris *et al.*, 2013a). The Changes in Health, End-stage disease and Signs and Symptoms (CHESS) scale identifies individuals at risk of serious health decline, with scores ranging from 0 (not at all unstable) to 5 (highly unstable) (Armstrong *et al.*, 2010; Hirdes *et al.*, 2003; Hirdes *et al.*, 2014). The Cognitive Performance Scale (CPS) is based on memory impairment, level of consciousness, and executive function, with scores ranging from 0 (intact) to 6 (very severe impairment) (Jones *et al.*, 2010a; Landi *et al.*, 2000; Morris *et al.*, 1994; Wellens *et al.*, 2013). The Depression Rating Scale (DRS) screens for depressive symptoms with values ranging from 0 (no depressive symptoms) to 14 (severe depressive symptoms) (Burrows *et al.*, 2000; Martin *et al.*, 2008; Szczerbińska *et al.*, 2011). The interRAI Pain scale uses frequency and intensity of pain to create a score from 0 to 3, with higher scores indicating greater pain (Fries *et al.*, 2001). Finally, the Method for Assigning Priority Levels (MAPLe) decision support algorithm, which ranges from low to very high with higher scores indicating greater needs, has been shown to predict nursing home placement, caregiver distress, and ratings that the “client would be better off in other living environment” in many different international jurisdictions (Hirdes *et al.*, 2008b). MAPLe has also been validated as a predictor of institutionalization from acute hospital settings to nursing homes (Noro *et al.*, 2010). Hence, all scales used in this dissertation have sound psychometric properties and have been tested and used in many different studies (Morris *et al.*, 1997; Morris *et al.*, 1999; Landi *et al.*, 2000; Hirdes *et al.*, 2008a; Wellens *et al.*, 2013).

Items including socio-demographic, diagnostic and health characteristics in the RAI-HC/interRAI HC were compared individually: age group (65-74, 75-84, 85+), gender, marital status, disease diagnoses (e.g., heart failure, Alzheimer’s and other related dementia, stroke, emphysema, diabetes, cancer, and hypertension), other health issues (e.g., fell in last 90 days, unsteady gait, shortness of breath, bathes independently, and self-rated health), bladder and bowel incontinence, mental health (any anxiety symptoms, delirium, any aggressive behavior, and hallucinations/delusions), social and economic issues (made economic trade-offs, conflict with others, and social isolation), and communication (expression impairments, comprehension impairments, and interpreter needed). In addition, selected informal caregiving variables including living arrangements and caregiver distress were compared. Also, selected health services and interventions resources (e.g., physical therapy, occupational therapy, nurse visits, personal support/ home making services, oxygen therapy, dialysis, intravenous, wound care, influenza vaccine, and mammogram) were compared.

Clinical scales within the RAI-HC/interRAI HC were also compared, including CPS, DRS, CHESS, MAPLe, Pain, and interRAI IADL-ADL Functional Hierarchy Scale. These scales were collapsed into different categories using cut-offs used by Hirdes *et al.* (2011). Moreover, selected CAPs within the RAI-HC/interRAI HC were also compared.

Ethnicity was identified using the RAI-HC assessment item on primary language. Using a language as a classification or substitute for ethnicity has been validated elsewhere (Rezai *et al.*, 2013). Case managers completing the assessment used standard language codes provided by the Canadian Institute for Health Information as part of the Home Care Reporting System technical specifications. Ethnicity for native Koreans were not inferred because they were all assumed to have lived in that country for a substantial time period. In addition, an item on the need for an interpreter examined English/French fluency directly based on the client or caregivers response, so it is not inferred from the ethnicity. The need for an interpreter item was not part of the interRAI HC in Korea; however, this was not a problem as native Koreans were assumed to be fluent in speaking Korean.

5.2.4 Analysis

Descriptive statistics with percentages and frequencies were used to examine the health profile of older Korean Canadians compared to native Koreans, Chinese Canadians, and other Canadians. In this analysis, only the home care clients aged 65 and older were included.

Bivariate differences in socio-demographics, clinical characteristics, health and health service use by different groups were evaluated using chi-square analysis (alpha level $p<0.05$). All statistical analyses were performed using SAS software (Version 9.4).

5.3 Results

Table 1 provides the percentage of home care clients with selected socio-demographic, diagnostic and health characteristics by ethnicity. Korean Canadians had a somewhat higher percentage of women (68%) and tended to be older (46% of clients aged 85 and older), whereas native Koreans had a somewhat lower percentage of women (60%) and tended to be younger (26% of clients aged 85 and older) than the other two groups. However, native Korean males were substantially more likely to be married than other male groups.

The distributions of medical diagnoses were relatively comparable between the four groups, except Korean Canadians and native Koreans had notably higher rates of Alzheimer’s and other related dementia (ADRD) (26% and 31%, respectively) than Chinese Canadians who had the lowest rates of ADRD (20%). However, Korean Canadians and native Koreans had lower rates of cancer (9% and 4%, respectively) than Chinese Canadians and other Canadians (13% and 16%, respectively). Moreover, Korean Canadians and native Koreans had slightly higher rates of diabetes (32% and 31%, respectively) than Chinese Canadians and other Canadians (28% and 24%, respectively). However, other Canadians had twice the rate of heart failure (13%), emphysema/COPD (17%), and shortness of breath (27%) compared to the three Asian groups. Surprisingly, native Koreans had significantly higher rates of stroke (45%), but lower rate of hypertension (24%) compared to three other groups. Native Koreans also demonstrated lower falls (8%), unsteady gait (40%), and bathing independently (7%).

Nevertheless, Native Koreans had the highest rates of poor self-rated health, bladder and bowel incontinence followed by Korean Canadians. Native Koreans also had substantially higher rates in any anxiety symptoms and delirium (28% and 17%, respectively). Moreover, native Koreans were more likely to make economic trade-offs (10%) compared to three other groups. Korean Canadians had slightly higher rates of any aggressive behaviors (11%) and higher rates of conflict with others (19%) compared to other three groups.

The rates of expressive and receptive deficits in communication were also highest in native Koreans followed by Korean Canadians. The most dramatic difference between groups was with respect to need for an interpreter, where Korean Canadians (83%) and Chinese Canadians (87%) were about 10 times as likely to need an interpreter compared to other Canadians (9%).

Table 1. Percentage of home care clients with selected socio-demographic, diagnostic and health characteristics by ethnicity, Ontario, 2002-2015 and South Korea, 2011-2012

	Korean Canadians (N=1,093)		**Native Koreans (N=287)**		**Chinese Canadians (N=13,176)**		**Other Canadians (N=613,065)**				
Characteristic	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**df**	**X^2test**	**P-value**
Female	67.5	(738)	59.9	(172)	62.9	(8,285)	62.8	(384,817)	3	11.6	0.009
Age Group									6	327.6	<.0001
65-74	17.3	(189)	27.2	(78)	14.4	(1,901)	20.2	(123,971)			
75-84	36.5	(399)	46.3	(133)	46.3	(6,096)	43.1	(264,211)			
85 and older	46.2	(505)	26.5	(76)	39.3	(5,179)	36.7	(224,956)			
Married									3	16.4	0.0009
Male	73.0	(259)	87.8	(101)	73.0	(3,572)	62.2	(141,883)			
Female	22.5	(166)	25.0	(43)	30.0	(2,487)	27.2	(104,855)			
Overall	38.9	(425)	50.2	(144)	46.0	(6,059)	40.2	(246,738)			
Diagnosis											
Heart Failure	6.7	(73)	4.2	(12)	6.3	(828)	13.1	(80,391)	3	591.3	<.0001
Alzheimer's/Dementia	25.5	(279)	30.7	(88)	20.3	(2,681)	23.9	(146,790)	3	100.7	<.0001
Stroke	15.9	(174)	44.6	(128)	13.3	(1,758)	16.4	(100,468)	3	255.5	<.0001
Emphysema/COPD	6.1	(67)	5.2	(15)	8.0	(1,060)	16.8	(103,095)	3	830.3	<.0001
Diabetes	32.1	(351)	30.7	(88)	27.8	(3,657)	24.4	(149,558)	3	119.2	<.0001
Cancer	9.3	(102)	3.8	(11)	12.7	(1,672)	16.1	(98,848)	3	181.3	<.0001
Hypertension	61.0	(667)	23.7	(68)	64.3	(8,476)	57.1	(350,057)	3	413.8	<.0001
Health Issues											
Fell in last 90 days	39.4	(431)	8.4	(24)	38.6	(5,085)	39.0	(239,185)	3	114.3	<.0001
Unsteady gait	68.8	(752)	39.7	(114)	66.4	(8,755)	62.6	(383,903)	3	162.9	<.0001
Shortness of breath	14.9	(163)	18.5	(53)	16.8	(2,220)	26.6	(163,003)	3	713.5	<.0001
Poor self-rated health	24.7	(270)	47.7	(137)	23.2	(3,062)	19.0	(116,318)	3	327.1	<.0001
Bathes independently	20.2	(221)	7.3	(21)	25.5	(3,362)	26.1	(159,942)	3	74	<.0001
Occasional/ Worse Incontinence											
Bladder	32.8	(359)	41.1	(118)	24.9	(3,285)	27.4	(168,000)	3	83.5	<.0001
Bowel	14.9	(163)	45.3	(130)	9.8	(1,286)	9.0	(55,262)	3	512.4	<.0001
Mental Health											
Any anxiety Symptoms	20.4	(223)	28.2	(81)	17.6	(2,323)	15.6	(95,574)	3	93.9	<.0001
Delirium	3.7	(40)	17.1	(49)	2.3	(301)	2.9	(17,520)	3	227.3	<.0001
Any Aggressive Behavior	10.8	(118)	8.7	(25)	7.0	(925)	8.5	(51,958)	3	43.1	<.0001
Hallucinations/Delusions	6.2	(68)	3.5	(10)	3.4	(446)	3.8	(23,535)	3	24.2	<.0001
Social & Economic Issues											
Made economic trade-offs	1.9	(21)	9.8	(28)	1.3	(167)	1.2	(7,447)	3	178.2	<.0001
Conflict with others	19.3	(211)	13.6	(39)	14.0	(1,851)	12.9	(78,911)	3	55.9	<.0001
Social Isolation	39.8	(435)	38.7	(111)	37.1	(4,888)	44.4	(272,092)	3	289.8	<.0001
Communication											
Expression Impairments	17.8	(195)	39.7	(114)	11.6	(1,528)	10.0	(61,183)	3	391.4	<.0001
Comprehension Impairments	18.6	(203)	42.5	(122)	13.5	(1,784)	11.2	(68,765)	3	407	<.0001
Interpreter needed	83.3	(910)	-	(-)	86.9	(11,456)	8.7	(53,618)	3	90033.7	<.0001

Table 2 provides the distribution of selected informal caregiving variables by ethnicity. Native Koreans were much less likely to live alone or to live only with their spouse compared with other groups. On the other hand, three Asian groups were about twice as likely as other Canadians to live with their child only. Similarly, native Koreans, Korean Canadians, and Chinese Canadians were also much more likely to live with their primary and secondary caregivers than other Canadians. However, all groups' primary and secondary caregivers were more likely to be a child or spouse. The rates of caregiver distress were highest in Korean Canadians (35%) followed by native Koreans (31%) and Chinese Canadians (30%), and the lowest in the other Canadians (23%).

Table 2. Percentage distribution of selected informal caregiving variables by ethnicity, Ontario, 2002-2015 and South Korea, 2011-2012

	Korean Canadian (N=1,093)		**Native Korean (N=287)**		**Chinese (N=13,176)**		**Others (N=613,065)**				
Informal Caregiving Variable	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**df**	**X^2test**	**P-value**
Who lived with at referral									12	7545.1	<.0001
Lived alone	27.0	(295)	10.5	(30)	21.8	(2,876)	34.0	(208,669)			
Lived with spouse only	27.2	(297)	19.5	(56)	23.7	(3,126)	31.7	(194,182)			
Lived with spouse and other (s)	9.1	(100)	28.6	(82)	18.1	(2,383)	6.2	(37,870)			
Lived with child (not spouse)	28.5	(311)	34.5	(99)	31.6	(4,168)	14.5	(88,863)			
Other living arrangements	8.2	(90)	4.5	(13)	4.7	(619)	13.6	(83,382)			
Primary helper lives with client	61.3	(670)	80.5	(231)	66.3	(8,737)	51.6	(316,386)	6	1266.3	<.0001
No such helper	3.0	(33)	3.1	(9)	1.4	(179)	2.2	(13,681)			
Secondary helper lives with client	27.7	(303)	33.8	(97)	33.1	(4,356)	14.0	(85,989)	6	4118.3	<.0001
No such helper	31.7	(346)	33.4	(96)	22.3	(2,936)	26.5	(162,692)			
Primary helper relationship to client									9	1361.2	<.0001
Child or child-in-law	62.8	(686)	58.2	(167)	66.7	(8,793)	52.5	(321,973)			
Spouse	26.3	(288)	31.0	(89)	26.1	(3,442)	31.3	(191,958)			
Other relative	4.8	(53)	1.0	(3)	4.5	(597)	8.1	(49,699)			
Friend/neighbor	3.0	(33)	1.4	(4)	1.2	(164)	5.9	(35,874)			
Secondary helper relationship to client									9	941.6	<.0001
Child or child-in-law	54.8	(599)	37.3	(107)	64.3	(8,466)	52.1	(319,576)			
Spouse	3.1	(34)	8.7	(25)	4.3	(562)	2.0	(11,984)			
Other relative	7.0	(76)	5.6	(16)	7.6	(996)	9.1	(55,495)			
Friend/neighbor	3.5	(38)	4.2	(12)	1.7	(225)	5.6	(34,134)			
Caregivers distressed/ overwhelmed	34.6	(378)	31.0	(89)	30.2	(3,978)	22.8	(139,514)	3	498.0	<.0001

Table 3 provides the distribution of various clinical algorithms and scale scores by ethnicity. Although the four groups had somewhat similar distributions for pain, there were clear differences with respect to MAPLe, depressive symptom, and cognitive and functional status. Native Koreans had the highest percentage with a CPS score greater than 3 (42%) followed by Korean Canadians (21%), indicating moderate or worse impairment in cognition. They also had the highest percentage with a DRS score greater than 3 (39%) followed by Korean Canadians (22%), indicating a potential depression.

Similarly, native Koreans and Korean Canadians’ interRAI IADL-ADL Functional Hierarchy Scale scores indicated higher rates of impairment (87% and 60% of clients scoring greater than 5, respectively). Notably, native Koreans had more than quintuple the proportion of clients scoring greater than 9 in the interRAI IADL-ADL Functional Hierarchy Scale compared with Korean Canadians (about 68% compared with 11%, respectively). However, native Koreans had about half the rate of health instability based on the CHESS scale (6%). These differences were also reflected in the MAPLe algorithm, which is a composite measure combining factors like ADL impairment, cognition, falls, IADL, and behaviour. Native Koreans and Korean Canadians had the largest proportion in the two highest MAPLe categories (57% and 51%, respectively) compared with Chinese Canadians and other Canadians.

Table 3. Distribution of clinical scale scores by ethnicity, Ontario, 2002-2015 and South Korea, 2011-2012

	Korean Canadian (N=1,093)		**Native Korean (N=287)**		**Chinese (N=13,176)**		**Others (N=613,065)**				
Clinical Scale	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**df**	**X^2test**	**P-value**
Pain Scale									6	175.0	<.0001
0	35.0	(383)	45.3	(130)	38.6	(5,082)	36.1	(221,362)			
1--2	52.5	(574)	46.3	(133)	53.6	(7,062)	51.7	(317,034)			
3+	10.0	(109)	7.7	(22)	6.4	(845)	9.6	(58,936)			
Cognitive Performance Scale									9	1137.6	<.0001
0	29.4	(321)	12.5	(36)	30.5	(4,016)	40.6	(249,006)			
1--2	49.6	(542)	40.4	(116)	56.4	(7,429)	47.1	(288,602)			
3--4	14.5	(159)	16.7	(48)	9.5	(1,251)	8.7	(53,075)			
5--6	6.5	(71)	25.1	(72)	3.6	(480)	3.7	(22,427)			
Depression Rating Scale									6	254.4	<.0001
0	50.8	(555)	22.3	(64)	58.3	(7,684)	59.7	(365,998)			
1--2	27.2	(297)	33.1	(95)	26.1	(3,438)	23.9	(146,448)			
3+	22.0	(241)	39.4	(113)	15.6	(2,052)	16.4	(100,509)			
interRAI IADL-ADL Functional Hierarchy Scale									9	2366.1	<.0001
0	1.2	(13)	3.1	(9)	1.3	(174)	2.4	(14,990)			
1--4	38.7	(423)	9.1	(26)	47.4	(6,246)	53.5	(328,190)			
5--8	48.9	(534)	18.8	(54)	41.9	(5,526)	37.6	(230,763)			
9+	11.3	(123)	68.3	(196)	9.3	(1,226)	6.4	(38,997)			
CHESS Scale									6	425.1	<.0001
0	26.3	(288)	41.5	(119)	28.8	(3,792)	22.7	(138,927)			
1--2	60.0	(656)	46.3	(133)	56.7	(7,474)	59.1	(362,131)			
3+	13.5	(148)	5.6	(16)	14.5	(1,910)	18.3	(112,030)			
MAPLe									6	654.5	<.0001
1--2	16.7	(182)	4.5	(13)	18.8	(2,478)	27.6	(169,240)			
3--3	31.9	(349)	30.0	(86)	35.0	(4,614)	31.4	(192,501)			
4--5	51.4	(562)	57.5	(165)	46.2	(6,084)	41.0	(251,397)			

*Note: In some cases, the number of cases is less than the full sample size because missing data are excluded.

Table 4 provides the percentage of home care clients receiving selected health services and medical interventions by ethnicity. The use of physical and occupational therapy were similar across groups; except Korean Canadians received lower physical therapy (9%), and native Koreans had a minimal occupational therapy (1%). Korean Canadians and Chinese Canadians had fewer nurse visits (18% and 16%, respectively) compared with other Canadians (31%); however, about 63% of native Koreans received nurse visits. Similarly, Korean Canadians and Chinese Canadians were much less likely to receive personal support or home making services (44% and 45%, respectively) compared with other Canadians (55%); however, about 81% of native Koreans received personal support or home making services.

Moreover, native Koreans were more likely to receive intravenous and wound care interventions, but less likely to receive influenza vaccines and mammogram compared with other groups. Native Koreans were much less likely to have emergency department visits and hospitalizations; similarly, Korean Canadians and Chinese Canadians were also less likely to have emergency department visits and hospitalizations compared to other Canadians.

Table 4. Percentage of home care clients receiving selected health services and medical interventions by ethnicity, Ontario, 2002-2015 and South Korea, 2011-2012

	Korean Canadian (N=1,093)		**Native Korean (N=287)**		**Chinese (N=13,176)**		**Others (N=613,065)**				
Resource Utilization	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**df**	**X^2 test**	**P-value**
Any Rehabilitation											
Physical Therapy									3	109.7	<.0001
No	91.2	(997)	87.1	(250)	89.1	(11,740)	86.3	(528,986)			
Yes	8.8	(96)	12.9	(37)	10.9	(1,435)	13.7	(84,120)			
Occupational Therapy									3	74.1	<.0001
No	81.1	(886)	98.6	(283)	81.8	(10,781)	83.3	(510,662)			
Yes	18.9	(207)	1.0	(3)	18.2	(2,394)	16.7	(102,444)			
Nurse Visits									3	1468.3	<.0001
No	81.7	(893)	36.9	(106)	83.8	(11,037)	69.5	(426,067)			
Yes	18.3	(200)	63.1	(181)	16.2	(2,138)	30.5	(187,053)			
Personal Support/Homemaking									3	609.8	<.0001
No	55.8	(610)	18.8	(54)	54.8	(7,227)	45.2	(277,411)			
Yes	44.2	(483)	81.2	(233)	45.1	(5,948)	54.8	(335,721)			
Medical Interventions											
Oxygen therapy	1.3	(14)	2.4	(7)	2.2	(287)	5.4	(32,964)	3	302.9	<.0001
Dialysis	2.5	(27)	2.4	(7)	1.8	(240)	1.2	(7,312)	3	61.0	<.0001
Intravenous	1.7	(19)	12.2	(35)	1.2	(160)	2.2	(13,269)	3	194.1	<.0001
Wound care	6.5	(71)	16.4	(47)	5.8	(765)	11.1	(68,074)	3	401.3	<.0001
Influenza vaccine	69.5	(760)	64.1	(184)	77.7	(10,240)	74.1	(454,222)	3	115.9	<.0001
Mammogram	8.5	(93)	2.4	(7)	11.9	(1,569)	12.9	(79,080)	3	57.7	<.0001
Emergency Department Visits									6	493.1	<.0001
None	84.6	(925)	93.4	(268)	84.2	(11,088)	76.9	(471,256)			
1	11.9	(130)	4.9	(14)	12.8	(1,691)	17.4	(106,887)			
2+	3.5	(38)	1.4	(4)	3.0	(397)	5.7	(34,977)			
Hospitalizations									6	439.2	<.0001
None	66.4	(726)	92.0	(264)	66.6	(8,780)	59.7	(365,775)			
1	30.2	(330)	4.9	(14)	29.5	(3,889)	34.5	(211,220)			
2+	3.4	(37)	3.1	(9)	3.8	(507)	5.9	(36,121)			

*Note: In some cases, the number of cases is less than the full sample size because missing data are excluded.

