LIFE SATISFACTION AND ASSOCIATED PREDICTORS IN AN OLDER ADULT POPULATION

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

In

THE FACULTY OF GRADUATE STUDIES

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September, 2020

Abstract

Older adults are increasing in numbers worldwide. Life satisfaction, a component of subjective wellbeing, is believed to be indicative of successful aging and longevity in older adults. The aim of this investigation was to explore socio-demographic, social support, and health-related factors that possibly explain life satisfaction among community dwelling older adults in Alberta, Canada. An ordinal logistic regression was conducted on pooled data using multiple imputation on data collected by the Canadian Community Health Survey 2015-2016 (*N* = 2678). A final model arrived at after purposeful selection of variables predicted the dependent variable over and above the intercept only model, $p < .001$. Older men had higher life satisfaction than older women, as did those who attained at least secondary school education. The factors explaining life satisfaction were perceived general and mental health, perceived life stress, having strong emotional bond to at least one person, having a strong sense of belonging to a local community, and being physically active. This result indicates that emphasizing healthy lifestyle practices earlier in life and keeping older adults active and socially engaged could increase and ensure satisfaction with life as people age. The findings also suggest that several of the factors predicting life satisfaction are modifiable. In designing, implementing, and evaluating care strategies, clinicians should consider and utilize this construct.

Keywords: life satisfaction, satisfaction with life, older adults

Dedication

I dedicate this thesis to my family. You have loved me unconditionally and have seen me through successes and failures over the years. Thank you for still believing in me and for your encouragement and support always.

Acknowledgement

Thanks be to God from whom all blessings flow. He is forever faithful and forever sure. Thank you to my husband Elton – who has put up with me, nourished me, and supported me through to the end of this thesis. I will finally have more time to sit with him on the sofa and go for more walks. Also, my son, my mother, friends, and other family members: I am deeply grateful for their overwhelming support, and encouragement.

I would like to express my sincere gratitude to my thesis supervisor, Dr Richard 'Rick' Sawatzky, for his understanding, patience, wisdom, humility, and encouragement, without which completion of this thesis would not have been possible. He has stretched me further than I thought I could ever go and has been a source of inspiration.

I am extremely grateful to Dr Angela Wolff, the second reader for this paper, for her assistance and generous suggestions throughout this project. Expression of gratitude also goes out to Dr Marvin Mc Donald, the third reader for this paper. Thank you for lending your expertise. To all the faculty members who were instrumental in my pursuit for higher learning and have impacted me in so many ways in my journey to completing my final project, and my fellow students whom I have learnt from through interactions, and friendships, I am most grateful.

I would like to express sincere gratitude to Dr Ruth Lee whose mentorship, guidance and support have been invaluable. I could not have completed this project without the assistance and tiring work of Mrs. Janice Thompson, the librarian at the William Osler Health Science Library, to whom I am forever indebted and greatly appreciative of. To my colleagues at work who have been a source of encouragement and have facilitated swaps to accommodate me in my quest to complete my Master of Science in Nursing I thank you all.

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List of Abbreviations

LS	Life satisfaction
CCHS	Canadian Community Health Survey
SPSS	Statistical Package for Social Sciences
GDP	Gross Domestic Product
OECD	The Organization for Economic Co-operation and Development
QoL	Quality of life
SWB	Subjective wellbeing
SWLS	Satisfaction with Life Scale
CINAHL	Cumulative Index to Nursing and Allied Health Literature
SOC	Selective Optimization and Compensation
ADLs	Activities of daily living
BMI	Body Mass Index
CI	Confidence Interval
MCAR	Missing Completely at Random
MAR	Missing at Random
MI	Multiple Imputation
VIF	Variance Inflation Factor
IBM	International Business Machine Cooperation
CCTB	Canada Child Tax Benefit

Life Satisfaction and Associated Predictors in an Older Adult Population

Chapter One: Introduction and Background

Life satisfaction (LS) is the cognitive aspect of subjective wellbeing. According to Diener (2019), subjective wellbeing is composed of LS, negative affect, positive affect, and salient domains of life. It is believed that subjective wellbeing is dependent on both internal and external factors. Examples of internal factors are one's coping skills, personality, temperament, and quality of social relationships, whereas external factors include the society in which one lives, and one's ability to meet basic needs (Diener, 2019). The scientific study of subjective wellbeing is believed to be at least 90 years old (Maddux, 2018). Knowing what encompasses and predicts life satisfaction will perhaps continue to elude men and women for years to come. Nonetheless, it is worthwhile to examine and attempt to determine the factors that influence satisfaction with one's life, specifically in relation to the stages of life. Schellenberg, Hou, & Helliwell (2015) postulate that together with indicators of mental and physical health, satisfaction with life indicates how well people thrive.

There have been numerous attempts to explain predictors of LS over the years and many countries have employed means to measure the degree of life satisfaction within their own populations. Ellison, Gay and Glass (1989) described life satisfaction as "a cognitive assessment of an underlying state thought to be relatively consistent and influenced by social factors" (no page available). LS is a component of subjective wellbeing that continues to be more and more of interest to researchers, individuals, governments, and various industries. An older person who has greater LS is more likely to have greater happiness and be self-actualized.

Older adults are growing in numbers as life expectancy is increasing worldwide despite more acts of terrorism, turmoil in war-torn regions, and natural disasters due to climate change.

The average life expectancy in Canada was 82.1 years in 2017 according to Statistics Canada (2020). With an increase in technological advances, greater resources, and better healthcare systems, the number of older adults living to a ripe old age will continue to grow. The world has seen a decrease in birth rates even as people are living longer; as such, many countries are experiencing an increase in their age-dependency ratio, which is the number of youths and seniors in relation to those people working (age 20-64 years) (Statistics Canada, 2016). According to Statistics Canada, Canada's total demographic dependency ratio is projected to rise to 84 dependents for every 100 people of working age by 2056 as the proportion of seniors increases. Aging populations are faced with challenges of increased health cost, redistribution of healthcare resources, and increased need for social services. There are also a growing number of older adults facing ageism, social isolation, depression, exploitation and the effects of chronic diseases and cognitive and physical decline (WHO, 2019; Singer, 2018). These social and physiological factors affect how satisfied older adults are with their lives.

The aim of this research project was to examine socio-demographic, social support and health-related factors that are associated with life satisfaction in a community dwelling older adult population and consider how this information can be utilized to help this group individually and at municipal and provincial levels. Therefore, the research question for this investigation was as follows: To what extent can older adults' satisfaction with life be explained by their perception of health, health behaviours, social support, and socio-demographics?

The variables selected for this study were arrived upon based on literature review and gaps identified, as well as the unique characteristics of the population chosen for this investigation. Data for this research was obtained from the Canadian Community Health Survey (CCHS) public use files of 2015-2016 prepared by Statistics Canada (2019), and the IBM

Statistical Package for Social Sciences (SPSS) Grad Pack Advanced version 26.0 was utilized to carry out the analysis. The population of interest for this study was older adults. Older adults for the purpose of this study are those 65 years and older. There are numerous questions arising as we consider this area of study – what contributes to a satisfied life in an older adult? Could support structures/ life events earlier in life influence this subjective wellbeing later in life? Do younger people – loved ones, caregivers and policymakers – truly know what constitutes a satisfied life for the older adult? Many answers may be beyond the scope of this investigation but perhaps will provoke us into considering other questions: Did the same factors contribute to a satisfied life in earlier stages of development? Or have these factors changed over time?

Next, I provide background information about life satisfaction of older adults to discuss challenges faced by societies with aging demographics but more importantly the challenges faced by older adults - our golden agers. This information I hope will help us to consider strategies and develop focus interventions to address problems identified and to move to support increased satisfaction with life in this population.

Background

In Canada, the proportion of the senior population (age 65 and older) has been increasing steadily over the past 40 years, and according to demographic projections is expected to increase rapidly until 2031 (Statistics Canada, 2018). In 2017, the number of seniors exceeded the number of children 14 years and younger for the first time ever (Statistics Canada, 2018). With people living longer in Canada, there has been a seismic shift to creating senior-friendly communities and enabling the older adult to age in place. Examining the predictors of LS in this population holds the potential to provide impetus for lending support that will assist our older adults to live

satisfied lives and minimize the threats to their wellbeing. This is not limited to support rendered in this stage of life but sooner. Having an insight into the factors that explain variability in LS has implications for individuals, government, and social and health policymakers.

Boarini et al. (2012), as cited by Lu, and Schellenberg et al. (2015), stated that individual-level characteristics such as age, employment status, and health status have been shown to be correlated with LS. The World Happiness Report (Helliwell, Layard, and Sachs, 2018) attempted to show how six key variables contribute to explaining the national average happiness scores for the various countries for the years 2005 to 2017. These variables are gross domestic product (GDP) per capita, social support, healthy life expectancy, social freedom, generosity, and absence of corruption. There are several theories as to what constitutes satisfaction in life and ongoing research to unearth empirical data to support these schools of thought. Some researchers credit heredity, personality traits, personal values/life priorities, behavioural choices and health, domain satisfactions, and social structures as determinants of LS (Oshi, 2012; Headey, & Muffels, 2016; Diener, Inglehart, & Tay, 2012).

Community level characteristics have been identified by Ballas (2013) and Schwanen and Wang (2014) as factors such as urban size and population density, natural endowments, economic opportunity or deprivation, and access to and quality of infrastructure, amenities, and services (as cited by Lu et al., 2015). The Organization for Economic Co-operation and Development (OECD), which is made up of 36 member states, is responsible for developing the better life index. In 2018 OECD reported that Canada ranked 7th on their list. The result is from tracking happiness from 2015-2017. According to OECD (2018), LS measures how people evaluate their life as a whole instead of on their current feelings. A scale of 0 to 10 is used with 0 being the lowest and 10 being the highest. The average score among OECD members is 6.5.

Canada's score was 7.3. Countries with scores of 5.5 or less are Greece, Hungary, Portugal, and Turkey, while countries with higher scores are Denmark, Finland, Iceland, Norway, and Switzerland (OECD, 2018).

