

**THE ASSOCIATION BETWEEN PHYSICALLY ACTIVE LEISURE, PHYSICAL AND
MENTAL HEALTH AND LIFE SATISFACTION AMONG CANADIAN IMMIGRANTS**

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Abstract

Immigrants constitute more than one fifth of the Canadian population. Little is known about predictors of immigrant life satisfaction in this country. This cross-sectional study explored the levels and predictors of life satisfaction among immigrants in Canada with respect to their length of stay. Physically active leisure, mental health, physical health, and social factors were evaluated as potential predictors. The study utilized the 2014 Canadian Community Health Survey, with immigrants (N = 8875) between 12 – 80 years old. Data was analyzed using bivariate and multivariate logistic regression models between life satisfaction and predictors. High levels of life satisfaction, physical and mental health, and poor levels of physically active leisure were prevalent among immigrants. Sense of belonging and income predicted life satisfaction. While no significant differences were found related to length of their stay sense of belonging and income were stronger predictors among short-term compared to long-term immigrants. No predictors moderated mental health and life satisfaction or physically active leisure and life satisfaction. The present study addressed the need of future research in the field life satisfaction among Canadian immigrants.

Keywords: Life satisfaction, Canadian immigrants, physically active leisure, self-perceived health, self-perceived mental health

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Table of Contents

ABSTRACT	ii
ACKNOWLEDGEMENT.....	iii
TABLE OF CONTENTS	v
LIST OF TABLES	vii
CHAPTER 1 INTRODUCTION.....	1
1.1 Background of the study.....	1
1.2 Purpose statement and significance of the study	6
CHAPTER 2 LITERATURE REVIEW.....	8
2.1 Life satisfaction	9
2.2 Life satisfaction among immigrants	12
2.3 Life satisfaction and social factors	14
2.3.1 Social factors.....	15
2.4 Physical activity and life satisfaction	20
2.5 Health and life satisfaction	25
2.6 Conclusion.....	35
CHAPTER 3 METHODS	37
3.1 Secondary Data Analysis.....	38

3.2	Variables, Operational definitions and Measures.....	41
3.3	Data Analysis.....	45
CHAPTER 4: RESULTS		50
4.1	Sample Profile and social factors	50
4.1.5	Health.....	55
4.2	Bivariate Associations between Predictor Variables and Life Satisfaction	57
4.3	Multivariate Associations between Predictors and Life Satisfaction	58
4.3.1	Mental Health Predictors	59
4.3.2	Physically Active Leisure	60
4.3.3	Income	61
CHAPTER 5: DISCUSSION AND CONCLUSION.....		72
5.1	Levels of health, physically active leisure, and life satisfaction	72
5.2	Predictors of life satisfaction.....	76
5.3	Limitations of study.....	81
5.4	Strengths of the study.....	83
5.4	Future recommendations	84
5.5	Recommendations for Practitioners	85
5.6	Conclusion.....	87
REFERENCES		89

List of tables

Table 1: Sample profile of immigrants	63
Table 2: Social factors of immigrants	64
Table 3: Frequencies for outcome and categorical predictor variables	65
Table 4: Descriptive statistics for overall activity score	66
Table 5: Frequencies for health variables	67
Table 6: Descriptive statistics for health variables	68
Table 7: Logistic Regression Model for Total Sample (n = 8875)	69
Table 8: Logistic Regression Model for Short-Term Immigrants (n = 1683)	70
Table 9: Logistic Regression Model for Long-Term Immigrants (n = 7192).....	71

Chapter 1 Introduction

1.1 Background of the study

Global migration is not a recent phenomenon; it has been prevalent in the history of Canada for around 150 years (Canada, 2018). Canada is often viewed as a country of choice among immigrants looking for a host country with excellent opportunities. Consequently, immigrants and their descendants constitute 21.9 % of Canada's total population and it is estimated this percentage could reach around 24.5% - 30% by 2036 (Statistics Canada, 2018). Generally, developed countries favour in-flow of immigrants to maintain population growth and increase the labour market for a positive impact on their economy (National Academics of Sciences Engineering and Medicine, 2017). Similar factors are responsible for favouring immigration in Canada, such as fulfilling the labour market shortage, workforce maintenance, and inflation in gross domestic product (GDP) (Picot. 2013). Since economic growth is the primary reason to promote migration in Canada (Picot, 2013), the majority of the studies focus on the integration of immigrants into the labour market (Green, Liu, Ostrovsky & Picot, 2016). On the other hand, immigrants coming to Canada have reasons for migration apart from economic growth, such as education, improved standard of living, and greater life satisfaction (Bartram, 2011; Helliwell, 2003, Statistics Canada, 2018).

The literature has many operational definitions for life satisfaction which have evolved (Prasoon & Chaturvedi, 2016). In 1961, Tobin and Neugarten described life satisfaction as a definition of successful ageing. Andrew and Crandall (1976) defined

it as an overall assessment of one's feelings at any given point in an individuals' life and Diener, in 1984, termed it as an important component of well-being. Prasoan & Chaturvedi (2016), found that after a post-war era in the United States of America in the mid 80s, the constructs of life satisfaction and well-being started to change. Social factors replaced economic factors thus recognizing that life satisfaction is not merely material gratification (Prasoan & Chaturvedi, 2016). The literature explains that life satisfaction is governed by factors beyond economic parameters such as social factors, physically active leisure, physical health, mental health, and sense of belonging (Brief, Butcher, George & Link, 1993; Caron, Mercier, Diaz & Martin, 2005; Diener, Suh, Lucas & Smith, 1999; Nygren et al., 2005). Thus, while financial stability and success are significant to an individual's life satisfaction, it is not limited to it (Prasoan & Chaturvedi, 2016).

Life satisfaction among immigrants has been studied extensively over the years; however, drawbacks are still present in the literature. Out-migration is an area of research which is relevant in the context of immigrants. All the migration that takes place is not permanent. Many immigrants who move to Canada either return to their source country or move to another country (Statistics Canada, 2018). Evidence indicates that six out of ten immigrants who leave Canada, do so within the first year of immigration and some working-class immigrants out-migrate after staying for 10 or 20 years (Statistics Canada, 2018). It has also been found that out-migration varies according to the country of origin and social class of the migrant. According to Otrachshenko and Popova (2014), the personal reasons behind migration are to achieve

greater life satisfaction by improving standard of living and increasing the quality of life. However, studies have found that immigrants are not always able to achieve these goals, which ironically decreases their life satisfaction further (Bartram, 2011). Therefore, similar to life satisfaction affecting the intention of migration, the level of life satisfaction after migration, also affects the decision to settle permanently in the country or to out-migrate. Mara and Landesmann in 2013, further confirmed that the decision to permanently settle or to out-migrate is positively associated to life satisfaction related to social, economic, and individual subjective factors. The factors responsible for out-migration are not explored in Canada but, a study on immigrants in the United States has shown some evidence that non-economic factors such as immigrant's life satisfaction are crucial to prevent out-migration (Massey & Akresh, 2006). Therefore, concluding the arguments of Layard, 2011, there is a need to shift the focus of immigration-related research in Canada from economic factors to non-economic factors.

It is also found that often life satisfaction levels of immigrants are compared with the host country's native population (Senik, 2014). A recent study in Canada also supported such findings where life satisfaction of immigrants was compared with native Canadian population (Frank, Hou, & Schellenberg, 2016). Most of these comparative studies are done on recent immigrants who migrated within a few years (Frank et al, 2016). These findings are often generalized for the immigrants with the extended period of stay leading to the thought of immigrants having greater life satisfaction. Short-term immigrants experience high levels of life satisfaction because

of the sense of accomplishment due to migration, which is an essential event in their life. As immigrants spend time in the host country, they start experiencing issues which affect their life satisfaction. These vary from recognition of their credentials in trades and professions, development of physical and mental health issues, and troubles integrating within the local community affecting their life satisfaction (Cumming, Lee & Orepoulos, 1989). Therefore, collecting data only from short-term immigrants leads to over-representation of highly satisfied immigrants. Thus, it is important to consider length of residence within the host country when studying life satisfaction among immigrants. Another significant drawback of life satisfaction literature among immigrants is the over-reliance on the contribution of economic factors towards life satisfaction of immigrants. Many immigrants move to a new country for various reasons, other than economic gains such as improved quality of life, education, and change in lifestyle behaviours (Bartram, 2011; Helliwell, 2003, Statistics Canada, 2018). Therefore, it becomes important to include other parameters apart from economic factors when studying life satisfaction among immigrants.

Life satisfaction is dependent on various factors, physically active leisure is one lifestyle behaviour that has been positively linked with life satisfaction (Valois, Zullig, Huebner & Drane, 2004). Effects of participation in leisure activities are beyond the effects of participation in any other form of physical activity as leisure is associated with perceived freedom which is a vital concept that introduces intrinsic motivation, perceived control, and optimum leisure arousal (Poulsen et al, 2006; Witt & Ellis, 1985). Physically active leisure has been identified as a contributory factor towards life satisfaction (Poulsen, Ziviani & Cuskelly, 2006). The relationship

between life satisfaction and physically active leisure varies across the lifespan in an individual (Hyde, Maher & Elavsky, 2013). Various mediating pathways have been suggested to explain this relationship such as increases in physically active leisure improves the following: physical health (Borg, Hallberg & Blomqvist, 2006), positive affect (Hyde, Conroy, Pincus & Ram, 2011; Stephens, 1988), mental health, and self-efficacy (Motl et al., 2005) which eventually increases life satisfaction. These findings have been studied among the general population (Tomasone, Wesch, Ginis & Noreau, 2013).

Similarly, physical and mental health are also reported as a strong predictor of life satisfaction (Pinto, Fontaine, & Neri, 2016). Self-rated health is considered an imperative mediator in the relationship of health and life satisfaction (Pinto et al., 2016). Both physical and mental health are significant predictors of life satisfaction. However, some studies suggest that mental health is the stronger predictor of life satisfaction whereas, others suggest physical health is the stronger predictor (Pulvil et al., 2016). Also, recent studies have shown that physical and mental health are interconnected and influence each other (Ohrnberger, Fichera & Sutton, 2017).

Physically active leisure, mental health, and physical health are regarded as strong predictors of life satisfaction among the general population, but have not been widely explored among immigrants. A few studies have shown that health and physically active leisure activities contribute to higher life satisfaction among immigrants (Kim, 2000; Nesterko, Ulitsa, Friedrich, & Glaesmer, 2018;). According to these studies, immigrants engaged in leisure activity had improved levels of acculturation (Kim, 2000), while immigrants who had greater health related quality of

life also had greater life satisfaction (Nesterko et al, 2018). However, according to the literature studied for this thesis, there has been no study which explores social factors such as age, sex, marital status, etc. in relation to both physically active leisure participation, mental, and physical health as potential predictors of life satisfaction for immigrants in Canada or elsewhere in the world. Thus, the present study aims to explore if physically active leisure, physical health, mental health, and social factors are associated with life satisfaction among immigrants in Canada.

1.2 Purpose statement and significance of the study

Immigrants constitute a large percentage of the Canadian population and future predictions further support an increase in the number of immigrants in Canada. Life satisfaction is usually considered as a measure to evaluate immigrants' integration in the host country, but existing evidence is not concrete and has drawbacks. To understand immigrants' integration, it is necessary to have an estimate of life satisfaction levels and predictors of life satisfaction among immigrants. Time since arrival in the host country seems to be a critical factor to influence life satisfaction among immigrants. Thus, the purpose of this secondary data analysis study, using data from the 2014 Canadian Community Health Survey is to explore social factors such as physically active leisure participation, mental health, and physical health as facilitators of life satisfaction among immigrants in Canada. Also, this study will explore how these associations differ between immigrants concerning the time since arrival (i.e., 9 years or less than 9 years and 10 or more years). The study addresses the following research objectives:

1. To investigate levels of physically active leisure, physical and mental

health, and life satisfaction among immigrants in Canada.

- a. To determine if levels of physically active leisure, physical and mental health, and life satisfaction differ among Canadian immigrants in relation to time since arrival.
2. To explore the association between physically active leisure, physical and mental health, and life satisfaction among immigrants in Canada.
 - a. To determine if the association between physically active leisure, physical and mental health, and life satisfaction differ among Canadian immigrants in relation to time since arrival.
 3. To determine if social factors, physically active leisure, mental health, and physical health predict life satisfaction among immigrants in Canada.
 - a. To determine if predictors of life satisfaction differ among Canadian immigrants in relation to time since arrival.

Chapter 2 Literature review

Migration refers to a permanent or semi-permanent physical transition of an individual or group of individuals from one geographical location and social context to another (Thurston & Vissandjee, 2005). The definition of an immigrant population varies in different countries but, nationality and place of birth are the two most important defining criteria's (OECD, 2006). In 2016, the Canadian Census, defined an immigrant as a foreign-born individual who landed in Canada as an immigrant or permanent resident and have been granted the right to live and work in Canada by the immigration authorities (Statistic Canada, 2018). The 2016 Canadian Census revealed that there were 7,540,830 immigrants in Canada who represent over one fifth (21.9%) of the total Canadian population. The proportion of the immigrant population is rising. In 2006, it was 19.8% and in 2011 it further increased to 20.6%. According to Statistics Canada's population projection, foreign-born individuals could represent 24.5% to 30% of the Canadian population by 2036. There are many reasons for people immigrating to another country such as Canada. Push and pull factors facilitate immigration. Push factors are those that force people to leave their home countries such as lack of jobs, poverty, political persecution, religious persecution, civil war, and natural disasters (Kline, 2003). Pull factors usually attract individuals to a precise destination such as improved quality of life, financial empowerment, and greater life satisfaction (Klein, Hofmeister, Lockyear, Crutcher & Fidler, 2009).

After relocating, immigrants often face the challenge of adapting to a new place in terms of physical and cultural environment (Moghaddam, Taylor & Lalonde, 1987). The

process of change/adaptation in cultural pattern between host and immigrant after continuous first-hand contact with each other is termed as acculturation (Berry, 1990; Berry, Trimble & Olmedo, 1986; Redfield, Linton & Herskovits, 1936). Acculturation can take place in any direction, but tends to induce more changes in immigrant population (Berry, 1990; Rothe, Tzuang & Pumariega, 2010). The literature reveals two-dimensional theory of acculturation: unidimensional theory and bi-dimensional theory. The unidimensional theory indicates eventual disappearance of a cultural identity of the immigrant population. In contrast, the bi-dimensional theory suggest that immigrant preserves their cultural identity while adapting to the host culture (Berry, 1997). According to the two-dimensional theory of acculturation, it is entirely an individual's choice to maintain or reject one's own cultural identity and accept or reject a relationship with the host culture. The individual adopts an acculturation attitude of: a) integration, where the individual preserves the features of his/her own culture while showing interest in adapting elements of host culture; b) assimilation, marks complete loss of original culture and absorption of the host cultural holistically; c) separation/segregation, where the individual maintains their own culture while rejecting the host culture; d) marginalization, which marks rejection of both the culture (Berry, 2001).

2.1 Life satisfaction

Life satisfaction is an overall assessment of an individual's feeling and attitude about one's life at a point in time according to his/her judgment criteria. It is one of the three essential components of subjective well-being, the other two being, positive affect and negative affect (Diener, 1984; Shin & Johnson, 1978). Life satisfaction is multi- dimensional; it comes from many sources which are unique and

different for everyone; and it can change anytime with change in events and situations (Diener, Emmons, Larsen & Griffins, 1985).

2.1.1 Theories of life satisfaction. Life satisfaction has been studied from different theoretical perspectives, such as telic and autotelic theories, top-down and bottom-up theories, association theories, and judgment theories (Diener, 1984; Festinger, 1954; Maslow, 1965; Murray 1959). According to telic theories, satisfaction of needs and achievement of goals is proposed as the most important determinant of life satisfaction (Murray, 1959). Autotelic theories, on the other hand, explain that life satisfaction is achieved by engaging in activities that lead to need satisfaction (Maslow, 1965). Omodei and Wearing (1990) combined the telic and autotelic approaches and concluded that people are more likely to engage in activities that they think would lead to satisfaction of their needs and goals. Perception of opportunities for need satisfaction leads to the experience of involvement and behaviour that results in satisfaction (Omodei and Wearing, 1990).