Table 5 presents the distribution of selected Clinical Assessment Protocols (CAPs) among ethnicity. For the functional performance domain, both Korean Canadians and native Koreans had high triggering rates for institutional risk (57% and 81%, respectively) than Chinese Canadians (51%) and other Canadians (46%). For the cognitive/ mental health domain, native Koreans had lower triggering rate for prevent decline in communication (6%), but higher triggering rate in delirium (19%), and abusive relationship (5%) compared to other groups. For the social life domain, native Koreans had the lowest triggering rate in informal support (9%) followed by Chinese Canadians (19%), Korean Canadians (25%), and other Canadians (31%), but the highest in social relationship (29%) followed by Korean Canadians (18%), Chinese Canadians (16%), and other Canadians (13%). Lastly, for the clinical issues domain, native Koreans had the lowest rates for falls (8%), but higher for dehydration (27%) compared to other groups. Both the native Koreans and other Canadians had similar triggering rates for cardio-respiratory conditions (45% and 44%, respectively), and Korean Canadians and Chinese Canadians had similar triggering rates (38% and 35%, respectively). Lastly, native Koreans had the lowest rates for appropriate medications (8%) followed by Korean Canadians (14%), Chinese Canadians (15%), and other Canadians (24%).

Table 5. Distribution of selected Clinical Assessment Protocols (CAPs) among ethnicity, Ontario, 2002-2015 and South Korea, 2011-2012

	Korean Canadian (N=1,093)		**Native Korean (N=287)**		**Chinese (N=13,176)**		**Others (N=613,065)**				
Clinical Assessment Protocols	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**%**	**(n)**	**df**	**X^2test**	**P-value**
Functional Performance											
Institutional Risk									3	359.1	<.0001
0 – Not Triggered	43.1	(471)	12.5	(36)	49.1	(6,466)	54.2	(332,017)			
1 – Triggered	56.7	(620)	80.8	(232)	50.8	(6,698)	45.8	(280,598)			
Cognition/ Mental Health											
Delirium									3	301.4	<.0001
0 – Not Triggered	96.3	(1,053)	76.0	(218)	97.7	(12,873)	97.2	(595,595)			
1 – Triggered	3.7	(40)	18.8	(54)	2.3	(301)	2.9	(17,520)			
Communication									6	316.4	<.0001
0 – Not Triggered	75.4	(824)	67.9	(195)	76.7	(10,103)	79.9	(489,566)			
1 – Triggered to Facilitate Improvement	11.2	(122)	21.3	(61)	10.8	(1,425)	7.5	(45,761)			
2 – Triggered to Prevent Decline	13.4	(146)	5.6	(16)	12.5	(1,647)	12.7	(77,640)			
Abusive Relationships									6	92.0	<.0001
0 – Not Triggered	99.7	(1,090)	74.6	(214)	99.3	(13,081)	98.9	(606,038)			
1 – Triggered Moderate Risk Status	-	(-)	-	(-)	0.0	(6)	0.2	(1,165)			
2 – Triggered High Risk Status	0.3	(3)	4.5	(13)	0.6	(83)	0.9	(5,345)			
Social Life											
Informal Support									3	961.7	<.0001
0 – Not Triggered	75.0	(820)	82.2	(236)	81.4	(10,720)	69.1	(423,663)			
1 – Triggered	25.0	(273)	9.1	(26)	18.6	(2,450)	30.9	(189,252)			
Social Relationship									3	183.9	<.0001
0 – Not Triggered	82.5	(902)	65.5	(188)	83.8	(11,036)	86.7	(531,692)			
1 – Triggered	17.5	(191)	29.3	(84)	16.2	(2,140)	13.3	(81,345)			
Clinical Issues											
Falls									6	143.5	<.0001
0 – Not Triggered	60.6	(662)	91.3	(262)	61.4	(8,090)	61.0	(373,926)			
1 – Triggered Medium Risk	19.1	(209)	7.0	(20)	20.3	(2,678)	21.8	(133,467)			
2 – Triggered High Risk	20.3	(222)	1.4	(4)	18.3	(2,407)	17.2	(105,718)			
Cardio-Respiratory Conditions									3	363.7	<.0001
0 – Not Triggered	62.5	(683)	54.7	(157)	64.5	(8,504)	56.3	(345,255)			
1 – Triggered	37.5	(410)	44.9	(129)	35.4	(4,670)	43.7	(267,803)			
Dehydration									6	1065.7	<.0001
0 – Not Triggered	97.2	(1,062)	66.9	(192)	98.4	(12,970)	98.1	(601,232)			
1 – Triggered Low Risk	0.5	(6)	8.0	(23)	0.4	(54)	0.6	(3,570)			
2 – Triggered High Risk	2.3	(25)	19.2	(55)	1.1	(147)	1.3	(8,134)			
Appropriate Medications									3	589.7	<.0001
0 – Not Triggered	85.8	(938)	91.6	(263)	84.6	(11,149)	76.2	(466,878)			
1 – Triggered	14.2	(155)	8.4	(24)	15.4	(2,024)	23.8	(146,069)			

*Note: In some cases, the number of cases is less than the full sample size because missing data are excluded.

5.4 Discussion

The goal of this chapter was to describe and compare health and health service use of Korean Canadians, native Koreans, Chinese Canadians, and other Canadians. The overall findings in health profiles indicated some distinct differences among individual ethnic groups.

Generally, both Korean Canadians and native Koreans exhibited higher impairments, and three Asian groups had higher caregiver distress compared with other Canadians.

Korean Canadians and native Koreans had higher cognitive impairments reflected in notably higher rates of ADRD, and higher percentages of clients scoring more than 3 in CPS. The CPS score of 3, indicating moderate impairment, corresponds to a mean score of 15.4 in mini–mental state examination (MMSE) (Morris *et al.*, 1994). Therefore, these findings were lower than the average MMSE score of 21.5 reported in Korean Longitudinal Study of Ageing (KLoSA) 2012, showing that Korean home care clients in this study were more cognitively impaired than the subjects in KLoSA (Korean Statistical Information Service, 2012).

As might be expected based on Confucian values or filial piety (aka "Hyo") that emphasize the reciprocity of children to respect and provide support to their aging parents for giving birth and rearing them into adulthood, a higher percentages of children or children-in-law took care of and lived with clients in the three Asian groups compared with other Canadians. Also, the three Asian groups were more likely to live with their primary and secondary caregivers than other Canadians reflecting the multi-generational household. However, there were also significantly higher rates of informal caregiver distress in these groups, indicating that these caregivers were not impervious to the challenges of supporting relatives with heavy care needs.

Korean Canadians and native Koreans also had higher physical impairments demonstrated through higher rates in bladder and bowel incontinence, and interRAI IADL-ADL Functional Hierarchy Scale scores. These findings were higher than the bladder incontinence (2.5%) and ADL limitations (8.2%) reported by KLoSA (Korean Statistical Information Service, 2012). Consequently, both of these two groups had higher percentage of clients scoring 4 or more in MAPLe levels (51% and 57%, respectively). Consistent with the impairments, both Korean Canadians and native Koreans had high triggering rate of institutional risk CAP (57% and 81%, respectively) which identifies clients with impaired functioning who are at high risk of institutional placement in the coming months (Morris *et al.*, 2010).

Interestingly, both Korean Canadians and native Koreans also demonstrated significantly higher percentages of clients who score 3 or more in DRS, which reflects potential depression within the group. The percentage of DRS3+ in native Koreans was 39%, which was higher, but comparable to 29% released by Statistics Korea in 2011 (Korean Statistical Information Service, 2011). However, KLoSA 2012 reported a much lower rate of approximately 8% (Korean Statistical Information Service, 2012). The percentage of DRS3+ in Korean Canadians was 22%, this was similar to 20% of moderate to severe depression (6+ in Geriatric Depression Scale Short Form) reported by Kim *et al.* (2014); however, lower than the 32% of probable depression (16+ in Center for Epidemiologic Studies Depression Scale) reported by Kim (2011).

Also, native Koreans had significantly higher rates of stroke (45%) and poor self-rated health (48%) compared to three other groups. The rate of stroke was surprisingly higher than the rate (5.4%) reported by KLoSA 2012, and the rate for poor self-rated health was surprisingly lower than the rate (83%) reported by KLoSA 2012 (Korean Statistical Information Service, 2012). However, the native Koreans had lower fall rates and unsteady gait compared to other groups. The more severe impairments in native Koreans could be explained by a selection bias in the small sample which only included long-term care insurance beneficiaries; however, the Canadian sample also focused on long-stay home care clients aged 65 and older. The differences may therefore also reflect differences in service eligibility in the two countries.

Although there are advantages of doing an international comparisons, limitations that may influence the interpretation needs to be addressed and clarified. As mentioned earlier, the native Korean home care client sample was a sub-sample of clients who were long-term care insurance beneficiaries. The long-term care insurance criteria in Korea prioritize clients into five ranks by variety of impairments ranging from cognition to physical function with need-based requirements due to medical interventions and rehabilitations. Therefore, the result from this sample does not represent all native Korean home care clients unlike the Korean Canadian home care clients from a provincial-level data. Therefore, comparing the native Koreans to Korean Canadians, Chinese Canadians, and other Canadians just by matching them with age (aged 65 and older) may not take into account the eligibility or clinical differences in these populations. Although, it is clear that both the sample from Ontario and Korea are eligible for public home care services and are receiving them, more steps need to be taken to make the comparison more compatible. This study was a first step to see the initial difference in the client's health profiles and health service use. Subsequent studies can be more tailored to comparing Korean Canadians and native Koreans by matching additional variables from the long-term care insurance criteria, so that these two groups will be more similar. Further, the native Korean sample only had an initial assessments, so when the data collection for follow-up assessments are done, additional analysis with the use of multivariate and longitudinal models can be done. Such models could provide a better understanding of the differences in between these two groups and the factors that are driving the differences. Thus, further studies are needed to explore the many possible questions that this international comparison might help to address.

The dramatic difference found with respect to need for an interpreter, where Korean Canadians (83%) and Chinese Canadians (87%) were about 10 times as likely to need an interpreter compared with other Canadians (9%), represented the critical importance of language barriers for home care clients and their caregivers in Canada. As many other studies have indicated the negative influence on health service use with limited language proficiency (Fuller-Thomson *et al.*, 2011; Kirmayer *et al.*, 2011; Lebrun, 2012; Sears *et al.*, 2013). Also, referred as an enabling factor in the Andersen and Newman framework, language barriers are known to impede access to health services by the individual. The result demonstrated the need for interpreters in older ethnic minorities who do not speak the official languages.

Moreover, the rates of caregiver distress were highest in the Korean Canadians (35%) followed by native Koreans (31%), showing that these Korean caregivers were not impervious to the challenges of supporting clients with heavy care needs, despite of the ethical foundation of filial piety within the minds of most Koreans. In other words, the higher impairments in Korean Canadians were reflected through the higher caregiver distress. This trend can be exacerbated by the limited language proficiency of the client as caregiver may play an additional role of becoming a language and cultural broker for the client (Yoo, 2014).

The high service use, including personal support/home making services and nurse visits, in native Koreans was consistent with the higher impairments represented in this group, which reflects the need factor in the Andersen and Newman framework that represents most immediate cause that generate the use of health services through ones perceived or evaluated need. However, Korean Canadians, who had higher impairments, tended to receive less or similar level of services compared to Chinese Canadians and other Canadians. Moreover, it is interesting to note that native Koreans and Korean Canadians showed lower influenza vaccination and mammogram rates, perhaps indicating lower levels of adherence to preventive interventions. The lower use of health services may reflect the predisposing and enabling factors such as cultural beliefs and language barriers that may influence or impede access to services. Overall, Korean Canadians, even with the higher impairments reflecting higher need factor, tended to receive less or similar level of services due to predisposing and enabling factors such as cultural beliefs and language barriers.

The lower emergency department visits in native Koreans, Korean Canadians, and Chinese Canadians may reflect that they were being managed well at home. This was consistent with the value of stoicism where Asian cultures may often encourage people to keep their feeling or pain inside rather than expressing them. However, it was also possible that Eastern medicines and therapies were used instead of conventional health care services. This may also reflect the lower triggering rates of appropriate medications CAP in the three Asian groups compared to other Canadians, as this CAP identifies clients with nine or more medications with specific health conditions (Morris *et al.*, 2010). Similarly, these factors reflect predisposing factors such as ethnicity and culture that may influence the medication and health service use. Alternatively, language barriers may discourage older clients who do not speak English/French to avoid visits to emergency department, which reflect an enabling factor that impedes service use.

There was one interesting finding from the informal support CAP, which identifies clients who currently require help with IADL, focusing on those who have families that are challenged to respond fully to the emerging needs of the person (Morris *et al.*, 2010). Even though, both Korean Canadians and native Koreans exhibited high caregiver distress, the informal support CAP was very low (9%) for native Koreans, but high (25%) for Korean Canadians. The high informal support CAP in Korean Canadians provided an additional information that they were lacking informal support, and may be more vulnerable compared to native Koreans and Chinese Canadians.

The findings of this study have highlighted many different factors and important evidence on health and health service use in Korean Canadians, native Koreans, Chinese Canadians, and other Canadians. However, there were many limitations that need to be addressed when interpreting the results.

First, the cross-sectional nature of the dataset used here limits one's ability to make causal inferences in these findings. Second, there may be errors involved in the ascertainment of clinical characteristics like depressive symptoms or caregiver distress, as it is usually assumed that there may be under detection of clinical characteristics. This study showed that the RAI-HC assessment distinguished differences among groups by primary language/ethnicity. The employment of culturally and linguistically sensitive practice, the flexible and comprehensive approach when assessing client's status and not solely based on fixed narratives, provided a better approach to investigating the health of different language groups. Thus, ascertainment error may not be a serious issue for results based on interRAI assessments. Third, fluency in other languages was not considered because only the primary language was assessed in the RAI-HC. Fourth, the ascertainment of caregiver distress was a binary variable, so the subjective severity of the distress cannot be determined beyond its presence or absence. However, other papers have used same variable to examine caregiver distress (Chang & Hirdes, 2015; Hirdes *et al.*, 2012; Mitchell *et al.*, 2015). Fifth, the native Korean sample being investigated included only the long-term care insurance beneficiaries. Thus, the results for native Koreans may not be generalizable to all community-dwelling Korean older adults receiving formal home care services in Korea. Sixth, the sample size for native Koreans were small compared to other groups. Seventh, the data collection periods were different for Ontario and Korea, covering a much shorter time span in Korean data due to limited availability.

Despite these limitations, the present study is the first study to compare the health and health service use in Korean Canadians, native Koreans, Chinese Canadians, and other Canadians. The higher impairments and higher caregiver distress in Korean Canadians and native Koreans informed the need for better health care policies for both Canadian and Korean health care systems. Hence, the next chapter investigated further into the informal caregiver distress among older Korean Canadians, Chinese Canadians, and other Canadians using logistic regression models to predict factors that contribute to an onset of and an improvement in caregiver distress. The native Koreans were excluded due to small sample size.

6. Informal Caregiver Distress among Older Korean Canadians, Chinese Canadians, and Other Canadians

6.1 Introduction

Immigration later in life is often stressful as immigrants are uprooted from their native society and the cultural adjustments and language barriers are likely to be more severe (Hynie *et al.*, 2011; Kim, 2006; Kim *et al.*, 2014; Mui, 1996; Mui, 2001; Yoo, 2014). These difficulties coping with the new society and lack or inappropriate use of the resources can increase social isolation, depression, and other health concerns (Kang *et al.*, 2013). Moreover, these struggles in older immigrants affect the life and health of other family members as the older members of the family become more dependent on these informal caregivers (Chung, 2013; Han *et al.*, 2008; Kim & Knight, 2008; Kwak & Lai, 2012; Lee & Farran, 2004; Yoo, 2014; Wong *et al.*, 2005). However, these issues have often been overlooked as a major issue in immigration policies.

Korean culture, based on familism, is strongly kinship-oriented, discourages individual needs and desires, and emphasizes the welfare of the family (Chun *et al.*, 2007; Kim & Lee, 2003; Kim *et al.*, 1991; Lavoie *et al.*, 2010; Youn *et al.*, 1999). Filial piety, a foundational Confucian value that emphasizes the responsibility of children to provide support and care to their elders is a cultural norm in Korea. It acts as a guideline for intergenerational relationships among family members with love and affection, repayment, family harmony, responsibility, and sacrifice (Kim, 2010; Kim *et al.*, 1991; Lieber *et al.*, 2004; Sung, 1995; Yoo, 2014).

In Korea, filial piety is also called “Hyo” and it is usually regarded as the expression of responsibility and respect for parents and their sacrifice for the family (Han *et al.*, 2008; Kim, 1996; Yoo & Kim, 2010). The notion of filial piety has been deeply ingrained into the social structure of the Korean society, which includes caring for parents in their old age due to a sense of indebtedness (Durst, 2010a; Kim, 1996; Lee & Farran, 2004). This value continues as Yoo (2014) describes the situation of the Korean immigrant children who care for their parents as becoming a "parent to their parents" because the children play a major supportive role and become a language and cultural broker for their parents. They play these roles partly due to the obligation of filial piety, but mostly due to repayment of the debt and/or sacrifice that their parents have made for them as they are the reason why their parents have immigrated.

A few studies dealt with topics related to informal caregiver distress in Korean Canadians. Kim (1996) examined changes in the tradition of filial piety and found no real changes reflected by high levels of ethnic attachment and association. Yoon (2008) studied the aging experience of elderly Korean immigrant women and found that family continues to be a major source of support to the lives of the women; however, living alone, a symbol for an autonomy and independence, was preferable for them. Kwak (2010) and Kwak and Lai (2012) examined the social support in older Korean immigrants and indicated that use of social support promoted social involvement, relieved financial insecurity, and feeling of being a burden, and concluded that a combination of social support and social services were necessary for older Korean immigrants to have successful adjustments to a new environment.

Jun (2005) investigated the background characteristics and predictors of caregiver burden among Korean Canadians. Using 57 Korean Canadian primary caregivers in Ontario, he found that married caregivers felt more burdened than non-married caregivers and caregivers with a Canadian nationality felt more burdened than caregivers with Korean nationality. Although this thesis used surveys to collect the perspectives of the caregiver and their status to predict caregiver burden, it lacked information about the client whom the caregiver was supporting, that may predict caregiver distress. It was also limited by its small sample size.

As previously highlighted in the descriptive statistics among groups, the high caregiver distress in Korean and Chinese Canadians in Chapter 5 provided enough foundation to explore further into caregiver distress. Thus, this chapter examined the informal caregiver distress in older Korean immigrants and the influence of cultural traditions of “Hyo” by using cross-cultural comparisons among Korean Canadians, Chinese Canadians, and other Canadians in Ontario. The risk and protective factors associated with an onset of and an improvement in caregiver distress were identified and their relationships were compared to check for differences among groups, using bivariate and multivariate logistic regression models. Further, generalized estimating equations (GEE) were used to control the agency-level effects that may be present among different Community Care Access Centres (CCAC).

6.2 Methods

6.2.1 Data sources

This study was based on secondary data analysis of health information from Ontario using the Resident Assessment Instrument–Home Care (RAI-HC). The RAI-HC, first introduced in 1997, is a person-centered assessment system, developed for use with clients in home and community-based settings, that contains 21 sections including personal information and over 350 items across a wide range of domains, such as socio-demographics, health, functional status, and resources and service use (Morris *et al.*, 1997). The RAI-HC can be used to support a variety of functions, including outcome measurement based on scales, which measure clients’ clinical status over time, and Clinical Assessment Protocols (CAPs), which provide guidelines for further assessment and person-centered care planning (Hirdes *et al.*, 1999). All assessments are performed and completed by trained health professionals, mostly nurses, as part of the standard clinical assessment done for all home care clients. It usually takes 40 minutes to an hour to complete all the items based on direct interviews of clients and their caregivers as well as reviews of available records and information gained from other formal caregivers (Carpenter & Hirdes, 2013).