Although it is known that Canadians are satisfied with their lives overall, exploring the nuances of LS is necessary to identify if older adults, as the subgroup of the larger population that consumes a large portion of the health budget, have the same level of satisfaction. It is worthwhile separating and examining the scores of our older adults and, more importantly, exploring perceptions of health, health behaviours, social support systems, and socio-demographic characteristics with satisfaction with life in general in this group. Knowing the scores and relationships of seniors' perceptions would help answer the following questions and aid to better utilize scarce healthcare resources: Are focus and resources heading in the right directions? In this time of fiscal restraints, how can society get the most out of initiatives and programs aimed at bettering the lives of older adults? Are older adults benefiting from the best society has to give? Are the threats to LS in this population being attacked from every angle?

The Conference Board of Canada (2018) reports that on average in the OECD life satisfaction is higher among men, youth, older people, and those with more education, employed, and higher incomes. This pattern they believe holds true for Canada, except that Canadian women scored higher in LS than Canadian men. Also, the Gallup World Poll by the OECD reports that LS varies by gender, age, marital status, education, income and work status (The Conference Board of Canada, 2018). Ng, Tey and Asadullah (2017) purported that health is being given primacy as a determinant of wellbeing among the oldest old (>/= 80 years) in China. Leyden Academy on Vitality and Ageing (2017) reports that the Leiden 85-Plus Study indicates that elderly people in the Netherlands who are ill are as satisfied with their lives as those who are

healthy. In addition, Proctor, Linley and Maltby (2009) report that the relationships between demographic variables including age and gender with LS are weak, and research has shown that these variables contribute only modestly to the prediction of youth LS. Yet others have indicated that LS among the older adult group is high (The Conference Board of Canada, 2018).

Globally and in Canada the proportion of older adults is growing. Older adults are sometimes made to feel useless, as if they are a burden to society, and for some, even to family members. To the contrary, the older adults among us are most valuable and are to be supported in staying healthy, engaged, and active for as long as possible. For all that they have been and are and for all that they have done, as a society we ought to care for and ensure older adults are satisfied with their lives. Determinants of LS are thought to be at community and personal levels and include personality traits, values, behavioural choices, health, and social structures. In examining LS among older adults, the relevant terms surrounding this construct are explored by defining key concepts. As I considered the importance of exploring this topic, a review of existing literature was done, including theories that might support or inform the examination of LS in an older adult population.

Definition of Terms

To better understand this research, I defined three key terms that are important and relevant to the information that follows: life satisfaction, older adult, and subjective wellbeing. These are the primary constructs that form the basis for this study.

Life Satisfaction

An individual's subjective wellbeing is comprised of three domains: life satisfaction, negative affect, and positive affect (Diener, 1984, as cited by Margolis, Schwitzgebel, Ozer, &

Lyubomirsky, 2018). LS is a cognitive evaluation of one's life as a whole and life satisfaction judgements are based on one's own subjective criteria, rather than necessarily reflecting outward conditions (Shin & Johnson, 1978). The overall positive evaluation of life as determined by the individual at any given time is what constitutes satisfaction with life.

Prasoon and Chaturvedi (2016) paraded an array of definitions of life satisfaction: "life satisfaction is characterized, in agreement with cognitive theory, as the individual's cognitive judgements about comparisons based on the compatibility of their own living conditions with the standards" (Diener, Emmons, Larsen, & Griffen, 1985, p. 24). Cribb (2000) stated LS refers to "an assessment of overall conditions of existence as derived from a comparison of one's aspirations to one's actual achievement" (p. 24). Veenhoven (1993) summarized LS as the degree to which a person positively evaluates the overall quality of his/her life as a whole. Taken together, the three definitions indicate that individuals make judgements or assessments of their life to determine how satisfied they are with their life. This satisfaction is based on a comparison of individuals' life relative to their aspirations and or societal standards. It is believed that LS has antecedents in work and family domains as well as in personality traits (Prasoon & Chaturvedi, 2016).

In the literature, the concepts of "quality of life" and "life satisfaction" are sometimes used interchangeably; however, these are better viewed as two distinct concepts that relate to each other. LS can be regarded as an indicator of Quality of Life (QoL) (Lim, Min, Thorpe & Lee, 2016). According to the WHO (1997), QoL is defined as "the individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns" (p.1). LS may be an indicator of

QoL as determined by an individual, but in essence LS is the subjective evaluation of how satisfied one is with his or her life.

Most relevant to this study is Veenhoven's (1993) definition of LS as an individual's overall positive assessment of their life as a whole. Various measuring tools are used to determine LS. For example, LS can be measured by asking a person to choose a score between 0 and 10, with 0 being very dissatisfied and 10 very satisfied, to indicate how satisfied they are with their life as a whole. This project uses Veenhoven's definition as it best describes the author's perception of the construct as well as being most suited for the question asked of the respondents in this sample to determine their LS.

Older Adult

An older adult is an individual who has entered the latter stage of their life. While in some societies 'older adult' means 50 years and above, in other societies an 'older adult' could be viewed as someone above 80 years old. Most developed countries have accepted the chronological age of 65 years as a definition of an older adult (WHO, 2019). The chronological age of 65 and above is still the most often used age range to categorize the older adult (Statistics Canada, 2016). The term 'older adult' can be interchanged with senior, elderly or elder. More and more persons are working past 65 and living active, productive lives. Nevertheless, as social, and medical services still consider this demarcation, it only makes sense to continue to use this age as the beginning of this segment of the human cycle. Sixty-five is the official age when pension begins in most societies (WHO, 2019) and is also used when considering medication dosage and other treatment modalities in healthcare. Though the term 'older adult' is relative and

need not be defined by age, for the purpose of this study older adult refers to those persons 65 years and older.

Subjective Wellbeing (SWB)

Subjective wellbeing (SWB) is the scientific term for happiness and life satisfaction (Diener, 2019). In 1984 Diener developed a tripartite model of SWB which consists of life satisfaction, positive affect, and negative affect. Later he revised it to reflect four independent constructs, adding salient domains of life (Diener, 1990; Diener, et al., 1999, as cited by Rodriguez, Latkova, and Sun, 2007). The model describes how people experience the quality of their lives and includes both emotional reactions and cognitive judgements. According to Diener (1984), a person who is happy would have a high LS, frequent positive feelings, and infrequent negative feelings. It is believed that people's level of SWB is influenced by both internal and external factors. Internal factors would include personality and outlook, and external factors would be the society in which one lives. Diener (2019) also listed major determinants of SWB: a person's inborn temperament, their quality of social relationships, social provisions provided by the society in which they live, and their ability to meet basic needs.

Subjective wellbeing is considered a self-reported measure of wellbeing that is typically obtained by questionnaire. The five-item Satisfaction with Life Scale (SWLS) developed by Diener and colleagues in 1985 has been the dominant measure of LS since its creation (Margolis, Schwitzgebel, Ozer, et al., 2018). The SWLS was developed to assess a respondent's satisfaction with life as a whole (Pavot & Diener, 1993).

Study Significance

Globally, seniors are the fastest growing group. This worldwide demographic shift cannot be ignored or slighted. Along with its challenges come opportunities to ensure the world's older adults experience satisfaction with their life. This study is important because it will contribute to the body of knowledge about what constitutes a satisfied life among the older adult population in Canada. The obvious areas of target are health and social services, as older adults are known to have more health issues than younger people and for the most part are also no longer part of the workforce. If the factors having direct bearing on LS in older adults could be determined, nurses and other healthcare providers could attempt to ensure that older adults' satisfaction with life is not threatened or diminished. Therefore, it is imperative that we consider the following questions: How satisfied are older adults on the whole with their lives? Can we determine the predominant factors that explain this component of subjective wellbeing?

According to Statistics Canada (2016), almost one in seven Canadians was a senior in 2014, and by 2030 this number will jump to nearly one in four. The government is committed to ensuring that Canadian seniors have a good quality of life and are supported in becoming active and engaged citizens (Government of Canada – Action for Seniors Report, 2014). Supporting positive aging is a social responsibility (Colleges & Associations of Registered Nurses of Alberta, 2011).

LS in older adults is associated with positive aging, which I have summed up as advancing in age with absence of or minimal physical ailments, having good mental health, remaining physically active and socially engaged, while having a feeling of contentment. The absence of these elements of positive aging further compounds the challenges that come with old age. Weiss (2020) states that "the positive aging movement is about striving to create a society

for all ages that prepares for and celebrates the aging process" (no page available). Individuals need to become aware of how they can successfully transition into their *sunset years*. All industries should be made to implement programs that support employees to do so. At the government and community level, much can be done to inform, support and facilitate wellness, engagement, and enablement. Therefore, the concepts of *aging well* and *aging well in place* are so important in this era. Societies that care about and attend to the needs of seniors, recognize detrimental trends, and implement strategies to curve or reverse these trends will have high LS among this age group.

Attention needs to be given to the variables that predict LS to a large extent. Those with a positive correlation are to be encouraged and developed; those with a negative correlation are to be curved or eliminated. Not all predictors of LS are objective. Some subjective elements such as personality traits are inherited. However, genetic disposition can be navigated and persons can be enabled whatever their baseline or inherent state. The determinants of LS in older adults and utility of this knowledge have substantial implications as they also tell us where to put our focus and resources to ensure LS is high as people age. This information could inform care and direct policies that could decrease depression and suicide among seniors, decrease hospitalization and reflect a highly civilized society. From the standpoint of healthcare, differences between age cohorts among older adults may prove useful in planning intervention strategies.

Nurses and other healthcare personnel should have knowledge of and understand how LS is determined within the populations they care for. Therefore, those who focus on the older adult population will have an interest in the findings of this and similar studies. They can provide a basis for advocacy and for intervention and care strategies. Nurses focus on targeting determinants of health – physical, psychological, emotional, and social – that determine QoL and

LS in order to promote good outcomes for communities. In primary prevention, education targeting factors that diminish LS and promoting factors that enhance and strengthen LS is pivotal. A better appreciation of this subject area will result in an increased understanding of the needs of the older adult population, which can in turn better motivate persons to promote and adopt healthy lifestyle practices. Seeing to the wellbeing of clients and the community at large has long been a priority for nurses and other care team members. Nurses are the frontline workers who spend the most time with members of the community, especially older adults. It is important to understand the life stage of this population and its challenges. Nurses are in a unique position for political advocacy, able to raise issues and concerns that face various populations. Furthermore, nurses are able to enhance and increase LS in older adults by lobbying for increasing their access to services that will foster social integration and meeting health care needs.