The top-down and bottom-up theories discuss the causal influences of various social factors and other outcome variables of life satisfaction. According to Diener (1984), top-down causation is when certain variables are hypothesized as the outcome of life satisfaction while and bottom-up causation is when certain variables are considered as predictors of life satisfaction. A fulfilled need increases the domain satisfaction which in turn leads to overall life satisfaction (Diener, 1984; Leonardi, Spazzafumo, Marcellini, & Gagliardi, 1999). Some researchers have also indicated bi-directional models, postulating that life satisfaction determines and results from

various domains of life satisfaction (Lance, Laulenschlager, Sloan & Varca, 1989; Headey, Veenhoven, & Wearing, 1991).

Judgment theory pronounces life satisfaction as a direct function of a mental comparison between some standard and actual conditions. The judgmental theory has its roots in various social psychological theories such as social comparison theory (Festinger, 1954), downward comparison theory (Wills, 1981), relative deprivation theory (Crosby, 1976; Davis, 1959), and congruity theory (Sirgy, 1987, Joseph Sirgy & Tyagi, 1986). Social comparison theory postulates that evaluating oneself is an inherited desire of individuals. In the absence of objective standards to compare, people satisfy themselves by competing with similar others (Festinger, 1954). The theory of downward comparison states that people who experience negative emotions improve their life satisfaction by comparing themselves with someone less fortunate than themselves (Wills, 1981). The relative deprivation theory claims that a person feels deprived of something when they compare themselves to someone who has the object, feels entitled to the object and not feel responsible for not having the object (Crosby, 1976; Davis, 1959). The congruity theory is based on the identification of a set of standards used in judging personal life circumstances. It states that though the evaluation concept is specific to a situation the general satisfaction/dissatisfaction towards life event can be developed through the summation of evaluation outcomes. This summative index involves a set of judgements about one's life accomplishments using a set of different standards (Meadow, Mentzer, Rahtz & Sirgy, 1992.; Sirgy, 1987; Joseph Sirgy & Tyagi, 1986).

2.2 Life satisfaction among immigrants

In the early nineties, the literature revealed that the primary objective of migration was to gain economic stability (Borjas, 1990). Therefore, during that period the process of immigration and immigrant integration was studied through many perspectives, but largely with emphasis on studies of immigration in respect to labour market impact and financial outcomes (Chizwick, 1989). Nonetheless, in recent years, migration has become a topic of interest among the field of social development (Bischoff & Wanner, 2008) as immigrants often cite their primary reason for migration is to obtain greater life satisfaction (Sam, 1998). Amit (2010) also identified the need to study immigration beyond economic metrics.

Ideally, to study the life satisfaction among immigrants, longitudinal studies are required with data on life satisfaction before and after migration. However, such data rarely exists. Most of the studies done are cross-sectional and the data is collected after migration into host countries. Existing studies either compare the reported levels of life satisfaction with source country or the host country populations (Amit, 2010; Bartrem, 2011; Frank et al., 2016; Nesterko, Brachler, Grander & Glaesmer, 2013), or they report the level of life satisfaction among migrants before and after their immigration (Lundholm & Malmberg, 2006). Melzer (2011) identified the drawbacks in both types of methods. He reported that studies comparing life satisfaction of immigrants with native or source country population failed to identify if the difference in life satisfaction was due to actual migration, or the native or source country population with which immigrants were compared could already have low or high levels of life satisfaction. Moreover, when respondents

report their life satisfaction before and after immigration, objectivity is not absolute.

Effects of migration on life satisfaction. Results of studies related to life satisfaction among immigrants are inconsistent. Several authors report no difference in self-reported life satisfaction between the native-born population and immigrants. Sam (2000) studied life satisfaction among 506 adolescents living in Norway with immigration backgrounds from Vietnam, Pakistan, Turkey, and Chile found no significant differences in life satisfaction between native and immigrant residents. Similarly, Foroughi, Misajon and Cummins (2001) found no significant difference in levels of life satisfaction between Persian immigrants and native Australians in their study. Wengler in (2010) also studied life satisfaction of Turkish immigrants in Germany and found similar levels life satisfaction as natives among Turkish immigrants. The literature also reveals similar findings in Germany and Switzerland with a heterogeneous group of immigrants (Neto & Barros, 2007; Nesterko et al., 2013). A recent study in Canada also found that immigrants and native-born populations have similar levels of life satisfaction (Frank et al., 2016). In contrast, several other studies report poor life satisfaction among immigrant populations in comparison to native-born populations population. A self-reported study in the Netherlands found that life satisfaction of immigrants was less than natives (Verkuyten, 2008). Poor life satisfaction was found among Turkish immigrants in Norway and Sweden (Virta, Sam & Westin, 2004). Furthermore, Bartram (2011) also found lower levels of life satisfaction among immigrants in comparison to native population in 13 European countries and the United States of America respectively. A Canadian study by Lou and Beaujot (2005) evaluated mental health

including life satisfaction among Canadian immigrants who reported poor mental health. They found that 30.29% immigrants with poor mental health had poor life satisfaction while only 5.76% immigrants with poor mental health reported high life satisfaction. They also compared life satisfaction between Canadians and immigrants and found that among individuals with poor mental health, the Canadian population had a slightly higher level of life satisfaction (Lou & Beaujot 2005). While Lou and Beaujot's study focused on individuals with poor mental health, this study suggests that immigrants have lower life satisfactions compared to native-born Canadians.

According to the surveyed literature, there are various factors which promote life satisfaction such as social factors, physically active leisure, mental health, and physical health (Fergusson et al., 2015; Sato, Jordan & Funk, 2014). These factors often affect life satisfaction individually as well as in conjunction with other factors such as physical and mental health together. These factors will be discussed in the following sections.

2.3 Life satisfaction and social factors

Socio-cultural adaption is an essential process of acculturation, which allows the immigrant to settle well in the host environment (Leung, Pe-Pua & Karnilowicz, 2006). A study by Sam (1998), found social factors predicts acculturation and life satisfaction. The literature explores various social factors such as age, gender, marital status, length of stay, education, and income, as determinants of life satisfaction (Setia, Lynch, Abrahamowicz, Tousignant, & Quesnel-Vallee in 2011).

2.3.1 Social factors.

2.3.1.1 Age. Life satisfaction depends non-linearly on age. It is considered marginally higher in individuals under 25 years, further decreases by mid-40's and eventually starts to increase again and is found to be greater in the age group above 65 years (OECD, 2006). It has also been found that certain demographic variables interact with age to determine life satisfaction. For example, in an early study of life satisfaction across the lifespan, Cutler (1979) found that young adults were more satisfied with life after they were content with their family, home, and hobbies; whereas older adults were more satisfied if they were happy with their health and their job. A study in Libya found that life satisfaction was higher in people who were married and had high social prestige (Shebani, Wass, & Guertin, 1987). On the contrary, young adults were more satisfied when they experienced close family ties and had one social group outside the family (Shebani et al., 1987).

Immigrant studies on life satisfaction have found diverse results. Many studies revealed that young immigrants had higher life satisfaction as compared to older age group immigrants (Nesterko et al, 2013.; Leao, Sundquist, Johansson & Sundquist, 2009). However, a study done among older Hispanic immigrants in the United States of America found these immigrants had higher life satisfaction than native-born Hispanics and Non-Hispanic American population.

2.3.1.2 Gender. Life satisfaction has been found to vary by gender. According to the searched literature, studies suggests that life satisfaction does not vary by gender, while others found females more satisfied in life than males (Blanchflower & Oswald, 2004; Easterlin, 2003; Kahneman and Krueger, 2006). In

contrast few studies also found that females have lower life satisfaction than males (Kant & Sharma, 1996; Mroczek & Kolarz,). Females report lower life satisfaction compared to men, in terms of overall happiness, coping with daily life, and other factors such as dealing with responsibilities and cultural limitations (Kant & Sharma, 1996; Mroczek & Kolarz, 1998; Stevenson & Wolfers, 2009). Overall, considerable disagreements are present in the available literature about gender influencing life satisfaction. Some studies argue that females might report greater or lower life satisfaction due to their emotional behaviour, volume of those emotions, and their greater expressivity of emotions (Frey & Strutzer, 2010). Marcelli and Easterlin (2005), found happiness to vary across the lifespan in both genders; however, it increases for men and decreases for women in their adult life. The studied literature suggests that among immigrants gender does not hold a significant relationship with life satisfaction and inconsistent findings have been extracted from studies done globally (Bonini, 2008; Neto, 1995). Some studies found that females report higher life satisfaction than males. However, differences were found in first and second-generation immigrants (Yuen, 2015). Among males, first-generation immigrants reported lower life satisfaction than females, whereas the second-generation immigrant amongst the males reported having greater life satisfaction (Ghafourian Bashi, 2016).

2.3.1.3 Marital/Partnership status. Literature reports greater life satisfaction among married people than single, divorced, cohabitant, and widowed individuals (McCullough & Zick, 1992; White, 1992). Lower risk of mortality, sharing common

household goods, opportunities of growth from a supportive relationship, the accumulation of assets, and wealth together are several advantages of marriage over the single individual that promotes greater life satisfaction (Zimmermann & Easterlin, 2006). The theory of social selection and social causation explains the positive relationship between marriage and life satisfaction. According to the theory of social selection, people with high levels of life satisfaction are more likely to get married and sustain the marriage (Gove, Style & Hughes, 1990). However, the social causation theory suggests that marriage provides the opportunity to become more satisfied due to associated benefits, as well as protective emotional and relational factors linked with marriage. In 2013, Botha and Booysen found that the relationship between marriage and life satisfaction has been deeply studied in developed countries and has not been explored much in developing countries. He also found that studies in developing countries have reported mixed results between marital life and well-being. Sarracino (2008) found a significant relationship among well-being and marital life in nine developing countries from the World Value Surveys. Moreover, some literature also found gender differences regarding life satisfaction and marriage; women have been found to have lower life satisfaction compared to men when married (Chipperfield & Havens, 2001).

Among immigrants, marital status significantly affects levels of life satisfaction. Studies found that immigrants who migrated with their family led to higher levels of life satisfaction shortly after migration where life satisfaction was studied immediately and after a specific period since migration among married immigrants; however due to

the family the immigrants were under stress and now had lower levels of life satisfaction while adapting to host country (Martin & Lichter, 1983; Ong et al., 1996). A recent study in Canada reported similar findings that family (explicitly having children) is positively associated with life satisfaction for the initial few months of immigration only (Masferrer, 2016).

2.3.1.4 Length of stay. Studies show that as length of stay in the country increases, immigrants report higher life satisfaction compared to newer immigrants and life satisfaction slowly increases over time and becomes comparable to native-born population (Leao et al., 2009; Nesterko et al., 2013; Neto, 1995; Vieno, Santinello, Lenzi, Baldassari & Mirandola, 2009). All these studies were cross-sectional. A recent longitudinal study in Canada reveals contradictory findings. Masferrer (2016) found life satisfaction decreased after four years of stay in Canada. This decrease may be due to a transfer in reference group over time from the country of origin to the host country (Bartram, 2011; Mara & Landesmann, 2013).

2.3.1.5 Education. There is vast literature on life satisfaction and education; however, the influence of education on life satisfaction still has no clarity. Most studies claim a positive relationship between education and life satisfaction (Dittman & Goebel, 2010; Frey & Stutzer, 2000; Ozcobanlar & Acma, 2015). The literature suggests that education improves self-confidence, self-estimation, and social networks which leads to feelings of accomplishment and purposeful life. These, in turn, provide opportunities for better job, income, and health (Chen, 2012; Mahadea & Rawat, 2008). Nonetheless, there are studies which suggest an inconsistent or negative association (Powdthavee, 2003). A study found that higher education leads

to higher expectations of job and income, but failure to achieve these, leads to low life satisfaction (Ferrante, 2009). Ferrer-i-Carbonell in 2005, found that comparison with peers to be prominent in terms of job and income status. He concluded that different income status, but similar education background, was a strong reason for poor life satisfaction.

A recent study by Statistics Canada, compared life satisfaction with education among immigrants and Canadians. The study reported that higher education leads to reduced life satisfaction among immigrants as well as in Canadians. However, the study also found that immigrants (30%) were more educated as compared to the Canadian population (12%) (Frank and Hou, 2017). This negative association was also found to be weaker among immigrants from developing countries when compared to immigrants from developed countries (Frank & Hou, 2017). A similar study was done among immigrant engineers in Canada and found that immigrants, not employed in their field of education, had poor life satisfaction as compared to the ones who were employed in engineering jobs (George, Chaze, Fuller-Thomson, & Brennenstuhl, 2012). Overall, it indicates that, despite the vast literature, it is still difficult to conclude the relationship between education and life satisfaction.

2.3.1.6 Income. Increasing financial stability is one reason which motivates immigrants for migration (Borjas, 1990) and extensive studies have been conducted to study the effect of economic growth among immigrants (Green et al., 2016). Many studies indicate a positive correlation between income and life satisfaction, where high income leads to higher levels of life satisfaction. A study among Turkish and

Moroccan immigrants in the Netherlands found positive results where high levels of income were positively correlated to higher life satisfaction (Gokdemir & Dumludag, 2012). Another study by Kahneman & Deaton (2010) evaluated if money was associated to life satisfaction and subjective well-being. They found that individuals in the low income group had lower life satisfaction levels leading them to be in isolation and experience significantly high amount physical and mental health issues as compared to individuals in high income group (Kahneman & Deaton, 2010).

However, a Canadian study in 2012 compared life satisfaction among foreign-educated immigrants (George et al., 2012). The study found that immigrants employed in jobs related to their education were highly satisfied compared to those who were employed in odd jobs (not related to their field of study). The reason for differences in life satisfaction was the economic cost of international education (George et al., 2012). The study found similar results that these underemployed immigrants developed mental health issues, lost their self-confidence, and thought of themselves as failures. Additionally, these immigrants reported that they constantly questioned their decision to migrate to Canada and if they had the opportunity, they would move to a different country (George et al., 2012). These findings are further supported by other studies where income inequality contributes to different levels of life satisfaction. (Rozer & Kraaykamp, 2013; Verme, 2011).

2.4 Physical activity and life satisfaction

Another important parameter that affects life satisfaction is physical activity (Heo, Stebbins, Kim & Lee, 2013; Kaplan, Lazarus, Cohen, & Leu, 1991). Physical

activity is defined as the movement of skeletal muscles that result in energy expenditure (Caspersen, Powell & Christenson, 1985). Physical activity is widely studied in relation to physical health, mental health, and its beneficial effects are well documented in different populations. Physical activity significantly reduces the risk of various physiological health conditions such as cardiovascular diseases, diabetes mellitus, cancer, obesity, joint diseases (osteoarthritis and osteoporosis), and mental health conditions such as depression (Biddle, Gorely, & Stensel, 2004; Motl et al., 2005).

However, a positive association between physical activity and health (physical and mental) does not necessarily support a positive association between life satisfaction and physical activity. According to the literature physical activity and life satisfaction are associated in different ways. Firstly, there is a positive association where an increase in physical activity is associated with increased life satisfaction and decreased physical activities decreases life satisfaction. These findings have been proven in different populations such as adolescents, older adults, and even among people with physical disabilities (Holstein, Ito & Due, 1990; Heo, et al., 2013; Kaplan et al., 1991; Nesheim & Haugland, 2003; Tomasone, Wesch, Martin Ginis, & Noreau, 2013). Secondly, a dose-dependent relation is also observed where the intensity of physical activity is associated with the level of life satisfaction. For example, Mudrak, Slepicka and Siska (2011) found that seniors who were participating in moderate or combined moderate and strenuous physical activities reported significant positive association between life satisfaction and physical activity. Similar findings were reported among high school adolescents in South Carolina (Dilek Guven, Ozcan,

Tasgin & Arslan, 2013). The authors found that students who did not participate in exercises for at least 20 minutes a week, were less satisfied in comparison to those students who participated for 20 minutes or more. On the contrary, studies have also found that there is limited or no significant association between life satisfaction and physical activity (Busing & West, 2016; Dilek Guven et al., 2013).

An essential component of physical activity is leisure activity which is defined as any activity done in free time, with the purpose of relaxation, social achievement or personal development (Brightbill, 1963; Gist & Fava, 1964). Studies conclude that leisure activity improves physical and mental health promoting life satisfaction (Cho, 2014). Leisure also improves social relationships in communities which eventually improves life satisfaction (Ayotte, Margrett, & Hicks-Patrick, 2010; Driver, 2005). A secondary study done in the United States studied the relationship between leisure activities, health, and social relationships. The study found that participants engaged in leisure activities had improved life satisfaction, improved health, and positive social relationships (Chang, Wray & Lin, 2014).