The RAI-HC has been shown to have sound psychometric properties, and the items and scales in the RAI-HC have demonstrated good validity, inter-rater reliability and internal consistency (Hirdes *et al.*, 2008a; Landi *et al.*, 2000; Morris *et al.*, 1997; Poss *et al.*, 2008b). The RAI-HC has been mandated for use in eight Canadian provinces and territories, including Ontario (Canadian Home Care Association, 2013).

6.2.2 Sample

The sample consisted of home care clients aged 65 and older who were assessed with RAI-HC between March 2002 and 2015 in Ontario. The three main comparison groups were Korean Canadians (N = 428), Chinese Canadians (N = 6,401), and other Canadians (N = 269,371). Clients' first two consecutive assessment records in the RAI-HC dataset were used in the analysis.

6.2.3 Measures

A number of scales representing different clinical and risk domains can be calculated using the items in the RAI-HC. When used longitudinally, these scales may be used for outcome measurement. The Activities of Daily Living Hierarchy (ADLH) scale measures physical disability, with scores ranging from 0 (no impairment) to 6 (total dependence) by considering performance in early loss (e.g., dressing) to late loss (e.g., eating) areas of function (Landi *et al.*, 2000; Morris *et al.*, 1997; Morris *et al.*, 1999). The Instrumental Activities of Daily Living (IADL) Hierarchy scale, which ranges from 0 to 6, considers meal preparation, housework, shopping, finances and medications, with higher scores indicating greater difficulty in IADL (Morris *et al.*, 2013a). The interRAI IADL-ADL Functional Hierarchy Scale was created in 2013 through a combination of both the ADL Hierarchy and IADL Hierarchy Scales and it ranges from 0 to 11, with higher scores indicating greater functional impairments (Morris *et al.*, 2013a). The Changes in Health, End-stage disease and Signs and Symptoms (CHESS) scale identifies individuals at risk of serious health decline, with scores ranging from 0 (not at all unstable) to 5 (highly unstable) (Armstrong *et al.*, 2010; Hirdes *et al.*, 2003; Hirdes *et al.*, 2014). The Cognitive Performance Scale (CPS) is based on memory impairment, level of consciousness, and executive function, with scores ranging from 0 (intact) to 6 (very severe impairment) (Jones *et al.*, 2010a; Landi *et al.*, 2000; Morris *et al.*, 1994; Wellens *et al.*, 2013). The Depression Rating Scale (DRS) screens for depressive symptoms with values ranging from 0 (no depressive symptoms) to 14 (severe depressive symptoms) (Burrows *et al.*, 2000; Martin *et al.*, 2008; Szczerbińska *et al.*, 2011). The Instrumental Activities of Daily Living Capacity (IADLC) scale, which ranges from 0 to 6, considers meal preparation, ordinary housework, and phone use, with higher scores indicating greater difficulty in IADL (Morris *et al.*, 2000; Morris *et al.*, 2013a). The interRAI Pain scale uses frequency and intensity of pain to create a score from 0 to 3, with higher scores indicating greater pain (Fries *et al.*, 2001). Finally, the Method for Assigning Priority Levels (MAPLe) decision support algorithm, which ranges from low to very high with higher scores indicating greater needs, has been shown to predict nursing home placement, caregiver distress, and ratings that the "client would be better off in other living environment" in many different international jurisdictions (Hirdes *et al.*, 2008b). MAPLe has also been validated as a predictor of institutionalization from acute hospital settings to nursing homes (Noro *et al.*, 2010). Hence, all scales used in this dissertation have sound psychometric properties and have been tested and used in many different studies (Morris *et al.*, 1997; Morris *et al.*, 1999; Landi *et al.*, 2000; Hirdes *et al.*, 2008a; Wellens *et al.*, 2013).

Items and clinical scales in the RAI-HC were used as covariates to examine the risk and protective factors for caregiver distress. Two RAI-HC items in were used to define caregiver distress: "A caregiver is unable to continue in caring activities - e.g., decline in the health of the caregiver makes it difficult to continue" and "Primary caregiver expresses feelings of distress, anger or depression". The presence of either of these indicators was considered to be indicative of potential distress. Although, the first indicator may be caused by other factors (e.g., aging of the caregiver), the indicator also included health declines associated with caregiver distress. These items on caregiver distress have been used previously to develop MAPLe decision support algorithm for prioritization of home care clients' access to community and facility based health services (Hirdes *et al.*, 2008b). In addition, they have been employed to measure caregiver distress in other publications (Chang & Hirdes, 2015; Hirdes *et al.*, 2012; Mitchell *et al.*, 2015).

Ethnicity was obtained by the RAI-HC assessment item on primary language. Case managers completing the assessment used standard language codes provided by the Canadian Institute for Health Information as part of the Home Care Reporting System technical specification. In addition, the need for an interpreter item was assessed directly based on the client or caregivers response, so it is not inferred from the ethnicity.

6.2.4 Analysis

To investigate the risk and protective factors associated with an onset of (increase) and an improvement in (decrease) caregiver distress accounting for the different ethnic groups, odds ratios (OR) and their 95% confidence intervals (CI) for predictive variables were obtained by using bivariate and multivariate logistic regression models. Further, generalized estimating equations (GEE) were used to control the agency-level effects that may be present among different Community Care Access Centres (CCAC). Summary scales were treated as continuous variables when tested in models. All other variables, except ethnicity and age group variables, were binary. The significance level for entry and exit to the model was set at 0.05. A correlational analysis was performed with the study variables using the PROC CORR function of SAS to check for associations and multi-collinearity among different variables within the model. All statistical analyses were performed using SAS software (Version 9.4).

6.3 Results

There were 276,200 initial RAI-HC assessments with follow-up assessments performed with older adults between March 2002 and 2015. From this sample, 60,063 (21.8%) of home care clients' caregivers expressed distress at baseline, and 65,894 (23.9%) of home care clients' caregivers expressed distress at follow-up. In addition, 19,644 (7.1%) of home care clients' caregivers moved from not distressed to distressed state (onset of caregiver distress), 13,813 (5.0%) of home care clients caregivers moved from distressed to not distressed state (improvement in caregiver distress), and 46,248 (16.8%) of home care clients' caregivers remained distressed.

Table 6 presents the bivariate logistic regression results for selected variables for predicting an improvement in caregiver distress. In the bivariate analysis, all the variables listed were significant ($p<0.05$). Odd ratios of these bivariate analysis showed that Korean Canadians and Chinese Canadians were less likely to have an improvement in caregiver distress (odd ratio of 0.54 and 0.66, respectively).

Other variables that lowered the odds of an improvement in caregiver distress included if the client needs interpreter, an increase in MAPLe level, if primary caregiver lives with client, if the client is married, if the client has difficulty using the phone, if the client has a persistent anger with self or others, if the client has Alzheimer's and other related dementia, if the client has condition or disease that make cognition, ADL, mood, or behavior patterns unstable, and lastly, if the primary caregiver is not satisfied with support received from family and friends.

Variables that increased the odds of an improvement in caregiver distress included if the client is female, if the client has good prospects of recovery, if the client's treatments changed in last 30 days, if the client had hospital visits in last 90 days, if the client had two or more hours of physical activities in the last 3 days, the number of months between assessments, if the client had surgical wound, if the client had daily nurse monitoring, and lastly, if the client now lives with other persons (as compared to 90 days ago).

Table 6. Bivariate logistic regression results for selected variables for predicting an improvement in caregiver distress

Variable	**Parameter Estimate**	**Standard Error**	**Wald Chi-Square**	**Probability**	**Odds Ratio**	**Lower CI**	**Upper CI**
Ethnicity	—	—	49.9	<.0001	—	—	—
Other (Reference)	—	—	—	—	1.00	—	—
Chinese	-0.08	0.09	0.7	0.41	0.66	0.58	0.74
Korean	-0.27	0.17	2.6	0.11	0.54	0.33	0.88
Interpreter needed	-0.37	0.03	162.8	<.0001	0.69	0.66	0.73
MAPLe	-0.21	0.01	518.4	<.0001	0.81	0.80	0.83
Primary caregiver lives with client	-0.42	0.02	415.0	<.0001	0.66	0.63	0.68
Female	0.23	0.02	137.0	<.0001	1.26	1.21	1.31
Married	-0.28	0.02	199.0	<.0001	0.76	0.73	0.79
Good prospects of recovery	0.71	0.03	477.3	<.0001	2.04	1.91	2.18
Difficulty with phone use	-0.50	0.02	662.6	<.0001	0.61	0.58	0.63
Treatments changed in last 30 days	0.36	0.02	256.9	<.0001	1.44	1.38	1.50
Hospital visits in last 90 days	0.30	0.02	213.9	<.0001	1.34	1.29	1.40
Persistent anger with self or others	-0.29	0.03	134.5	<.0001	0.75	0.71	0.79
Two or more hours of physical activities in the last 3 days	0.07	0.02	10.7	0.001	1.07	1.03	1.11
Number of months between assessments	0.10	0.00	797.0	<.0001	1.10	1.09	1.11
Surgical wound	0.58	0.06	111.0	<.0001	1.79	1.60	1.99
Alzheimer’s and other related dementia	-0.56	0.02	725.0	<.0001	0.57	0.55	0.60
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	-0.25	0.02	163.5	<.0001	0.78	0.75	0.81
Daily nurse monitoring	0.31	0.02	170.6	<.0001	1.36	1.30	1.42
Primary caregiver is not satisfied with support received from family and friends	-0.15	0.04	18.4	<.0001	0.86	0.80	0.92
As compared to 90 days ago, client now lives with other persons	0.42	0.03	165.5	<.0001	1.53	1.43	1.63

Table 7 and 8 present the multivariate logistic regression models for predicting an improvement in caregiver distress (C statistic = 0.646 and 0.649, respectively). Two multivariate analyses, one accounting for all the variables included in the bivariate analysis, and the other excluding the interpreter needed variable, showed no major change in parameter estimates and odd ratios for all variables. All the variables were significant within the two models. The variable that dealt with whether the client has condition or disease that make cognition, ADL, mood, or behavior patterns unstable was close/borderline to the significance of 0.05 ($p = 0.05$) in the model without interpreter needed variable, but became more significant when interpreter needed was included in the model. In contrast, the ethnicity variable was significant in the analysis without interpreter needed variable; however, in the model accounting for all variables, it was close/borderline to the significance of 0.05 ($p = 0.03$).

Table 7. Multivariate logistic regression model for predicting an improvement in caregiver distress without interpreter needed variable

Variable	**Parameter Estimate**	**Standard Error**	**Wald Chi-Square**	**Probability**	**Odds Ratio**	**Lower CI**	**Upper CI**
Ethnicity	—	—	41.9	<.0001	—	—	—
Other (Reference)	—	—	—	—	1.00	—	—
Chinese	-0.08	0.09	0.8	0.37	0.67	0.59	0.76
Korean	-0.23	0.17	1.8	0.18	0.58	0.36	0.96
Interpreter needed (Excluded)	—	—	—	—	—	—	—
MAPLe	-0.05	0.01	18.0	<.0001	0.95	0.93	0.98
Primary caregiver lives with client	-0.25	0.03	68.3	<.0001	—*	—*	—*
Female	0.11	0.02	23.3	<.0001	1.11	1.07	1.16
Married	-0.03	0.04	0.7	0.39	—*	—*	—*
Good prospects of recovery	0.41	0.04	135.8	<.0001	1.51	1.41	1.61
Difficulty with phone use	-0.20	0.02	78.2	<.0001	0.82	0.78	0.86
Treatments changed in last 30 days	0.22	0.02	81.5	<.0001	1.25	1.19	1.32
Hospital visits in last 90 days	0.10	0.02	21.4	<.0001	1.11	1.06	1.16
Persistent anger with self or others	-0.13	0.03	25.6	<.0001	0.87	0.83	0.92
Two or more hours of physical activities in the last 3 days	0.10	0.02	23.5	<.0001	1.11	1.06	1.15
Number of months between assessments	0.10	0.00	759.3	<.0001	1.10	1.09	1.11
Surgical wound	0.19	0.06	10.3	0.001	1.21	1.08	1.36
Alzheimer’s and other related dementia	-0.28	0.03	119.7	<.0001	0.76	0.72	0.80
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	-0.04	0.02	3.8	0.05	0.96	0.92	1.00
Daily nurse monitoring	0.14	0.03	28.1	<.0001	1.15	1.09	1.21
Primary caregiver is not satisfied with support received from family and friends	-0.13	0.04	12.6	0.001	0.88	0.82	0.94
As compared to 90 days ago, client now lives with other persons	0.40	0.03	130.5	<.0001	1.49	1.39	1.59
Interaction term: Primary caregiver lives with client and Married	-0.10	0.05	4.6	0.03	0.90	0.82	0.99

* Odds ratio not reported for variables with interaction terms.

C statistic = 0.646

Table 8. Multivariate logistic regression model for predicting an improvement in caregiver distress with interpreter needed variable

Variable	**Parameter Estimate**	**Standard Error**	**Wald Chi-Square**	**Probability**	**Odds Ratio**	**Lower CI**	**Upper CI**
Ethnicity	–	–	7.1	0.03	–	–	–
Other (Reference)	–	–	–	–	1.00	–	–
Chinese	0.00	0.09	0.0	0.98	0.85	0.74	0.97
Korean	-0.16	0.17	0.9	0.35	0.73	0.44	1.19
Interpreter needed	-0.32	0.03	99.2	<.0001	0.73	0.68	0.77
MAPLe	-0.05	0.01	16.8	<.0001	0.96	0.93	0.98
Primary caregiver lives with client	-0.22	0.03	53.6	<.0001	–*	–*	–*
Female	0.11	0.02	27.2	<.0001	1.12	1.07	1.17
Married	-0.02	0.04	0.2	0.65	–*	–*	–*
Good prospects of recovery	0.40	0.04	130.9	<.0001	1.50	1.40	1.60
Difficulty with phone use	-0.17	0.02	57.3	<.0001	0.84	0.81	0.88
Treatments changed in last 30 days	0.22	0.02	77.7	<.0001	1.25	1.19	1.31
Hospital visits in last 90 days	0.11	0.02	22.5	<.0001	1.11	1.07	1.16
Persistent anger with self or others	-0.13	0.03	24.6	<.0001	0.88	0.83	0.92
Two or more hours of physical activities in the last 3 days	0.09	0.02	20.2	<.0001	1.10	1.06	1.15
Number of months between assessments	0.10	0.00	786.8	<.0001	1.10	1.10	1.11
Surgical wound	0.20	0.06	10.9	0.001	1.22	1.08	1.36
Alzheimer's and other related dementia	-0.28	0.03	127.1	<.0001	0.75	0.72	0.79
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	-0.05	0.02	6.4	0.01	0.95	0.91	0.99
Daily nurse monitoring	0.12	0.03	23.4	<.0001	1.13	1.08	1.19
Primary caregiver is not satisfied with support received from family and friends	-0.12	0.04	11.0	0.001	0.88	0.82	0.95
As compared to 90 days ago, client now lives with other persons	0.39	0.03	127.0	<.0001	1.48	1.38	1.58
Interaction term: Primary caregiver lives with client and Married	-0.14	0.05	9.1	0.003	0.87	0.79	0.95

* Odds ratio not reported for variables with interaction terms (see Figure 2).

C statistic = 0.649

Table 9 presents the bivariate logistic regression results for selected variables for predicting an onset of caregiver distress. In the bivariate analysis, all the variables listed were significant ($p<0.05$). Odd ratios of these bivariate analysis showed that Korean and Chinese Canadians were more likely to have an onset of caregiver distress (odd ratio of 1.36 and 1.23, respectively). Also, being in the age group of 75-84 and 85 and older had somewhat higher odds of an onset of caregiver distress (odd ratio of 1.08 and 1.04, respectively).

Other variables that increased the odds of an onset of caregiver distress included if the client needs interpreter, an increase in MAPLe level, if primary caregiver lives with client, if the client is married, if the client have difficulty with phone use, if the client's treatments changed in last 30 days, if the client has a persistent anger with self or others, if the client has Alzheimer's and other related dementia, if the client has condition or disease that make cognition, ADL, mood, or behavior patterns unstable, if the primary caregiver is not satisfied with support received from family and friends, if the client has taken sedatives in the last 7 days, if the client has any anxiety symptoms, and if the client has worsening in decision making as compared to status of 90 days ago.

Variables that lowered the odds of an onset of caregiver distress included if the client is female, if the client has good prospects of recovery, if the client had hospital visits in last 90 days, if the client had two or more hours of physical activities in the last 3 days, the number of months between assessments, if the client had surgical wound, and lastly, if the client had daily nurse monitoring.

Table 9. Bivariate logistic regression results for selected variables for predicting an onset of caregiver distress

Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Probability	Odds Ratio	Lower CI	Upper CI
Ethnicity	—	—	20.7	<.0001	—	—	—
Other (Reference)	—	—	—	—	1.00	—	—
Chinese	0.03	0.07	0.2	0.63	1.23	1.12	1.35
Korean	0.14	0.12	1.3	0.25	1.36	0.96	1.94
Interpreter needed	0.30	0.02	167.3	<.0001	1.35	1.29	1.41
MAPLe	0.53	0.01	3145.2	<.0001	1.71	1.67	1.74
Primary caregiver lives with client	0.84	0.02	2818.0	<.0001	2.31	2.24	2.39
Female	-0.46	0.02	894.6	<.0001	0.63	0.62	0.65
Married	0.66	0.02	1915.0	<.0001	1.93	1.88	1.99
Good prospects of recovery	-0.23	0.03	69.8	<.0001	0.79	0.75	0.84
Difficulty with phone use	0.76	0.02	2481.2	<.0001	2.14	2.08	2.20
Treatments changed in last 30 days	0.12	0.02	38.5	<.0001	1.13	1.09	1.18
Hospital visits in last 90 days	-0.06	0.02	15.1	<.0001	0.94	0.91	0.97
Persistent anger with self or others	0.63	0.03	634.9	<.0001	1.88	1.79	1.97
Two or more hours of physical activities in the last 3 days	-0.22	0.02	191.5	<.0001	0.80	0.78	0.83
Number of months between assessments	-0.10	0.00	1152.3	<.0001	0.91	0.90	0.91
Surgical wound	-0.41	0.05	66.3	<.0001	0.67	0.60	0.73
Alzheimer’s and other related dementia	0.83	0.02	2636.5	<.0001	2.29	2.22	2.36
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	0.60	0.02	1548.4	<.0001	1.82	1.77	1.88
Daily nurse monitoring	-0.28	0.02	238.1	<.0001	0.75	0.73	0.78
Primary caregiver is not satisfied with support received from family and friends	0.94	0.05	415.0	<.0001	2.55	2.33	2.79
Sedatives taken in the last 7 days	0.27	0.02	184.4	<.0001	1.31	1.26	1.36
Any anxiety symptoms (e1c, e1d, e1e)	0.47	0.02	495.5	<.0001	1.59	1.53	1.66
Worsening in decision making as compared to status of 90 days ago	0.70	0.02	1493.6	<.0001	2.02	1.95	2.09
Age group	—	—	15.9	0.0003	—	—	—
65-74 (Reference)	—	—	—	—	1.00	—	—
75-84	0.04	0.01	15.0	0.0001	1.08	1.04	1.13
85+	0.00	0.01	0.0	0.96	1.04	1.00	1.09

Tables 10 and 11 present the multivariate logistic regression models for predicting an onset of caregiver distress (both with C statistic = 0.699). Two multivariate analyses, one accounting for all the variables included in the bivariate analysis, and the other excluding the interpreter needed variable, showed no major change in parameter estimates and odd ratios for all variables. All the variables were significant within the two models except for the ethnicity variable that lost its significance when interpreter needed variable was added into the model (P-value changes from 0.05 to 0.71).