The Institute of Healthcare Improvement (2019) in partnership with the American Hospital Association and the Catholic Health Association of the United States has put forward the John A. Hartford Foundation 4Ms Framework of an Age-Friendly Health System: *What Matters*, *Medication, Mentation*, and *Mobility.* Their goal was to rapidly spread the 4Ms Framework to 20% of US hospitals and medical practices by 2020. According to IHI, *What Matters* refers to knowing and aligning care with each older adult's specific health outcome goal and care preferences. If *medication* is necessary, care attenders should ensure that age-friendly medications are used and do not interfere with what matters most to the older person, mobility or mentation. *Mentation* involves preventing, identifying, treating and managing dementia, depression, and delirium across settings of care (including in the community). *Mobility* involves ensuring older adults move safely every day in order to maintain function and do *What Matters*

(IHI, 2019). These four essential elements are pivotal to enhance QoL and LS for every older adult.

Studies have suggested that LS may be an important public health construct (Strine and colleagues, 2007) and thus a concept important to individuals, communities, and nations. LS, though relatively consistent, may change over time in individuals as well as society at large. LS is believed to be dependent on intrinsic and extrinsic factors and both subjective and objective characteristics. People are living longer, and many see this longevity as a problem. There are concerns about the impending huge challenges to society, especially impacting health, social and financial sectors. We are the seniors of tomorrow. Today's older adults were yesterday's men and women in the workforce – the homemakers, the innovators, the entrepreneurs, the teachers, and administrators. Nurses have a social responsibility to see to their wellbeing. Exploring the factors that contribute to their wellbeing is crucial to help older adults live satisfied lives.

Nurses practice ethically and understand the importance of autonomy regarding patients and family. Nurses acknowledge and ensure that what matters to individuals is considered and incorporated into care strategies (Health Innovation Network – South London, 2016). One of the most important utilities of study findings on LS in older adults is to be aware of, understand, appreciate, and be willing to consider determinants of LS in planning and developing strategies for health promotion, illness prevention, illness/injury recovery, and rehabilitation for target populations and communities overall.

The most important element to consider when planning interventions for older adults is what matters to them, what would make them happy, and what outcome is best suited for their lifestyle. Therefore, nurses and other care strategists should incorporate findings of determinants

of LS in any vision for the health and wellbeing of citizens. A fundamental underpinning of nursing therapeutics must be consideration and integration of factors that directly influence and determine LS. Nurses must aim to assist and enable adults to age successfully and to be satisfied with their lives. While not all factors are in the purview of health care professionals, we can bring awareness to policymakers, urban planners, and all those who impact the lives of seniors or other client groups.

The importance of this study could be far reaching and provide impetus for social and health policies and services. Using this information, nurses and other healthcare providers can strategize and implement appropriate programs comprehensive enough to maintain and increase LS among community dwelling older adults. The findings of this investigation may also have relevance for individuals as they consider meaning and purpose as well as what constitutes a satisfied life as they age.

Chapter Summary

The projection that the senior population will increase globally, including in Canada, is well established. This phenomenon comes with challenges and opportunities. Positive aging is an area of interest at various levels. Healthcare practitioners are expected to guide and inform interventions and strategies to meet this need. In agreement with Sahar and colleagues (2017), nurses possess the health knowledge and background to empower older adults to foster improved health and self-efficacy, which lead to greater LS. The next chapter explores existing literature to examine significant determinants of LS in older adults across regions.

Chapter Two: Literature Review

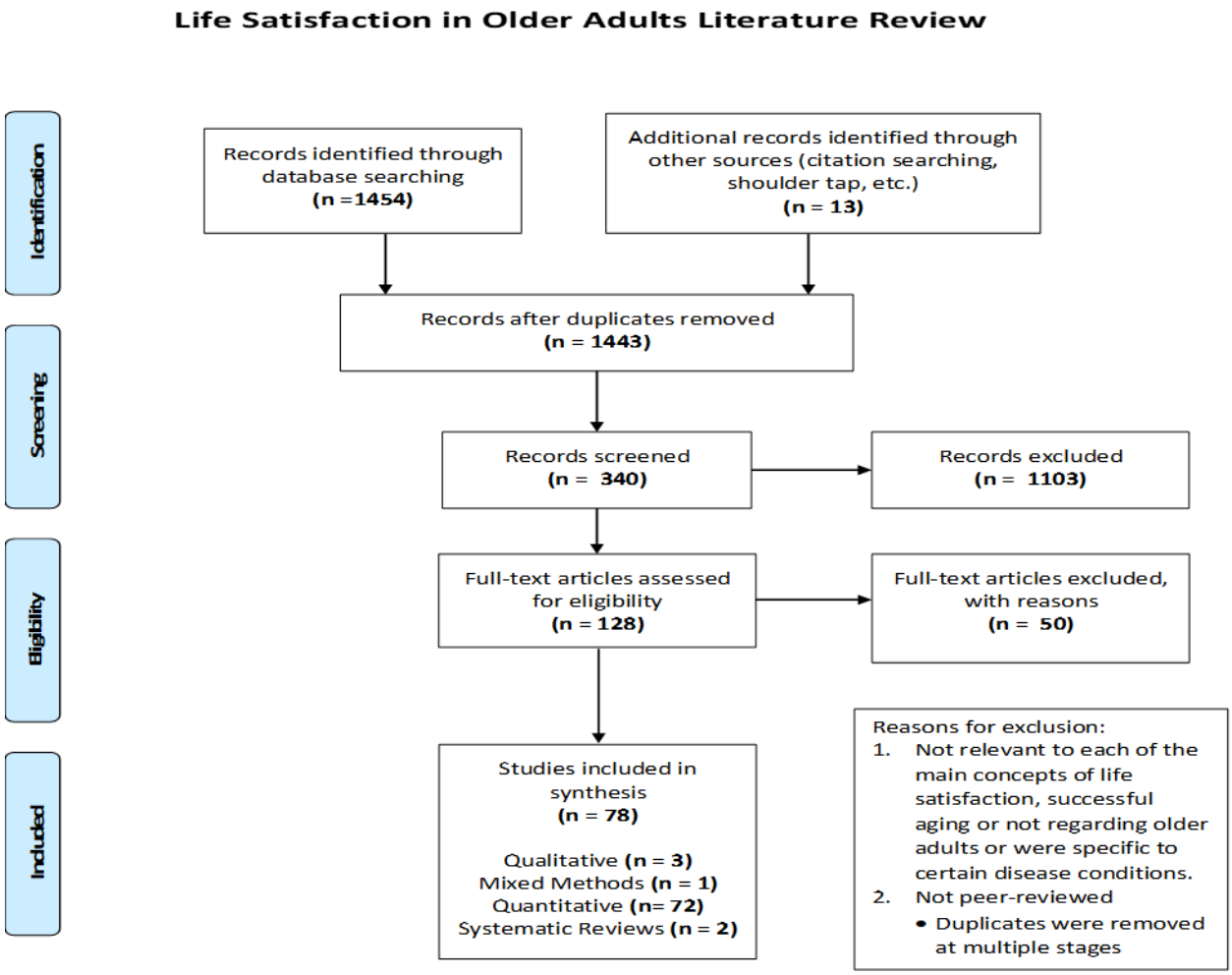
In order to embark on a study of life satisfaction, a review of existing literature was conducted. The purpose of the search was to become more aware of the common predictors of LS among older adults and to examine theories that support this construct as well as theories supporting the aging process, in particular, studies explaining successful aging. The research focus was on identifying common variables, explaining a greater percentage of variability in LS among seniors, and determining a basis for examining predictors for this study. In this search, variation and similarities among cultures and regions became evident, as well as theoretical arguments and frameworks having a bearing on LS. Gaps pertaining to the study of LS in older adults also became apparent.

Search Strategy

A preliminary literature search conducted in the Cumulative Index to Nursing and Allied Health Literature (CINAHL) identified research articles on life satisfaction in the older adult as well as theories of LS and successful aging. Initial searches included use of subject headings such as ‘Life Satisfaction,’ ‘Personal Satisfaction,’ ‘Satisfaction with Life,’ and ‘Wellbeing.’ The majority of articles were eliminated based on a perfunctory review of title or description. The initial search also included specific variables such as ‘food insecurity’ and ‘income.’ The search was re-done excluding these terms. The remaining 102 articles were exported to EBSCOhost for profound review. Theories supporting LS were also located using CINAHL. Headings like ‘Nursing Theories,’ ‘Nursing Models,’ Theoretical Models,’ ‘Quality of Life,’ ‘Sociological Theory,’ and ‘Psychological Theory’ were used, yielding 42 articles. CINAHL was not the only

database used. CINAHL has a nursing and allied health focus so it was appropriate to retrieve articles from the social work aspect along with nursing (See Appendix A & Figure 1 on page 28).

Medline and PsychInfo were also employed using the same strategy. After purposeful elimination, these searches resulted in 25 articles (please see Figure 1 schematic diagram and Appendix A for detailed description of search strategies). The strategies varied only in the use of subject headings in CINAHL and Medline but not in PsychInfo. For PsychInfo the subject heading was 'Life Satisfaction.' Otherwise the strategies were similar in order to maintain relevancy and consistency in the search topic. CINAHL results were limited to peer-reviewed journals. PsychInfo was limited to journal articles (book chapters and dissertations were excluded). Medline had no restrictions as to the type of articles. Information was also retrieved via browsing and included government reports. Exclusion criteria for the literature review included non-English, not peer-reviewed and younger than 65 years old. Inclusion criteria were English language, published between 2008 and 2019 (in order to obtain data that was most current), and subjects age 65 years and older. Articles found via browsing were not restricted to these dates, as well as the articles primarily focusing on theories. (See Appendix B for articles most relevant to thesis focus).



Moher, D., Liberati, A., Tetziaff, J., Attman, D. (2009)

Figure 1. Diagram of Search Strategy for Literature Review for this study.

In this section, I delve into what life satisfaction entails, traverse theories of life satisfaction and explore the common predictors of LS in older adults found in available literature. The information unearthed is then summarized and a conceptual framework of the common predictors of LS in older people is presented (see Figure 2).