2.4.1 Physical activity level among immigrants. Low levels of physical activity are common in immigrants. Immigrants have lower physical activity participation compared to the native population in many host countries (Misra, Endemann, & Ayer, 2005; Maximova, O'Loughlin, Tan & Gray-Donald, 2007). These activity levels vary from country to country. In the United States of America, 60% of immigrants are inactive (Misra, Patel, Davies & Russo, 2000), 78.7 % inactive in the United Kingdom (Misra et al., 2005), and 71.7 % in Canada

(O'Loughlin et al., 2007). According to literature, there is a lack of awareness about benefits of physical activities among immigrants. Studies find ideas such as “exercise is for people who go to fitness centers” and “exercise is only for men” to be prevalent among immigrants (Eaton, Nafziger, Strogatz, & Pearson, 1994; Marcus & Simkin, 1994; Springer et al., 2010).

There are some unusual findings in literature regarding immigrants' physical activity levels. According to these findings, immigrants become more physically active after migration (Kukaswadia, Pickett, & Janssen, 2014). However, their levels of physical activity are still lower than the host country population. It is also found that immigrants are not able to meet the recommended level of physical activity physical activity determined by the country, but they eventually meet the criteria as the length of stay increases. Many studies have also found that second-generation immigrants are more physically active. Similarly, the immigrants who migrated at a young age are more physically active compared to those who migrated in older age (Crespo, Smit, Andersen, Carter-Pokras & Ainsworth, 2000; Liu, Probst, Harun, Bennett & Torres, 2009; Slattery et al., 2006; Singh, Stella, Siahpush & Kogan, 2008; Tremblay, Bryan, Perez, Ardern & Katzmarzyk, 2006; Taverno, Rollins, & Francis, 2010). Studies also suggest that female immigrants are less physically active than male immigrants and religious beliefs, cultural influence, and family responsibilities prevent them from being physically active (Wieland et al., 2015).

2.4.2 Physically active leisure and life satisfaction among immigrant. The benefits of physical activity in relation to health has been proven in various studies among general population (e.g., Huebschmann, Schauer, Bauer, Regensteiner &

Reusch, 2018; Swain, Franklin, Williams & Lee, 2018). However, such findings have not been explored much among the immigrant population. Several authors have identified the need to study physical activity in relation to health promotion among immigrants as research suggests that immigrants are at higher risk of diabetes, obesity, hypertension, and cardiovascular diseases (Tremblay et al., 2006; Venkataraman, Nanda, Baweja, Parikh & Bhatia, 2004). Therefore, measures are required to improve levels of physical activity among immigrants.

Similarly, studies on leisure physical activity among immigrants are scarce. However, the present studies reveal that leisure time activities play a pivotal role among immigrants. Studies found that leisure activities can help immigrants cope with the stress of acculturation (Kim, Kim, Henderson, Han & Park, 2016). Similarly, a study among recent Korean immigrants reported lower levels of leisure physical activity which resulted in a slower process of acculturation and poor levels of life satisfaction (Kim, 2000). Physically active leisure also improves social relationships among immigrants. A study found that, through group leisure activities, immigrants achieved a sense of ethnic empowerment as immigrants met other people from their countries of origin which improved their sense of belonging in the community as well (Kim et al., 2016). The study also found that immigrants also improved their self-esteem, self-confidence, and sense of self-achievement which improved their overall life satisfaction (Kim et al., 2016). Leisure activities have also allowed immigrants to improve their physical health and mental health (Kim, Chun, Heo, Lee & Han, 2016). Similarly, Stack and Iwasaki (2009) studied the effects of physically active leisure among Afghan immigrants to Canada. The study found that leisure activity facilitated social connections, through

which they could adapt to the process of acculturation more easily.

2.5 Health and life satisfaction

The World Health Organization in 1948 defined health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.” However, amendments have been proposed by several authors for the present definition (Card, 2017; Chuengsatiansup, 2003; Jadad & Grady, 2008; Huber et al., 2001; Larson, 1999; Kagawa-Singer, 1993; Saracci, 1997; Sartorius, 2006; Smith, 2008). In 2010, the Health Council of the Netherlands and the Netherlands Organization for Health Research and Development conducted a conference where a multidisciplinary group of 38 international experts suggested replacement of the definition of health with the concept of health. The proposed concept viewed health as a sense of well-being with an emphasis on the ability to adapt and self-manage health (Gezondheidsraad.nl, 2010). Three interrelated domains of health: 1) physical health, 2) mental health, 3) social health were also identified (Gezondheidsraad.nl, 2010). The effects of these respective domains, i.e., mental health and physical health on life satisfaction will be discussed in the following sections.

2.5.1 Physical health and life satisfaction. Physical health is a domain of health which focuses entirely on the human body and its physiological functioning (Chirico, 2016). According to Schulkin (2004), a healthy individual maintains a state of physiological balance within the body and through the changing circumstances called ‘homeostasis.’ On occasions of physiological stress a healthy individual maintains this equilibrium and the inability of the body to maintain this physiological coping mechanism results in illness or disease (McEwen, 2003). Studies report that

illness has a negative effect in terms of life satisfaction (Boonstra, Reneman, Stewart, Post, & Preuper, 2013; Enkvist, Ekstrom & Elmstahl, 2012; Perez-Lopez, Fernandez-Alonso, Tralalon- Pastor, vara, Chedraui & Menopause Risk Assessment Research, 2012). Moreover, life satisfaction was found to be very low among people with chronic and prolonged diseases (Amuk, T., Oguzhanoglu, Oguzhanoglu, Varma, & Karadag, 2009). Enkvist et al., (2012) found that the reason for poor levels of life satisfaction was a low level of self-perceived health. Self-perceived health is a dimension of general health where one assesses their physiological status (Shields, 2008). Literature suggests that a physical illness affects self-perceived health which causes poor life satisfaction (Enkvist et al., 2012; Gwozdz, & Sousa-Poza, 2010; Mahomed, St John, & Patterson, 2012).

2.5.1.1 Physical health and life satisfaction among immigrants. Studies suggest that one of the reasons for migration is to achieve better health which can result in greater life satisfaction (Gatrell, & Elliott, 2014; Shaw, Dorling & Mitchell, 2002). The studies associating physical health and life satisfaction among immigrants are very scarce. A recent study found a positive association between health-related quality of life and life satisfaction among German immigrants in Israel (Nesterko, et al, 2018). Another study reported lower health-related quality of life among female migrants in Taiwan (Tsai & Sun, 2013). Moderate levels of health-related quality of life were reported among immigrants in Italy. However, the same study also found that among 15 percent of immigrants, the health-related quality of life was very poor (Domnich et al., 2013). A recent study in Canada compared the health status of adolescent immigrants and Canadians over length of stay. The study found that the

recent immigrants had better health-related life satisfaction compared to long-term immigrants and that immigrants were healthier than Canadians (Kwak, 2016; Kwak, 2018).

2.5.2 Mental Health and Life Satisfaction. Mental health is a somewhat vague concept. The term mental health has been used in literature since the 11th century and apparently consisted of state of mind and competence (Stones, Kozma, McNeil & Worobetz, 2011). Later in the 19th century, it was viewed in relation to mortality, insanity, and good character (Vaillant, 2003). There was no clear distinction between mental health and mental illness (Bingham & Banner, 2014). The diagnosis of mental health was based on psychiatric diagnosis (Winnicott, 1963). Consequently, mental health research was strongly based on the existence of mental disorders and negative affective states (Gillham & Seligman, 1999; Katschnig, 2006) and the definition of mental health was based on the presence or absence of selected symptoms (ICD-10; DSM-5). In 1947, the World Health Organization (WHO) introduced the pioneering definition of health which includes mental well-being. In 2007, a landmark paper stated that there is “no health without mental health” (Prince et al., 2007). In 2001, the WHO defined mental health as “state of well-being in which a human being realizes his or her abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community” (World Health Organization, 2001).

A few authors have defined mental health differently and have stated that mental health includes variables such as life satisfaction, lack of depression, distress, and prevalence of positive moods and emotions (Diener and Diener, 2009; Guney, Kalafat & Boysan, 2010; Headey, Kelly & Wearing, 1993). Life satisfaction is not only studied as a dimension of mental health, but research has shown that lower life

satisfaction is strongly associated with poor mental health and psychiatric comorbidities (Koivumma-Honkanen, 1998; Perez-Garin, Molero & BOS, 2015). The relationship between life satisfaction and mental health has been examined numerous times in clinical and general populations. Collectively, all studies report that life satisfaction is strongly positively associated with positive mental health and inversely related to poor mental health (Fergusson et al, 2015; Headey et al, 1993; Michalos & Zumbo, 2002; Tamini & Mohammady-Far, 2009; Valois et al., 2004). The strongest association of life satisfaction and mental health was examined and proven in different geographical societies in Britain, Germany, Australia, and New Zealand (Fergusson et al., 2015). Such findings were also true in the Canadian population. Using Canadian Community Health Survey two studies explored the relationship between self- reported life satisfaction and subjective mental health. Two recently conducted studies explored the relationship between self- reported life satisfaction and subjective mental health using the Canadian Community Health Survey. These found that subjective mental health is strongly related to self-reported life satisfaction compared to other selected variables (Lombardo, Jones, Wang, Shen, & Goldner et al, 2018; Sharpe, Ghanghro, Johnson & Kidwai, 2010).

2.5.2.1 Mental health status of immigrants. The process of migration is a usually a complicated and stressful experience that may cause poor mental health (Berry, 1990; Berry, Kim, Minde, & Mok, 1987; LaFromboise, Coleman, & Gerton, 1993). These postulations findings are further supported by worldwide studies indicating increased risk of mental health problems among immigrants due to the trauma of acculturative stress (Abebe, Lien, & Hjelde, 2014; Bourque, Van der Ven,

& Malla, 2011; Cantor-Graae, Zolkowska, & McNeil, 2005; Levecque, Lodewyckx, & Vranken, 2007; Westman, Sundquist, Johansson, Johansson, & Sundquist, 2006). A review in the United States analyzed the findings of seven studies and concluded the adverse effects of acculturation on mental health status among immigrants. The findings reported that lower acculturation stress reduced the prevalence of mental health disorders (Escobar, Nervi, & Gara, 2000).

Studies have also found that recent immigrants exhibit a phenomenon called “healthy immigrant effect”. The mental health of recent immigrant is on par with peers in the host country and is better than natives of the source country due to this healthy immigrant effect. The healthy immigrant effect occurs because only physically and mentally fit individuals are selected to apply for migration due to immigration policies (Ali, 2002; Chen, Ng, & Wilkins, 1996; Laroche, 2000; Perez, 2002). Evidence has been found in support of healthy immigrant effect in Canada, United States, United Kingdom, and Australia (Ali, 2002; Chen et al., 1996; Kennedy, Kidd, McDonald, & Biddle, 2015; Lou & Beaujot, 2005; Noh, & Avison, 1996; Ng, Wilkins, Gendron, & Berthelot, 2005; Perez, 2002; Singh & Siahpush, 2001; Stephen, Foote, Hendershot, & Schoenborn, 1994). However, healthy immigrant effect declines as the length of stay in country increases (Ali, 2002; Ali, McDermott, & Gravel, 2004; De Maio, & Kemp, 2010; Escobar et al., 2000; Lou & Beaujot, 2005; Vega, Kolody, Valle, & Hough, 1986). Ali (2002) and Lou and Beaujot (2005) provided the evidence for the decline of healthy immigrant effect in Canada. Ali (2002) examined mental health in the Canadian-born population and six immigrant cohort groups. Findings revealed that, generally, immigrants who arrived

in Canada a few years ago had the lowest depression rates, as compared to immigrants who arrived 10 to 14 years ago or more than 20 years who had higher rates of depression similar to the Canadian-born population. Lou and Beaujot (2005) also reported that recent immigrants were found to have good self-reported mental health compared to long-term immigrants but, long-term immigrants have similar self-rated mental health as the Canadian born population. On the other hand, some studies also concluded mixed or no support for healthy immigrant effect (Newbold, 2005).

Several factors determine the mental health status of the immigrant population such as pre-migration factors, post-migration factors, and social factors. The pre-migration factors are events occurring before migration which can cause psychological trauma to the immigrant. These include wars, natural disasters, loss of a family member, the distress of leaving the extended family behind (Hermansson, Timpka, & Thyberg, 2002; Silove, Steel, McGorry, Miles, & Drobny, 2002). Moreover, the added stress from the process of migration is also included in pre-migratory factors.

The post-migration factors come into play after the process of migration. The most common post-migratory factor is the process of acculturation where the immigrant tries to adapt him/herself in the host country (Escobar et al., 2000). Economic stability is another critical post- migratory factor which affects the mental health status of immigrants. Immigrants feel excessive competition and fewer opportunities for jobs affecting their socio-economic growth causing mental health issues (Picot, & Sweetman, 2004; Reitz, 2001). Immigrants continuously experience

difficulties in finding employment due to international education which forces immigrants to undergo an extensively long process to find a job (Girard, & Smith, 2013; Wald & Fang, 2008). These economic and employment-related factors make immigrants susceptible to mental health issues. Another post-migratory cause is the immigration status of the migrant. Many immigrants migrate as temporary foreign workers and must abide with certain restrictions and failure to do so can revoke action against them by immigration authorities (Ci, Hou and Morissette, 2018). They are only allowed to work only for a specific employer, work for a fixed number of hours, and work in a specific occupation. These restrictions could pose as hindrance for immigrants in achieving improved standard of living and increasing their level of life satisfaction. Therefore, immigrants are under immense pressure to achieve permanent residency status allowing them better job motility by lifting the imposed restrictions. Ci et al. (2018), also found that after achieving their permanent residency status, there was an increase in annual income of the immigrants which may have added to have improved standard of living. Studies suggest that this period of transition is very crucial and stressful for immigrants making them susceptible to developing mental health problems (Menezes, Georgiades, & Boyle, 2011).

An important factor closely linked with mental health is sense of belonging. Studies have found that lack of sense of belonging is associated with mental health problems such as depression, distress, and other psychological issues. (Clark, 1992; Haggerty & Williams, 1999). In the absence of support systems, immigrants experience high levels of stress and distress causing mental health issues (Kelaher, Potts & Manderson, 2001). Sense of belonging is a support system which enhances

the well-being of peers within a community. It includes mutual help to each other in the form of resources and even spending time together (Shumaker & Brownell, 1984). Studies report a positive association between life satisfaction and sense of belonging among various populations such as older adults (Roh, 2010), people with long-term mental illness (Chinman, Young, Hassell & Davidson, 2006), terminal illness (McEvoy, Schooler, Friedman, Steingard & Allen, 1993), caregivers (Wilson, Moore, Rubin, & Bartels, 1990) and university students (Mahanta & Aggrawal, 2013). Sense of belonging plays a very critical role during the process of acculturation and can either promote feelings of isolation or integration among immigrants (affecting their mental health and life satisfaction (Kelaheer et al., 2001). Studies on immigrants suggest that seeking support is usually hard for immigrants which intensifies the process of integration in the host country (Dhari et al., 1997). Several studies report that Canadian immigrants face challenges during their process of acculturation such as: small social networking groups, limited access to these groups, and language barriers (Galarneau & Morissette, 2004; Myles & Picot, 2005; Reitz, 2005; Stewart et al., 2008). These challenges can affect the level of life satisfaction among immigrants. Similar results are reported in studies done in the United Kingdom (Blakemore, 2000) and the European Union (Sundquist, 2001).

Literature also explains that sense of belonging together with spirituality enhances social connections and self-esteem improving mental health status thereby improving life satisfaction (Harvey, Bond, & Greenwood, 2009; Lee & Chan 2009; Park, Roh, & Yeo, 2011; Roh, 2010). Spirituality is described as either intrinsic or extrinsic. Intrinsic spirituality involves internal beliefs, attitudes, values, and practices

towards own religion, whereas, external spirituality is considered a means to solace and sociability to improve sense of belonging (Allport and Ross,1967). Studies reveal strong association between sense of belonging, spirituality, mental health, and life satisfaction. (O'Mahony, Donnelly, Bouchal, & Este, 2013). Overall, while negotiating many life stressors at one time, immigrants experience stress and become vulnerable to mental health issues (Fenta, Hyman, & Noh, 2004; Hollander, Bruce, Burström, & Ekblad, 2011; Oppedal, Roysamb, & Sam, 2004; Toselli, Gualdi-Russo, Marzouk, Sundquist, & Sundquist, 2014). Risk of the mental health issues persist in the second generation of the immigrants as well (Cantor-Graae, Pedersen, Mcneil, & Mortensen, 2003; Leao et al., 2006; Stafford et al., 2011; Veling at al., 2006). It was suggested that risk of mental health issues might be even higher for the second generation of immigrants (Harrison, Owens, Holton, Neilson, & Boot, 1988); however, some studies indicated no difference between the two generations (Bourque et al., 2011).