Table 10. Multivariate logistic regression model for predicting an onset of caregiver distress without interpreter needed variable

Variable	**Parameter Estimate**	**Standard Error**	**Wald Chi-Square**	**Probability**	**Odds Ratio**	**Lower CI**	**Upper CI**
Ethnicity	—	—	5.9	0.05	—	—	—
Other (Reference)	—	—	—	—	1.00	—	—
Chinese	0.03	0.07	0.2	0.64	1.12	1.02	1.24
Korean	0.05	0.12	0.2	0.69	1.14	0.79	1.64
Interpreter needed (Excluded)	—	—	—	—	—	—	—
MAPLe	0.15	0.01	349.5	<.0001	1.17	1.15	1.18
Primary caregiver lives with client	0.67	0.02	917.1	<.0001	—*	—*	—*
Female	-0.22	0.02	169.7	<.0001	0.80	0.78	0.83
Married	0.48	0.03	219.9	<.0001	—*	—*	—*
Good prospects of recovery	-0.07	0.03	5.1	0.02	0.94	0.88	0.99
Difficulty with phone use	0.14	0.02	56.5	<.0001	1.15	1.11	1.19
Treatments changed in last 30 days	0.14	0.02	42.6	<.0001	1.15	1.11	1.20
Hospital visits in last 90 days	-0.08	0.02	18.9	<.0001	0.93	0.90	0.96
Persistent anger with self or others	0.17	0.03	39.5	<.0001	1.19	1.12	1.25
Two or more hours of physical activities in the last 3 days	-0.05	0.02	7.7	0.01	0.95	0.92	0.99
Number of months between assessments	-0.08	0.00	828.8	<.0001	0.92	0.92	0.93
Surgical wound	-0.19	0.05	13.1	0.0003	0.83	0.75	0.92
Alzheimer’s and other related dementia	0.30	0.02	209.0	<.0001	1.35	1.29	1.40
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	0.26	0.02	244.6	<.0001	1.30	1.26	1.35
Daily nurse monitoring	-0.25	0.02	167.9	<.0001	0.78	0.75	0.81
Primary caregiver is not satisfied with support received from family and friends	0.57	0.05	139.4	<.0001	1.76	1.60	1.94
Sedatives taken in the last 7 days	0.27	0.02	176.5	<.0001	1.31	1.26	1.37
Any anxiety symptoms (e1c, e1d, e1e)	0.20	0.02	76.7	<.0001	1.22	1.17	1.28
Worsening in decision making as compared to status of 90 days ago	0.13	0.02	36.0	<.0001	1.14	1.09	1.18
Age group	—	—	39.0	<.0001	—	—	—
65-74 (Reference)	—	—	—	—	1.00	—	—
75-84	0.01	0.01	0.3	0.56	1.08	1.04	1.13
85+	0.07	0.01	34.9	<.0001	1.15	1.10	1.21
Interaction term: Primary caregiver lives with client and Married	-0.27	0.04	48.6	<.0001	0.77	0.71	0.83

* Odds ratio not reported for variables with interaction terms.

C statistic = 0.699

Table 11. Multivariate logistic regression model for predicting an onset of caregiver distress with interpreter needed variable

Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Probability	Odds Ratio	Lower CI	Upper CI
Ethnicity (Excluded - P-value = 0.71)	—	—	—	—	—	—	—
Other (Reference)	—	—	—	—	—	—	—
Chinese	—	—	—	—	—	—	—
Korean	—	—	—	—	—	—	—
Interpreter needed	0.11	0.02	19.6	<.0001	1.12	1.06	1.17
MAPLe	0.15	0.01	346.2	<.0001	1.17	1.15	1.18
Primary caregiver lives with client	0.66	0.02	880.9	<.0001	—*	—*	—*
Female	-0.22	0.02	172.4	<.0001	0.80	0.78	0.83
Married	0.48	0.03	214.7	<.0001	—*	—*	—*
Good prospects of recovery	-0.07	0.03	4.9	0.03	0.94	0.88	0.99
Difficulty with phone use	0.13	0.02	49.8	<.0001	1.14	1.10	1.18
Treatments changed in last 30 days	0.14	0.02	43.5	<.0001	1.16	1.11	1.21
Hospital visits in last 90 days	-0.08	0.02	19.1	<.0001	0.93	0.89	0.96
Persistent anger with self or others	0.17	0.03	39.0	<.0001	1.19	1.12	1.25
Two or more hours of physical activities in the last 3 days	-0.04	0.02	6.6	0.01	0.96	0.93	0.99
Number of months between assessments	-0.08	0.00	835.3	<.0001	0.92	0.92	0.93
Surgical wound	-0.19	0.05	13.1	0.0003	0.83	0.75	0.92
Alzheimer’s and other related dementia	0.30	0.02	212.9	<.0001	1.35	1.30	1.41
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	0.27	0.02	249.6	<.0001	1.31	1.26	1.35
Daily nurse monitoring	-0.25	0.02	163.1	<.0001	0.78	0.75	0.81
Primary caregiver is not satisfied with support received from family and friends	0.56	0.05	138.0	<.0001	1.76	1.60	1.93
Sedatives taken in the last 7 days	0.27	0.02	178.6	<.0001	1.32	1.26	1.37
Any anxiety symptoms (e1c, e1d, e1e)	0.19	0.02	73.2	<.0001	1.21	1.16	1.27
Worsening in decision making as compared to status of 90 days ago	0.13	0.02	36.1	<.0001	1.14	1.09	1.18
Age group	—	—	39.0	<.0001	—	—	—
65-74 (Reference)	—	—	—	—	1.00	—	—
75-84	0.01	0.01	0.3	0.61	1.08	1.04	1.13
85+	0.07	0.01	35.2	<.0001	1.15	1.10	1.21
Interaction term: Primary caregiver lives with client and Married	-0.26	0.04	44.3	<.0001	0.78	0.72	0.84

* Odds ratio not reported for variables with interaction terms (see Figure 3).

C statistic = 0.699

Table 12 compares the shared parameter estimates of final multivariate logistic regression models for predicting an onset with those for an improvement in caregiver distress with interpreter needed variable. The treatment changed in last 30 days variable was only variable that positively predicted for both an onset of and an improvement in caregiver distress. The effect of interaction term is described in Figure 2 and 3.

Table 12. Comparing shared parameter estimates of final multivariate logistic regression models for predicting an onset with those for an improvement in caregiver distress with interpreter needed variable

Variable	**Onset**		**Improvement**	
	Parameter estimate	**Direction of relationship**	**Parameter estimate**	**Direction of relationship**
Interpreter needed	0.11	+	-0.32	−
MAPLe	0.15	+	-0.05	−
Primary caregiver lives with client	0.66	+	-0.22	−
Female	-0.22	−	0.11	+
Married	0.48	+	-0.02	−
Good prospects of recovery	-0.07	−	0.40	+
Difficulty with phone use	0.13	+	-0.17	−
Treatments changed in last 30 days	0.14	+	0.22	+
Hospital visits in last 90 days	-0.08	−	0.11	+
Persistent anger with self or others	0.17	+	-0.13	−
Two or more hours of physical activities in the last 3 days	-0.04	−	0.09	+
Number of months between assessments	-0.08	−	0.10	+
Surgical wound	-0.19	−	0.20	+
Alzheimer’s and other related dementia	0.30	+	-0.28	−
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	0.27	+	-0.05	−
Daily nurse monitoring	-0.25	−	0.12	+
Primary caregiver is not satisfied with support received from family and friends	0.56	+	-0.12	−
Interaction term: Primary caregiver lives with client and Married	-0.26	−	-0.14	−

Tables 13 and 14 present the generalized estimating equations (GEE) results for an improvement in caregiver distress with the same variables used in the previous multivariate logistic regression models. After adjusting for agency-level (within-subject) effects with using 14 Community Care Access Centres as repeated subject, the ethnicity and exercise variables were no longer significant making them candidates for omission from the model (p>0.05).

Table 13. Generalized estimating equations (GEE) for an improvement in caregiver distress using all variables in logistic regression model (see Table 8)

Variable	**Parameter Estimate**	**Standard Error**	**Odds Ratio**	**Lower CI**	**Upper CI**	**Z**	**Pr > |Z|**
Ethnicity	—	—	—	—	—	—	—
Other (Reference)	—	—	1.00	—	—	—	—
Chinese	-0.10	0.05	0.91	0.82	1.00	-1.93	0.05
Korean	-0.18	0.24	0.83	0.52	1.32	-0.78	0.43
Interpreter needed	-0.21	0.05	0.81	0.74	0.89	-4.59	<.0001
MAPLe	-0.05	0.01	0.95	0.94	0.97	-5.14	<.0001
Primary caregiver lives with client	-0.21	0.05	0.81	0.73	0.89	-4.16	<.0001
Female	0.11	0.03	1.11	1.06	1.17	4.24	<.0001
Married	-0.02	0.03	0.98	0.93	1.04	-0.66	0.51
Good prospects of recovery	0.37	0.04	1.44	1.33	1.57	8.62	<.0001
Difficulty with phone use	-0.16	0.03	0.85	0.81	0.90	-6.04	<.0001
Treatments changed in last 30 days	0.19	0.04	1.21	1.12	1.30	5.17	<.0001
Hospital visits in last 90 days	0.13	0.02	1.14	1.09	1.18	6.71	<.0001
Persistent anger with self or others	-0.13	0.02	0.88	0.83	0.92	-5.54	<.0001
Two or more hours of physical activities in the last 3 days	0.04	0.03	1.04	0.99	1.10	1.67	0.10
Number of months between assessments	0.10	0.01	1.11	1.09	1.12	20.04	<.0001
Surgical wound	0.20	0.04	1.22	1.14	1.30	5.55	<.0001
Alzheimer’s and other related dementia	-0.27	0.03	0.76	0.72	0.80	-10.17	<.0001
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	-0.08	0.02	0.93	0.89	0.97	-3.25	0.001
Daily nurse monitoring	0.11	0.03	1.12	1.06	1.18	3.80	0.0001
Primary caregiver is not satisfied with support received from family and friends	-0.11	0.03	0.90	0.84	0.96	-3.24	0.001
As compared to 90 days ago, client now lives with other persons	0.38	0.03	1.46	1.36	1.56	10.85	<.0001
Interaction term: Primary caregiver lives with client and Married	-0.15	0.05	0.86	0.78	0.95	-3.07	0.002

Table 14. Final generalized estimating equations (GEE) for an improvement in caregiver distress using only variables that are significant in GEE

Variable	**Parameter Estimate**	**Standard Error**	**Odds Ratio**	**Lower CI**	**Upper CI**	**Z**	**Pr > |Z|**
Interpreter needed	-0.23	0.05	0.79	0.72	0.88	-4.59	<.0001
MAPLe	-0.05	0.01	0.95	0.94	0.97	-5.58	<.0001
Primary caregiver lives with client	-0.21	0.05	0.81	0.73	0.89	-4.22	<.0001
Female	0.11	0.03	1.11	1.06	1.17	4.15	<.0001
Married	-0.02	0.03	0.98	0.93	1.04	-0.67	0.50
Good prospects of recovery	0.37	0.04	1.44	1.33	1.57	8.66	<.0001
Difficulty with phone use	-0.16	0.03	0.85	0.81	0.90	-6.26	<.0001
Treatments changed in last 30 days	0.19	0.04	1.21	1.12	1.29	5.24	<.0001
Hospital visits in last 90 days	0.12	0.02	1.13	1.09	1.18	6.34	<.0001
Persistent anger with self or others	-0.13	0.02	0.88	0.84	0.92	-5.43	<.0001
Number of months between assessments	0.10	0.01	1.11	1.09	1.12	20.28	<.0001
Surgical wound	0.20	0.04	1.22	1.13	1.30	5.57	<.0001
Alzheimer’s and other related dementia	-0.26	0.03	0.77	0.73	0.81	-10.26	<.0001
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	-0.07	0.02	0.93	0.89	0.97	-3.21	0.001
Daily nurse monitoring	0.11	0.03	1.12	1.05	1.18	3.76	0.0002
Primary caregiver is not satisfied with support received from family and friends	-0.11	0.03	0.90	0.84	0.96	-3.27	0.001
As compared to 90 days ago, client now lives with other persons	0.38	0.03	1.46	1.36	1.56	10.73	<.0001
Interaction term: Primary caregiver lives with client and Married	-0.15	0.05	0.86	0.78	0.95	-3.08	0.002

Tables 15 and 16 present the generalized estimating equations (GEE) results for an onset of caregiver distress with the same variables used in the previous multivariate logistic regression models. After adjusting for correlated outcome data for the agency-level (within-subject) effects with using 14 Community Care Access Centres as repeated subject, the exercise variable was no longer significant making it a candidate for omission from the model ($p = 0.15$). Also, the ethnicity variable also showed a higher (non-significant) P-value for one of the ethnic groups ($p = 0.61$ for Korean).

Table 15. Generalized estimating equations (GEE) for an onset of caregiver distress using all variables in logistic regression model (see Table 11)

Variable	Parameter Estimate	Standard Error	Odds Ratio	Lower CI	Upper CI	Z	Pr > |Z|
Ethnicity	—	—	—	—	—	—	—
Other (Reference)	—	—	1.00	—	—	—	—
Chinese	0.08	0.03	1.08	1.02	1.15	2.58	0.01
Korean	0.08	0.16	1.09	0.79	1.50	0.50	0.61
Interpreter needed	0.13	0.01	1.13	1.11	1.16	10.10	<.0001
MAPLe	0.11	0.02	1.12	1.07	1.16	5.30	<.0001
Primary caregiver lives with client	0.55	0.03	1.73	1.63	1.83	18.87	<.0001
Female	-0.19	0.02	0.83	0.80	0.86	-10.47	<.0001
Married	0.39	0.03	1.47	1.40	1.55	15.38	<.0001
Good prospects of recovery	-0.05	0.02	0.95	0.91	0.99	-2.63	0.01
Difficulty with phone use	0.12	0.02	1.13	1.09	1.16	7.50	<.0001
Treatments changed in last 30 days	0.12	0.02	1.12	1.09	1.16	6.56	<.0001
Hospital visits in last 90 days	-0.07	0.02	0.93	0.90	0.96	-4.07	<.0001
Persistent anger with self or others	0.15	0.03	1.16	1.10	1.22	5.29	<.0001
Two or more hours of physical activities in the last 3 days	-0.03	0.02	0.97	0.93	1.01	-1.44	0.15
Number of months between assessments	-0.07	0.00	0.93	0.92	0.94	-15.34	<.0001
Surgical wound	-0.15	0.04	0.86	0.80	0.92	-4.24	<.0001
Alzheimer’s and other related dementia	0.26	0.02	1.29	1.24	1.34	12.99	<.0001
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	0.21	0.02	1.24	1.20	1.28	12.26	<.0001
Daily nurse monitoring	-0.22	0.02	0.80	0.77	0.84	-10.90	<.0001
Primary caregiver is not satisfied with support received from family and friends	0.50	0.04	1.64	1.52	1.78	12.61	<.0001
Sedatives taken in the last 7 days	0.23	0.02	1.26	1.20	1.32	9.60	<.0001
Any anxiety symptoms (e1c, e1d, e1e)	0.17	0.02	1.19	1.14	1.24	7.77	<.0001
Worsening in decision making as compared to status of 90 days ago	0.11	0.02	1.12	1.07	1.17	5.00	<.0001
Age group							
65-74 (Reference)			1.00	.	.		
75-84	0.07	0.03	1.08	1.02	1.13	2.89	0.004
85+	0.13	0.03	1.14	1.07	1.20	4.23	<.0001
Interaction term: Primary caregiver lives with client and Married	-0.19	0.03	0.83	0.79	0.87	-7.33	<.0001

Table 16. Final generalized estimating equations (GEE) for an onset of caregiver distress using only variables that are significant in GEE

Variable	**Parameter Estimate**	**Standard Error**	**Odds Ratio**	**Lower CI**	**Upper CI**	**Z**	**Pr > |Z|**
Ethnicity	—	—	—	—	—	—	—
Other (Reference)	—	—	1.00	—	—	—	—
Chinese	0.08	0.03	1.08	1.02	1.15	2.58	0.01
Korean	0.08	0.16	1.09	0.79	1.50	0.51	0.61
Interpreter needed	0.11	0.02	1.12	1.07	1.17	5.31	<.0001
MAPLe	0.13	0.01	1.14	1.11	1.16	10.64	<.0001
Primary caregiver lives with client	0.55	0.03	1.73	1.64	1.83	18.85	<.0001
Female	-0.19	0.02	0.83	0.80	0.86	-10.47	<.0001
Married	0.39	0.03	1.48	1.40	1.55	15.27	<.0001
Good prospects of recovery	-0.05	0.02	0.95	0.91	0.99	-2.63	0.01
Difficulty with phone use	0.12	0.02	1.13	1.10	1.17	7.86	<.0001
Treatments changed in last 30 days	0.12	0.02	1.13	1.09	1.17	6.73	<.0001
Hospital visits in last 90 days	-0.07	0.02	0.93	0.90	0.97	-3.99	<.0001
Persistent anger with self or others	0.15	0.03	1.16	1.10	1.22	5.28	<.0001
Number of months between assessments	-0.07	0.00	0.93	0.92	0.94	-15.32	<.0001
Surgical wound	-0.15	0.04	0.86	0.80	0.92	-4.22	<.0001
Alzheimer’s and other related dementia	0.25	0.02	1.29	1.24	1.34	12.11	<.0001
Has condition or disease that make cognition, ADL, mood, or behavior patterns unstable	0.21	0.02	1.24	1.20	1.28	12.30	<.0001
Daily nurse monitoring	-0.22	0.02	0.80	0.77	0.84	-10.84	<.0001
Primary caregiver is not satisfied with support received from family and friends	0.50	0.04	1.65	1.53	1.78	12.82	<.0001
Sedatives taken in the last 7 days	0.23	0.02	1.26	1.20	1.33	9.62	<.0001
Any anxiety symptoms (e1c, e1d, e1e)	0.18	0.02	1.19	1.14	1.25	7.83	<.0001
Worsening in decision making as compared to status of 90 days ago	0.11	0.02	1.12	1.07	1.17	4.98	<.0001
Age group							
65-74 (Reference)			1.00	.	.		
75-84	0.07	0.03	1.08	1.02	1.13	2.88	0.004
85+	0.13	0.03	1.14	1.07	1.21	4.23	<.0001
Interaction term: Primary caregiver lives with client and Married	-0.19	0.03	0.82	0.78	0.87	-7.33	<.0001

Significant interaction effects were found between if primary caregiver lives with client and the client's marital status in predicting both an improvement and an onset of caregiver distress. Figure 2 demonstrated lower odds of an improvement in caregiver distress when the client lived with primary caregiver (0.80) and the odds were even lower if the client was married (0.68) with reference to unmarried client who did not live with primary caregiver. In Figure 3, the odds of onset in caregiver distress were higher when primary caregiver lived with client (1.94) and even higher if the client was married (2.42) with reference to unmarried client who did not live with primary caregiver. In addition, the odds of onset in caregiver distress were higher with just being married (1.61).

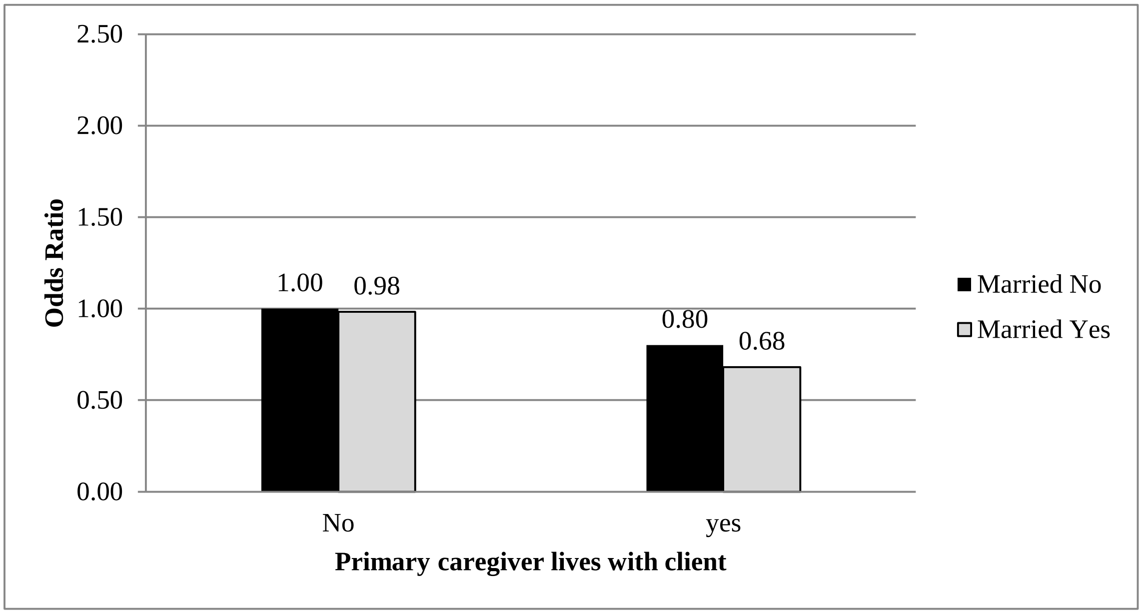


Figure 2. Interaction between primary caregiver lives with client and client's marital status in predicting an improvement in caregiver distress

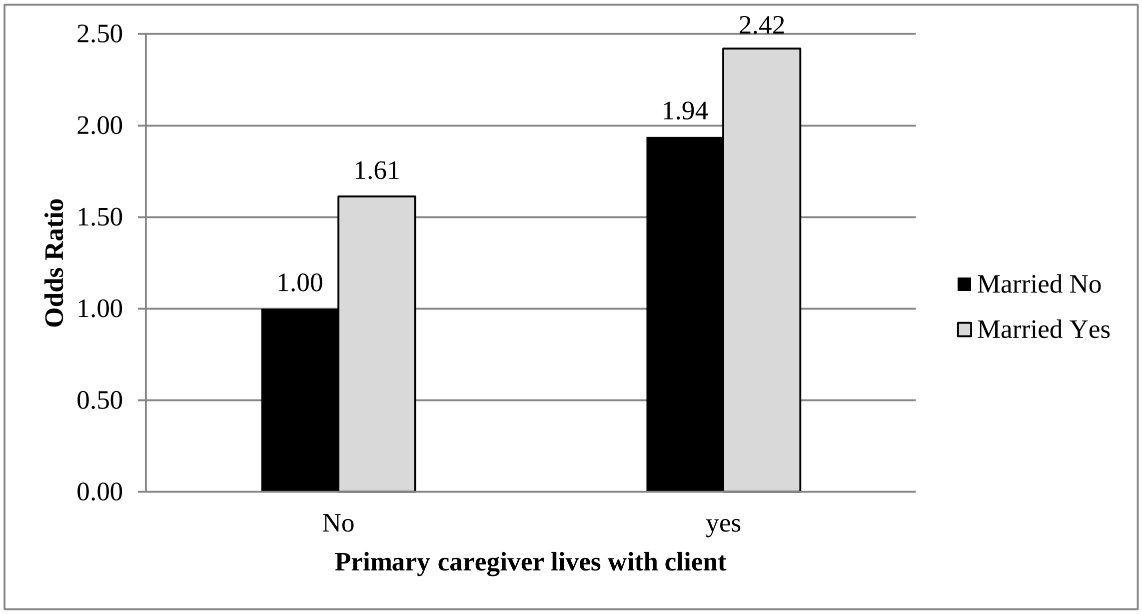


Figure 3. Interaction between primary caregiver lives with client and client's marital status in predicting an onset of caregiver distress

6.4 Discussion

This chapter examined the informal caregiver distress by providing evidence for risk and protective factors associated with an onset and an improvement in caregiver distress among different ethnicities. Further, GEE were used to control for agency-level effects investigating the correlated errors among CCACs. Results demonstrated that being a Korean or Chinese Canadian had lower odds of improvement in caregiver distress, and higher odds of onset in caregiver distress. These findings supported the higher caregiver distress in Korean Canadians and Chinese Canadians found in the previous chapter. However, language barriers based on the need for an interpreter appeared to be the main explanation for this effect rather than ethnicity alone.