What Does Life Satisfaction Entail?

Maddux (2018, p.3) expounded on Lyubomirsky's (2013, p.32), description of satisfaction with life as "the experience of joy, contentment, or positive wellbeing, combined with a sense that one's life is good, meaningful, and worthwhile." This definition does not necessarily mean there is perfection in every area of one's life, but that things are good overall. It is believed that people with greater LS are more successful in many areas of life. They are believed to be more social, altruistic, and active; they like themselves and other people better, have stronger bodies, and immune systems, and have better conflict resolution skills (Lyubomirsky, King & Diener, 2005).

LS is a component of subjective wellbeing. Diener's model of wellbeing consists of positive affect, negative affect, *salient domains of life*, and life satisfaction (Gana, Bailly, Saada, et al., 2012). A person is satisfied with his/her life when the positive events or happenings cancel out the negative ones. Based on the hedonistic conception of subjective wellbeing, a 'good life' is one in which there is more pleasure and enjoyment than pain and suffering regardless of the source of these events or experiences (Maddux, 2018). On the other hand, a eudemonic conception of wellbeing emphasizes that we flourish by fully exercising our own human capacities (Haybron, 2008, as cited by Maddux, 2018). According to Orpana and colleagues (2016), hedonic wellbeing often includes the presence of positive emotions and life satisfaction, while eudemonic wellbeing generally includes concepts such as self-actualization and finding meaning and purpose in life. It is about living up to one's full potential and "making progress towards one's valued goals, and living a life of purpose, meaning and virtue" (Maddux, 2018, p. 7-8). Various researchers have proposed different models of wellbeing. A popular one is the PERMA model by Seligman (2011), which comprises five parts: **p**ositive emotions, **e**ngagement, positive **r**elationships, **m**eaning and **a**ccomplishments (Maddux, 2018).

Theories of Life Satisfaction

In this project, theories substantiating and supporting positive aging and LS were explored as they underpin the definitions of this concept. The two basic types of theories that can be applied to subjective wellbeing and LS are life circumstance theories, known as 'bottom up' theories, and dispositional/construal, known as 'top-down' theories (Maddux, 2018). Life circumstance theories propose that LS is primarily the result of the negative and positive events/experiences encountered in one's life (Lyubomirsky & Dickerhoof, 2010, as cited by Maddux, 2018) and that subjective wellbeing and life satisfaction are a result of satisfaction with a variety of life domains, such as work and family (Maddux, 2018). According to Lyubomirsky and Dickerhoof (2010), dispositional/construal theories propose that subjective wellbeing primarily results from biological and temperamental factors that influence behaviours and cognitions – such as interpretations of life events instead of life circumstances themselves (as cited by Maddux, 2018).

Selective Optimization with Compensation Theory (SOC)

Central to the exploration of LS in older adults and successful aging is the Selective Optimization with Compensation (SOC) Theory by Baltes and Baltes (1990). This theory is grounded in psychology. In their work, these researchers expounded on writings by Roman philosopher Cicero who highlighted the strengths of old age for the same reasons others have viewed old age as a phase of loss and decline, and contended that "in old age it is finally possible for the individual to focus on further development and enjoyment of the mind and not to be distracted by bodily needs and pleasures" (p 2). Building on this concept, Baltes and Baltes (1990, p 3) "proposed a model in which the aging body with its reduced reserves and increased

vulnerability to illness is part of the story." The SOC model is said to provide a general theory for conceptualizing processes of successful development generally and particularly in aging (Donnellan, 2015).

SOC describes a universal model of adaptation individuals go through in order to maximize their potential and transcend to a higher level of functioning using selective optimization with compensation. Selection refers to an individual focussing their attention on fewer more important goals, optimization involves engaging in goal directed actions and means, and compensation involves maintaining a given level of functioning in the face of loss and decline (Donnellan, 2015). According to Baltes and Freund (2002), as cited by Donnellan (2015), these strategies acknowledge and address the decline and loss which occur in life, especially as one gets older. The selective optimization with compensation theory is a method employed in productive aging to adjust to physical and intellectual deficits related to growing older (psychologydictionary.org, 2020).

For humans and other living things, aging is an inevitable process; people will age as long as they remain alive. Conscious awareness, self-reflection, and choosing to create human and environmental integration (Roy and Andrews, 1999, as cited by Dixon, 1999) enable us to age successfully, and selective optimization with compensation is the process by which persons accomplish this process. Examples include modifying behaviours, using external aids, and activating unused resources (Donnellan, 2015). The overarching vein of reasoning is that across their lifespan individuals further their development by adapting to the reality of their situations – maximizing their potential gains and minimizing their losses; in doing so, selective optimization and compensation occur at various levels of analysis or integration, ranging from the macro-level of societies to the micro-levels, for example, biological cells (Baltes & Freund, 2002, as cited by

Donnellan, 2015). Older adults who successfully navigate these processes will have greater LS and age successfully, even in the presence of disability.

The Successful Aging Theory

In 1998 Rowe and Khan proposed that successful aging consists of three elements: low probability of disease and disability, high cognitive and physical capacity, and active engagement with life (cited by Rubinstein & de Medeiros, 2015). In their critique of this theory Rubinstein and de Medeiros (2015) were concerned that those who did not meet these conditions would be viewed as having failed to age successfully and somehow were to be blamed. Readers were asked to consider implications of the work of other researchers such as McLaughin, Conell, Herringa, Li and Roberts (2010). These researchers found in a study that only 12% of older adults aged successfully in one year, based on Rowe and Khan's criteria. It stands to reason then that a large percentage of persons may not be considered to be aging successfully when indeed they are. A person with a congenital or acquired disability is an example. A theory of successful aging can lend strength to the study of LS in older adults; however, Rowe and Khan's criteria for successful aging are rather idealistic and fail to be comprehensive or universally applicable. Aspects of successful aging include life satisfaction, competence, morale, and wellbeing (Rubinstein & de Medeiros, 2015).

Flood's (2005) mid-range nursing theory of successful aging provided a refreshing alternative to Rowe and Khan's idealistic and limited focus and proposed that adaptation and transcendence are the primary predictors of successful aging (McCarthy, 2011). According to Flood (2003, p. 34), as cited by McCarthy (2011), successful aging is "the individual perceived satisfaction in adapting to the physical and functional changes of aging, while experiencing

spiritual connectedness and a sense of meaning, and or purpose in life." Flood's theory conveys a holistic view of health and recognizes the importance of an individual's personal values and beliefs (McCarthy, 2011). As people age, they may experience restrictions and physical and or cognitive decline; nevertheless, persons want to overcome these limitations in order to live and thrive. Emphasis should be placed on enablement, such as creating senior-friendly communities and providing adequate social services for citizens throughout their lifespan.

In seeking to care for our older adults and advance the aging-well concept, active, healthy lifestyle practices need to be promoted with the hope that successful aging and high life satisfaction are the end-products. The theory of successful aging by Rowe and Khan (1998) was found to be limited if not discriminatory by several writers (Rubinstein & de Medeiros, 2015; Mc Carthy, 2011; Flood, 2005). Flood's (2005) mid-range nursing theory of successful aging appears to have enhanced Rowe and Khan's (1998) work by conveying a holistic lens which recognizes the individual's personal values and beliefs. They proposed that adaptation and transcendence are primary predictors of successful aging (McCarthy, 2011).

The Socioemotional Selectivity Theory

The Socioemotional Selectivity Theory holds that greater emotional saliency will motivate people to regulate their emotions to maintain high levels of subjective wellbeing (Carstensen, Fung, & Charles, 2003; Carstensen, Isaacowitz, & Charles, 1999). Older adults, becoming aware that time is limited, direct their efforts toward maintaining emotional wellbeing and engaging in successful emotion regulation strategies more than younger adults do (Gana et al., 2012). Older adults cherish their friends and loved ones and often seek out others to mentor. These dynamics bring to light the great risk to health and longevity that seniors may face due to

social isolation (National Institute on Aging, 2019), an issue that needs to be combatted to ensure increased LS in this group.

Studies that highlighted the primacy of socioemotional need among older adults included Strine, Chapman, Bullaz et al. (2007) who found that the level of LS decreases with infrequent social support; in contrast, social support and living with a partner positively and significantly predicted LS (Burton-Jeangros and Zimmerman-Sloutskis, 2014, Dumitrache, 2016, Lim, Min, Thorpe and Lee, 2016, and Fuller-Iglesias, 2015). According to these researchers, social and family support and neighbour relationships were major influencing factors of LS, as was loneliness.

Judgement Theories

Judgement theories state that the degree of LS experienced by a person at any given moment in time is a direct function of a cognitive comparison between some standard and actual conditions (Meadow, 1992). An example of a judgement theory is the Social Comparison Theory which stipulates that individuals use others as their measuring tape for developing their own standards (Carp & Carp, 1982; Emmons, et al., 1983; Michalos, 1980, as cited by Meadow, 1992). Range Frequency Theory by Parducci (1968, 1982) deals with carrying over of standards from a past life. Parducci (1968, 1982) postulates that a person is expected to be satisfied with current life if the standards of their previous life are exceeded but will be dissatisfied if their situation is substandard to their previous life (Meadows, 1992). Aspiration-level Theory puts forward the ratio of fulfilled desires. This theory maintains that the degree of life satisfaction or dissatisfaction experienced is a result of the ratio of fulfilled desires to total desires (Easterlin, 1974; Emmons, et al., 1983; Gerald, et al., 1982; Gibbs, 1973; Kammann, 1982; Mc Gill, 1967

& Wilson, 1960, as cited by Meadows, 1992). Judgement theories accentuate personal values and beliefs in determining LS.