Social factors such as age, sex, and marital status also contribute to mental health status. Immigrants migrating with families experience significant challenges to play the family role in a new culture and way of living, which affects their relationships and increases the risk of developing mental health problems. The age of the immigrant is another important social factor which affects mental health among immigrants. It has been found that elderly immigrants who migrate as dependents usually suffer from isolation making them vulnerable (Hossen, 2012). Studies also highlight that females are more prone to develop mental health problems due to culture and family responsibilities (Delara, 2016; Malhotra & Shah, 2015).

Discrimination and racism are also two factors which cause immigrants to develop mental health issues (Gee, Ryan, Laflamme, & Holt, 2006; Stafford, Newbold, & Ross, 2011; Veling et al., 2006).

2.5.2.1.1 Mental health and life satisfaction among immigrant. Over time the contributory effect of pre-migration factors, post-migration factors, and social factors is a decline in the healthy immigrant effect resulting in mental health issues.

Unfortunately, the literature does not provide concrete reasons for the decline in the healthy immigrant effect. It is difficult to conclude the relationship between mental health and life satisfaction among immigrants as only few studies have explored the association of life satisfaction and mental health. In one such study by Silvera and Ebrahim (1998), determining the psychiatric morbidity and well-being among immigrants, high levels of distress and depression were found to be associated with low levels of life satisfaction. However, another study looked at the effect of spirituality on life satisfaction and depression. The authors reported that spirituality was associated to life satisfaction but not with the depression among immigrants (Lerman et al., 2018). A single study was found among Canadian immigrants that looked at the prevalence of depressive symptoms among elderly Chinese immigrants (Lai, 2004). They reported that lower levels of life satisfaction were associated with depressive symptoms (Lai, 2004). It is interesting to note that all three of these studies were done on the elderly immigrant population. As per the literature reviewed, there are no studies done exploring the effects of mental health and life satisfaction in young immigrant populations. Therefore, studies are lacking among other Canadian immigrants specifically. Similarly, a study done in Ontario Canada, among Sudanese

immigrants found that high levels of distress, depression, and constant mental health issues reducing their life satisfaction (Simich, Hamilton & Baya, 2006). A study in immigrants of various ethnic groups in Canada also found that suicidal ideation due to acculturative stress and poor life satisfaction was also prevalent.

2.6 Conclusion

Arpino and De Valk (2018) observed that these different predictors of life satisfaction which have not been fully explored among Canadian immigrants and many gaps are present in existing literature. Considering the growing immigrant population in Canada, it is essential to study how all these factors are associated with life satisfaction among Canadian immigrants in order to improve their transition into this country and their quality of life as they remain in Canada.

Diener (1984) defined life satisfaction as a self-assessment of feeling at any given point of time ranging from negative to positive. Studies have also shown that life satisfaction is a holistic idea involving contributing factors such as health (physical and mental health), social factors (age, income, marital status and etc.), and leisure physical activity (Enkvist et al., 2012; George, et al., 2012; Headey et al., 1993; Steptoe, Deaton and Stone, 2015). These factors independently affect life satisfaction and moderate other factors which significantly alter the level life satisfaction. For example, studies have shown that physically active leisure moderates mental health and physical health which modifies life satisfaction (Knapen, Vancampfort, Moriën, & Marchal, 2015; Lubans et al, 2016). Similarly, social factors have been found to moderate leisure physical activity and health which also modifies life satisfaction (Hossen, 2012; Wieland et al., 2015). Therefore, based on these

findings, life satisfaction is dependent on several factors which independently and in conjugation to other factors moderate life satisfaction. Thus, the present study explored predictors of immigrant life satisfaction and tested if a) the association between mental health with life satisfaction was moderated by physically active leisure and/or social factors, and b) the association between physically active leisure with life satisfaction was moderated by social factors.

Chapter 3 Methods

This chapter provides an overview of the methodological procedures that were used for this study. This secondary data analysis research design used data from the 2014 Canadian Community Health Survey (CCHS). The CCHS is an annual cross-sectional survey collecting information related to health status, health care utilization, and health determinants for the Canadian population. The purpose of this study was to explore social factors, physically active leisure, mental health, and physical health as predictors of life satisfaction among immigrants in Canada. This study also explored how these associations differ between immigrants concerning their time since arrival (i.e., 9 years or less versus 10 or more years). The study addresses the following research objectives:

1. To investigate levels of physically active leisure, physical and mental health, and life satisfaction among immigrants in Canada.
 - b. To determine if levels of physically active leisure, physical and mental health, and life satisfaction differ among Canadian immigrants in relation to time since arrival.
2. To explore the association between physically active leisure, physical and mental health, and life satisfaction among immigrants in Canada.
 - b. To determine if the association between physically active leisure, physical and mental health, and life satisfaction differ among Canadian immigrants in relation to time since arrival.
3. To determine if social factors physically active leisure, and physical and

mental health constructs predicts life satisfaction among immigrants in Canada.

b. To determine if predictors of life satisfaction differ among Canadian immigrants in relation to time since arrival.

3.1 Secondary Data Analysis

Secondary data analysis conducts data analysis on data which was collected initially with a different primary objective (Johnstan, 2017). The practicality of using secondary data is becoming more prevalent in recent years (Andrews, Higgins, Andrews & Lalor, 2012; Smith & Smith, 2008). Secondary data analysis uses one of two approaches: a) research question-based approach or b) data-driven approach. In the data-driven approach research questions are formed according to the variables present in the data set whereas, in research question-based approach, suitable data sets are looked upon based on the research question, (Cheng & Phillips, 2014). The data-driven approach was primarily used in this study.

The advantages of using secondary data include already cleaned and formatted data and access to a large sample size (Smith & Smith, 2008). The CCHS is deemed representative of the national population of Canada as it is a federal survey done by experts specialized in conducting national surveys. The use of secondary data also helped accelerate the pace of the study as the time spent in data collection was eliminated (Doolan & Froelicher, 2009). However, the CCHS collected data to serve its purpose. Therefore, this secondary data study was limited to the variables and measurements used for the original purpose of data collection (Boslaugh, 2007).

Another disadvantage of using a secondary data set is that the secondary researcher is not necessarily aware of errors during the process of data collection such as low response rates or if the respondents fully understood the survey questions. Therefore, to overcome this, documents related to the process of data collection and reports published by the federal government were used to evaluate these steps (Boslaugh, 2007; Dale, Arber & Procter, 1988).

3.1.1 Canadian Community Health Survey. The CCHS is a nationally representative computer-assisted cross-sectional survey designed to collect information related to health status, health care utilization, and health determinants of the Canadian population who are twelve years of age and over. It also gathers data about diseases, health condition, lifestyle, social conditions, and other factors. Physically active leisure, depression, distress, physical and mental health, and sense of belonging in the community were some of the variables of interest in this study. CCHS is a joint effort between the Canadian Institute for Health Information, Statistics Canada and Health Canada. The primary use of CCHS data is for health surveillance and population health research by Canadian federal and provincial departments of health and human resources, social service agencies, non-profit organizations and researchers. The data of CCHS 2014 was collected in all ten provinces and three territories. For administrative purposes each province was divided into health regions (HR), and each territory was designated as a single HR. In total for CCHS 2014, data was collected in 110 HR. People excluded from the study included people living on reserves and aboriginal settlements, full-time members of the

Canadian forces, institutionalized populations and people living in the Quebec HRs of du Nunavik and region Terres- cries-de-la- Baie-Tames.

CCHS 2014, used a multi-stage sample allocation strategy to give relatively equal importance to all HR's. In this strategy, the sample is allocated among the provinces according to the size of their respective populations and the number of HR's they contain. Each province's sample is then allocated among its HR's proportionally to the square root of the population in each HR. Three sampling frames were used in a sequence to select a sample of households: area fame (40.5%); list frame of telephone numbers (58.5%); and random digit dialling (1%). Sampling procedures were repeated until the required sample size was reached. To provide reliable estimates to 110 HR's, a sample of 65,000 respondents was required. Using this sampling strategy, 97,467 households were selected in scope for the survey; out of these, 73,190 households accepted to participate in the survey. One individual was selected from each responding household out of which a response was obtained for 63,964 individuals.

Memorial University's Institutional Review Board determined that the present study was exempt from review because it involved secondary analysis of publicly available data that lack identifying information.

3.1.2 Sample. The original sample size of the CCHS data set consisted of 63,964 individuals who volunteered to participate in the survey. For this study, a sub-sample size of $n = 8875$ immigrants, representing 14.4% of the original sample was used. The sample was selected using the filter question related to immigration status.

The length of stay of immigrants was also determined using filter question related to time since arrival which was (1 = 0-9 years; 2 = 10 or more years). The immigrants were grouped in two (i.e., short-term immigrants and long-term immigrants).

3.2 Variables, Operational definitions and Measures

For this study, the variables were termed as predictor variables and outcome variables. The main predictor variables were social factors, physically active leisure, mental health (e.g., mood, depression, distress, and sense-of belonging), and physical health (i.e., self-perceived health). The outcome variable in this study was life satisfaction.

3.2.1 Demographic variables. The demographic variables were used to illustrate the cultural, demographical, and health background status of the immigrants. The information used in this study included: province of residence; knowledge of official language; language spoken at home; participation in leisure physical activity (1= yes; 2 = no); reduction in physical activity due to physical and mental health (1 = Sometimes; 2 = Often; 3 = Never), intends to improve physical activity level (yes/no), and perceived life stress (1 = Not at all stressful; 2 = Not very stressful; 3 = A bit stressful; 4= Quite a bit stressful; 5 = Extremely stressful), cultural, and racial origin.

3.2.2 Predictor variables. Predictor of life satisfaction among respondents selected for this study included social factors, physically activity leisure, mental health, and physical health.

3.2.2.1 Social factors. Several social factor variables were selected as predictors of life satisfaction including : sex (1 = male; 2 = female); age group (“12 to 19”; “20 to 29”; "30 to 39”; “40 to 49”; “50 to 59”; “60 to 69”; “70 to 79”; and 80 and above); marital status (1= married; 2 = common-law partner; 3 = widowed/ separated/ divorced; 4 = single); education level (1 = less than secondary school; 2 = secondary school; 3 = some post-secondary education; 4 = post- secondary graduation); and annual income (0 = no income or \$39,999; 2 = between \$40,000 to \$79,999; 3 = \$80,000 and above).

3.2.2.2 Physically active leisure behaviour. This section highlights the selected predictor variables related to physically active leisure among immigrants.

3.2.2.2.1 Leisure physical activity index. The CCHS survey required the respondents to report their self-perceived leisure physical activity index on a 3-point Likert scale (1 = Active; 2 = Moderately active; 3 = Inactive).

3.2.2.2.2 Total leisure activity score. The CCHS survey required respondents to report their participation in leisure physical activity from 24 different activities such as walking, bicycling, home exercises, any other leisure activity, and no activity on a dichotomous scale (yes/no). For activity respondents participated in they subsequently reported the frequency (how many times) and the time duration of the leisure physical activity on a 4-point scale (1=1 to 15 minutes; 2= 16 to 30 minutes; 3= 31 to 60 minutes; 4 = more than 1 hour). For this study, a new total activity score was calculated by summing the product of duration by time

duration for each of the 24 leisure activities.

3.2.2.3 Self-Perceived physical health. Participants were asked to report their self- perceived health on a 5-point Likert scale (1 = “Excellent”; 2 = “Very good”; 3 = good; 4 = “Fair”; 5 = “Poor”).

3.2.2.4 Mental health. This section highlights the data collected from participants related to different mental health issues such as self-perceived mental health, mood, distress, depression, and sense of belonging.

3.2.2.4.1 Self-perceived mental health. Participants reported their self-perceived mental health on a 5-point Likert scale (1 = “Excellent”; 2 = “Very good”; 3 = good; 4 = “Fair”; 5 = “Poor”).

3.2.2.4.2 Mood. To assess mood, items from the Bradburn Scale of Psychological Well- Being (Bradburn, 1969) were used in the CCHS survey. The Bradburn Scale denotes participants’ ability to cope with stresses of daily life and records the psychological reactions (positive and negative both) of daily life events. There are ten questions in the scale, five to assess positive affect and five for negative affect. The questions inquire about participants’ emotions in the past few weeks (e.g., “Did you feel pleased about having something accomplished? and “Did you feel depressed or very unhappy?”). CCHS survey used the same items as the Bradburn scale but modified the scoring. Instead of using dichotomous questions participants reported their frequency of such emotions on a 3-point scale (1 = often, 2 = sometimes, and 3 = never). CCHS derived two new composite variables by summing the appropriate 5 items to create: positive affect and negative affect scores.

Scores range from 5 – 15 with higher values indicating higher positive or negative emotions experienced. Using these two variables, CCHS derived another variable called the Balance Affect, which indicates participants' current level of psychological well-being. This variable was derived by taking the difference between scores of positive affect and negative affect. The overall affect balance score ranges from -10 to 10, where positive scores indicate positive (good) psychological well-being and negative scores indicate negative (poor) psychological well-being).

3.2.2.4.3 *Distress.* The Kessler Psychological Distress Scale (K10; Kessler & Mroczke, 1994) was used to assess psychological distress in the CCHS survey. National population health surveys have used this scale in countries like Australia and Canada (Sampasa-Kanyinga, Zamorski & Colman, 2018; Saunders & Daly, 2001). The scale measures distress with 10- questions related to non-specific distress and depressive symptoms over the period of last four weeks. CCHS scored distress on a scale of 1 to 5 (1 = all of the time; 2 = most of the time; 3 = some of the time; 4 = a little of the time; 5 = none of the time). However, for this study scoring was reversed to the original scoring (1 = none of the time; 5 = all of the time) so that higher values reflected higher levels of distress. A new composite variable called as Total Distress was calculated by summing the response of all 10 questions ranging from 10 to 50, where 50 indicates a higher risk of distress and 10 indicates lower risk. For interpretation purposes, CCHS followed the scoring defined by AMHOCH (Australian Mental Health and Outcome Classification and Network) where 10-15 = no distress, 16 - 30 = moderate symptom of distress and 31 - 50 = high symptom distress (Australian Bureau of Statistics, 2012). In this study the same scoring was

also used.

3.2.2.4.4 Depression. Participants were asked if they ever felt depressed on a dichotomous scale (Yes/No). The identified participants responded to Short Form Score, which was a derived tool used by CCHS (Canadian Community Health Survey, 2016). A subset of items from the Composite International Diagnostic Interview, which is used to measure major depressive episodes, were used in Short Form Score (Canadian Community Health Survey, 2016). The short form scores of depression ranged from 0 to 8 where higher scores indicate higher levels of depression.

3.2.2.4.5 Sense of belonging. The participants were asked to report their sense of belonging to the local community on a 4-point Likert scale where (1 = very strong; 2 = somewhat strong; 3 = somewhat weak; 4 = very weak). For the purpose of this study the variable was recoded so that higher scores indicate higher sense of belonging (1 = very weak; 2 = somewhat weak; 3 = somewhat strong; 4 = very strong).

3.2.3 Life Satisfaction. The outcome variable in this study was life satisfaction. The survey required participants to report their life satisfaction. i.e., how did they feel about their life as a whole at the time of the interview. on a 5-point Likert scale (1 = Very satisfied; 2 = Satisfied; 3 = Neither satisfied nor dissatisfied; 4 = Dissatisfied; 5 = Very dissatisfied). The variable was reverse coded so that the higher values indicate higher life satisfaction (1 = Very dissatisfied; 5 = Very satisfied).