One of the objectives of this chapter was to investigate the risk and protective factors for predicting changes in caregiver distress of families caring for older adults. A group of shared risk and protective factors were found: MAPLe level, primary caregiver lives with client, sex, marital status, good prospects of recovery, interpreter needed, difficulty with phone use, treatment changed in last 30 days, hospital visits in last 90 days, persistent anger with self or others, two or more hours of physical activities in the last 3 days, number of months between assessments, surgical wound, Alzheimer’s and other related dementia, client has condition or disease that make cognition, ADL, mood, or behavior patterns unstable, and daily nurse monitoring. Most of the shared risk factors represent need factors that represent most immediate cause of health service use through one’s perceived or evaluated needs (e.g., surgical wound, Alzheimer’s and other related dementia, and client has condition or disease that make cognition, ADL, mood, or behavior patterns unstable). However, some predisposing (e.g., sex) and enabling factors (e.g., interpreter needed) were also employed. While, caregiver distress is the dependent variable in this chapter, the three individual level factors (predisposing factors, enabling factors, and need factors) identified in the Andersen and Newman Framework were used as organizing principles and they had significant influences on caregiver distress.

The risk factors that impeded an improvement or facilitated an onset of caregiver distress included: an increase in MAPLe level, if primary caregiver lives with client, if the client is married, if the client needs interpreter, if the client has difficulty with phone use, if the client has a persistent anger with self or others, if the client has Alzheimer’s and other related dementia, and lastly, if the client has condition or disease that make cognition, ADL, mood, or behavior patterns unstable. All the risk factors and their relationship to caregiver distress was clear.

The protective factors that facilitated an improvement or impeded an onset of caregiver distress included: if the client is female, if the client has good prospects of recovery, if the client had hospital visits in last 90 days, if the client had two or more hours of physical activities in the last 3 days, the number of months between assessments, if the client had surgical wound, and if the client had daily nurse monitoring. Some protective factors and their relationship to caregiver distress may not be clear. For examples, factors such as hospital visits in last 90 days and surgical wound may be protective (lower odds of onset in caregiver distress or higher odds of improvement in caregiver distress) because these factors may indicate an acute state of the client's condition rather than chronic state where caregivers know that the client will get better.

Interestingly, the treatment changed in last 30 days variable predicted positively for both an onset of and an improvement in caregiver distress. The double sidedness of this variable may be due to the acute change that may occur with the treatment change; thus, this variable can either be risk factor for certain situations, but not for the other.

Ethnicity and interpreter needed variables were significantly associated with both an onset of and an improvement in caregiver distress when introduced without one another. However, when both variables were introduced as covariates in the caregiver distress model, the ethnicity variable was no longer significant in predicting an onset of caregiver distress, and close/borderline significant in predicting an improvement in caregiver distress. This analysis showed that it was the language barrier and not "Chinese-ness or Korean-ness" that was a key factor associated with caregiver distress. Thus, targeting language barriers can be a start in reducing distress experienced by home care clients and caregivers from cultural minorities as caregiver distress can be exacerbated by the limited language proficiency of the client as caregiver may play an additional role of becoming a language and cultural broker for the client (Yoo, 2014). As mentioned in Chapter 5, these two variables were two main predisposing and enabling factors that influenced the health service use. Although, the dependent variable for this chapter is caregiver distress, we are observing the similar influence of these factors.

Lack of language support, such as translation services, can be discriminatory to minority groups who do not speak the official languages of the dominant culture. Moreover, language barriers impair social function, a problem which may in turn lower self-esteem, a sense of security and control, access to important information, ability to make friends, and participate in the community (National Senior Council, 2014). The failure of the government to provide such services can exacerbate health outcomes in these populations (Flores, 2006; Woloshin *et al.* 1995).

Tests of interactions between the client's marital status and if primary caregiver lives with client showed that living with the primary caregiver and being married had an amplifying negative effect on both predicting an onset of and an improvement in caregiver distress when combined. Although, living with the primary caregiver was the main factor that lowered the odds in predicting an improvement in caregiver distress, marital status and living with the primary caregiver both increased the odds of predicting an onset of caregiver distress. These patterns were reasonable as clients who were married generally lived together with their spouse who were their main caregivers. Moreover, this result was consistent with the finding of Jun (2005) who found that married caregivers felt more burdened than non-married caregivers.

Lastly, after adjusting for agency-level (within-subject) effects with 14 different Community Care Access Centres, in both GEE results, the exercise variable was no longer significant. A possible reason for this pattern could be that the geographic differences that may affect facilities to promote or impede exercise was accounted for through involving CCACs. In the GEE predicting an improvement in caregiver distress, the ethnicity variable was also found to be insignificant when adjusting for the interpreter needed variable. Therefore, other than the exercise and ethnicity variables, GEE results were consistent with the multivariate logistic models exhibiting similar parameter estimates.

For multicultural societies, it is essential to account for linguistic diversity as part of health and social service delivery. Also, the language barriers are important considerations not only for Korean and Chinese Canadians, but also for other linguistic minorities. In light of the above findings, the government should provide supports to reach out to isolated minority populations of older adults to prevent further deterioration of their health, enhance their quality of life, and support caregivers, making a valuable social and economic contribution to society.

The findings of the present study were somewhat new as there were not many studies that looked at risk factors in predicting an onset of and an improvement in caregiver distress within Korean Canadians, Chinese Canadians, and other Canadians. Thus, these results provided support and emphasized the need for more research targeting immigrant informal caregivers and their coping strategies. Results clearly demonstrated that caregiver distress was less likely to improve and also that it was more likely to occur if the client was either Korean Canadians or Chinese Canadians, especially with language barriers. However, there were many limitations that need to be addressed when the interpreting the results.

First, the risk factors were only examined in the baseline assessment and not in the follow-up assessment which may have led to missing factors that examine the changes between the assessments. However, the longitudinal nature of the analysis offered a strength where it allowed identification of risk factors that predicted changes in caregiver distress. Second, fluency in other languages was not considered because only the primary language was assessed in the RAI-HC. Third, the ascertainment of caregiver distress was done using a binary variable, so the subjective severity of the distress cannot be determined beyond its presence or absence. Fourth, the results may only be generalizable to Korean and Chinese older adults receiving home care in Ontario, but not in other provinces such as British Colombia.

This chapter was built upon a previous study by Chang and Hirdes (2015) and once again demonstrated the need for translation services and other caregiver support services that were important not only for Korean and Chinese Canadians, but also for other linguistic minorities. The next chapter presented the quality of care that Korean older home care clients receive in Ontario, using the second-generation HCQIs, to inform quality gaps that may exist in the care that different ethnic groups may receive, and identify areas for improvement.

7. Home Care Quality Indicators in Older Korean Canadians, Chinese Canadians, and Other Canadians

7.1 Introduction

Immigration later in life is often stressful as immigrants are uprooted from their native society and the cultural adjustments and language barriers are likely to be more severe (Hynie *et al.*, 2011; Kim, 2006; Kim *et al.*, 2014; Mui, 1996; Mui, 2001; Yoo, 2014). Although there are many barriers in access to health services for immigrants, the two most important barriers are language and culture. Many studies have reported that lack of language skills resulted in immigrants accessing health services less often, resulting in decline of health (Fuller-Thomson *et al.*, 2011; Lebrun, 2012; Sears *et al.*, 2013). Moreover, many studies also have demonstrated the effects of cultural insensitivity hindering the use of health services, especially for maternity and mental health services (Fung & Wong, 2007; Higginbottom *et al.*, 2014; Higginbottom *et al.*, 2015; Lee *et al.*, 2014).

Older Korean immigrants, like many other older Asian immigrants, often face language barriers and cultural adjustments. They may also lack the information and resources to adjust to major differences between Asian and Western cultural norms and social expectations (Mui, 1996; Mui, 2001). However, there are very few studies that examine the quality of care that these immigrants receive (Gulati *et al.*, 2012; Lai & Surood, 2013; Prus *et al.*, 2010), and there are no studies on the quality of care in older Korean immigrants in Canada.

Outcome based quality indicators provide the most direct measure of the benefits that may have been realized from health services. Quality indicators are relative estimates that "indicate either the presence or absence of potentially poor care practices or outcomes" (Frijters *et al.*, 2013) or that "measure quality by examining the structure, process, and outcomes of care"

(Hirdes *et al.*, 2004). These indicators are intended to represent the proportion of clients with a given status at a point in time or who improve or decline over time (Foebel *et al.*, 2015; Hirdes *et al.*, 2004; Morris *et al.*, 2013b).

Home Care Quality Indicators (HCQIs) are specifically designed to measure quality in home care services (Hirdes *et al.*, 2004). HCQIs assess quality of care by evaluating consequences of care such as person's health status or change in health status. A second generation of HCQIs was recently developed by Morris *et al.* (2013b). The updated HCQIs have been refined, unclear descriptions of HCQIs were simplified, and new measures related to home care have been added (e.g., caregiver distress HCQI). Further, the individual level covariates for the risk adjustment were expanded and updated with temporal adjustments. The calculation methods for the risk adjustment were also upgraded to a two-step adjustment with direct stratification to allow for better cross-site comparison (Foebel *et al.*, 2015; Morris *et al.*, 2013b).

Several studies have used the first-generation HCQIs to investigate the effects of the risk adjustment on identifying the quality practices across different settings and in different programs within home care (Bos *et al.*, 2007; Dalby *et al.*, 2005; Fries *et al.*, 2003; Mofina & Guthrie, 2014; Sales *et al.*, 2011). Dalby and Hirdes (2008), a study of the relationship between agency characteristics and quality of home care, showed that a summary measure of quality was negatively correlated with the size of the population, suggesting a lower quality of home care with a larger population. Bos *et al.* (2007) also examined the cross-national variability of HCQIs by comparing the home care quality among 11 countries. Similarly, Sales *et al.* (2011) used HCQIs to identify and prioritize the indicators for quality improvement within continuing care. Lastly, Mofina and Guthrie (2014) applied HCQIs to compare quality in Ontario and Manitoba, and found significant levels of functional and cognitive impairment, health instability, and daily pain in home care clients from these two regions. Due to its recent development, there is only one study by Foebel *et al.* (2015) that used the second-generation HCQIs to assess the quality of home care services in six European countries. However, there are no studies that used the second-generation HCQIs to investigate the disparities in quality of home care for immigrants and the general population in Canada.

This final chapter examined the quality of care that Korean older home clients received in Ontario. The second-generation HCQIs provided evidence about quality gaps that may exist in the care that different ethnic groups receive, and helped to identify areas for improvement.

7.2 Methods

7.2.1 Data sources

This study was based on secondary data analysis of health information from Ontario using the Resident Assessment Instrument–Home Care (RAI-HC). The RAI-HC, first introduced in 1997, is a person-centered assessment system, developed for use with clients in home and community-based settings. It contains 21 sections including personal information and over 350 items across a wide range of domains, such as socio-demographics, health, functional status, and resources and service use (Morris *et al.*, 1997). The RAI-HC can be used to support a variety of functions, including outcome measurement based on scales that measure clients' clinical status over time and Clinical Assessment Protocols (CAPs) that provide guidelines for further assessment and person-centered care planning (Hirdes *et al.*, 1999). All assessments are performed and completed by trained health professionals, mostly nurses, as part of the standard clinical assessment done for all home care clients. It usually takes 40 minutes to an hour to complete all the items based on direct interviews of clients and their caregivers as well as reviews of available records and information gained from other formal caregivers (Carpenter & Hirdes, 2013).

The RAI-HC has been shown to have sound psychometric properties, and the items and scales in the RAI-HC have demonstrated good validity, inter-rater reliability and internal consistency (Hirdes *et al.*, 2008a; Landi *et al.*, 2000; Morris *et al.*, 1997; Poss *et al.*, 2008b). The RAI-HC has been mandated for use in eight Canadian provinces and territories, including Ontario (Canadian Home Care Association, 2013). In addition to its clinical applications, the RAI-HC can be used for quality measurement (Dalby *et al.*, 2005; Bos *et al.*, 2007; Foebel *et al.*, 2015; Hirdes *et al.*, 2004; Morris *et al.*, 2013b).

7.2.2 Sample

The study sample consisted of Korean Canadians aged 65 and older (N = 907), Chinese Canadians aged 65 and older (N = 18,451), and other Canadians aged 65 and older (N = 709,705) with all groups being assessed with the RAI-HC between January 2004 and December 2014 in Ontario.

7.2.3 Measures

The second-generation HCQIs can be grouped into four sub-groups with a total of 23 indicators. The first group deals with functional abilities, including ADL, IADL, cognition, and communication. The second group deals with clinical characteristics, including bladder continence, falls, weight loss, injuries, mood, pain, severe daily pain, and pain not being controlled. The third group involves social aspects, including caregiver distress, being alone and distressed, and social isolation. The last group examines health service use, including no influenza vaccination, and use of hospital, emergency department (ED) or emergent care (Morris *et al.*, 2013b).

This chapter compared selected HCQIs among Korean Canadians, Chinese Canadians, and other Canadians with a focus on cognition and psychosocial characteristics (cognitive improvement and decline, mood decline, pain not being controlled, continued caregiver distress, alone and distressed, use of hospital, emergency department or emergent care, and social isolation).

Ethnicity was operationalized using the RAI-HC assessment item on primary language. Case managers completing the assessment used standard language codes provided by the Canadian Institute for Health Information as part of the Home Care Reporting System technical specification.

7.2.4 Analysis

The second generation of risk adjusted HCQIs were used to investigate the quality of care in Korean Canadians, Chinese Canadians, and other Canadians. Further, the primary caregiver lives with client variable was used as a stratification to examine the effects of living with primary caregiver on mood decline and continued caregiver distress HCQIs. Also, the interpreter needed variable was used as a stratification to examine the effects of language barriers on continued caregiver distress and use of hospital, emergency department or emergent care HCQIs. Both of these variables were found to be one of the most influential variables when predicting caregiver distress in Chapter 6, and they are not part of covariates in continued caregiver distress HCQI. Due to sample size, Korean and Chinese Canadians were combined when examining the effect of the interpreter needed variable (only in Figures 14 and 15). All statistical analyses were performed using SAS software (Version 9.4).

7.3 Results

Figure 4 demonstrates the risk adjusted cognitive improvement HCQI over time by ethnicity. The general pattern appeared to decline over time for two groups. Korean Canadians performed worse (stayed lower) than Chinese Canadians and other Canadians between years 2004 and 2010. However, these groups intersected and stayed similar after year 2011. Figure 5 presents the risk adjusted cognitive decline HCQI over time by ethnicity. The general pattern for this HCQI seemed to increase over time. All home care clients stayed similar between years 2004 to 2009; however, rates started to rise after 2009 and Korean Canadians stayed about 5 to 7% higher than Chinese Canadians and other Canadians.

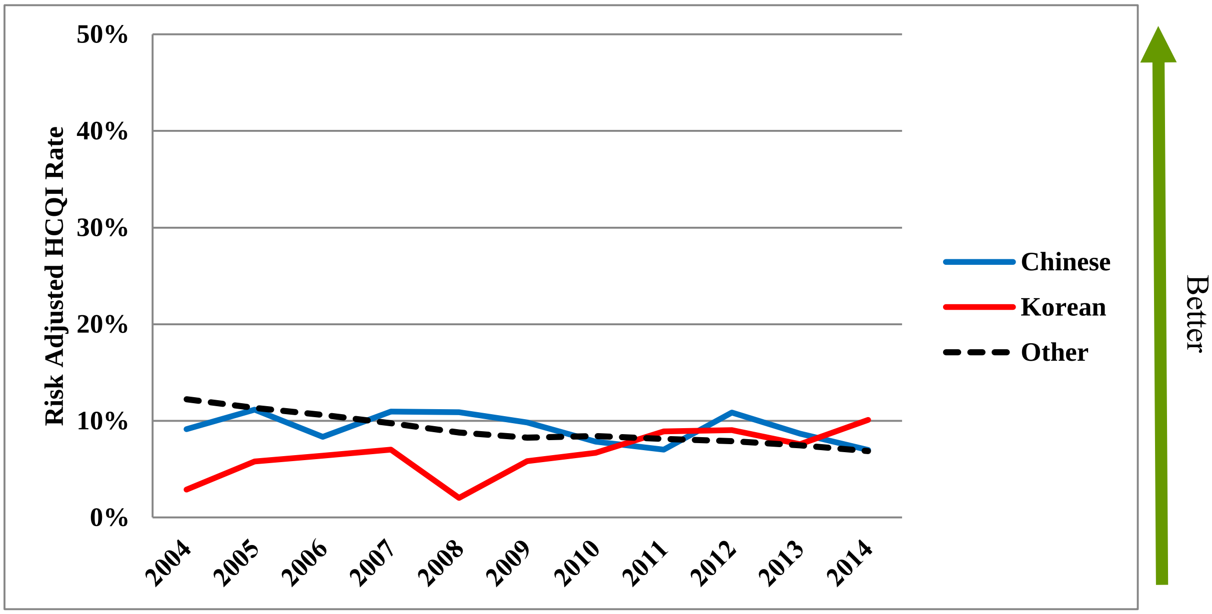


Figure 4. Cognitive improvement HCQI for home care clients by ethnicity, Ontario, 2004-2014

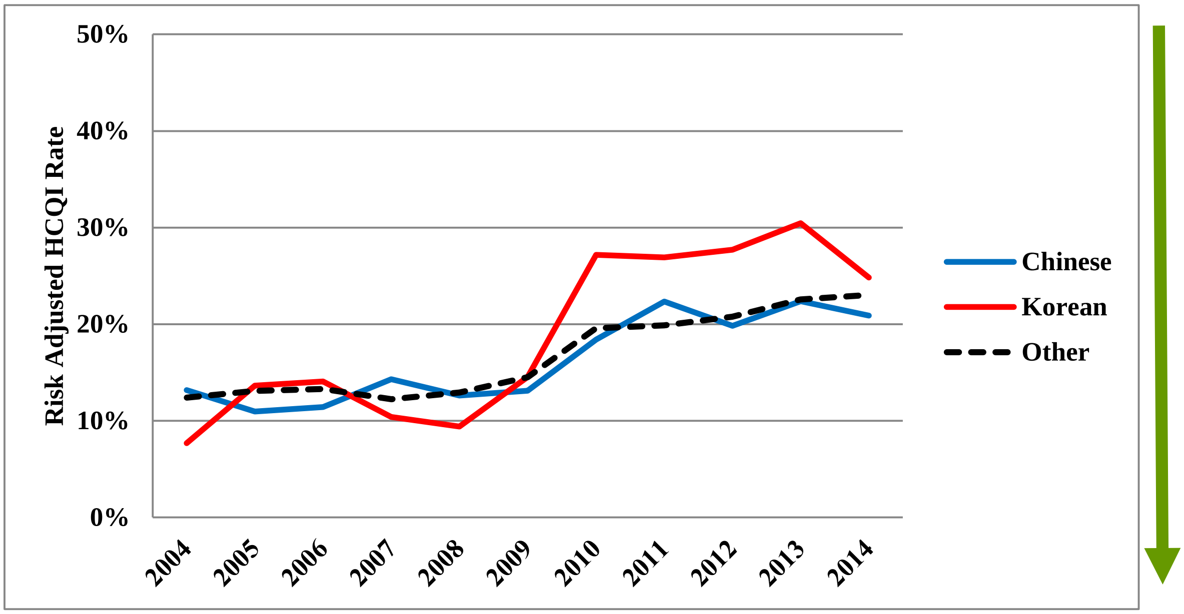


Figure 5. Cognitive decline HCQI for home care clients by ethnicity, Ontario, 2004-2014

Figure 6 demonstrates the risk adjusted mood decline HCQI over time by ethnicity. For all groups the rates of this indicator appeared to increase over time. Chinese Canadians generally stayed slightly lower than other Canadians. Korean Canadians generally stayed lower between years 2005 and 2009, stayed similar between years 2010 and 2012, and higher after year 2012 when compared to Chinese Canadians and other Canadians. Figure 7 demonstrates the risk adjusted mood decline HCQI over time by ethnicity, only for clients who live with their primary caregiver. The patterns were similar to Figure 6; however, the degree and magnitude of patterns have been amplified.