Set-point Theories

For a very long time set-point theory was the most widely accepted empirical theory of LS (Headey and Muffels, 2016). According to Headey and Muffels, set-point theory holds that adults' LS is stable, primarily due to stable personality traits such as neuroticism and extraversion, and do not change except in major life events (Headey, 2010). In the last few years this theory has been challenged, and some believe a new theory that accounts for changes is needed (Sheldon & Lucas, 2014). Using information from a 25-year old German study, Headey and Muffels (2016) reported that personal values/life priorities, choice of partner, behavioural choices relating to physical exercise, social participation, the balance between work and leisure, church attendance, changes in health, and changes in domain satisfactions may account for medium- and long-term change in LS in adults. Thus, these researchers have refuted set-point theories. Nevertheless, others believe that a person's basic demeanor and personality traits are responsible for their outlook on life and how they interpret life events, hence determining their LS (Oshi, 2012; Diener, Inglehart, & Tay, 2012)

Roy's (1976) Adaptation Model of Nursing

During research I found that most of the relevant literature came from psychology or other social sciences. At times it felt like unchartered territory. I was convinced that, like quality of life, LS was also a health outcome and indicator. The challenge was how to demonstrate this and what nursing theories could inform or support this construct? A considerable portion of time was spent deliberating this issue. Flood's (2005) mid-range nursing theory of successful aging

was most encouraging. Flood's holistic lens on Rowe and Khan's (1998) work was remarkable and made the concept something to which nurses could better relate. Nursing assumes that no person is left behind. Everyone is valued and can be assisted and supported to achieve their ideals, including aging successfully. "Nursing accepts the humanistic approach of *valuing others* and valuing others' opinions and perspectives" (Roy, 1976, as cited by Petiprin, 2016).

The adaptation model of nursing developed by Roy (1976) was also found to be appropriate for this project. According to Roy's (1976) model, a person is a bio-psycho-social being in constant interaction with a changing environment and uses innate and acquired mechanisms to adapt (Petiprin, 2016). An aging body is a significant change an individual experiences and can be perceived as one of the changing environments to which people have to adapt. The person inhabits a body, the environment changes, and the person adapts. As people age, they find it more and more difficult to see, hear, bend, or move around due to physiological changes. Roy's (1976) model asserts that adaptation occurs when people respond positively to environmental changes. This adaptation is said to be the process and outcome of individuals and groups who use conscious awareness, self-reflection, and choice to create human and environmental integration (Roy and Andrews, 1999, as cited by Dixon, 1999).

Roy's model (1976) describes the goal of nursing as promoting adaptation for individuals and groups. In promoting adaptation nurses contribute to health, *LS*, quality of life, and dying with dignity by assessing behaviours and factors that influence adaptive abilities and by intervening to enhance environmental interactions (Roy, 2011). The manmade environment is also considered. While the external physical environment may not change, the changes in a senior's body require that changes often be made to the external environment. Hence, the promotion of age-friendly communities.

Roy's adaptation model includes two subsystems: the cognator subsystem which is a major coping process involving four cognitive-emotive channels: perceptual and information processing, learning, judgement, and emotion. The second subsystem, the regulator subsystem, is a basic type of adaptive process that responds automatically through neural, chemical, and endocrine coping channels. (Roy, 1976, as cited by Petiprin, 2016). Roy's four adaptive modes are physiological needs, self-concept, role function, and interdependence (Petiprin, 2016). According to Roy (2011), these modes represent categories through which nurses assess behaviours persons use to deal with their internal and external environments. These behaviours originate out of the regulator and cognator subsystems. Nurses assess these behaviours and create effective adjustments against pervading stimuli to lead persons to an optimal level of adaptation.

The model utilizes a six-step nursing process to facilitate adaptation: first, assessment of the patient's behaviour; second, addressing the patient's stimuli; third, diagnosis of the patient; fourth, setting goals for the patient's health; fifth, intervention to take actions in order to meet those goals; and sixth, evaluation of the results to determine if goals were met (Roy, 1984, as cited by Dixon, 1999). The variables selected for this study address the bio-psycho-social sphere of individuals.

In utilizing Roy's adaptation model for nursing (1976) in this study of life satisfaction in the older adult, I have determined that the first step of assessment is recognizing that satisfaction with life is and can be an important public health construct. The second step is to consider and embark on an investigation to explore the variables that predict life satisfaction in older adults and to determine the relative importance of these predictors. The third is diagnosis of the patient (person, client, group, community, and nation) - this is accomplished by running an analysis to answer the research question and determine the meaning of the findings. The fourth involves

setting goals for the patient's health based on findings of the investigation. The fifth step in the process is to intervene by taking actions in order to meet the goals – action and advocacy can be immediate and long-term, direct and indirect, at individual and community level, and at local or provincial or national level. The actions are to integrate LS as an outcome for care strategies and to take steps to increase and maintain LS in populations being cared for. The sixth step is the evaluation of the results; evaluation can be ongoing and even futuristic, including subsequent studies.

Summary

In exploring theories substantiating and supporting LS, I explained the two basic types of theories: life circumstance theories (bottom-up), which propose that LS is primarily the result of negative and positive events or experiences, and dispositional theories (top-down), which propose that SWB and LS are primary results of biological and temperamental factors influencing behaviours and interpretations of life circumstances. Building on Rowe and Khan's (1998) theory of successful aging, Flood's (2005) mid-range nursing theory of successful aging conveys a holistic view of health and aging and asserts that aging successfully happens when individuals are satisfied in their adaptation to physical and functional changes of aging, while experiencing spiritual connectedness and a sense of meaning and purpose. The socioemotional selectivity theory posits that relationships become more important as older adults consider time limitations. Judgement theories assert that cognitive comparison between some standard and actual condition determines the degree of LS experienced by an individual at any given time. Social comparison theory, Parducci's (1982) range frequency theory, and aspiration level theory are examples of judgement theories. Set-point theory, which holds that LS in adults is stable, primarily due to stable personality traits such as neuroticism and extraversion is now being

challenged. Some researchers have found that major life events and circumstances can in fact cause changes in a person's level of LS over time. I purport there is a basis for both views.

Baltes and Baltes' (1990) selective optimization with compensation theory is believed to be the universal adaptation model that is utilized by persons as they age in order to cope with functional decline. Roy's (1976) adaptation model of nursing and Carstensen's (1999) socioemotional selectivity theory were utilized to form the theoretical foundation for this study. Roy's (1976) bio-psycho-social model posits that adaptation is the process and outcome of persons who use conscious awareness, self-reflection, and choice to create human and environmental integration. The use of this model in nursing to explore, conserve, and increase LS in older adults is promising.

Common Predictors of Life Satisfaction in the Older Adult

According to Gana, Bailly et al. (2012), subjective wellbeing is regarded as a key indicator of successful aging and the relationship between happiness and age is a particularly important topic in this area of study. With that in mind, it is imperative to look at aspects of subjective wellbeing such as LS in older adults and to investigate predictors of LS in this population as nurses and other healthcare providers prepare for and seek to mitigate consequences of an aging population. As people get older, their physical strength, bodily functions, and cognitive functions decline, along with increasing social losses (Gana, Bailly, et al., 2012). The literature however indicates the paradox that subjective wellbeing is maintained despite these declines. Schilling (2006) concluded that this may only hold true for the younger older adults (65-75). Gana (2012) credited several researchers such as Riediger, Freund & Baltes (2005) and Baltes (1987) for suggesting that older adults maximise the positive and minimise the

negative effects of aging by selective optimization with compensation, a universal model of adaptation (Donnellan, 2015). As the body changes and memory and other cognitive functions decline, individuals adapt by accepting loses and declines, focusing on what functions can be maintained, and utilizing aids such as hearing aids and canes to enable themselves to function and get by.

Social Supports and Relationships

Waldinger (2016) shared lessons from the longest study on *happiness* in the world in a TED talk video found on YouTube. In his presentation he revealed that the association between wellbeing and being in a satisfying relationship appears to have a powerful protective role for high wellbeing. According to Waldinger, the '*good life*' is based on good relationships. The idea of remarrying, especially after the death of a spouse, is shunned in certain cultures. However, more and more older adults are taking on new partners after divorce or the death of a spouse. Given the benefits of being in a satisfying relationship, this might increase longevity and improve wellbeing. Litwin and Stoeckel (2012) reported that several studies indicate that lack of a spouse or partner is associated with a lesser wellbeing in a variety of settings, especially for men. Older adults are also choosing to 'share house' with close friends as they move to *age in place*. In so doing they share expenses, support each other, and remain independent longer. Kim (1997) found loneliness to be a deterrent to LS and a predictor of health perceptions among older Korean immigrants in the United States (Prasoon & Chaturvedi, 2016). The social circumstances seniors find themselves in greatly impacts their satisfaction with life in general. Social networks and support are emerging as a significant predictor of overall LS.

While physical health and perceived mental health are expected to be a major determinant of subjective wellbeing and successful aging, the concept of social support is more foreign. Macia, Duboz1, Montepare and Gueye (2015, p.380) reported that several researchers (Cheng et al., 2009; Ryff, 1995; Steverink & Lindenberg, 2006) have shown that social relations, whether conceptualized in terms of social support, social network, social ties, or positive social relations, are an important predictor of subjective wellbeing and life satisfaction for older adults.

Spirituality

Social support and other social networks for older adults can also be found in places of religious gathering and among congregants. Spiritual experiences can also lead to an increased sense of purpose and meaning in life, which in turn boost LS. According to Aranda (2008); Fallot (2001); Krause (1995); and Wang et al. (2008), spiritual experiences have been associated with positive aspects of psychological wellbeing including increased life satisfaction and fewer depressive symptoms (cited by Ballew, Hannum, Gaines, Marx and Parrish, 2011). Spiritual experiences, a sense of belonging, and social involvement facilitated by places of worship can also lead to greater transcendence and a sense of purpose.

Socio-demographic

There are various socio-demographic factors that have been identified as predictors of LS. Education has been included as a variable in some studies examining LS; these findings however have been mixed and conflicting. In a cross-sectional household survey studying health and happiness in Finland, Poland, and Spain, Miret, Caballero, Chatterji et al. (2014) reported that respondents of younger age and higher levels of education reported less wellbeing. However, Burton-Jeangros and Zimmerman-Sloutskis (2016) found higher education to be a positive and significant predictor of LS in older Swedish women.