3.3 Data Analysis

The data was analyzed using computer-assisted software, i.e., SPSS

(Statistical Package for the Social Sciences) version 23. Data was screened for missing values and outliers prior to running analyses. Following the data screening, descriptive statistics (i.e., frequencies, mean, standard deviation, and standard error) were conducted to derive a profile of the sample and levels of physically active leisure, mental, and physical health, social factors, and life satisfaction. Descriptive statistics were conducted for the total sample, short-term immigrants (0-9 years) and longer-term immigrants (10+ years). Continuous variables were explored for normality (i.e., histograms, skewness, kurtosis, and the Kolmogorov-Smirnov test for normality) and it was found that none of the variables were normally distributed. Lack of normality was not surprising considering that most variables were at the interval level and many lacked variability (including life satisfaction). The sampling weights were not applied for the analysis.

Prior to further analysis, several variables were recoded. The outcome variable i.e., life satisfaction was measured on 5-point Likert scale, leading to poor variability and normality (Leung, 2011). Therefore, life satisfaction was collapsed into binary variable (0 = low; 1 = high); Very satisfied and Satisfied was collapsed into high life satisfaction while, neither satisfied nor dissatisfied, dissatisfied and very dissatisfied were collapsed into low life satisfaction. In order to have equal number of participants per group, the Leisure Physical Activity Index was also collapsed in into a binary variable (i.e. active and inactive) with active and moderately active forming the active group. The vast majority (97.3%) of respondents did not respond to the Mood Affect Balance scale following the inclusion question. Thus, considering high number of missing data (n = 8633) this variable had to be removed from subsequent analysis.

Prevalence of distress was reported by only 10.1% of the sample; therefore, the distress scale (K10 anxiety) was subsequently completed by only 840 respondents. Similarly, prevalence of depression was reported by only 17.6% of the sample; the depression short-form score was subsequently completed by only 1489 respondents. Due to high number of missing data points and lack of variability in responses in both the distress and depression scores, a new binary variable (incidence of depression/distress) was computed indicating whether respondents had reported ever having depression or distress (0 = no; 1 = yes).

To determine univariate associations between dichotomous life satisfaction (0 = active and 1 = inactive) outcome variable) and predictor variables (physically active leisure, mental and physical health, social factors) among total sample a series of univariate logistic regressions were computed. The model chi square statistic (omnibus test of model coefficients) was examined to determine if predictors improved the model. Predictor variables that were significantly associated with high life satisfaction were retained for further analysis.

Assumptions of logistic regression were explored including multi-collinearity and independence of errors (Field, 2013). To check for multi-collinearity variance inflation factors (VIF) and tolerance (1/VIF) were examined. VIF values greater than 10 (Myers, 1990) and tolerance values less than 0.2 (Menard, 1995) indicate multi-collinearity. No multi-collinearity was seen. Independence of errors was tested using the Durbin-Watson test; the assumption was met. A logistic regression model was analyzed with life satisfaction as the outcome variable. The model tested determined if a) the association between

mental health (sense of belonging and incidence of depression/distress) with life satisfaction was moderated by physically active leisure and/or social factors (income), b) the association between physically active leisure with life satisfaction was moderated by social factors (income). First, sense of belonging and incidence of depression/distress were entered into the model (Block 1). Next, physically active leisure was additionally entered in addition to the health variables (Block 2). Finally, income was added to the model (Block 3) with sense of belonging, incidence of depression/distress and physically active leisure level being retained in the model.

Contribution of individual predictors were assessed using the Wald Statistic and the odds ratio (Exp(B)). The model chi-square statistic was used to assess if models predicted the outcome variable compared to the constant. Cox and Snell and Nagelkerke R^2 were used to assess the effect size of each model block; however, caution should be made when interpreting these statistics as R^2 tests have less meaning in logistic regression (Field, 2013; Norušis, 2011). The omnibus tests were also used to compare blocks in order to determine the association between predictors and life satisfaction was moderated. Additionally, a greater than 10% difference between blocks in the odds ratios of individual predictors were considered moderating (Aschengrau & Seage, 2014). The models were conducted for the total time duration of immigrant as well as for the time since their arrival (i.e., 0-9 years and 10 or more years) to analyse if length of stay is associated with life satisfaction in immigrants. The 10% difference criteria in odds ratio was also used to assess if there

were significant differences in the association of predictors between short- versus long-term immigrants. The “very weak” sense of belonging and the lowest income category (No income - \$39,999) were the reference categories for these categorical predictors.

Chapter 4: Results

The following chapter presents the results of this study. First, the descriptive analyses are discussed: demographic and social factors, physically active leisure behaviour, health (mental health and physical), and life satisfaction. Second, bi-variate correlations of the association between predictors and life satisfaction are presented. The results of the logistic regressions are presented to explore if social factors, physically active leisure, and physical and mental health constructs predicts life satisfaction among immigrants in Canada.

4.1 Sample Profile and social factors

Descriptive statistics were performed to obtain sample characteristics for sample profile variables (see Table 1) and social factors (see Table 2). The total sample consisted of 8875 immigrants. A total of 1683 immigrants had been living in Canada for 0-9 years. Long-term immigrants (10+ years) consisted of 7192 participants.

4.1.1 Sample profile. 56.2% of the immigrants in total sample were white (23.6% in short-term immigrant group and 63.8% of long-term immigrant group) while 43.8% in total sample reported being a visible minority (76.4% of short-term and 36.2% of long-term immigrants). In terms of geographic location, nearly half (46.4%) of the total sample reported Ontario as their province of residence (31.3% of short-term and 50% of long-term immigrants). Only 3.1% of immigrants resided in Atlantic Canada (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick) for the total sample (3.2% of short-term and 3% of long-term

immigrants). A very small percentage (1.7%) of total sample resided in Canadian territories (Northwest Territories, Yukon, Nunavut); this was slightly higher among short-term (3.1%) compared to long-term (1.3%) immigrants. English was the preferred official language (87.8%) among the total sample (79.2% of short-term and 89.8% of long-term immigrants). However, 3% in total sample reported neither English nor French as their official language (4% of short-term and 2.7% of long-term immigrants). In terms of preferred language as means of communication, 68.5% of total sample reported English as their preference (45.4% of short-term and 73.9% of long-term immigrants). A quarter (24.3%) of immigrants preferred to communicate in their first language at home; this frequency was much higher among short-term immigrants (42.6%) compared to long-term immigrants (20.1%). 90.6% of total sample participated in physically active leisure activities with similar levels in short-term (91%) and long-term (90.5%) immigrants. Approximately one-tenth of immigrants (11.1%) felt restricted in physical activities due to physical or mental health issues while 37% had intentions of improving their level of physical activity in next 6 months (Table 1). In terms of perceived life stress, the majority of respondents reported being not very stressed or having no stress (42.6%), 38.5% reported being a bit stressful, whereas 3.1% of immigrants had extremely stressful lives. None of these frequencies differed in terms of length of stay.

4.1.2 Social factors. In the total sample, over half of immigrants (55%) were female (51.3% of short-term and 55.9% of long-term immigrants). Among the total sample, 6.2% immigrants were 12-19 years old, 45.7% between 20-59 years old, and almost half of the immigrants (48.2%) consisted of older adults (60 years and above).

Long-term immigrants had a similar age distribution with 3.2% immigrants 12-19 years old, 38.7% between 20-59 years old, and 58.2% immigrant were older adults (60 years and above) (Table 2). Short-term immigrants reflected a different age profile with 19% of immigrants 12-19 years old, 76% of immigrants 20-59 years old, while the older adult population in this group was only 5.1% (60-year and above). The majority of immigrants (59.4%) were married or had a common law partner (58.1% of short-term and 59.7% of long-term immigrants) while 19.1% of immigrants were single (37.2% of short-term and 14.9% of long-term immigrants) (Table 2).

The immigrants in total length of stay group were highly educated with 60.1% attaining a university or college degree (Table 2). The majority (61.4%) of short-term immigrant group had a university or college degree as did long-term immigrants (59.8%). Among the total sample, median household income from all sources was \$40,000 to \$59,000 per year and 31.3% of immigrants reported their annual household income from all sources to be more than \$80,000 per year (Table 2). A similar income distribution was found among short-term (median house hold income was \$40,000 – \$59,000 per year and 32.4% of immigrants earning more than \$80,000 per year) and long-term (median house hold income was \$40,000 – \$59,000 per year, with 31.1% immigrants reported their annual house hold income as \$80,000 or more) immigrants.

4.1.3 Life satisfaction. The immigrants reported their life satisfaction in general (Table 3) on a 5-point Likert scale. For the total sample, 37.9% of the immigrants reported being very satisfied and only 0.7% reported being very dissatisfied. Similar for shorter term immigrants, 38.7% were very satisfied and only 0.8% were very dissatisfied with their life

satisfaction. In terms of long-term immigrants, 37.8% reported having very satisfied life satisfaction and only 0.7% were very dissatisfied with life in general. On average, life satisfaction was high among the total sample ($M = 4.25$; $SD = 0.74$; $SE = 0.01$) as well as among short- ($M = 4.26$; $SD = 0.73$; $SE = 0.02$) and long-term ($M = 4.24$; $SD = 0.74$; $SE = 0.01$).

4.1.4 Physically active leisure behaviour. The immigrants reported their Leisure Physical Activity Index on a 3-point Likert scale where (1 = Active; 2 = Moderately active; 3 = Inactive). In total sample group more than one fourth of immigrants (27.5%) were actively involved in leisure activities while 48.1% were inactive (Table 3). Similarly, in the short-term immigrant group, 28.5% reported active on the leisure physical activity scale, while 47.9% reported inactive. The long-term immigrant group had similar results as total sample and short-term immigrants. More than one fourth (27.3%) of long-term immigrants had an active leisure physical activity index while 48.2% were inactive in their leisure physical activity.

Participants were asked to report the frequency of participation and their time duration from twenty-four different activities identified by CCHS for leisure in last three months. An overall total score was calculated for all the activities together. For the total sample group, the overall activity score for immigrants ranged from 0-1832 (minutes of participation in physically active leisure) in the last 3 months. Out of total sample, 13.1% reported no participation at all in any physically active leisure. On an average, it was found that immigrants reported low levels of physically active leisure participation ($M = 233.8$; $SD = 225.56$; $SE = 2.39$) (Table 4). The most popular leisure physical activities among total sample group were walking ($M = 89.1$; $SD = 112.42$; $SE = 1.19$), gardening ($M = 34.4$; $SD = 75.61$; $SE = 0.1$), home-exercises (M

= 35.0; $SD = 64.77$; $SE = 0.68$), and log running ($M = 10.9$; $SD = 35.79$; $SE = 0.38$) (Table 4). However, all immigrants did not participate in these activities, 33.9%, 59.3%, 61.2%, and 81.9% immigrants scored “0” in score for these activities respectively.

For short-term immigrants, 0-1776 (minutes of participation in physically active leisure) was the overall activity score and 10.5% of the immigrants reported no participation at all in any physically active leisure. The immigrants reported lower levels of physically active leisure similar to the total sample group ($M = 221.9$; $SD = 226.45$; $SE = 5.51$) (Table 4). The most participated activities included walking ($M = 69.3$; $SD = 94.67$; $SE = 2.30$), home exercises ($M = 35.0$; $SD = 65.36$; $SE = 1.59$), log running ($M = 18.9$; $SD = 43.63$; $SE = 1.06$), and gardening ($M = 13.4$; $SD = 41.09$; $SE = 1.00$) (Table 4). Like the total sample group, not all short-term immigrants participated in these activities and 34.4%, 57.5%, 65.1%, and 72.1% immigrants scored “0” in these activities respectively.

The overall activity score for long-term immigrants was similar to the score of sample immigrant group, 0-1832 (minutes of participation in physically active leisure); however, 13.7% of immigrants did not participate in any physically active leisure. On an average lower level of physically active leisure was found in long-term immigrants similar to total sample and short-term immigrants ($M = 236.6$; $SD = 225.28$; $SE = 2.65$) (see Table 4). The activities with the greatest participation included walking ($M = 66.2$; $SD = 115.70$; $SE = 1.36$), gardening ($M = 39.4$; $SD = 80.82$; $SE = .95$), home-exercises ($M = 35.0$; $SD = 64.63$; $SE = .76$), and swimming ($M = 7.3$; $SD = 28.93$; $SE = .34$). Out of all long-term immigrants, 33.8%, 56.4%,

62.1%, and 83.6% immigrants had no participation in these leisure activities respectively

4.1.5 Health.

4.1.5.1 Physical health. The immigrants were asked to report their self-perceived physical health, on a on a 5-point Likert scale (1 = Poor”; 5 = “Excellent). In the total sample group, 33.8% (Table 5) of immigrants reported very good physical health, whereas for 4.1% immigrants, their self-perceived physical health was poor. Similar frequencies were found for short-term immigrants (34.6% reported very good physical health and 4.1% stated that self- perceived physical health was poor) and long-term (33.7% reported very good physical health and 4.1% stated that self-perceived physical health was poor). On average, self-perceived physical health was high among the total sample ($M = 2.44$; $SD = 1.05$; $SE = 0.01$), as well as among short- ($M = 2.43$; $SD = 1.03$; $SE = 0.03$) and long-term immigrants ($M = 2.45$; $SD = 1.05$; $SE = 0.01$) (see Table 6). The total sample also identified the most important change brought to improve their health (see Table 5). More than half of the immigrants (54.0%) said that they started or increased the level of exercise or physically active leisure whereas only 1.3% stated that they reduced their stress levels. Similar frequencies were found for short-term immigrants (55.2% said that they started or increased the level of exercise or physically active leisure whereas only 1.3% reduced their stress levels) and long-term immigrants (53.7% said that they started or increased the level of exercise or physically active leisure whereas only 1.3% reduced their stress levels).

4.1.5.2 Mental health. The mental health of immigrants was assessed using

different variables such as self-perceived mental health, mood, distress, depression, and sense of belonging. For total sample group participants reported their self-perceived mental health on a 5-point Likert scale where (1 = “Excellent”; 2 = “Very good”; 3 = Good; 4 = “Fair”; 5 = “Poor”). In the total sample 39.8% (Table 5) reported excellent or very good self-perceived mental health (69.7% for short-term and 5.2% for long-term immigrants) whereas 5.8% of immigrants reported fair or poor mental health (69.9% for short-term and 5.9% for long-term immigrants). On average, self-perceived mental health was high among the total sample ($M = 2.03$; $SD = 0.94$; $SE = 0.01$) as well as among short- ($M = 2.0$; $SD = 0.92$; $SE = 0.02$) and long-term immigrants ($M = 2.03$; $SD = 0.94$; $SE = 0.01$) (see Table 6).

In terms of mood, only 2.4% of immigrant reported changes in their mood (2.6% for short-term and 2.4% for long-term immigrants). Balance Affect score was used to measure mood on a scale from -10 to 10, (where, positive score indicates good psychological well-being and negative score indicates poor psychological well-being). On an average, the total sample group had fair level of positive psychological well-being ($M = 3.8$; $SD = 3.12$; $SE = 0.21$). Similar fair levels of positive mood were found among short- ($M = 3.9$; $SD = 2.68$; $SE = 0.41$) and long-term immigrants ($M = 3.7$; $SD = 3.23$; $SE = 0.24$) (See Table 6).

The distress level of immigrants was also assessed on a 5-point Likert scale (1 = “None of the time”; 5 = “All of the time”). The overall distress score (K10) was calculated to measure the level of distress where (10 -15 = “No distress”; 16 - 30 = “Moderate distress”; 31 - 50 = “High distress”). The total sample of immigrants reported no distress ($M = 14.8$; $SD = 5.05$; $SE = 0.17$) as was the same for short-term

($M = 14.4$; $SD = 4.26$; $SE = 0.33$) and long-term ($M = 14.8$; $SD = 5.18$; $SE = 0.19$) (Table 6). To assess the level of depression, derived depression scale was used ranging from 0 to 8 where higher scores indicated higher levels of depression. On an average total sample group reported no depression ($M = 0.3$; $SD = 1.29$; $SE = 0.03$) (Table 6). Depression levels did not vary by length of stay (short-term: $M = 0.3$; $SD = 1.26$; $SE = 0.07$ and long-term: $M = 0.3$; $SD = 1.26$; $SE = 0.04$)

Sense of belonging was measured on a 4-point Likert scale where (1 = very weak; 4 = very strong). In terms of total sample, more than one fifth, 21.7 % (Table 5) immigrants had very strong sense of belonging to local community (21.4% for short-term and 21.8% for long-term immigrants) in comparison to 29% reported somewhat weak or very weak relationship with the community (70.7% for short-term and 29.3% for long-term immigrants). On average, sense of belonging was high among the total sample ($M = 2.85$; $SD = 0.84$; $SE = 0.01$) as well as among short ($M = 2.87$; $SD = 0.82$; $SE = 0.02$) and long-term immigrants ($M = 2.85$; $SD = 0.85$; $SE = 0.01$) (Table 6).