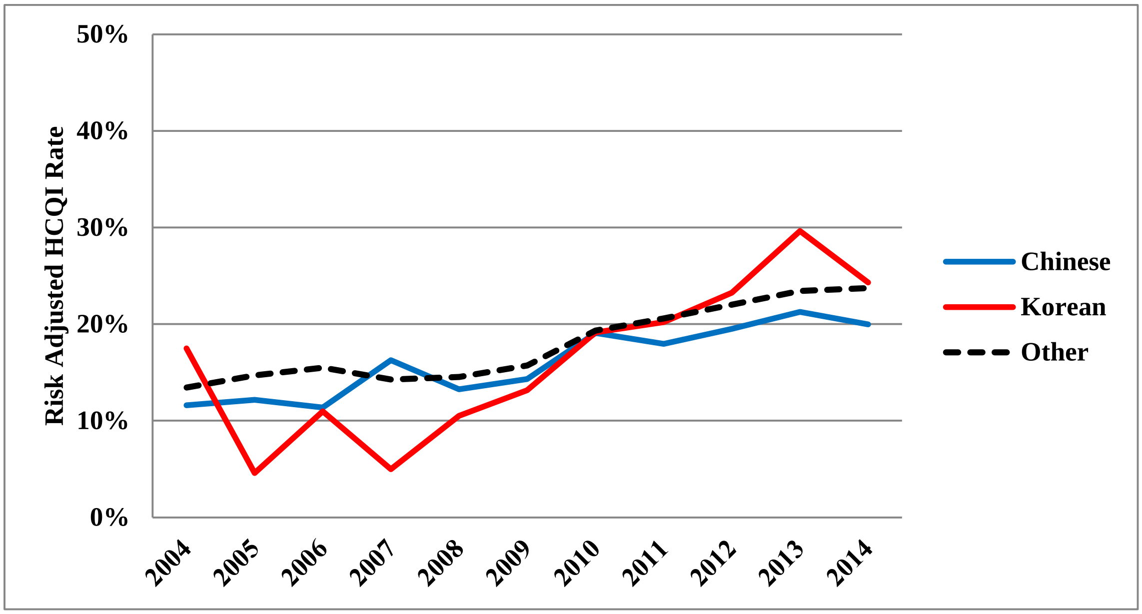


Figure 6. Mood decline HCQI for home care clients by ethnicity, Ontario, 2004-2014

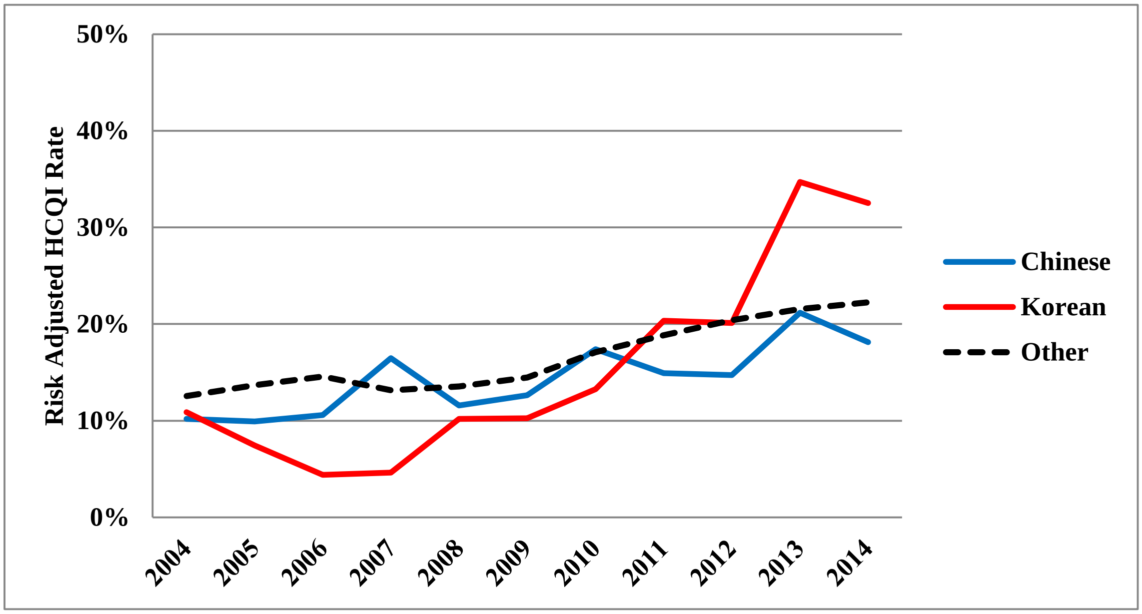


Figure 7. Mood decline HCQI for home care clients by ethnicity (only for clients who live with their primary caregiver), Ontario, 2004-2014

Figure 8 presents the risk adjusted pain not being controlled HCQI over time by ethnicity. There was little change in the rates for other Canadians, but a slight increase in the HCQI rates for Korean Canadians and Chinese Canadians. Korean Canadians' QI rates ranged from 8% to 15%, but they were similar to the rates for other Canadians. However, Chinese Canadians, who showed an increase in this HCQI, stayed higher than Korean and other Canadians. The gap between Chinese Canadians and other Canadians seemed to increase over time, from about 7 to 15%.

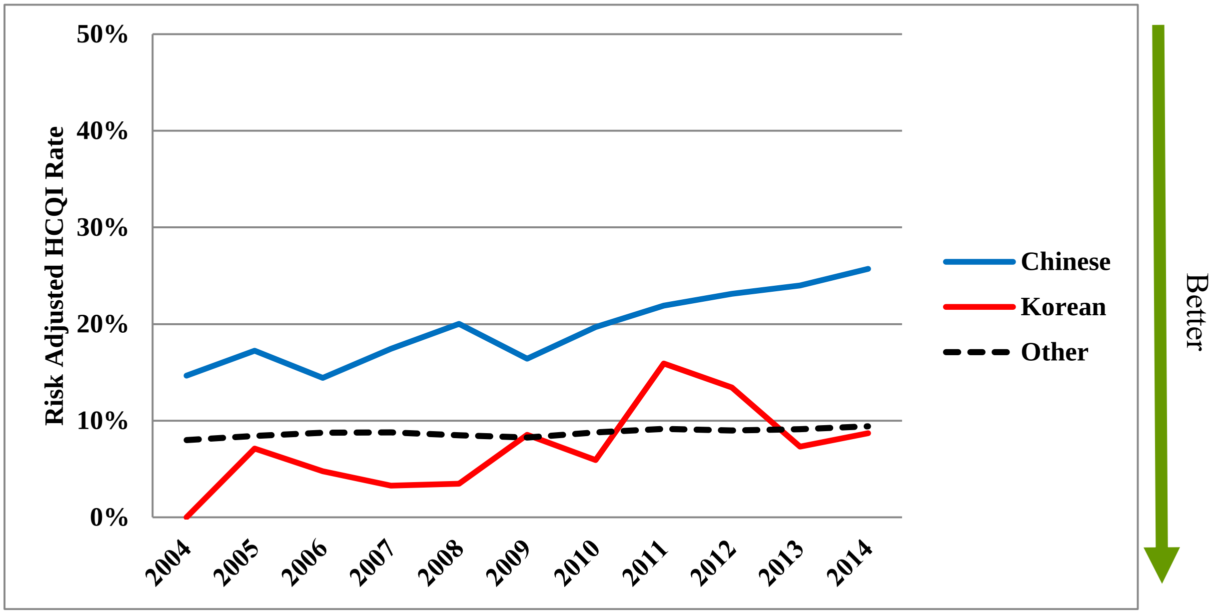


Figure 8. Pain not being controlled HCQI for home care clients by ethnicity, Ontario, 2004-2014

Figure 9 demonstrates the risk adjusted continued caregiver distress HCQI over time by ethnicity. For all groups there was an increase over time, especially after year 2009. Chinese Canadians stayed higher than other Canadians, with the gap of about 12% in 2014. Korean Canadians had fluctuating rates that moved between the two other groups; however, in 2014, the rate surpassed the Chinese Canadians.

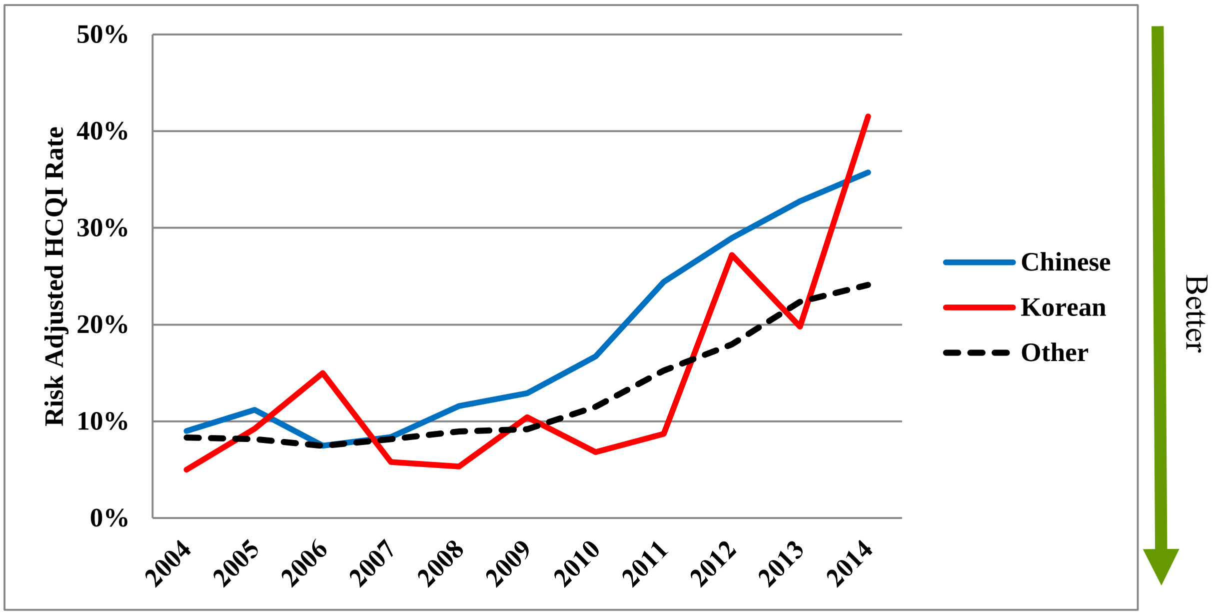


Figure 9. Continued caregiver distress HCQI for home care clients by ethnicity, Ontario, 2004-2014

Figure 10 shows the risk adjusted continued caregiver distress HCQI over time by ethnicity, only for clients who live with their primary caregiver. The overall rates for Chinese Canadians and other Canadians were about 10% lower compared to the rates in Figure 9; however, rates for Korean Canadians stayed fairly consistent irrespective of living arrangements. In this figure, the Korean Canadians showed a similar or higher rate of the HCQI compared to the Chinese Canadians.

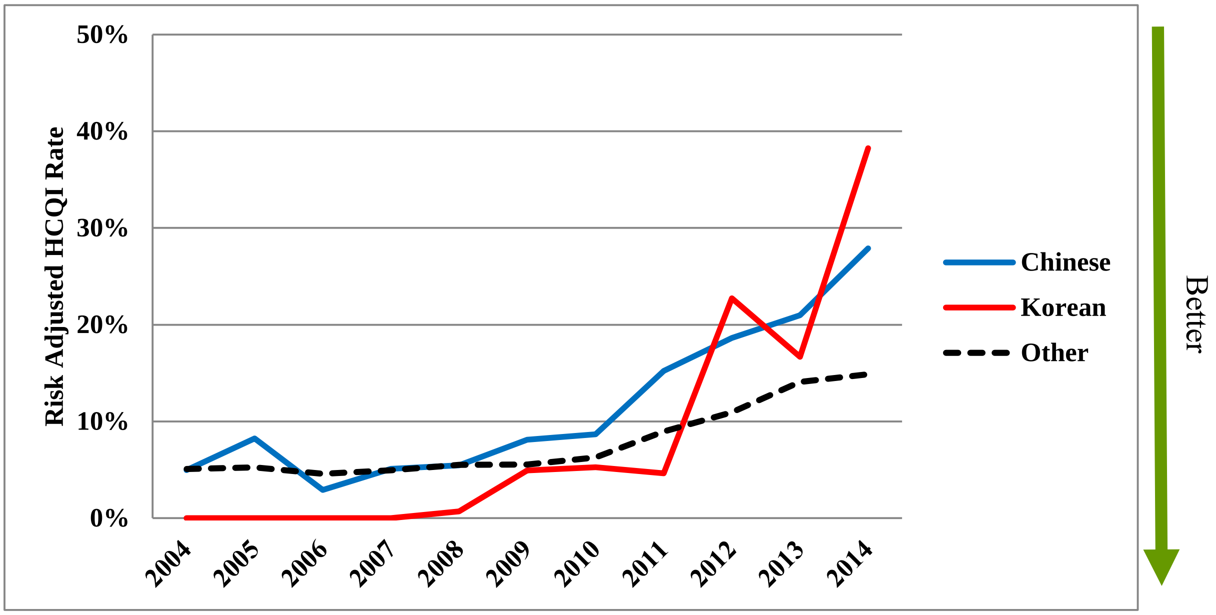


Figure 10. Continued caregiver distress HCQI for home care clients by ethnicity (only for clients who live with their primary caregiver), Ontario, 2004-2014

Figure 11 shows the risk adjusted alone and distressed HCQI over time by ethnicity. There was a slight increase in this HCQI over time for the Chinese Canadians and other Canadians who had similar rates. However, Korean Canadians had more volatile fluctuations with the highest rates between 2008 and 2012.

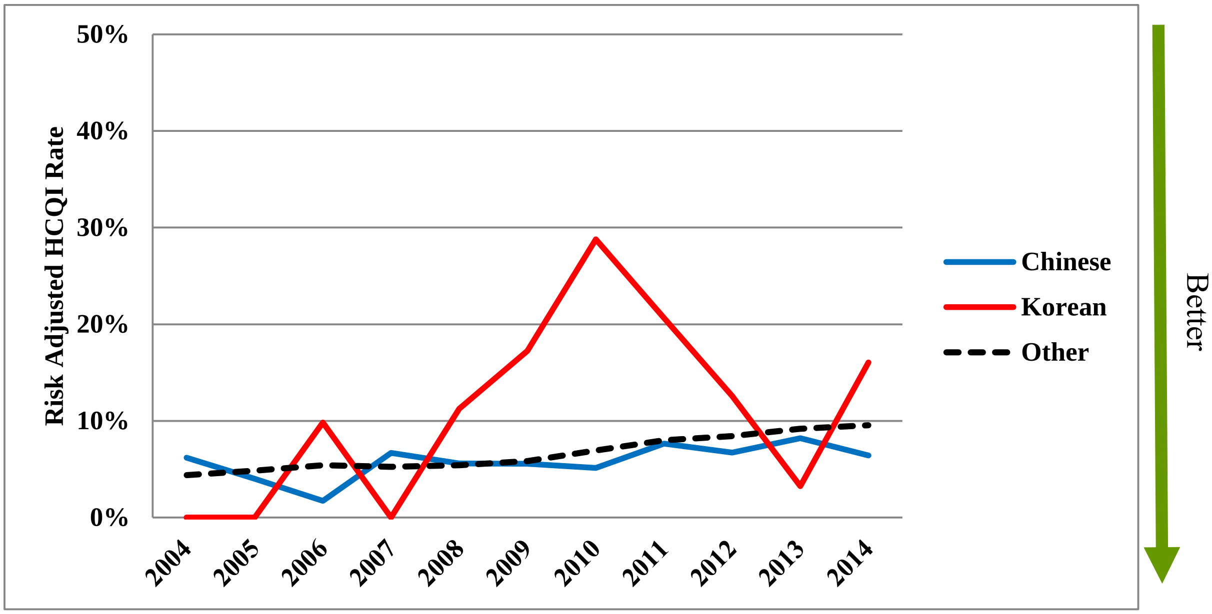


Figure 11. Alone and distressed HCQI for home care clients by ethnicity, Ontario, 2004-2014

Figure 12 presents the risk adjusted HCQI for use of hospital, emergency department or emergent care over time by ethnicity. The general pattern seemed to increase over time for all groups, especially after year 2009. The rates for Korean Canadians and Chinese Canadians were similar and were about 5 to 10% lower than other Canadians.

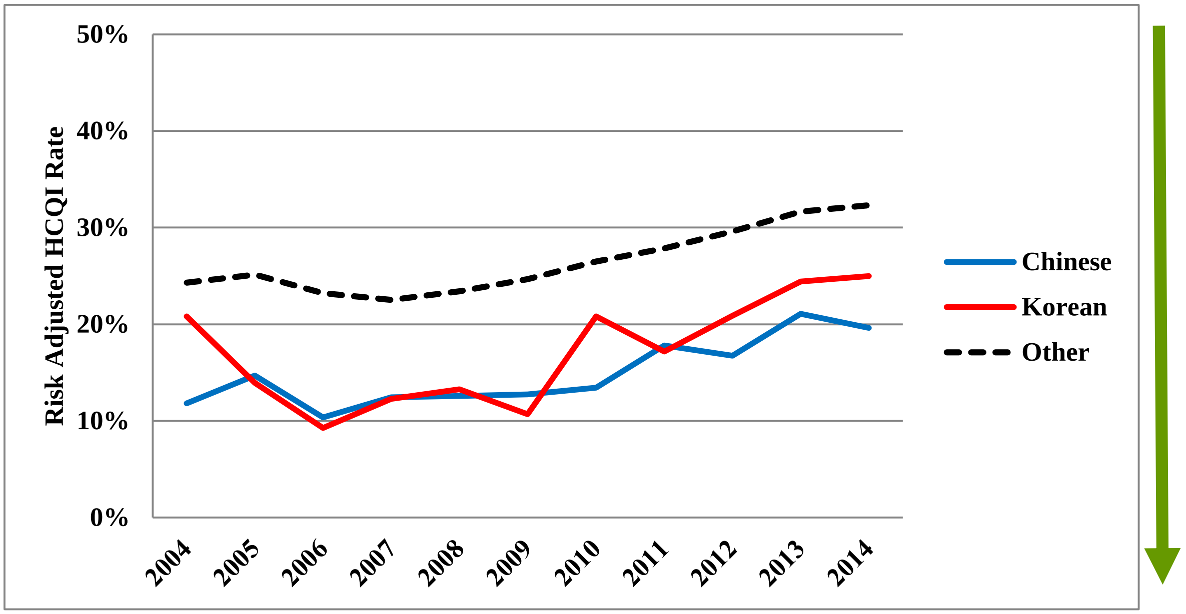


Figure 12. Use of hospital, emergency department or emergent care HCQI for home care clients by ethnicity, Ontario, 2004-2014

Figure 13 presents the risk adjusted social isolation HCQI over time by ethnicity. There was a little change over time for Chinese Canadians and other Canadians. Although Korean Canadians had fluctuating rates, they tended to stay higher than Chinese Canadians and other Canadians from 2006 and onwards. Other Canadians showed the lowest rates over time and Chinese Canadians remained in between the two groups.