Lee and Lee (2013) found that social engagement and psychological functioning were more prominent predictors for better educated respondents, and that the health and LS of less educated respondents was influenced by demographic factors. Since these studies included but were not limited to older adults, only studying an older adult population may produce different results. According to Lee and Lee (2013), there are educational disparities attributed to income status among major predictors of health and wellbeing. Kim and Sok's (2012) study showed higher monthly income contributes to LS of older adults. Beutel, Glasemer, Decker et al. (2009) found that LS was strongly associated with a good household income, while Macia and colleagues (2015) reported a similar impact of overall economic conditions on LS.

e Many studies have indicated that income has not been shown to be a significant predictor of LS; however, several other studies have shown income to be an important variable. Lim and colleagues (2016) reported that financial security is an essential component of LS and is significantly associated with LS in older adults. Findings on the degree of impact are mixed. Income determines food security and is related to recreation and transportation and even housing. The findings of this study could shed light on whether we are doing enough for our seniors as well as if resources are being properly allocated.

Studies have shown inconsistent results in terms of the bearings age and gender have on LS, especially in older adults. Older women have been found to be more satisfied with their lives than older men. Gender differences (and similarities) may also become apparent. Marital status is also important; the literature shows that those with partners tend to have higher life satisfaction in general (Litwin & Stoeckel, 2012). Other demographic factors that may be associated with life satisfaction include country of birth and cultural/racial identity.

Personality Traits

Research findings indicate that objective life conditions such as physical health, socioeconomic status, finances, and physical and social environment cannot fully explain the wellbeing of older persons (Ardelt, 1997). “Personality characteristics and developmental influences appear to have a stronger impact” according to Ardelt (1997, p.15). Ni Mhaolain, Gallagher, O Connell, Chin et al. (2012) reported that extroverted personality traits act as a predictor of higher LS, and Macia and colleagues (2015) and Siedlecki and colleagues (2008) reported that negative affect is negatively associated with LS consistently across the life span. Gana and colleagues (2012) purported that LS is highly heritable and found subjective wellbeing to be relatively stable. Yet they also reported that research on stability and changes in LS yield inconsistent results. Ardelt (1997) posited that satisfaction in old age depends primarily on psychosocial development and credited wisdom as explaining most of the variation in LS in old age, contending that wisdom is the reason why people experience satisfaction and a sense of fulfillment in old age.

Perception of Health

Beutel, Glaesmer, Wiltink et al. (2010) found personal and social resources and the absence of anxiety and depression to be of the highest importance for the maintenance of LS in aging men. Within this same group, health, income, and family were the most important, and living conditions, friends and family life produced the most satisfaction. Among frail older adults, Wilhelmson, Fritzell, Eklund et al. (2013) found psychological health, partner relationship, and activities of daily living (ADLs) significantly explaining life satisfaction. A common theme among these studies is the importance of physical and mental health. Closely

related to physical health is an individual's mobility and ability to carry out the activities of daily living (ADLs).

Resilience is important to successful aging and life satisfaction and is mediated by physical and subjective characteristics, mental and emotional health, and social support **(**Gerino, Rollè, Sechi and Brustia, 2017). These researchers found that loneliness, resilience, and mental health had a relationship with mental and physical QoL and posited that resilience partially mediated the relationship between loneliness and mental health. The available body of literature reported mixed findings on the effects of general health on LS; however, a substantial amount of data revealed a strong association between LS and emotional and psychological wellbeing. Discovering the impact of these factors on elderly Canadians could direct future programs and funding to benefit this group as well as informing their care.

Emotional health has been shown to be an important predictor of LS in the older adult population. The study by Ni Mhaolain, Gallagher et al. (2012) suggests that the mental and emotional status of geriatric individuals plays the most significant role in determining LS. According to Hayer (1987), as cited by Siedlecki, Tucker-Drob, Oishi, and Salthouse (2008), depression is consistently reported to be negatively related to LS in both clinical and non-clinical samples. As stated by Strine, Chapman, and Balluz et al. (2007), decreased LS is related to "the mean number of days in the past thirty days of poor mental health, depressive symptoms, anxiety symptoms" (p.45), as well as somatic complaints such as body pain, insufficient sleep and activity limitations. The findings of the eight-year longitudinal study by Gana, Bailly, Saada et al. (2012) support changes in LS over time but indicated that their model showed the change taking place at varied rates.

Health Behaviours, Leisure and Mobility

Health behaviours are influenced by the social, cultural, and physical environments in which people live and work (Statistics Canada, 2020). Healthy lifestyle practices promote health and wellbeing, while unhealthy practices put us at risk for diseases and disability. These behaviours are formed by individual choices and external constraints (Statistics Canada, 2020). Unhealthy behaviours that increase risk from preventable deaths include smoking, drinking alcohol, eating a poor diet, and being sedentary. The literature review uncovered a few studies that examined life satisfaction in relation to health behaviours.

Strine and colleagues (2007) found that the prevalence of smoking, drinking, obesity, and physical inactivity increased with decreasing levels of life satisfaction. Rodriguez, Latkova, and Sun (2007) cited other researchers' work, stating that physical and leisure activities (Menec, 2003), exercising (Menec and Chiperfield, 1997), and participating in activities in general (Fernandez-Ballesteros et al., 2001) are significant predictors of wellbeing in older adults. Brae, lk Suh, Ryo and Heo (2017) found that light physical activities, but not vigorous physical activities, were positively associated with physical health and LS. Ni'Mhaolain and associates (2012) found that physical activity was among the key determinants of life satisfaction in a healthy, older community-dwelling population. In their study of low-income older adults in rural South Korea, Choi and Choi (2017) suggested that enhancement of older adults' leisure competence may increase participation in leisure activities and subsequently increase satisfaction with life.

Life satisfaction among older adults has become an important issue in geriatric care and is influenced by numerous physical, mental, and social factors (Beyaztas, Kurt & Bolayir, 2012).

It is reasoned that wellbeing should decrease with age since older people are no longer working, have more physical discomfort and limitations, and experience social losses. For the most part, research has shown the opposite. Globally, LS is on average high among seniors; some credit this to Carstensen's socio-emotional selectivity theory. Others have reported a decline in LS among the older-old due to increased severity of diseases and disability as well as cognitive decline. Lim, Min, Thorpe et al. (2016) posited that LS is influenced by individual and demographic characteristics as well as age, and that especially in the older adult population LS should be considered a multidimensional construct encompassing different domains. These include physical and mental status, socioeconomic status, social and family relationships, and the environment (Lim, Min, Thorpe, et al., 2016).

Summary

The review of literature uncovered no studies that rank predictors of LS in the older adult in terms of relative significance. Appendix B has a list of the most relevant articles for my research focus. In Figure 2 I have summarized the various characteristics/factors that were found to be common predictors for this group. In this review of determinants of LS in the older adult, physical health and social support/engagement were the most frequent variables explored and found to be significant, followed by general and mental health and physical activity/mobility/leisure activity. Next came economics, cognition, and religion/spirituality. Other miscellaneous predictor variables for LS in older people were education, personality traits, resilience, wisdom, and frailty. In the Canadian context, are the predictors of LS among older adults the same variables or are they in this order? This exploration could prove useful to health and social services decision makers as well as individuals. The articles utilized for this review

were primarily quantitative studies, seven of which focussed on measurement tools of LS and twelve on theories of LS and successful aging.

According to Jang (2004), life satisfaction in older people is a result of subjective feelings of happiness and contentment brought about by their acceptance of the changes that come with aging (Kim & Sok, 2013). Similar to persons in other stages of life or circumstances, older persons do undergo adaptation, minimizing their loses and maximizing their potential gains as per Baltes and Baltes' (1990) SOC theory. Aging successfully is not synonymous with having high satisfaction in life. However, the interconnectedness of these conceptualizations is apparent when studying LS in the older adult. According to Cho, Martin, and Poon (2015), LS is an important outcome and can serve as an indicator of successful aging (as cited by Maher & Conroy, 2015). St John, Mc Kenzie and Menec (2015) posited that LS is strongly associated with mortality in old age, which could indicate that it is a reflection of one's health (as cited by Maher & Conroy, 2015).

The theories explored in this review all have relevance and increase one's perception of LS among older adults. Carstensen's (1999) socioemotional selectivity theory and Roy's (1976) adaptation model for nursing provided the theoretical framework for this study. As important as the SOC theory is to LS in older adults and successful aging, this investigation is not designed to delineate the relationship of this construct to this theory. The socioemotional theory has been included because of the prominence of social support and relationships as a determinant of LS in older adults. It was anticipated that social provision indicators would emerge as having a significant association with LS in this population.

As Strine and colleagues (2007) concluded, life satisfaction may be an important public health construct. This is even more significant for the older adult population with their numerous

vulnerabilities. Older adults are valued, their contributions appreciated, and their wisdom needed. Keeping seniors active and engaged and supporting them in various dimensions will help to increase LS in this population. Life satisfaction could possibly predict longevity and recovery from illness and injury, as well as the futility of certain care models and interventions for this age group.

Below is a conceptual framework of the variables that are common in current literature regarding LS in an older adult population (see Figure 2). Though it could be argued that most of the variables could be bidirectional, some are more likely to be one direction or another. The arrows depicted in Figure 2 represent the primary direction of the relationship of each category of variable explaining LS found in literature.