4.2 Bivariate Associations between Predictor Variables and Life Satisfaction

A series of univariate logistic regression models were conducted to determine associations between predictor variables among the total sample. The omnibus test of model coefficients was examined to determine if predictors improved the model. In terms of physical activity variables, the Leisure Physical Activity Index was significantly associated with life satisfaction ($\chi^2 (1) = 106.678$, $p < .001$, $OR = 2.19$) while the total physical activity score ($\chi^2 (1) = .638$, $p = .424$,

OR = 1.00) was did not have a significant univariate association. In terms of health variables, self-perceived physical health ($\chi^2 (1) = .666, p = .414, OR = 0.97$), self-rated mental health ($\chi^2 (1) = .000, p = .995, OR = 1.00$), and mood ($\chi^2 (1) = 22.277, p = .213, OR = 1.04$) were not significantly associated with life satisfaction while presence of depression/distress ($\chi^2 (1) = 20.873, p < .001, OR = 1.54$) and sense of belonging ($\chi^2 (3) = 187.108, p < .001, OR = 1.88, 3.90, \text{ and } 4.75$ for each of the 3 non-reference categories) were significantly associated.

Among the social factors sex ($\chi^2 (1) = 1.389, p = .239, OR = 1.09$), age groups ($\chi^2 (7) = 7.770, p = .353, OR = 1.08, 1.07, 1.13, 1.12, 1.89, 1.18, \text{ and } 1.00$ for each of the 7 non-reference categories), marital status ($\chi^2 (3) = 5.234, p = .155, OR = 1.05, 1.09, \text{ and } 1.26$ for each of the 3 non-reference categories), and education ($\chi^2 (3) = 8.382, p = .239, OR = 1.21, 0.87, \text{ and } 1.12$ for each of the 3 non-reference categories) were not significantly associated with life satisfaction. Income ($\chi^2 (4) = 211.47, p < .001, OR = 2.06, 4.01 \text{ and } 5.43$ for each of the 3 non-reference categories) was the only social factor that was significantly associated with life satisfaction. Thus, the significant predictors that were retained for future analysis included the Leisure Physical Activity Index (physical activity behaviour), presence of depression/distress (and sense of belonging as health-related variables, and income as a social factor.

4.3 Multivariate Associations between Predictors and Life Satisfaction

To determine if social factors, physically active leisure, and physical and mental health constructs predict life satisfaction among immigrants in Canada, a logistic regression model was analyzed. Predictors that were retained for the

regression model included the Leisure Physical Activity Index (physically active leisure), presence of depression/distress, and sense of belonging as health-related variables, and income as a social factor. The model was analyzed for the total sample and for time since arrival subgroups (i.e., 0-9 years and 10 or more years) to determine if length of stay predicts life satisfaction in immigrants (Tables 7, 8, and 9).

4.3.1 Mental Health Predictors

Sense of belonging and incidence of depression/distress were entered into the model (Block 1). These predictors were a significantly better fit to the data compared to without for the total sample ($\chi^2(4) = 187.51, p < .001$), short-term immigrants ($\chi^2(4) = 41.07, p < .001$) and long-term immigrants ($\chi^2(4) = 149.53, p < .001$). These predictors accounted 4.8% of the variance in life satisfaction (Cox and Snell ($R^2 = .022$)) and Nagelkerke ($R^2 = .048$)) among the total sample. Mental health explained a significantly greater ($\Delta 18\%$) among short-term (Nagelkerke ($R^2 = .057$)) compared to long-term (Nagelkerke ($R^2 = .047$)); however, these effect sizes are small. Greater sense of belonging was associated with greater likelihood of high life satisfaction.

Among the total sample of immigrants who perceived a somewhat weak sense of belonging were 1.9 times more likely to have high life satisfaction compared to very weak sense of belonging; people perceiving a somewhat strong sense of belonging were 3.9 times more likely; and having a very strong sense of belonging was highly associated with high life satisfaction (OR = 4.8). Among short-term immigrants' people who perceived a somewhat weak sense of belonging were not

significantly more likely to have high life satisfaction compared to a very weak sense of belonging. Thus, very weak and somewhat weak categories did not differ in terms of their association with life satisfaction among short-term immigrants. In contrast, among long-term immigrants' people who perceive a somewhat weak sense of belonging were 2.0 times more likely. Short-term (OR = 3.8) and long-term immigrants (OR = 3.9) who perceived a somewhat strong sense of had a similar association with life satisfaction. Having a very strong sense of belonging was significantly more ($\Delta 19\%$) positively associated with life satisfaction among short-term (OR = 5.4) compared to long-term (OR = 4.6). Sense of belonging was the strongest predictor of life satisfaction among all predictor variables for the total sample (OR = 4.8), short- (OR = 5.4) and long-term (OR = 4.6) immigrants. Incidence of depression/distress was not significantly associated with differentiating between being in high or low life satisfaction group in any of the models.

4.3.2 Physically Active Leisure

Physically active leisure was additionally entered into the models in addition to sense of belonging and incidence of depression/distress (Block 2). The model was a significantly better fit to the data with physically active leisure being included as a predictor compared to without for the total sample ($\chi^2(1) = 77.49, p < .001$), short-term immigrants ($\chi^2(1) = 12.65, p < .001$) and long-term immigrants ($\chi^2(4) = 65.11, p < .001$). These predictors accounted 6.8% of the variance in life satisfaction (Cox and Snell ($R^2 = .031$) and Nagelkerke ($R^2 = .068$)) among the total sample.

Physically active leisure explained had more variance in life satisfaction among short-term (Nagelkerke ($R^2 = .075$)) compared to long-term (Nagelkerke ($R^2 =$

.068)); however, difference in length of stay was not significant ($\Delta 9\%$). These effect sizes are small. Being physically active leisure was associated with high life satisfaction. Among the total sample, immigrants with physically active leisure were 2.0 times more likely to be in high life satisfaction group compared to those in inactive group. Length of stay did not influence this association (short-term OR = 1.9 and long-term immigrants OR = 2.0). Physical active leisure did not significantly change the association between sense of belonging or incidence of depression/distress and life satisfaction for total sample, short-term, and long-term immigrants ($\Delta \text{OR} < 10\%$). Thus, the association between mental health (sense of belonging and incidence of depression/distress) with life satisfaction was not moderated by physically active leisure.

4.3.3 Income

Income was added to the model (Block 3) with sense of belonging, incidence of depression/distress and physically active leisure being retained in the model. The model was a significantly better fit to the data with physically active leisure being included as a predictor compared to without for the total sample ($\chi^2(1) = 181.019, p < .001$), short-term immigrants ($\chi^2(1) = 40.817, p < .001$) and long-term immigrants ($\chi^2(4) = 150.42, p < .001$). These predictors accounted 11.3% of the variance in life satisfaction (Cox and Snell ($R^2 = .052$) and Nagelkerke ($R^2 = .113$)) among the total sample. Thus, Block 3, with all predictor variables included, explained the greatest amount of variance in life satisfaction. Income explained a significantly greater ($\Delta 14\%$) among long-term (Nagelkerke ($R^2 = .114$)) compared to short-term

(Nagelkerke ($R^2 = .130$)) immigrants; these effect sizes are small. Income did not significantly change the association between sense of belonging, incidence of depression/distress or physically active leisure and life satisfaction for total sample, short-term, and long-term immigrants ($\Delta OR < 10\%$). Thus, the associations between mental health (sense of belonging and incidence of depression/distress) or physically active leisure with life satisfaction was not moderated by social factors (income).

Table 1: Sample profile of immigrants

Variable description	Total (n = 8875)		0 – 9 years (n = 1683)		10+ years (n = 7192)	
	%	(n)	%	(n)	%	(n)
Culture or racial origin						
White	56.2	(4927)	23.6	(394)	63.8	4533
Visible minority	43.8	(3842)	76.4	(1273)	36.2	2569
Province of residence						
Atlantic Canada (NL, NB, PEI, NS)	3.1	(273)	3.2	(54)	3.0	(219)
Quebec	10.1	(898)	16.3	(275)	8.7	(623)
Ontario	46.4	(4119)	31.3	(526)	50.0	3593
Manitoba	5.1	(450)	8.3	(139)	4.3	(311)
Saskatchewan	2.7	(242)	6.7	(112)	1.8	(130)
Alberta	10.4	(926)	14.9	(251)	9.4	(675)
British Columbia	20.5	(1820)	16.2	(273)	21.5	(1547)
Yukon, Northwest territories, Nunavut	1.7	(147)	3.1	(53)	1.3	(94)
First official language						
English	87.8	(7760)	79.2	(1327)	89.8	(6433)
French	7.1	(629)	13.4	(225)	5.6	(404)
Both English and French	2.1	(190)	3.3	(56)	1.9	(134)
Neither English nor French	3.0	(263)	4.0	(67)	2.7	(196)
Languages spoken at home						
English	68.5	(6069)	45.4	(760)	73.9	5309
French	5.1	(448)	9.6	(161)	4.0	(287)
Both English and French	2.1	(184)	2.4	(40)	2.0	(144)
Neither English nor French	24.3	(2156)	42.6	(714)	20.1	(1442)
Participation in leisure physical activity						
Yes	90.6	(7767)	91.0	(1485)	90.5	(6282)
No	9.4	(809)	9.0	(146)	9.5	(663)
Reduction in physical activity due to physical and mental health						
Sometimes	11.1	(983)	11.1	(186)	11.1	(797)
Often	7.6	(675)	6.4	(107)	7.9	(568)
Never	81.2	(7179)	82.5	(1385)	80.9	(5794)
Intends to improve physical activity level						
	%	(n)	%	(n)	%	(n)
Yes (has lot of not applicable values ??)	37.4	(95)	37.0	(20)	37.5	(75)
No	62.6	(159)	63.0	(34)	62.5	(125)
Perceived life stress						
Not at all stressful	17.4	(1529)	18.0	(301)	17.2	(1228)
Not very stressful	25.2	(2214)	26.2	(438)	24.9	(1776)
A bit stressful	38.5	(3384)	37.4	(624)	38.7	(2760)
Quite a bit stressful	15.9	(1396)	15.2	(254)	16.0	(1142)
Extremely stressful	3.1	(273)	3.1	(52)	3.1	(221)

Table 2: Social factors of immigrants

Variable description	Total (n = 8875)		0 – 9 years (n = 1683)		10+ years (n = 7192)	
	%	(n)	%	(n)	%	(n)
Sex						
Male	45	(3993)	48.7	(819)	44.1	(3174)
Female	55	(4882)	51.3	(864)	55.9	(4078)
Age Group						
12 - 19 years old	6.2	(548)	19.0	(319)	3.2	(229)
20 - 29 years old	8.0	(712)	22.5	(378)	4.6	(334)
30 - 39 years old	12.3	(1095)	32.3	(544)	7.7	(551)
40 – 49 years old	12.3	(1090)	15.7	(264)	11.5	(826)
50 – 59 years old	13.1	(1163)	5.5	(92)	14.9	(1071)
60 – 69 years old	20.9	(1851)	3.3	(55)	25.0	(1796)
70 – 79 years old	17.0	(1505)	1.5	(26)	20.6	(1479)
80 years old and above	10.3	(911)	0.3	(5)	12.6	(906)
Marital status						
Married	55.6	(4919)	53.2	(894)	56.1	(4025)
Common law partner	3.8	(330)	4.9	(83)	3.6	(255)
Widow/separated/Divorced	21.5	(1904)	4.6	(78)	25.5	(1826)
Single/Never-married	19.1	(1693)	37.2	(626)	14.9	(1067)
Highest level of education of respondent						
Less than secondary school graduation	18.1	(1573)	19.4	(321)	17.7	(1252)
Secondary school graduation	18.0	(1567)	13.5	(223)	19.1	(1344)
Some post-secondary education	3.8	(331)	5.6	(93)	3.4	(238)
Post-secondary certificate, diploma, university degree	60.1	(5236)	61.4	(1015)	59.8	(4221)
Total house hold income from all sources						
No income or less than \$20,000	10.3	(911)	9.6	(162)	10.4	(749)
\$20,000 - \$39,999	24.0	(2129)	23.1	(389)	24.2	(1740)
\$40,000 - \$59,999	19.8	(1760)	20.0	(336)	19.8	(1424)
\$60,000 - \$79,999	14.5	(2129)	14.9	(250)	14.4	(1038)
\$80,000 or more	31.3	(911)	32.4	(544)	31.1	(2235)

Table 3: Frequencies for outcome and categorical predictor variables

Variable description	Total (n = 8875)		0 – 9 years (n = 1683)		10+ years (n = 7192)	
	%	(n)	%	(n)	%	(n)
Life Satisfaction						
Very satisfied	37.9	(3207)	38.7	(621)	37.8	(2586)
Satisfied	52.6	(4449)	52.3	(840)	52.7	(3609)
Neither satisfied nor dissatisfied	6.4	(540)	6.4	(102)	6.4	(438)
Dissatisfied	2.3	(197)	1.8	(29)	2.5	(168)
Very dissatisfied	0.7	(61)	0.8	(13)	0.7	(48)
Leisure physical activity index						
Active	27.5	(2361)	28.5	(465)	27.3	(1896)
Moderately active	24.3	(2086)	23.5	(384)	24.5	(1702)
Inactive	48.1	(4129)	47.9	(782)	48.2	(3347)
Self-perceived health						
Excellent	20.0	(1772)	19.9	(334)	20.0	(1438)
Very good	33.8	(2997)	34.6	(582)	33.7	(2415)
Good	32.1	(2841)	32.4	(545)	32.0	(2296)
Fair	9.9	(880)	8.9	(150)	10.2	(730)
Poor	4.1	(364)	4.1	(69)	4.1	(295)
Self-perceived mental health						
Excellent	34.7	(2974)	35.8	(579)	34.5	(2395)
Very good	35.1	(3009)	33.9	(549)	35.4	(2495)
Good	24.3	(2085)	25.0	(405)	24.2	(1680)
Fair	4.7	(403)	4.6	(75)	4.7	(328)
Poor	1.1	(94)	.6	(10)	1.2	(84)
Sense of belonging to community						
Very strong	21.7	(1830)	21.4	(343)	21.8	(1487)
Somewhat strong	49.3	(4152)	51.0	(819)	48.9	(3333)
Somewhat weak	21.5	(1813)	21.0	(337)	21.6	(1476)
Very weak	7.5	(628)	6.6	(106)	7.7	(522)
Most important change to improve health						
Started/physical activity/exercise	54.0	(689)	55.2	(123)	53.7	(566)
Lost weight	7.6	(97)	7.2	(16)	7.7	(81)
Improved eating habits	17.9	(228)	14.8	(33)	18.5	(195)
Quit/reduced smoking	3.3	(42)	4.0	(9)	3.1	(33)
Drank less alcohol	.5	(6)	.4	(1)	.5	(5)
Reduced stress level	1.3	(17)	1.3	(3)	1.3	(14)

Table 4: Descriptive statistics for overall activity score

Variable description	Total sample (n = 875)			Short-term (0 -9 years) (n = 1683)			Long-term (10+ years) (n = 7192)		
	M	(SD)	SE	M	(SD)	SE	M	(SD)	SE
Total physically active leisure	233	225.6	2.39	221	226.5	5.51	236.6	225.3	2.65
Walking	89.1	12.42	1.19	35	65.36	1.59	66.2	115.7	1.36
Gardening	34.4	75.61	0.1	13.4	41.09	1	39.4	80.82	0.95
Home exercises	35	64.77	0.68	35	65.36	1.59	35	64.63	0.76
Log running	10.9	35.79	0.38	18.9	43.63	1.06	9.08	33.42	0.39