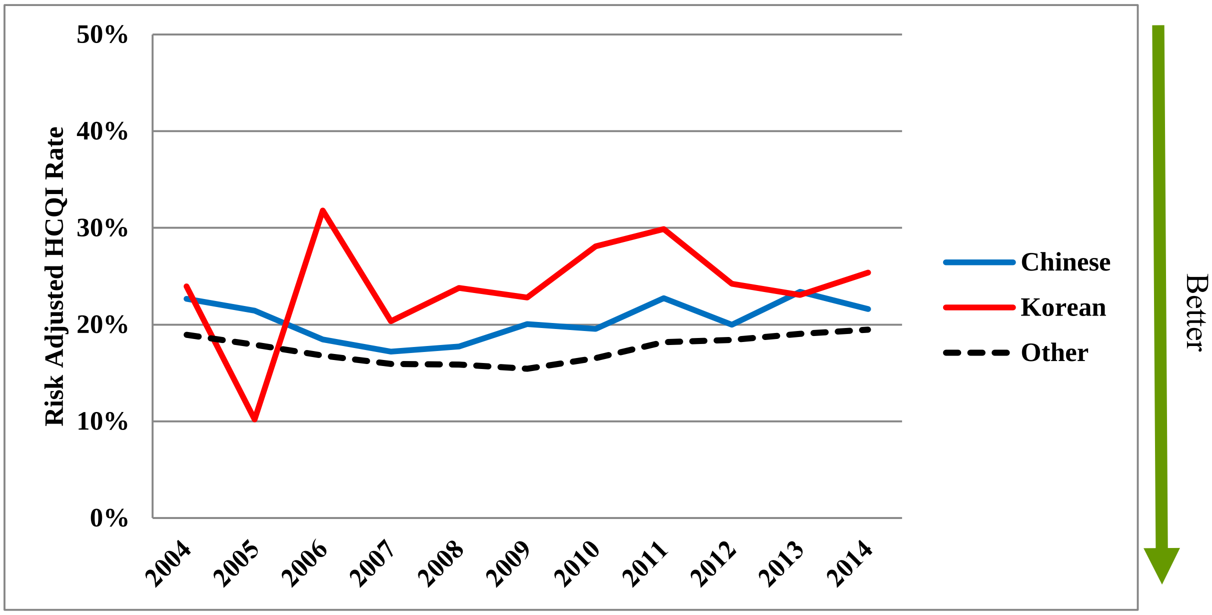


Figure 13. Social isolation HCQI for home care clients by ethnicity, Ontario, 2004-2014

In Figures 14 and 15, in order to examine the effect of need for an interpreter, Korean and Chinese Canadians were grouped due to the small sample size in Korean Canadians. Figure 14 shows the risk adjusted continued caregiver distress HCQI over time by ethnicity and by whether the clients need or do not need an interpreter. For Korean and Chinese Canadians, the continued caregiver distress rates for clients who need and do not need an interpreter seemed to be similar between 2004 and 2009. However, from 2010, clients who need an interpreter had higher rates of caregiver distress than clients who do not need an interpreter, and the gap seemed to increase over time. For other Canadians, the clients who need an interpreter consistently scored about 10% higher than clients who do not need an interpreter. In addition, the rates for Korean and Chinese Canadians were generally higher than other Canadians.

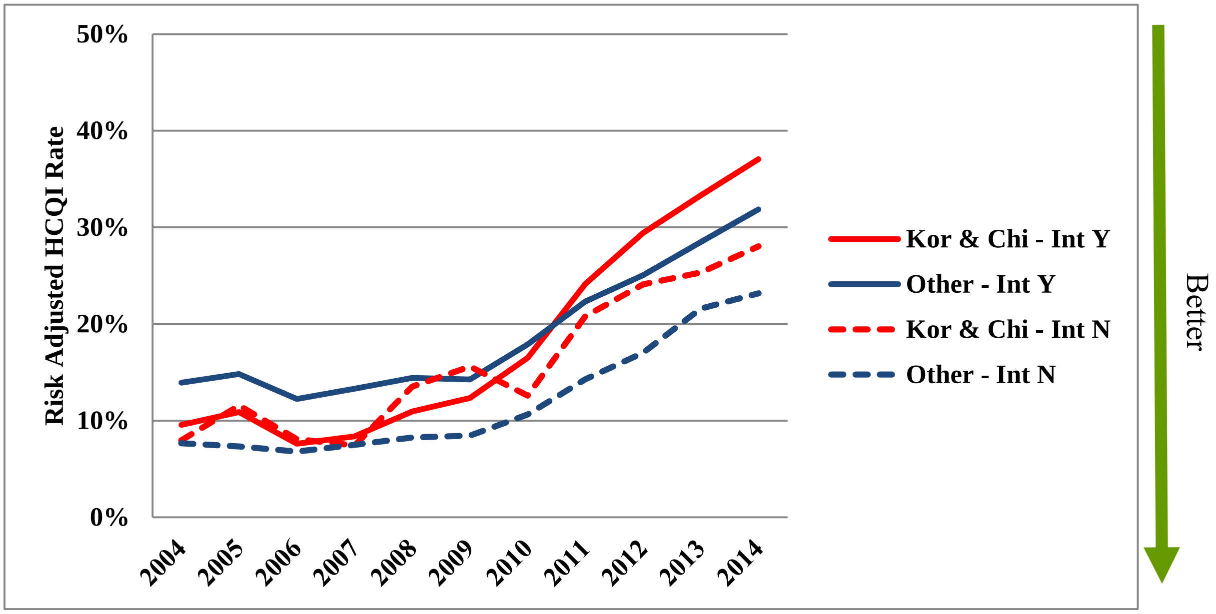


Figure 14. Continued caregiver distress HCQI for home care clients by ethnicity and interpreter needed, Ontario, 2004-2014

*Kor = Korean; Chi = Chinese; Int = Interpreter needed; Y = Yes; N = No

Figure 15 presents the risk adjusted HCQI for use of hospital, emergency department or emergent care over time by ethnicity and by whether the clients need or do not need an interpreter. For Korean and Chinese Canadians, the rates fluctuated over time between clients who need and who do not need an interpreter; however, generally, clients who do not need an interpreter had rates about 5% higher than client who need an interpreter. For other Canadians, the rate was the same at around 25%; however, the gap between clients who need and who do not need an interpreter started to slowly widen. In 2014, clients who do not need an interpreter scored about 5% higher than clients who need an interpreter. In addition, the rates for Korean and Chinese Canadians were generally lower than other Canadians.

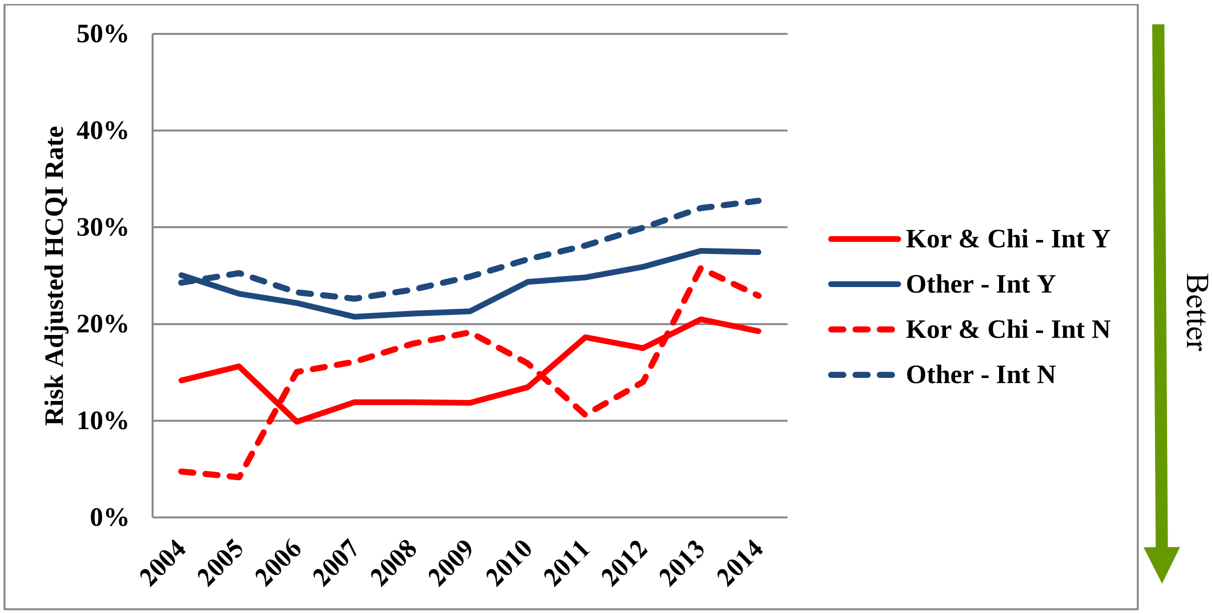


Figure 15. Use of hospital, emergency department or emergent care HCQI for home care clients by ethnicity and interpreter needed, Ontario, 2004-2014

*Kor = Korean; Chi = Chinese; Int = Interpreter needed; Y = Yes; N = No

7.4 Discussion

This study used a selected number of risk adjusted second-generation HCQIs to examine the quality of home care with respect to cognition and psychosocial characteristics among Korean Canadians, Chinese Canadians, and other Canadians. The results of this study have demonstrated some interesting HCQI patterns. Some specific areas quality of care were identified where service providers for Korean Canadians have opportunities to improve quality. These included the areas of cognitive and mood decline, alone and distressed, and social isolation in recent years. Chinese Canadians had very high rates of pain not being controlled, which need to be targeted. Other Canadians showed high rates of use of hospital, emergency department or emergent care, which need to be addressed. All home care clients showed an increase in continued caregiver distress, where reasonable interventions might be employed to manage this (e.g., Caregiver ReCharge program that targets caregivers of clients with high needs and provides temporary relief by substituting caregiving by trained personal support workers) (Mississauga Halton Local Health Integration Network, 2014).

Caregiver distress has been a focus in previous chapters, and the present analyses have shown that continued caregiver distress HCQI appears to be a rising quality problem in home care since 2009. Moreover, living with the primary caregiver substantially lowered rates of continued caregiver distress HCQI for Chinese Canadians and other Canadians. It would have been reasonable to predict a higher continued caregiver distress for primary caregivers who are living with the client; however, accounting for various risk adjustments, the result in this HCQI demonstrated that the opposite was true. One reason for this pattern may be that for Chinese Canadians and other Canadians, living with the primary caregiver may indicate more resources such as having more than one family caregivers who can help (i.e., spouse, child, relative, and friend). Nevertheless, continued caregiver distress for Korean Canadians seemed to be consistent whether the client lives with the primary caregiver or not. One reason for the minimal effect in Korean Canadians could be that most of the older Koreans live with their primary caregivers. However, the high triggering rate in informal support CAP mentioned in Chapter 5 suggested that this may not be the case. Thus, this difference may be caused by cultural or other situational differences; however, it was clear that some differences exist as the presence of a primary caregiver living with the clients did not affect Koreans as much as Chinese Canadians and other Canadians.

Similarly, in Figure 14, when the clients do need an interpreter, the continued caregiver distress HCQI rates were generally higher for all home care clients when compared to clients who do not need an interpreter. This pattern substantiated the results from the multivariate logistic analyses in Chapter 6 and once again strengthened the evidence that addressing language barriers may not only support clients, but also help alleviate informal caregiver distress. This result also illustrated that the language barriers were important considerations not only for Korean and Chinese Canadians, but also for other linguistic minorities. In addition, it would have been reasonable to predict that among clients who do not need an interpreter (assumed to have no language barriers), the rates for Korean and Chinese Canadians and other Canadians would be similar; however, Korean and Chinese Canadians still showed higher rates of caregiver distress. This pattern may be explained by other cultural or situational differences that are driving the distress. Also, the different levels of language proficiency that was not accounted for can be another explanation.

Another very important and interesting finding in this study involved the HCQI that measured the use of hospital, emergency department or emergent care. The use of hospital, emergency department or emergent care is an acute proxy for an illness or health decline. It may also reflect the quality of primary care. Thus, lower use of hospital and emergency department visits usually represents good quality of care with lower instances of illness, health decline, and/or better primary care. The result of this HCQI demonstrated that Korean Canadians were doing better throughout the years as a lower percentage of clients were using hospital, emergency department or emergent care when compared to other Canadians. However, when considering the results of other HCQIs, Korean Canadians were doing similar to other Canadians or worse in health status measures. With this in mind, it was surprising to observe a lower percentage in the use of hospital, emergency department or emergent care HCQI. In fact, this might indicate cultural and language barriers to accessing acute care services. Thus, more attention was needed when interpreting this HCQI. One might argue that this HCQI may not be suitable for representing different cultural groups; however, it might simply be reflecting the low use of hospital and ED visits noted in Chapter 5 as a result of stoicism, use of Eastern medicine, and/or language barriers that discourage visits to emergency department. Thus, for clients with limited language proficiency, the lower results could also be interpreted as negative findings that show barriers to access in health care.

Similar patterns were observed in Figure 15 where the rates for Korean and Chinese Canadians were generally lower than other Canadians. However, the rates were generally lower when the client needs an interpreter than when the client does not need an interpreter for all home care clients, which again reflect barriers to access in health care for clients with limited language proficiency.

Additionally, this HCQI included a range of covariates such as physician visits, difficulty in bathing, diabetes, number of months between assessments, institutional risk, Cognitive

Performance Scale, Depression Rating Scale, and clinical risk scale that included health indicators such as shortness of breath, weight loss, other fractures, chest pain, vomiting, flare-up, bladder continence, insufficient fluid, worsening of decision making, and change in ADL status. Thus, it considered various health and other clinical characteristics in its risk-adjustment. With all these various covariate accounted for, the lower percentages in Korean Canadians reflect barriers in access to care. Therefore, it is also possible to consider the primary language/ethnicity and/or interpreter needed variables as covariates for the risk adjustments to account for the unequal distribution of client diversity; however, caution needs to be taken as this process may hide the existing communication barriers that may be a quality issue themselves.

Similar to the findings of Tjam (1997), Chinese Canadian home care clients demonstrated lower formal service use in Chapter 5 and reported lower rates of the HCQI that measured the use of hospital, emergency department or emergent care. However, significant differences were shown in the pain not being controlled HCQI for older Chinese Canadians. One explanation for this pattern may be related to the use of traditional Chinese medicine (TCM). According to Tjam (1997), Chinese Canadians experiencing pain reported 5 to 6 times higher odds of using TCM and combined medicine, which is consistent as Chinese use medication mainly for symptomatic relief. As TCM is very important/familiar to elderly Chinese when dealing with pain, they resort to TCM instead of using Western medicine. The patterns in the pain not being controlled HCQI showed that Chinese Canadians were consistently 5-15% higher than other Canadians. This pattern may be a consequence of preferring TCM over Western practitioners (Tjam, 1997). As identified by Tjam (1997) this continues to be a serious problem, not necessarily because Chinese Canadians use TCM, but because their needs may not be met by using TCM alone. Therefore, the high rates in pain not being controlled HCQI implied that Chinese home care clients were receiving treatments that were not be appropriate for managing pain. Unlike Chinese Canadians, Korean Canadians HCQI rates for pain were similar to other Canadians. This may be due to the fact that Korean Canadians were more willing to use Western medicine. Thus, this result also demonstrated that pain management and medication use were driven by social and cultural factors. A better understanding of TCM and its effects on pain, and better education about Western medicine for Chinese home care clients may be necessary.

The findings of this study have highlighted several differences in the quality of home care for Korean Canadians, Chinese Canadians, and other Canadians. However, there were limitations that need to be noted when the interpreting the results. First, in the analyses for some years the sample size for Korean Canadians was below 50. This may have affected the stability of HCQIs and have created more measurement errors (noise) compared to Chinese Canadians and other Canadians. The HCQIs for year 2015 were not calculated due to small sample sizes. Second, unlike general calculations of HCQIs, this study only calculated HCQIs for older adults aged 65 and older. Thus, this narrowing in selection of sample may have influenced age covariates that were involved in the calculation of the HCQIs. Moreover, the results may not be generalizable to home care clients who are younger than 65, short-stay clients, or to Canadians receiving home care services in other provinces. Lastly, there may be a value in considering the reasons for the use of hospital, emergency department or emergent care when selecting the clients for the calculation of the HCQI, but these are not addressed or factored in the HCQI. In order to account for reasons, information from other sources are necessary, which complicates the calculation of the HCQIs. Also, lack of primary care data or adequate primary care measures to check the use of primary care for Korean and Chinese Canadians within the RAI-HC were another weakness; however, this will be addressed by using the new interRAI HC as it contains more adequate measures.

Despite these limitations, the present study was the first to compare the quality of care in Korean Canadians, Chinese Canadians, and other Canadians. The different targets of improvement shown by different results in HCQIs informed the need for better health interventions in different ethnic groups to improve the quality of care. Overall, this work has illustrated that it is feasible to use the HCQIs to assess quality performance in different ethnic groups by the primary language.

Evaluating the quality of care provided to older adults from different ethnic groups is an important consideration in Canada where 1 in 5 people in the population is foreign-born (Statistics Canada, 2011b). Adequate and culturally sensitive home care services are very important to ensure the quality of life of older immigrants. In this study, HCQIs were used to assess and evaluate the quality of care and found some distinctive differences that need to be addressed. The advanced risk adjustment method in the second-generation HCQIs accounted for client health profile differences and gave a more accurate reflection of the effectiveness of the home care services being provided.

The second-generation HCQIs demonstrated variability by cultural group and showed distinctive needs for Korean Canadians, Chinese Canadians, and other Canadians. The results showed that service providers for Korean Canadians needed to set targets for improvement in cognitive and mood decline, alone and distressed, and social isolation. For Chinese Canadians, the priority areas were pain, and other Canadians should target use of hospital, emergency department or emergent care. Moreover, caregiver distress was a major quality of care problem for each of these groups, but especially for Korean and Chinese Canadians. This study is the first study to use the second-generation HCQIs to assess quality of care in different ethnic groups. This work can be a start in investigating racial and cultural differences in quality of care with the goal of decreasing health disparities in the culturally mosaic of Canadian home care.

8. General Discussion and Summary

Over the past 150 years of Canadian history, there have been various drivers that have contributed to the population growth. In more recent years, two-thirds of population growth has been due to immigration. Statistics Canada projects that immigration will continue to be a key driver of population growth in Canada (Statistics Canada, 2016). This growth highlights the importance of evaluating and appraising the needs of the ever-growing population of immigrants in Canada, especially those who have a limited proficiency in the two official languages. This dissertation explored the health disparities, informal caregiver distress, and quality of care of community-residing Korean older adults by comparing Korean Canadians, native Koreans, Chinese Canadians, and other Canadians. This is the first cross-cultural study to examine the health disparities and caregiver distress of Korean older adults in Ontario and in Korea using the RAI-HC/interRAI HC, and to explore quality of care by ethnicity in Ontario using the second-generation HCQIs.

In 2006, Korean and Chinese Canadian immigrants comprised of about 4% of the total population, and these populations continue to increase in size. Since 2003, 1,093 older Koreans and 13,176 older Chinese have received home care services in Ontario based on the RAI-HC data. More than 80% of these clients needed an interpreter. Health disparities were evident from the overall findings in Chapter 5 where both Korean Canadians and native Koreans generally exhibited higher impairments compared with Chinese Canadians and other Canadians. In addition, higher caregiver distress was present in the three Asian groups compared to other Canadians. Upon further examination of caregiver distress, results in Chapter 6 demonstrated that being a Korean or Chinese Canadian was associated with lower odds of an improvement in caregiver distress and higher odds of an onset of caregiver distress over time. However, language barriers based on the need for an interpreter appeared to be the main explanation for this effect rather than ethnicity alone. Lastly, Chapter 7 examined quality of care using the second-generation HCQIs and found different opportunities to target different groups for quality improvement initiatives. For Korean Canadians, such initiatives should focus on cognitive and psychosocial factors, whereas Chinese Canadians need interventions to target pain, and other Canadians need to improve on the use of hospital, emergency department or emergent care**.** Most importantly, all groups exhibited an increase in continued caregiver distress over time, though the two Asian groups' rates seemed to increase more steeply.

Overall, the older Korean Canadian home care clients demonstrated substantial health needs and family caregivers had a dire need for additional supports from formal services. However, these clients had a lower or similar use of home care services (i.e., personal support/ homemaking services, and the use of hospital, emergency department or emergent care), and had higher levels of caregiver distress indicating that their informal caregivers were struggling. Thus, more practical interventions or resources need to be devoted to this population.

8.1 A Health Profile of Older Korean Canadians, Native Koreans, Chinese Canadians, and Other Canadians

The goal of Chapter 5 was to describe and compare health and health service use of Korean Canadians, native Koreans, Chinese Canadians, and other Canadians. The overall findings in the health profiles indicated that both Korean Canadians and native Koreans exhibited higher cognitive and physical impairments than other groups. Furthermore, the three Asian groups had notably higher caregiver distress compared with other Canadians. Moreover, the dramatic difference found with respect to the need for an interpreter, where Korean Canadians and Chinese Canadians were about 10 times as likely to need an interpreter compared with other Canadians, pointed to the critical importance of language barriers for home care clients and their caregivers in Canada.