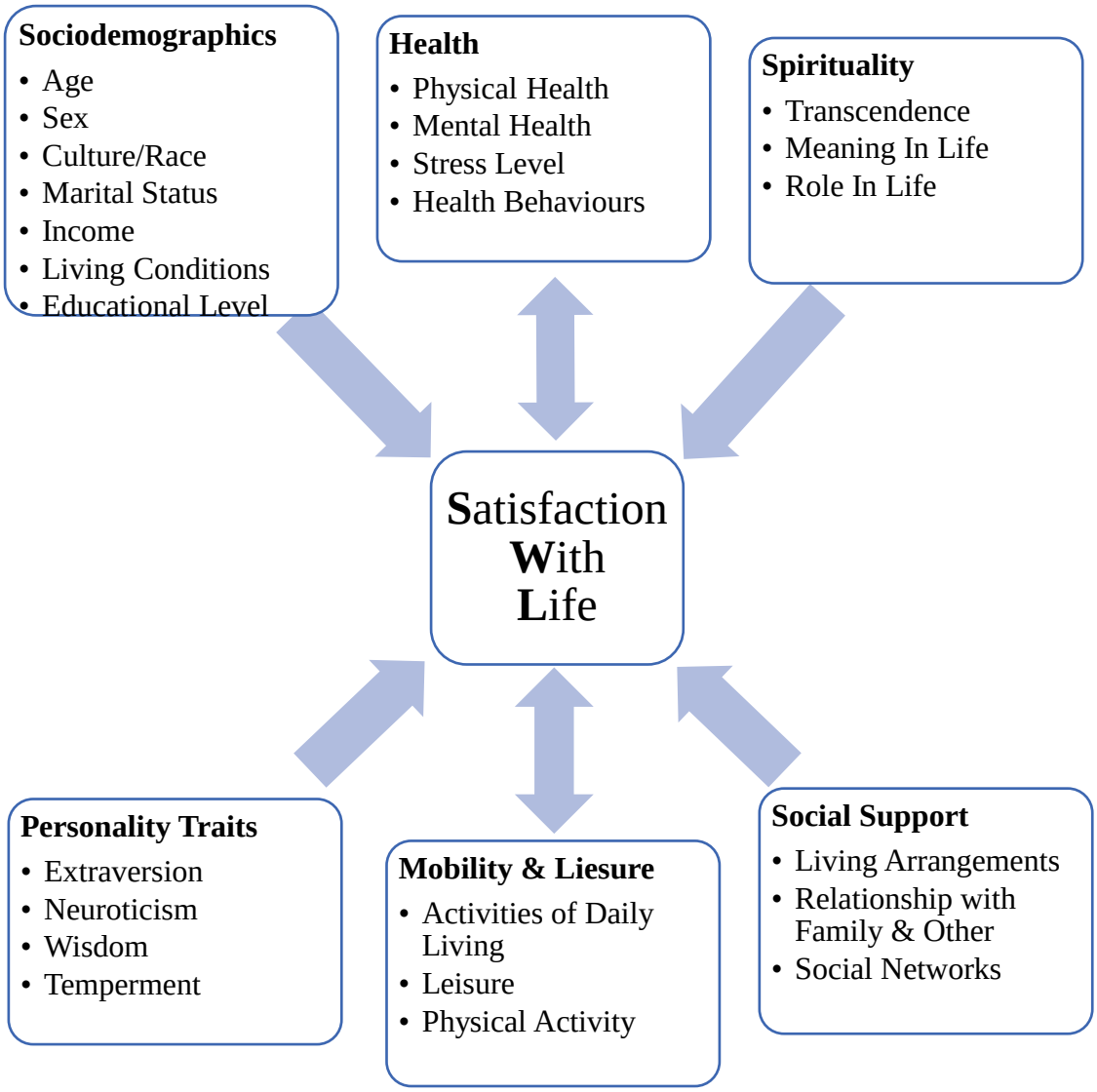


Figure 2. Conceptual Framework of Predictors of Life Satisfaction in Older Adults Found in Literature.

Most of the variables in the above conceptual framework were considered in this study but not all were available in the CCHS datasets. Variables that fall in the personality and spirituality categories were unavailable. Furthermore, the cross-sectional design of the CCHS data was not intended to elicit information on variables such as these. Activities of daily living

and leisure were contained in the dataset but were not available for the Province of Alberta. Alberta was chosen because most of the variables sought were available.

Purpose and Objectives

The purpose of this study was to determine significant predictors of life satisfaction among community dwelling older adults in order to add to the body of knowledge on this subject area and to provide guidance for health and social policies and programs to support this population. The aim of this study was to examine the extent to which variation in life satisfaction is explained by health perception health behaviours (that are indicative of health status), social supports, and socio-demographic characteristics in a community dwelling older adult population.

The objectives for this study were

Perceived Health

1. To examine whether a relative improved *satisfaction with life* is explained by better *perceived general health*, better *perceived mental health*, and lower *perceived life stress*.

Health Behaviours

2. To examine whether a relative higher *satisfaction with life* is explained by having fewer *unmet healthcare needs* and fewer indicators of poor health (i.e., cigarette smoking, high alcohol use, low consumption of fruits and vegetables, and a high *Body Mass Index (BMI)).*
3. To examine whether a higher *satisfaction with life* is connected to being more physically active.

Socio-demographics

4. To examine whether a relative higher *satisfaction with life* is explained by being female, a lower age, and having a significant other/spouse.
5. To examine whether a relative higher *satisfaction with life* is explained by higher levels of education and higher income.
6. To examine whether a relative higher *satisfaction with life* is explained by self-identifying as White and being born in Canada.

Social Support

7. To examine whether a relative higher *satisfaction with life* is explained by having greater social support (i.e., a sense of belonging to a local community, having a significant bond with at least one person, and living arrangements in a social environment).

Chapter Three: Research Methods

The purpose of this study was to examine predictors of life satisfaction among community-dwelling older adults. In this section, the study design and data collection method are outlined, the sample is described, and a detailed description of measures used for this study is given. Measures are separated into four categories: health perception data, health behaviour data (BMI as a biological health indicator is also included in this category), socio-demographic data, and social supports. This is followed by explanation of the approach to data analysis and ethical considerations, and a summary of the methods described.

Study Design and Data Collection

This study utilized existing data from the Canadian Community Health Survey (CCHS) 2015-2016 Public Use Microdata file. The CCHS is a cross-sectional survey collecting health and social data on the Canadian population. A quantitative analysis of this survey was undertaken to meet objectives and answer the research question. The CCHS collects information related to health status, care utilisation and health determinants for the Canadian population (CCHS Survey Documentation - Stats Canada, 2019). Trained interviewers use randomly selected telephone numbers representing each health region to contact respondents. The survey collects data from a large sample of respondents and is designed to provide reliable estimates at the health region level. Persons 12 years and over who are living in private dwellings, who comprise more than 97% of the Canadian population within this age group, are included in this survey. Those living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Armed Forces, and residents of certain remote areas are excluded from

the sampling frame (CCHS Survey Documentation- Statistics Canada, 2019). The total exclusions represent less than 3% of the Canadian population.

Participation in the survey is voluntary and data is collected directly from survey respondents using computer assisted interviews. Each component of the CCHS questionnaire is developed in collaboration with specialists from Statistics Canada and other federal and provincial departments and/or academic fields (Statistics Canada, 2019). The components are comprised of common content, optional content, and rapid response content. According to Statistics Canada (2019), optional content fulfills the unique data needs of each province or territory and can vary from year to year. The variables utilized in this investigation were both common and optional in content. For the year 2015-2016, 109,659 cases were processed, and 1283 variables were generated (2015-2016 CCHS Survey Documentation, 2019).

Sample

The sample for this analysis was the population comprised of community dwelling adults 65 years and above. Only one person within a household was chosen for interview (CCHS 2015-2016 Survey Documentation – Statistics Canada, 2019). A stratified random sample was used for the CCHS survey. According to Statistics Canada (2019), persons aged 18 and over were identified, and a group selected from a list of telephone numbers from the Canada Child Tax Benefit (CCTB) that records the 12-17 age population. From the overall sample data, I utilized those meeting the criteria and living in Alberta. The Province of Alberta was chosen because of the availability of variables of relevance to this project. Alberta is the fourth most populous province in Canada, and its population growth is projected to be the highest among Canadian provinces over the next 25 years. Alberta's population is estimated to number between 5.6 and

6.8 million people compared to 4 million in 2013 (Statistics Canada, 2014). The primary reasons for Alberta's population growth are immigration and interprovincial migration (Statistics Canada, 2019).

Measurement of Concepts of Interest

This paper analyzed four categories of variables (see Tables 1 & 2 & Appendix C): health perceptions, health behaviours, social supports, and socio-demographic data. Health perception variables are **self-perceived (general) health**, **self-perceived mental health,** and **perceived life stress**. Other health-related variables, categorized as health behaviours or indicators, include **perceived unmet healthcare needs**, **BMI**, **alternate physical activity** (measure of physical activity and mobility), **daily consumption of fruits and vegetables**, **smoking status**, and **type of drinker**. Social support variables include **living/family arrangements**, **sense of belonging to a local community**, and a **strong emotional bond to at least one person**. Socio-demographic variables are **age**, **sex**, **marital status**, **cultural/racial identity**, **country of birth**, **highest level of education**, and **total household income** (see Table 1).

Variables selected for this investigation (see Table 1) were a combination of what the literature revealed to be common and significant predictors of LS in older adults that were available in the CCHS dataset. Biological factors, personality traits, and spiritualty were not included. Variables that come under these categories were not available in the data sets utilized for this investigation. However, a category called health behaviours has been included to attempt to capture modifiable lifestyle practices that may influence LS as people age. Overall, the analysis included one dependent variable – **s*atisfaction with life***, and 19 independent variables,

two of which are continuous. The variables were segregated into four categories in line with the theme and focus of this paper.

Table 1

Variables Selected for Study

Variable Name	Response/Description
Dependent Variable	
Satisfaction with Life (SWL)	
SWL Category 1	1= Very Satisfied
SWL Category 2	2 = Satisfied
SWL Category 3	3 = Neither Satisfied nor Dissatisfied
SWL Category 4	4 = Dissatisfied
SWL Category 5	5 = Very Dissatisfied
Independent Variables	
Socio-demographics	
Age	13 = 65-69, 14 = 70-74, 15 = 75-79, 16 = 80+
Sex	1= Male, 0 = female (sex at birth)
Marital Status	1 = Married, 2 = common-law, 3 = widowed/divorce/separated, 4 = single
Country of Birth	1 = Landed immigrant/non-permanent resident, 2 = non-immigrant (Canadian born)
Cultural/racial Identity	1 = White, 2 = non-white (Aboriginal or other visible minority)
Educational Level	1 = Less than secondary school graduation, 2 = secondary school graduation (no post secondary graduation), 3 = post-secondary certificate/diploma/degree
Total Household Income	1 = < $20,000, 2 = $20,000-$39,999, 3 = $40,000-$59,999, 4 = $60,000-$79,999, 5 = > or = $80,000
Perception of Health	

Perceived Health (general)	1 = Excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor
Perceived Mental Health	1 = Excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor
Perceived Life Stress	1 = Not at all stressful, 2 = not very stressful, 3 = a bit stressful, 4 = quite a bit stressful, 5 = extremely stressful
Health Behaviours/Indicators	
Unmet Healthcare Needs	1 = Yes, 0 = no (respondent's perception)
Type of Drinker (Alcohol)	1 = Regular, 2 = occasional, 3 = did not drink in last 12 months
Smoking Status	1 = Current daily, 2 = current occasional, 3 = former, 4 = former occasional, 5 = experimental, 6 = lifetime abstainer
Alternate Physical Activity	1 = Active, 2 = moderately active, 3 = somewhat active, 4 = sedentary
Daily Consumption of Fruits & Vegetables	Range per serving (0-35)
Body Mass Index	Adjusted. Range 14.23-56.72 Kg/m2
Social Support	
Living/Family Arrangements	1 = Unattached -living alone, 2 = unattached - living w others, 3 = living w spouse, 4 = parent living w spouse & children, 5 = single parent living w children, 6 = child living with single parent w or w/o siblings, 7 = child living with 2 parents w or w/o siblings
Sense of Belonging to a local community	1 = Very strong, 2 = somewhat strong, 3 = somewhat weak, 4 = very weak
Strong bond to at least one person	1 = Strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree

Note. Variables were taken from the Canadian Community Health Survey 2015-2016. w - with. w/o - without.