Table 5: Frequencies for health variables

	Total (n = 8875)		0 – 9 years (n = 1683)		10+ years (n = 7192)	
	%	(n)	%	(n)	%	(n)
Self-perceived health						
Excellent	20.0	(1772)	19.9	(334)	20.0	(1438)
Very good	33.8	(2997)	34.6	(582)	33.7	(2415)
Good	32.1	(2841)	32.4	(545)	32.0	(2296)
Fair	9.9	(880)	8.9	(150)	10.2	(730)
Poor	4.1	(364)	4.1	(69)	4.1	(295)
Most important change to improve health						
Started/increased/physical activity/exercise/sport	54.0	(689)	55.2	(123)	53.7	(566)
Lost weight	7.6	(97)	7.2	(16)	7.7	(81)
Changed diet/improved eating habits	17.9	(228)	14.8	(33)	18.5	(195)
Quit smoking/reduced amount smoked	3.3	(42)	4.0	(9)	3.1	(33)
Drank less alcohol	.5	(6)	.4	(1)	.5	(5)
Reduced stress level	1.3	(17)	1.3	(3)	1.3	(14)
Received medical treatment	9.3	(119)	10.3	(23)	9.1	(96)
Took vitamins	1.2	(15)	1.3	(3)	1.1	(12)
Others	5.0	(64)	5.4	(12)	4.9	(52)
Self-perceived mental health						
Excellent	34.7	(2974)	35.8	(579)	34.5	(2395)
Very good	35.1	(3009)	33.9	(549)	35.4	(2495)
Good	24.3	(2085)	25.0	(405)	24.2	(1680)
Fair	4.7	(403)	4.6	(75)	4.7	(328)
Poor	1.1	(94)	.6	(10)	1.2	(84)
Sense of belonging to community						
Very strong	21.7	(1830)	21.4	(343)	21.8	(1487)
Somewhat strong	49.3	(4152)	51.0	(819)	48.9	(3333)
Somewhat weak	21.5	(1813)	21.0	(337)	21.6	(1476)
Very weak	7.5	(628)	6.6	(106)	7.7	(522)

Table 6: Descriptive statistics for health variables

Variable description	Total sample (n = 8875)			Short-term (0 -9 years) (n = 1683)			Long-term (10+ years) (n = 7192)		
	M	(SD)	SE	M	(SD)	SE	M	(SD)	SE
Self-perceived health	2.44	(1.05)	.01	2.43	(1.03)	.03	2.45	(1.05)	.01
Self-perceived mental health	2.03	(.94)	.01	2.0	(.92)	.02	2.03	(.94)	.01
Mood	3.8	(3.12)	.21	3.9	(2.68)	.41	3.7	(3.23)	.24
Distress	14.8	(5.05)	.17	14.4	(4.26)	.33	14.8	(5.18)	.19
Depression	.3	(1.29)	.03	.3	(1.26)	.07	.3	(1.26)	.04
Sense of belonging	2.85	(.84)	.01	2.87	(.82)	.02	2.85	(.85)	.01

Table 7: Logistic Regression Model for Total Sample (n = 8875)^d

Variable		B	(SE)	Wald $\chi^2_{(df)}$	95% CI for Exp(B)		
					Lower	Exp(B)	Upper
Block 0	Constant	2.27	.04	3629.98 ₍₁₎ ***		9.72	
Block 1: Mental health	Sense of belonging (very weak) ^a			200.12 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.64	.12	29.08 ₍₁₎ ***	1.50	1.90	2.40
	Sense of belonging (somewhat strong)	1.37	.11	142.89 ₍₁₎ ***	3.13	3.92	4.91
	Sense of belonging (very strong)	1.56	.14	125.8 ₍₁₎ ***	3.64	4.78	6.29
	Presence of depression/distress ^b	.07	.09	0.66 ₍₁₎	.90	1.07	1.28
	Constant	1.20	.10	143.7 ₍₁₎ ***		3.31	
Block 2: Physical Activity	Sense of belonging (very weak) ^a			172.45 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.61	.12	25.83 ₍₁₎ ***	1.45	1.84	2.22
	Sense of belonging (somewhat strong)	1.28	.12	122.07 ₍₁₎ ***	2.86	3.58	4.49
	Sense of belonging (very strong)	1.48	.14	111.62 ₍₁₎ ***	3.35	4.41	5.81
	Presence of depression/distress ^b	.10	.09	1.22 ₍₁₎	0.93	1.10	1.31
	Physical activity ^c	.69	.08	74.53 ₍₁₎ ***	1.71	2.00	2.34
	Constant	.95	.10	83.07 ₍₁₎ ***		2.58	
Block 3: Income	Sense of belonging (very weak) ^a			169.25 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.54	.12	19.25 ₍₁₎ ***	1.35	1.71	2.18
	Sense of belonging (somewhat strong)	1.22	.12	107.67 ₍₁₎ ***	2.70	3.40	4.28
	Sense of belonging (very strong)	1.52	.14	112.75 ₍₁₎ ***	3.44	4.56	6.03
	Presence of depression/distress ^b	.17	.09	3.62 ₍₁₎	0.99	1.19	1.41
	Physical activity ^c	.60	.08	54.63 ₍₁₎ ***	1.55	1.82	2.14
	Income (No income - \$39,999) ^a			167.74 ₍₂₎ ***			
	Income (\$40,000- \$79,999)	.71	.09	64.70 ₍₁₎ ***	1.71	2.03	2.42
	Income (\$80,000 and above)	1.34	.11	147.03 ₍₁₎ ***	3.07	3.81	4.73
	Constant	.45	.11	15.91 ₍₁₎ ***		1.57	

^a reference category; ^b Yes; ^c Active; ^d Effective sample size for model = 8298

*** $p < .05$

Table 8: Logistic Regression Model for Short-Term Immigrants (n = 1683)^d

Variable		B	(SE)	Wald χ^2 (df)	95% CI for Exp(B)		
					Lower	Exp(B)	Upper
Block 0	Constant	2.34	0.09	691.51 ₍₁₎ ***			
Block 1: Mental health	Sense of belonging (very weak) ^a			41.17 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.46	.29	2.58 ₍₁₎	.90	1.58	2.78
	Sense of belonging (somewhat strong)	1.35	.28	23.19 ₍₁₎ ***	2.22	3.84	6.64
	Sense of belonging (very strong)	1.69	.35	23.06 ₍₁₎ ***	2.72	5.41	10.77
	Presence of depression/distress ^b	-.18	.20	.78 ₍₁₎	.57	.84	1.24
	Constant	1.36	.25	29.81 ₍₁₎ ***		3.88	
Block 2: Physical Activity	Sense of belonging (very weak) ^a			37.42 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.48	.29	2.74 ₍₁₎	.92	1.61	2.85
	Sense of belonging (somewhat strong)	1.31	.28	21.73 ₍₁₎ ***	2.14	3.71	6.45
	Sense of belonging (very strong)	1.64	.35	21.47 ₍₁₎ ***	2.57	5.14	10.29
	Presence of depression/distress ^b	-.18	.20	.81 ₍₁₎	.56	.84	1.24
	Physical activity ^c	.65	.19	12.21 ₍₁₎ ***	1.33	1.92	2.78
	Constant	1.08	.26	17.37 ₍₁₎ ***		2.95	
Block 3: Income	Sense of belonging (very weak) ^a			37.68 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.41	.30	1.86 ₍₁₎	.84	1.50	2.69
	Sense of belonging (somewhat strong)	1.30	.29	20.08 ₍₁₎ ***	2.08	3.67	6.47
	Sense of belonging (very strong)	1.63	.36	20.51 ₍₁₎ ***	2.53	5.12	10.39
	Presence of depression/distress ^b	-.11	.20	.27 ₍₁₎	.60	.90	1.34
	Physical activity ^c	.54	.19	8.18 ₍₁₎ ***	1.19	1.72	2.50
	Income (No income - \$39,999) ^a	.		30.35 ₍₂₎ ***			
	Income (\$40,000- \$79,999)	.25	.20	1.64 ₍₁₎	.87	1.29	1.90
	Income (\$80,000 and above)	1.63	.30	30.13 ₍₁₎ ***	2.86	5.12	9.17
	Constant	.69	.28	6.02 ₍₁₎ ***		1.99	

^a reference category; ^b Yes; ^c Active; ^d Effective sample size for model = 1576

*** $p < .05$

Table 9: Logistic Regression Model for Long-Term Immigrants (n = 7192)^d

Variable		B	(SE)	Wald χ^2 (df)	95% CI for Exp(B)		
					Lower	Exp(B)	Upper
Block 0	Constant	2.26	0.04	2937.68 ₍₁₎ ***			
Block 1: Mental health	Sense of belonging (very weak) ^a			160.25 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.68	.13	27.04 ₍₁₎ ***	1.53	1.97	2.55
	Sense of belonging (somewhat strong)	1.37	.13	119.27 ₍₁₎ ***	3.08	3.93	5.03
	Sense of belonging (very strong)	1.54	.15	102.53 ₍₁₎ ***	3.46	4.66	6.28
	Presence of depression/distress ^b	.13	.10	1.70 ₍₁₎	0.94	1.14	1.38
	Constant	1.16	.11	113.77 ₍₁₎ ***		3.20	
Block 2: Physical Activity	Sense of belonging (very weak) ^a			136.10 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.64	.13	23.35 ₍₁₎ ***	1.46	1.89	2.45
	Sense of belonging (somewhat strong)	1.27	.13	99.80 ₍₁₎ ***	2.77	3.55	4.55
	Sense of belonging (very strong)	1.45	.15	90.01 ₍₁₎ ***	3.17	4.28	5.78
	Presence of depression/distress ^b	.16	.10	2.67 ₍₁₎	.97	1.17	1.43
	Physical activity ^c	.70	.09	62.57 ₍₁₎ ***	1.69	2.02	2.40
	Constant	.92	.11	65.43 ₍₁₎ ***		2.50	
Block 3: Income	Sense of belonging (very weak) ^a			134.09 ₍₃₎ ***			
	Sense of belonging (somewhat weak)	.57	.13	18.12 ₍₁₎ ***	1.36	1.78	2.31
	Sense of belonging (somewhat strong)	1.22	.13	88.70 ₍₁₎ ***	2.62	3.38	4.36
	Sense of belonging (very strong)	1.50	.16	92.44 ₍₁₎ ***	3.3	4.47	6.07
	Presence of depression/distress ^b	.23	.10	5.24 ₍₁₎ ***	1.03	1.26	1.53
	Physical activity ^c	.61	.19	46.52 ₍₁₎ ***	1.55	1.85	2.20
	Income (No income - \$39,999) ^a			143.68 ₍₂₎ ***			
	Income (\$40,000- \$79,999)	.82	.10	68.21 ₍₁₎ ***	1.87	2.27	2.76
	Income (\$80,000 and above)	1.28	.12	115.90 ₍₁₎ ***	2.85	3.60	4.55
	Constant	.39	.12	10.23 ₍₁₎ ***		1.48	

^a reference category; ^b Yes; ^c Active; ^d Effective sample size for model = 6722

*** $p < .05$

Chapter 5: Discussion and Conclusion

The purpose of this study was to explore level and association of physically active leisure, health (physical and mental health), and life satisfaction among immigrants in Canada and to determine the predictors of life satisfaction among immigrants in Canada. This study also examined how these associations differ with the time since the arrival of immigrants (i.e., 9 years or less than 9 years and 10 or more years). This chapter discusses the findings of the research questions of this study. The strengths and limitations of the present study, future recommendations, and implications for researchers are also discussed.

5.1 Levels of health, physically active leisure, and life satisfaction

5.1.1 Level of physical health Overall, in this study, immigrants reported good self-perceived physical health 85.9% (i.e., excellent, very good and good). In terms of length of stay short-term immigrants had slightly better self-perceived health (86.9%; i.e., excellent, very good, and good) than long-term immigrants (85.7%). These results fall in line with the previous studies where recent Canadian immigrants had better self-rated physically health when compared to long-term immigrants (Ali, 2002; Chen et al., 1996; Kwak, 2016; Kwak, 2018; Kwak and Rudmin, 2014). Moreover, the present study provides supports for healthy immigrant effect in relation to physical health between short-term and long-term immigrants.

5.1.2 Level of mental health. In this study for the total sample, immigrants reported excellent mental health. The present study found no significant levels of reported distress, depression, or other psychological disorders. The results were

consistent with previous studies that found a low prevalence of poor mental health issues among immigrants (Lou & Beaujot, 2005; Robert & Gilkinson, 2012). It is interesting to note that, though these studies also found a small percentage of immigrants with poor mental health (5.95% in Lou & Beaujot's (2005) study), the frequency of immigrants with poor mental health was still higher than the present study (1.1%). In terms of length of stay, a negligible difference was found among short-term (0.6%) and long-term immigrants (1.2%). The healthy immigrant effect was also supported in the present study (Kennedy et al., 2015; Kwak, 2016; Kwak and Rudmin, 2014; Lou & Beaujot, 2005; Noh, & Avison, 1996); however, the difference between the short-term and long-term immigrants was negligible. Lou and Beaujot (2005) found that long-term immigrants (6.85%) had higher levels of poor mental health when compared to short-term immigrants (3.69%) based on 2002 CCHS data. These differences in self-perceived mental health between the present and the previous study may reflect changes in mental health characteristics of immigrants in Canada indicating that immigrant mental health has immensely improved over the years. This could be the reason for the negligible difference among short-term and long-term immigrants.

Sense of belonging which is closely associated to mental health was also found to be strong among immigrants. More than half (71%) of the immigrants in the total sample reported high levels of sense of belonging (very strong and somewhat strong). The present study did not find much of a difference in sense of belonging between short-term and long-term immigrants: 72.4% of short-term immigrants and 70.7% of long-term immigrants reported high level of sense of belonging (very strong

and somewhat strong). These results support previous studies where immigrants in Canada had high sense of belonging (Hou, Schellenberg & Berry, 2016; Painter, 2013).

5.1.3 Level of physically active leisure. In the past, studies have measured and compared level of physical activity among Canadian immigrants to the native population (O'Loughlin et al., 2007; Tremblay et al., 2006). The present study however assessed level of physically active leisure only among the immigrants. The results of this study are consistent with findings of O'Loughlin et al. (2007) and Tremblay et al. (2006) who found low levels of leisure physical activity being prevalent among immigrants. Lower levels of physically active leisure were also found in a recent study by Mahmood, Bhatti, Leon and Gotay (2018) who studied leisure time physical activity among Canadian immigrants using 2011-12 CCHS data set. According to Mahmood et al. (2018) over half (54.9%) of the immigrants reported no physically active leisure. It is interesting to note that immigrants in the year 2014 were more active (51.8% active or moderately active) as compared to immigrants in 2012 (45.1% active or moderately active). This indicates a trend that immigrants are becoming more engaged in physical leisure activities than previous years.

In terms of length of stay, in the present study both short-term immigrants and long-term immigrants had similar levels of physically active leisure i.e., 52% and 51.8% respectively. The results are contradictory to previous studies where short-term immigrants reported lower level of physically active leisure compared to long-term immigrants (Mahmood et al., 2018; Tremblay et al., 2006). Tremblay et al. found that

only 16% of recent immigrants were physically active as compared to 20% in the long-term immigrants. Similarly, Mahmood et al. (2018) also found that only 40.4% of short-term immigrants had some sort of physically active leisure when compared to 47.3% in the long-term immigrant group. Two possible reasons could justify these differences. Firstly, both the studies were based on older CCHS surveys: Tremblay et al (2006) used the CCHS survey done in 2000-01 and Mahmood et al (2018) derived their study from the 2011-12 CCHS survey. Level of physically active leisure among immigrants has increased over the years therefore it could possibly justify similar levels of physically active leisure in terms of length of stay. Secondly, the difference in the age group of samples could also allow for this change. The present study had broader age group of (12 years to 80 years) whereas both the previous studies had immigrants between 20 years to 64 years. This wider age group may have affected the average level of physically active leisure.

5.1.4 Level of life satisfaction. Most of the published studies in English have either compared life satisfaction of Canadian immigrants to native or source country populations and have not focused on immigrant life satisfaction alone (Frank et al., 2016; Lou & Beaujot 2005; Sharpe & Capeluck, 2012). The present study however explored the level of life satisfaction among immigrants only. The results of the present study are contradictory to the study by Lou and Beaujot (2005) who studied life satisfaction among immigrants with poor mental health using 2002 CCHS data set. They found that only 5.76% immigrants with poor mental health had high level of life satisfaction (very satisfied and satisfied). In contrast, while the present study examined all immigrants, regardless of mental health, 90.5% (very satisfied and

satisfied) of immigrants reporting high life satisfaction in present study. In terms of length of stay, no significant difference was found between short-term (91.0%) and long-term (90.5%) immigrants. However, Lou and Beaujot (2005) found that long-term immigrants (6.85%) were more satisfied than the short-term immigrants (3.01%).