Korean Canadians, who had higher impairments, tended to receive less or similar level of services compared to Chinese Canadians and other Canadians. The lower emergency department visits in native Koreans, Korean Canadians, and Chinese Canadians may reflect that they were managed well at home with primary care services. However, there was also possibility that Eastern medicines and therapies might have been used as an alternative to the conventional Western health care services. Alternatively, language barriers may have discouraged older clients, who do not speak English/French, to avoid visits to emergency department. Overall, Korean Canadians, even with the higher impairments reflecting higher need factor, tended to receive less or similar level of services due to predisposing and enabling factors such as cultural beliefs and language barriers.

Although the native Korean home care client sample that was used in this thesis was a small sub-sample that may not represent the whole native older Korean home care client population in Korea, distinctive differences in health profiles were recognized when compared to the Korean Canadian home care client sample. Thus, the older Korean Canadian home care clients may have evolved and acculturated into the host environment after immigration, forming a third cultural group that is also distinct from the older native Korean population in Korea. Nonetheless, more samples are required from Korea in order to more accurately investigate the general changes and differences found between these two populations. Further, this study was a first step to see the initial difference in the client's health profiles and health service use in these countries. Subsequent studies can be more tailored to comparing Korean Canadians and native Koreans by matching additional variables from the long-term care insurance criteria, so that these two groups will be more comparable. Also, if follow-up assessments of the native Korean sample become available, additional analysis with the use of multivariate and longitudinal models can be done to examine and gain a better understanding of the differences in between these two groups and the factors that result in these differences.

In conclusion, the higher impairments in Korean Canadians and native Koreans, and higher caregiver distress in Asian home care clients suggested the need for better health care policies in both Canadian and Korean health care systems. Notably, the high percentages of clients needing an interpreter for Korean and Chinese Canadians, highlighted the need for urgent review of language support in home care services.

8.2 Informal Caregiver Distress among Older Korean Canadians, Chinese Canadians, and Other Canadians

Chapter 6 examined informal caregiver distress by providing evidence for risk and protective factors associated with an onset of and an improvement in caregiver distress among Korean Canadians, Chinese Canadians, and other Canadians in Ontario. Results demonstrated that being a Korean or Chinese Canadian had lower odds of an improvement in caregiver distress, and higher odds of an onset of caregiver distress. These findings were consistent with the higher caregiver distress in Korean and Chinese Canadians found in the previous chapter. However, the relationship between ethnicity and interpreter needed variables in regression models showed that it was the language barrier and not “Chinese-ness or Korean-ness” that was a key factor associated with caregiver distress. Thus, language barriers based on the need for an interpreter appeared to be the main explanation for this effect rather than ethnicity alone. Therefore, targeting language barriers can be a start in reducing distress experienced by home care clients and caregivers from cultural minorities.

A group of shared risk and protective factors were found such as MAPLe level, primary caregiver lives with client, sex, marital status, good prospects of recovery, interpreter needed, surgical wound, Alzheimer's and other related dementia, and client has condition or disease that make cognition, ADL, mood, or behavior patterns unstable. Most of the shared risk factors represent need factors that represent most immediate cause of health service use through one's perceived or evaluated need (e.g., surgical wound, Alzheimer's and other related dementia, and client has condition or disease that make cognition, ADL, mood, or behavior patterns unstable). However, some predisposing and enabling factors were also present including sex, marital status, and interpreter needed. Although, the dependent variable for this chapter is caregiver distress and not health service use, the three individual level factors (predisposing factors, enabling factors, and need factors) identified in the Andersen and Newman Framework were used as organizing principles and they had significant influences on caregiver distress.

Tests of interactions between the client's marital status and if primary caregiver lives with client showed that living with the primary caregiver and being married had an amplifying negative effect on both predicting an onset of and an improvement in caregiver distress when combined.

Lastly, after adjusting for agency-level (within-subject) effects with 14 different Community Care Access Centres, the exercise variable was no longer significant in both models predicting an onset of and an improvement in caregiver distress. A possible reason for this could be that the geographic differences that may affect facilities to promote or impede exercise was accounted for through involving CCACs.

In conclusion, for multicultural societies, it is essential to account for linguistic diversity as part of health and social service delivery because language barriers are important considerations not only for Korean and Chinese Canadians, but also for other linguistic minorities. In light of the above findings, the government should provide supports to reach out to isolated minority populations of older adults to prevent further deterioration of their health, enhance their quality of life, and support caregivers.

8.3 Home Care Quality Indicators in Older Korean Canadians, Chinese Canadians, and Other Canadians

Chapter 7 used a selected set of risk adjusted second-generation HCQIs to examine the quality of home care with respect to cognition and psychosocial characteristics among Korean Canadians, Chinese Canadians, and other Canadians in Ontario. The results of this study have shown some very interesting patterns of HCQIs. Korean Canadians demonstrated opportunities to improve quality in cognitive and mood decline, alone and distressed, and social isolation in recent years. Chinese Canadians had high rates of pain not controlled for which reasonable interventions can be developed (e.g., bridging training/education programs for immigrants on Western medicine and available resources that may be helpful in improving familiarity and compliance with Western pain management). Other Canadians showed high rates of use of hospital, emergency department or emergent care. All groups showed an increase in continued caregiver distress, where reasonable interventions might be employed to manage this (e.g., Caregiver ReCharge program that targets caregivers of clients with high needs and provides temporary relief by substituting caregiving by trained personal support workers) (Mississauga Halton Local Health Integration Network, 2014).

The continued caregiver distress HCQI appeared to be a rising quality problem in home care since 2009. Moreover, when the client lived with the primary caregiver, the rates were generally lower for Chinese Canadians and other Canadians. However, for Korean Canadians the rates seemed to be consistent, so the rates appeared to be higher than Chinese Canadians and other Canadians. These differences may have been caused by cultural or other situational differences. However, it was clear that Korean Canadians who lived with their primary caregiver may require more careful attention by home care services.

Another important finding in this chapter was from the result of the HCQI that measured the use of hospital, emergency department or emergent care. This HCQI demonstrated that Korean Canadians were doing better throughout the years because lower percentages of clients were using hospital, emergency department or emergent care compared to other Canadians. However, Korean Canadians were doing similar or worse in other HCQIs when compared to other Canadians. With this in mind, it was questionable to observe lower percentages in the use of hospital, emergency department or emergent care HCQI. Thus, some caution was needed when interpreting this HCQI as this result may reflect barriers to access in health care for clients with limited language proficiency.

In addition, it is possible to consider the primary language/ethnicity and/or interpreter needed variables as covariates for the risk adjustments. As risk adjustments are made to make fair comparisons among different agencies by controlling for the unequal distribution of client-level or agency-level characteristics. A facility or an agency that is located in a culturally diverse region (e.g., Toronto) will tend to have higher language barriers that may affect service use or quality outcomes when compared to a more homogenous region with one majority ethnicity (e.g. Guelph). Accounting for client diversity may be necessary; however, caution needs to be taken as this process may hide the existing communication barriers that may be a quality issue themselves.

Overall, this work has shown distinctive differences in various areas of quality of care among ethnic groups, illustrating the feasibility of using the HCQIs to assess quality performance in different ethnic groups using the primary language. Evaluating the quality of care provided to older adults from different ethnic groups is an important consideration in Canada where 1 in 5 people in the population is foreign-born (Statistics Canada, 2011b). Adequate and culturally sensitive home care services are important to ensure quality of life of older immigrants.

8.4 Implications for Practice

This dissertation has many implications for practice. First, older Korean home care clients seemed to get less home care services such as physio-therapy and personal support services despite their higher impairments in cognition, ADL, and IADL functions. This inverse pattern may be explained by the possibility that they seek formal services at a later time when they are more impaired than other Canadians due to the cultural tendencies or language barriers that may discourage them from using formal services and these are predisposing and enabling factors that can lead to inequitable access to health services. This can be a starting point for further examination to see if any barriers exist in using the services for other immigrants, especially with limited proficiency in the official languages.

Second, the high need for an interpreter in Korean and Chinese Canadians should to be addressed. Language barriers are fundamental problems that usually come with immigration. Language barriers can also be considered as a temporal disability as it limits the client’s ability to express and communicate freely with health care providers. However, it is one of the easiest problems to address as there are many different ways to surmount those barriers (e.g., a better integration between multicultural centres and home care services for affordable and often free language interpretation and translation services). As demonstrated in the multivariate logistic analyses in Chapter 6, addressing language issues may not only support the client, but also help alleviate informal caregiver distress. Considering that often, the adult children or informal family caregivers play a major supportive role and become a language and cultural broker for their parents (Yoo, 2014). Lack of language support, such as translation services, not only exacerbates the health of clients, but also the health of their informal caregivers.

Lastly, the high percentage of informal caregiver distress and the soaring continued caregiver distress HCQI especially in Korean and Chinese Canadians demonstrated the need for caregiver support programs for their informal caregivers. Identifying and targeting these caregivers is straight forward as only two items in the RAI-HC are used and they can be employed as a triggering mechanism to alert home care professionals or clinicians. Further, there is a great potential in using the risk and protective factors, identified in Chapter 6, to make baseline algorithms that may be used to better select and prioritize groups of client caregivers into tailored interventions to reduce caregiver distress. Disregarding the burden of informal caregivers and leaving them to burnout, may lead to other serious problems such as elder neglect and abuse. Therefore, there needs to be appropriate supports for the informal caregivers to prolong the client's ability to stay at home. In particular, culturally sensitive support services for immigrant caregivers are a priority as studies have also reported barriers in accessing these services (Lai & Surood, 2010; Neufeld *et al.*, 2002). Immigrant populations are also aging, and immigrant caregivers are three times more likely to have negative health consequences than non-immigrants (Suwal, 2010). Therefore, without appropriate services, the health of caregivers is also in danger.

8.5 Implications for Research

The present dissertation is the first study to examine the health disparities in older Korean immigrants in Canada by investigating their health and health service use, informal caregiver distress, and quality of care. The use of a native Korean sample, with limitations in sample size and selection, as a comparison in Chapter 5 showed that further international comparisons and collaboration can be pursued and encouraged when studying the acculturation and changes in health that immigration brings.

Although this dissertation has demonstrated the feasibility of using the interRAI assessments and outcome measures in differentiating health by ethnicities, more studies are encouraged to investigate the effects of language as an important factor predicting health service use and needs. Similarly, further research is needed to fully understand the effects of language barriers in the outcomes of service-related HCQIs as the results may need to be interpreted with caution (i.e., the HCQI that measured the use of hospital, emergency department or emergent care).

The comparison of caregiver distress in Korean Canadians, native Koreans, Chinese Canadians and other Canadians adds to existing Korean Canadian research as no studies have investigated these population subgroups in home care. Further, the incorporation of temporality in identifying the risk and protective factors in predicting an onset of and an improvement in caregiver distress is another step in improving evidence for decision making and supporting home care interventions. Also, the use of advanced risk adjusted second-generation HCQIs to assess caregiver distress has led to the confirmation of rising caregiver distress over the years for all home care clients in Ontario. This dissertation has provided a foundation for future studies on caregiver distress as an issue of growing importance in Canada.

Overall, this dissertation has broadly tapped into many important areas of research. Future research on immigrants or minorities is vital as these populations may face the same difficulties and barriers that Korean Canadian home care clients experienced. This work can be a starting point in investigating racial and cultural differences in quality of care in pursuit of decreasing health disparities in culturally diverse Canadian home care clients.

8.6 Implications for Policy

The evidence presented in this dissertation demonstrates health disparities and some differences in quality of care by ethnic groups. Therefore, efforts are needed to address the identified areas for improvement and to better accommodate the needs of immigrants. Further, these findings inform and support policy makers to develop and implement more appropriate policies and guidelines regarding the health status and service use of immigrants in home care.

One important finding of the dissertation is the critical importance of language barriers for home care clients and their caregivers. Studies have reported that language barriers are the most common adaptation difficulties among immigrants (Koh & Bell, 1987; Mui, 1996; Wong *et al.*, 2005). Also, these difficulties may carry over to the experience of informal caregivers as they act as the language and cultural broker for the client and carry out their daily routine with or for them (Yoo, 2014). Consequently, addressing language issues is a fundamental requirement for any home care agency serving clients from linguistic minorities as these issues are important considerations not only for the clients, but also for their caregivers.

Many other issues have been raised regarding the use of informal interpreters such as family members specifically in health care concerning patient rights, medical ethics, and patient safety (Bezuidenhout & Borry, 2009). A systematic review by Karliner *et al.*, (2007) reported the overall benefits of the use of professional interpreters on improvement in communication, utilization, clinical outcomes and satisfaction with care. Likewise, a Swedish study (Hadziabdic *et al.*, 2015) concluded that to improve multilingual elderly health care, one must consider the dynamics of organizational routines, organizational cultural awareness, and cultural health knowledge and beliefs of an individual when developing tailored interpretation services for older immigrants. Therefore, policies promoting and improving the access to formal translation and appropriate interpretation services are desperately needed.

Lack of language support such as translation services can be discriminatory to minority groups who do not speak the majority language. The importance of language barriers is also recognized in Health Canada's report on *Language Barriers in Access to Health Care* in 2001 (Bowen, 2001). This report provided an overview of research describing the impact of language barriers on health care access and quality, and included the historical and cultural context in Canada. It also gave an overview of relevant legislation, and implications for provision of health interpreters and language access services. However, there were no follow-up reports or updates to that initial report. The failure of the government to provide such services can exacerbate health outcomes in linguistic minorities (Flores, 2006; Woloshin *et al.* 1995). Thus, the government should provide supports to reach out to any isolated minority population of older adults to prevent further deterioration of their health, enhance their quality of life, and support caregivers.

Home care is a very important part of the Canadian health care system that help clients to remain independent and healthy in their homes. With the above major implications addressed and targeted, the appropriateness and effectiveness of home care services for ever-growing immigrants will improve, and so could their health and their caregivers' well-being. As the expected demand for home care services increases with the aging population, more attention is required to resolve soaring rates of caregiver distress.

8.7 Strengths & Limitations

Using the provincial level data from Ontario and other additional data from Korea, this dissertation comprehensively covered the health profiles, health service use, and quality of care of Korean Canadians compared to native Koreans, Chinese Canadians, and other Canadians. Although Korean Canadians are growing rapidly in number, they are not as large as other major groups of immigrants like Chinese Canadians. Thus, research on them, especially on older Koreans, is limited by sample size. This research was possible as the RAI-HC was used to assess and include older Korean home care clients from 2002 onwards and hence, it is the largest study of older Korean Canadian home care clients to date. The native Korean sample was only used in Chapter 5 due to its sample size; however, inclusion of this sample allowed for comparison of Koreans in Canada and Korea.

Another unique aspect of this work was the use of temporal relationships to predict risk and protective factors for caregiver distress. The longitudinal nature of the data allowed for more robust analyses such as an investigation of the baseline risk factors that predicted an onset of or an improvement in caregiver distress. These analyses were more complex, but more informative to prioritize caregivers for interventions. There was only one other dissertation that examined the risk factors for caregiver distress in a smaller sample of Korean Canadians with cross-sectional data (Jun, 2005), so this dissertation is a big step in Korean research that needs to be highlighted.

Further, this dissertation is one of the first studies to use the second generation of risk adjusted HCQIs in identifying the quality of care in home care clients. The HCQIs used in this dissertation have been refined, unclear description of HCQIs were simplified, and new measures related to home care (e.g., caregiver distress HCQI) have been added. Further, the covariates for the risk adjustment were expanded and updated. Also, the calculation methods for the risk adjustment were upgraded to a two-step adjustment with direct stratification for better cross-site comparison. The advanced risk adjustment method in the second-generation HCQIs accounted for the differences in the client's health profile and gave a more accurate reflection of the effectiveness of the home care services being provided.

Another strength that needs to be discussed is regarding the properties of interRAI assessments, especially the RAI-HC. This research on the RAI-HC, which is an assessment collected as part of regular practice, has shown its utility in distinguishing and examining different ethnicities. The employment of culturally and linguistically sensitive practice, the flexible and comprehensive approach when assessing client's status and not solely based on fixed narratives, has proven to be effective when investigating the health of different ethnicities by different language. Similarly, the outcome measures such as scales and HCQIs that are produced from the assessments are able to show discrete patterns of variation in health status of different ethnicities. These properties of interRAI assessments should encourage researchers to conduct more future studies that examine the health of ethnicities of interest.

One main limitation of this dissertation is the generalizability of the findings. First, the native Korean sample being investigated in Chapter 5 was only a fraction of a Korean population, which only included the long-term care insurance beneficiaries who tend to be more impaired. Thus, the results for native Koreans may not be generalizable to all community-dwelling Korean older adults receiving formal home care services in Korea. Second, the results using the Ontario data may only be generalizable to home care clients in Ontario rather than

Canada as a whole. As subtle differences in eligibility in home care services, or types of services provided and other geographic factors may determine the health, health service use, and quality of care in home care clients. Further, different requirements for immigration into different provinces may also influence health status. For example, immigrants coming into British Columbia may be more affluent than immigrants coming into Ontario, the wealth differences may also influence the level of resources that are available to them. However, the implications from this study may still apply to a large proportion of Korean older adults in Canada receiving home care services, as about half of Korean Canadian population resides in Ontario (Statistics Canada, 2006).

8.8 Future Research

This dissertation, the first study to investigate the health, health service use and quality of care in older Korean home care clients, is only a starting point for minority research. Future research is required to explore effective methods to target linguistic minority immigrants' needs so that they receive fair and appropriate treatments and are not left vulnerable. While, future research is required to determine whether these findings are applicable beyond the province of Ontario, this research provides some new insights, especially on the rising issue of caregiver distress, and adds to current knowledge of the importance of language barriers. Although this dissertation focused on Korean and Chinese home care clients, this work can be replicated in other ethnicities of interest to examine their needs. Moreover, depending on the sample size, geographic differences by smaller regions can be examined to explore specific regional needs; or larger regions such as provinces or countries can be compared to compare differences in the health care and health policies.

In summary, the current research has contributed new knowledge to the understanding of the health, health service use and quality of care in older Korean home care client, and also highlighted several issues regarding caregiver distress and language barriers. Health care in the 21st century emphasizes a tailored care in an integrated health care system. In the same way, ethnic differences, including language barriers, need to be addressed and accounted for in the health care system. Having an effective and appropriate home care that is tailored to the client's need, rather than one size fits all, will support clients to stay fit and healthy in home care longer. This in turn, may decrease health care costs. Canada, a nation of diversity, is a country that places equity as a core value. Therefore, it should be more equipped to deal with the needs of ever-growing immigrants by supporting access to language services and expanding research on the experience of cultural minorities.

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Appendix A. Description of RAI-HC Clinical Scales

Clinical Scale	**Description**	**Score (range)**
Activities of Daily Living Hierarchy (ADLH) scale	Measures functional performance reflecting a person's ability to care out activities of daily living. Items include personal hygiene, locomotion, toilet use and eating.	(0-6)
Changes in Health, End-stage disease and Signs and Symptoms (CHESS) scale	Measures individuals at risk of serious health decline or health instability. Items include change in decision making and ADL status, vomiting, peripheral edema, dyspnea, end-stage disease, weight loss, insufficient fluid, dehydrated, decrease in food or fluid, and fluid output exceeds input.	(0-5)
Cognitive Performance Scale (CPS)	Measures a person's cognitive status. Includes daily decision-making, short-term memory, expression (i.e., making self-understood), and self-performance in eating. Higher scores indicate greater severity in cognitive impairment.	(0-6)
Depression Rating Scale (DRS)	Screens for mood symptoms. Items include made negative statements, persistent anger with self or others, expressions of what appear to be unrealistic fears, repetitive health complaints, repetitive anxious complaints/ concerns, crying and tearfulness, and sad, pained, worried facial expression.	(0-14)
Instrumental Activities of Daily Living (IADL) Hierarchy scale	Measures functional independence reflecting a person's ability to care out instrumental activities of daily living. Items include meal preparation, ordinary housework, shopping, managing finances and medications.	(0-6)
interRAI IADL-ADL Functional Hierarchy Scale	Measures the functional impairments through a combination of both the ADL Hierarchy and IADL Hierarchy scales.	(0-11)
Method for Assigning Priority Levels (MAPLe)	Decision tree algorithm used to prioritize access to home care and long term care services by home care clients. Items include ADL Hierarchy scale, CPS, behavioral issues, daily decision making, falls, ulcers, wandering, and meal preparation.	(1-5)/ low to very high
Pain Scale	Measures frequency and intensity of pain.	(0-3)