5.2 Predictors of life satisfaction.

The present study aimed to determine the predictors of life satisfaction among immigrants in Canada. According to the results of this study, sense of belonging, physically active leisure, and income were significant predictors to life satisfaction among the immigrant population in Canada. Physical health, mental health, and social factors (such as age, sex, marital status, length of stay and education) did not significantly predict life satisfaction. Sense of belonging and income were the strongest predictors of life satisfaction for short-term immigrants while physically active leisure did not differ as a predictor by length of stay.

Sense of belonging. In the present study sense of belonging was the strongest predictor of life satisfaction. Previous studies have demonstrated sense of belonging as a strong predictor for life satisfaction among immigrants. Amit and Bar-Lev (2015) found that sense of belonging significantly influenced life satisfaction of among Israeli immigrants. Similarly, Huang, Wang and Kulka (2015) found that peer support influenced life satisfaction among immigrants of Asian descent in the United States. A study of second-generation immigrants in France by Neto (1994) also found that sense of belonging was significantly associated with greater life satisfaction. Chow in 2007 studied life satisfaction among immigrants

from Hong- Kong in Canada and found consistent results with other studies that sense of belonging was a significant predictor for life satisfaction. Though the previous studies support the present findings, it should be noted that previous studies studied specific ethnic groups of immigrants such as immigrants from Hong-Kong (Chow, 2007), second-generation immigrants (Neto, 1994) and elderly Korean immigrants (Park et al., 2011). The present study however supports sense of belonging as a predictor of life satisfaction in a much larger and generalized group of immigrants. The results of this study also demonstrate a stronger relationship between sense of belonging and life satisfaction than previous studies. The present study found that immigrants with a very strong sense of belonging were 4.8 times more likely to have higher life satisfaction whereas Huang et al. (2015) found that a group of Asian immigrants were only 2.76 times more likely to have greater life satisfaction. The present study also found that sense of belonging independently predicted life satisfaction and was not significantly moderated by physically active leisure or income.

The present study is also first of its kind which found that that the relationship of sense of belonging as a predictor of life satisfaction varies with length of stay. The short-term immigrants were 5.4 times more likely to have greater life satisfaction, as compared to 4.6 times among long-term immigrants. Sense of belonging to the local community is important for recent immigrants as it promotes integration within the new surroundings, thereby helping through the process of acculturation (Kelaher et al., 2001). If an immigrant experiences a disconnect with the community. they become isolated which affects the mental health of immigrants as well as overall life satisfaction (Harvey et al

2009; Lee & Chan 2009). Therefore, sense of belonging is a central predictor of life satisfaction for immigrants and is more important for recent immigrants.

5.2.1 Physically active leisure. The present study to the best of our knowledge was first of its kind to examine physically active leisure as a predictor of life satisfaction among immigrants in Canada as well as in relation to length of stay. The results of the present study found that physically active leisure predicts life satisfaction among immigrants in Canada. However, it was the weakest predictor of all. The study indicates that active immigrants are two times more likely to have greater life satisfaction when compared non-active immigrants. This study is in line with previous studies which found that physically active leisure is a significant predictor for satisfaction (Cha, 2018; Kim, Lee, Chun, Han & Heo, 2017; Maher, Pincus, Ram & Conroy, 2015). However, these previous studies were not carried out among Canadian immigrants.

Physically active leisure remained a significant predictor for life satisfaction for both short-term and long-term immigrants; no significant differences were found for length of stay. Short-term immigrants were 1.9 times more likely to report greater life satisfaction, while long-term immigrants were 2.0 time more likely to have high life satisfaction as compared to non- active immigrants. The present study found no other predictors to significantly affect the association of physically active leisure and life satisfaction.

5.2.2 Income. Among the social factors, income was the only variable which was significantly associated with life satisfaction. Out of all the predictor variables

income was the second strongest predictor for life satisfaction. The results of regression were similar for total sample and long-term immigrant group. For the total sample, middle-income category immigrants (i.e. \$40,000 - \$79,999) were twice (2.0) as likely and the highest-income category immigrants (i.e. \$80,000 and above) were 3.8 times more likely to report high life satisfaction compared to the immigrants in lowest-income category (\$39,999 and below). Whereas in long-term group, middle income category immigrants (i.e. \$40,000 - \$79,999) were 2.2 times and highest income category immigrants (i.e. \$80,000 and above) were 3.6 times more likely to report high life satisfaction when compared with immigrants in the lowest-income category (\$39,999 and below). These results are also consistent with previous studies where income significantly predicted life satisfaction (Cheung and Lucas, 2015; Green et., 2016; Stevenson and Wolfers, 2008). This studies also agrees with Borjas (1990) who found that gaining economic stability is one of reasons for migration and that income is a strong predictor of life satisfaction (Calys-Tagoe, et al., 2014; Edwards and Klemmack,1973; Kahneman and Deaton, 2010).

For short-term immigrants, income was a significantly stronger predictor of life satisfaction than for the total sample or long-term immigrants. Results found that immigrants in middle income category (i.e. \$40,000 - \$79,999), did not significantly (1.3 times) change life satisfaction when compared to immigrants in lowest income category (\$39,999 and below). Thus, immigrants in lowest and middle-income categories have the same relationship with life satisfaction. However, immigrants in highest income category (i.e. \$80,000 and above) were 5.1 times more likely to report higher life satisfaction compared to immigrants in lowest

income category (\$39,999 and below). Recent immigrants must establish themselves in a new country and monetary support (income) is required for this establishment. If lacking monetary support, they experience troubles in self sustainment and develop sense of self-deprivation which leads to lower life satisfaction (Schwarze & Härpfer, 2007). Therefore, this result of this study indicate that income is a very strong predictor for life satisfaction among short-term immigrants.

5.2.3 Health. The results of the present study found that neither physical health nor mental health predicted life satisfaction among immigrants. The present study was consistent with the findings of Kwak (2018) who also found a negligible association between self-rated physical health and life satisfaction. Studies have also concluded that physical health does not predict life satisfaction unless it leads to disability (Broe et al., 1999; Puvill, Lindenberg, de Craen, Slaets, & Westendorp, 2016). Moreover, only the individuals who are physically and mentally fit are selected by the immigration policies to apply for immigration (Ali, 2002; Perez, 2002). Therefore, these two reasons may explain why physical health did not predict life satisfaction among immigrants in present study.

However, for mental health the results of present study are inconsistent with previous studies which found mental health to significantly predict life satisfaction among Canadian immigrants (Robert & Gilkinson, 2012). In the present study, only 1.1% of immigrants reported poor mental health. The level of depression, distress, and negative moods were also relatively low in the present study. It is possible that due to the social stigma associated with mental health, immigrants did not truthfully report their mental health status. A study by Derr (2015) found that immigrants sought

mental health services significantly less than non-immigrants in America. A recent study done by Salami, Salma, and Hegadoren (2019) in Alberta also found that social stigma associated with mental health inhibits immigrants to seek mental health services. The cultural interpretations of mental health may inhibit immigrants from revealing mental health problems. Another possible reason for the low prevalence of reported mental health issues in the present study could be the tool used to evaluate mental health status. CCHS survey used single-item measure to evaluate mental health status and it is possible that this tool was not able to capture the mental health issues among immigrants (Fisher, Matthews & Gibbons, 2016; Rammstedt & Beierlein, 2014). Therefore, it is a future study is recommended to evaluate mental health status of immigrants using more robust tools and measures.

5.3 Limitations of study

The results of this study need to be interpreted considering its limitations. This study was a secondary analysis of 2014 CCHS dataset and the data was not collected with the specific purpose to study life satisfaction of immigrants in Canada. As a result, the present study was limited to the variables and measurements obtained for original survey. Moreover, variables which were related to immigrants could not be adequately used in this study. For example, it was not possible to study life satisfaction among different ethnic groups, as the responses were limited to white or visible minorities. The design used by the CCHS was cross-sectional and thus study could only provide association not causation. It is possible that there might be a reciprocal relationship between life satisfaction and predictors of life satisfaction which could not explored in this study (Fergusson et al, 2015). This study intended to

explore life satisfaction among immigrants in terms of their length of stay. An ideal dataset to answer this research question would be longitudinal, but as CCHS is cross-sectional survey, this study was only able to conclude if there was any difference in the life satisfaction between the short-term and long-term immigrants. In absence of longitudinal data, the present study cannot interpret how length of stay influences life satisfaction of immigrants over time. Moreover, this length of stay was measured with only 2 responses (i.e. 0-9 year and 10 or more years). These categories are not discrete enough to evaluate life satisfaction among immigrants who have in Canada only for a short period of time.

There may have been some sample biases in the survey due to the selection criteria adopted. CCHS is a computer assisted telephone survey, where one individual from each household is selected to answer the survey questions (Surveys and statistical programs, 2019). Therefore, the sample size (n = 8875) does not represent the total sample but rather the number of respondents who participated in the survey. Another bias would have been introduced due to language barriers. Only the immigrants with communication and comprehension skills in English or French participated in the survey. There is a possibility that the immigrants who were not included in the survey may have had lower levels of life satisfaction due to language barriers when compared to immigrants (90.5%) who had high life satisfaction. This might have affected life satisfaction levels of immigrants as studies have found that language plays a significant role in life satisfaction (Salami, Salma & Hegadoren, 2019). CCHS resolved this language barrier in their recent surveys (i.e. 2015

onwards) by recruiting interviewers with wide array of language competencies (Surveys and statistical programs, 2019).

Additionally, the measurement of variables is a limitation of the study. CCHS measured life satisfaction on a single-item self-report measure which is derived from *Satisfaction with Life Scale* (SWLS) developed by Ed Diener and colleagues (Atroszko, Sawicki, Mąkinia, & Atroszko, 2017; Diener et al., 1985). Similarly, self-perceived health and self-perceived mental health were also measured on single-item self-report measure. Studies suggest that multiple-item measures test a hypothesis more accurately as they have higher reliabilities and high content validity in comparison to single-item measures (Carmines & McIver, 1981; Fisher, Matthews & Gibbons, 2016; Rammstedt & Beierlein, 2014). Moreover multiple-item measures allow different aspects of a construct to be evaluated making it more definitive and reliable (Bergkvist & Rossiter, 2007). Therefore, it would have been better if multiple-item measures were used as they would have added to the richness of the data and would have increased the reliability and validity of the study.

5.4 Strengths of the study.

Apart from limitations the present study also has several strengths. Immigrants are a growing population and are important to social fabric of the Canadian community. This study used a national level population-based survey which allows for rich and diverse sample to be studied across Canada increasing the external validity of the study. Being a Statistics Canada survey, control and monitoring measures were implemented throughout the process of data collection to minimise non-sampling errors. These measures included evaluation of response rate and use of

improved data collection tools (Surveys and statistical programs, 2019). A major strength of this study was inclusion of multiple potential factors associated with life satisfaction of immigrants in Canada. Moreover, this study also explored the determinants of life satisfaction in immigrants in terms of length of stay.

5.4 Future recommendations

There are several recommendations that can be made for further research in the area of immigrant life satisfaction in Canada. Firstly, more research is needed on factors associated with immigrant life satisfaction. Qualitative and observational research should be done to determine more factors linked to life satisfaction and how these factors shape life satisfaction among immigrants. Quantitative longitudinal research is required to analyse the predictability of these factors on life satisfaction. The present study could not establish relationship between physical health, mental health, social factors and life satisfaction. More appropriate tools and surveys measuring life satisfaction, might have changed the findings of the present study. Therefore, the second recommendation is to design surveys specific to immigrant life satisfaction. These surveys should include scales on different domains of life satisfaction such as life satisfaction related to physical and mental health rather than evaluating life satisfaction in general. The future surveys should use tools to measure physical and mental health on multiple- item measures rather than single item self-report measure as in the present study. This would help extract more detailed information of immigrant health status (Fisher et al., 2016). The future surveys should also include questions such as life satisfaction before and after migration, which can help identify if the change in life satisfaction was due to the event of

migration or the immigrants had higher life satisfaction prior to the migration process.

Another future recommendation will be to address the limitations of language barriers. Future survey research should be offered in multiple languages in order to increase the total number of immigrants participating in the survey, thereby increasing the external validity of the study further (Field, 2013). A study on more recent data sets would also highlight the recent trends in life satisfaction among immigrants in Canada. A study using subsequent CCHS surveys is also recommended as this would define and help draw a picture of immigrant life satisfaction over years.

The present study could only analyse difference in life satisfaction between short-term and long-term immigrants due to cross-sectional nature of data set. To analyse if length of stay is associated with life satisfaction, longitudinal studies are needed as they collect data from the same participant over the time, thus giving a much clear picture about their life satisfaction. Longitudinal studies are also recommended as they would help explore the endogenous relationship between life satisfaction its predictors. Therefore, another future recommendation is to conduct longitudinal studies to explore life satisfaction among immigrants in terms of their length of stay.

5.5 Recommendations for Practitioners

Immigrants in Canada have maintained the population growth of the country, fulfilled the influx for labour market shortage, and positively impacted Canadian economy by inflating the GDP of Canada (National Academics of Sciences,

Engineering and Medicine, 2017; Picot, 2013). Therefore, immigrants are growing in population and important within Canadian society. Their life satisfaction is as important as Canadian population. Therefore, the following are some recommendations made for government and public health agencies, to improve life satisfaction of immigrants in Canada holistically. The results of this study indicate that sense of belonging was the most significant predictor of life satisfaction among immigrants. Efforts should be made to make sure that immigrants are accepted in communities with more ease. It is recommended that multi-cultural and community events should be organised regularly which gives a feeling of acceptance to the immigrants. Studies have found that the physical environment speaks and distinguishes people who are welcomed in public space (Schmitt, Davies, Hung and Wright, 2010). Therefore, steps should be taken to make work places, local markets, schools, colleges, and universities in become more welcoming for immigrants. Principles of inclusion should be instilled from a young age and schools play a vital role for this.

Income was the second most important predictor for life satisfaction. Foreign education of immigrants makes it difficult to find a job in their field of education and immigrants settle down for odd jobs with minimum wages until their credentials are evaluated. Past studies have concluded that recent immigrants fall in low income groups which leads to lower life satisfaction (Ferrante, 2009; Ferrer-i-Carbonell, 2005; Hatfield, 2004). Policies and measures should be implemented by Canadian immigration authorities to get the education and credentials pre- evaluated before entering Canada. This will help them save their time spent in credential evaluation so

that they can easily apply for jobs that are available and thus increase their life satisfaction.

A third recommendation is regarding physically active leisure. The results of the present study reveal that almost half (48.1%) of Canadian immigrants are inactive. On average, immigrants reported only 234 minutes of physical activity leisure over 3-month period. This clearly indicates that immigrants are involved in minimal physically active leisure (1 hour and 13 minutes in one month). Steps should be considered to improve physically active leisure for immigrants. A study by Mohamed, Hassan, Weis, Sia and Wieland (2014) found that community cohesion and community inspiration were strong facilitators in promoting physical activity in immigrants in the United States. Therefore, steps should be taken to educate immigrants about benefits of physically active leisure and communities should become more inclusive towards immigrants.

5.6 Conclusion

In conclusion this topic is important as immigrants constitute more than one fifth (21.9%) of the Canadian population and their numbers will continue to increase in coming years. This study was one of the first studies in Canada to examine physically active leisure and sense of belonging as predictors of life satisfaction in respect to length of stay of immigrants. In the present study, levels of life satisfaction, physically active leisure, physical health mental health and sense of belonging were examined. The results of present study found that immigrants had good levels of life satisfaction and physical and mental health. Levels of physically active leisure was low among immigrant population. The present study also explored the predictors of

life satisfaction for Canadian immigrant population. Physically active leisure, presence of depression/distress, and sense of belonging as health-related variables and income as a social factor were significant predictors. Sense of belonging and income were the strongest predictor for life satisfaction for total sample and for short-term and long-term immigrants as well. The present study was not able to demonstrate any significant factors mediating or moderating mental health and life satisfaction and physically active leisure and life satisfaction. It was found that the association between mental health (sense of belonging and incidence of depression/distress) with life satisfaction was not moderated by physically active leisure or income. Additionally, the association between physically active leisure with life satisfaction was not moderated by income. Predictors of life satisfaction by length of stay had similar associations. However, sense of belonging and income were stronger predictors of life satisfaction among short-term immigrants as compared to long-term. The present study was able to highlight the need of special tools and surveys required to explore life satisfaction among immigrants. The present study strongly recommends future studies to explore factors that predict life satisfaction longitudinally.

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81

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