Measurement of Dependent Variable. ***Life satisfaction in general*** is the dependent variable for this study (CCHS 2015-2016 Survey Documentation, p. 79).The CCHS includes two

life satisfaction scales: (a) an 11-point scale ranging from 0-10, which is often treated as a continuous variable in statistical analysis, and (b) an ordinal Likert scale with five ordered categories ranging from 'very satisfied' to 'very dissatisfied.' Initially the scale with eleven categories was selected for this study in order to conduct a multivariable linear regression. However, the assumptions were not met and an ordinal version of the ***satisfaction with life*** variable in the CCHS was used instead to carry out an ordinal logistic regression analysis. For this variable, respondents were asked, using a scale from 1-5, where 1 means 'very satisfied;' 2 'satisfied;' 3 'neither satisfied nor dissatisfied;' 4 'dissatisfied;' and 5 'very dissatisfied,' about how they felt about their life as a whole at the time of being asked. This ***satisfaction with life*** variable is categorical. Measuring tools for LS vary and there is still no consensus as to the most reliable and meaningful one. Some researchers think that assessing a single domain of LS or overall LS will miss many important aspects of LS as age-related LS is thought to be multifaceted and complicated (Lim, Min, Thorpe, et al., 2016), while others suggest a single-item measure is adequate. Cheung and Lucas (2014) assessed the validity of a single-item life satisfaction measure by comparing single-item measures to the Satisfaction with Life Scale (SWLS). They found that the single-item life satisfaction measure demonstrated substantial degree of criterion validity with the SWLS. In other words, the single-item life satisfaction scale performed very similarly to the multi-item SWLS.

Measurement of Independent Variables

Indicators of health were determined by individuals' perception of their health, their healthcare needs, and their various health behaviours. Socio-demographic characteristics and three social support variables together with the health variables made up the list of independent variables being explored in this study in order to investigate LS in an older adult population.

Health. For **perceived health**, the following question was asked of respondents: *In general, would you say your health is 'excellent,' 'very good,' 'good,' 'fair,' or 'poor'?* (CCHS Survey Documentation, 2015-2016, p.31) Respondents chose one of these options: excellent which was coded as 1, 'very good' as 2, 'good' as 3, 'fair' as 4, and 'poor' as 5. Lower scores indicate persons are healthy. For **perceived mental health** (CCHS 2015-2016 Survey Documentation, p. 31), respondents were asked the following: *in general, would you say your mental health is 'excellent,' 'very good,' 'good,' 'fair,' or 'poor?'* Coding of responses was 1 for 'excellent,' 2 for 'very good,' 3 for 'good,' 4 for 'fair,' and 5 for 'poor.' Lower scores indicate persons are mentally healthy. **Perceived life stress** (on most days) was coded in five categories: 1 for 'not at all stressful,' 2 for not 'very stressful,' 3 for 'a bit stressful,' 4 for 'quite stressful,' and 5 for 'extremely stressful.' Lower scores indicate a better state of health and minimal stressful issues or situations. These health perception variables can be found in Table 1.

There is strong evidence that good perceived health (general and mental) has been found to be a positive predictor of life satisfaction in older persons while poor health is associated with lower life satisfaction levels. Several studies have reported this correlation (Burton-Jeangros and colleagues, 2014; Dumitrache and colleagues, 2016; Lim and colleagues, 2016; Sook-Young and colleagues, 2012 & 2013). Gana and colleagues (2013) found that poor health predicted dissatisfaction with life. Life stress has a direct bearing on mental and even physical health. Along with self-rated health, Orpana and colleagues (2016) found that being older with lower levels of perceived life stress and higher levels of perceived coping was associated with higher levels of wellbeing.

Health Behaviours. Health behaviours are indicators of health and are habits that individuals perform based on practices such as type of diet and amount of dietary intake,

physical activity (mobility and activity), smoking and consumption of alcohol. Even though there is a universal healthcare system in Canada, persons may also perceive that they have healthcare needs that are not quite being met, as a result this perception is also assessed.

One important health behavior is a diet high in fruits and vegetables. For this first concept, I used **daily consumption of fruits and vegetables**. A continuous variable was used with values ranging from 0-35, representing the number of servings of fruits and vegetables consumed in a day.

Second, physical activity is important for the maintenance of health. **Alternate physical activity** in minutes per week was selected to depict how active respondents were (CCHS 2015-2016 Survey Documentation, p.44/171). Responses were coded as follows: 1= active, 2 = moderately active, 3 = somewhat active, and 4 = sedentary. Lower scores indicate a higher activity level.

Third, alcohol consumption is represented by the variable **type of drinker** and describes drinking practices over the past 12 months. Responses were in three categories. ‘Regular drinker’ was coded as 1, ‘occasional drinker’ as 2, and ‘did not drink in the last 12 months’ as 3. Lower scores indicate a greater consumption of alcohol.

Finally, the **smoking status** variable was represented by six categories: ‘current daily smoker’ which is coded as 1; ‘current occasional smoker’ which is coded as 2; ‘former daily smoker’ (now non-smoker) as 3; ‘former occasional smoker’ (now non-smoker) as 4; ‘experimental smoker’ (at least 1 cigarette, non-smoker) as 5; and ‘lifetime abstainer’ (never smoked a whole cigarette) as 6. Lower scores are indicative of a greater intake of nicotine from smoking cigarettes. Smoking, though used for pleasure, can have an adverse effect on health.

A balance of one's dietary intake and level of physical activity can be determined by weight, or more accurately the **BMI**. **BMI,** while not a behaviour, is considered a health indicator and is a continuous variable that is derived from respondents' self-reported height and weight. The range available among the respondents is 14.23 to 51.34. This variable will be grouped with the health behaviours variables. The **BMI** is arrived at by calculating weight in kilograms by height in meters squared. According to the Canadian weight classification system, **BMI** can be classified into ranges associated with health risks. For adults age 18 years and over **BMI** less than 18.5 is considered as underweight, 18.5- 24.9 is considered as normal weight, 25-29.9 as overweight, and a **BMI** of 30 and over as obese (Government of Canada, 2020).

For the **perceived unmet healthcare needs** variable (CCHS 2015-2016 Survey Documentation, p. 59), the question asked of respondents was as follows: *During the past 12 months, was there ever a time when you felt that you needed health care, but you didn't receive it?* The option for responses was 'yes' or 'no.' Yes was coded as 1, and 'no' as 2. Note that this score was the respondent's perception that they had healthcare needs not being met. The CCHS (2015-2016) document did not elaborate on the kinds of needs individuals perceived. However, these needs may include not having a family doctor, being unable to get referral to specialists or get reasonable appointments, or having difficulty obtaining appointments for investigations or procedures.

Social Supports. For the first variable, **sense of belonging to a local community** (CCHS 2019 Survey Documentation, p. 31), response choices were 'very strong,' 'somewhat strong,' 'somewhat weak,' and 'very weak' to the question, *how would you describe your sense of belonging to your local community?* A response of 'very strong' was coded as 1, 'somewhat strong' as 2, 'somewhat weak' as 3, and 'weak' as 4. Higher scores indicated a strong sense of

belonging to a local community and thus a greater social network. The second variable **living/ family arrangements** (p.23) has seven categories: 'unattached – living alone' coded as 1; 'unattached' – living with others' as 2; 'living with spouse/partner' as 3; 'parent living with spouse/partner and children' as 4; 'single parent living with children' as 5; 'child living with single parent with/without siblings' as 6; 'child living with two parents with/without siblings' as 7; and 'other' as 8. A score other than 1 indicated an individual not living alone. The third variable having a **strong emotional bond with at least one person** is a discrete variable with responses of 'strongly agree,' 'agree,' 'disagree,' and 'strongly disagree.' These are coded from 1-4. Lower scores indicated that individual have stronger emotional bonds.

Socio-demographic. There were seven socio-demographic variables in this study. The first was **age** in terms of chronological age. For this study older adults age 65 and older were divided into four categories. The categories were 65-69, 70 -74, 75-79, and 80 years and older. The age categories were determined based on responses to the question, what is your age? In the public use data files, the responses were collapsed into 16 categories, the first being 12-14 years and the last being 80 years and older (p.74). Separating the age variable into four cohorts allowed examination of differences among the groups. Higher scores are indicative of older individuals. For the **sex** variable (CCHS 2019 Survey Documentation, p. 23), the interviewer entered the sex of the individual and if necessary asked if they were male or female. This response was viewed as representing the individual's sex at birth. Male was coded as 1 and female as 2 (p. 72). **Marital status** was represented by four categories (CCHS 2019 Survey Documentation, p. 23): What is your marital status? Are you married, living common law, widowed, separated, divorced or single? Married was coded as 1, common law as 2, widowed/ separated/divorced as 3, and single as 4 (p.72). For **total household income** (CCHS 2019 Survey Documentation, p. 35), the

possible responses were less than $20,000 to no income, coded as 1, $20,000 to $39,999, coded as 2, $40,000 to $59,999, coded as 3, $60,000 to $79,999, coded as 4, $80,000 and greater, coded as 5. (p. 417). The concept **cultural/racial Identity** (p. 53) was represented by two categories – White and non-white (Aboriginal or other visible minority), using the values 1 and 2. The **Country of birth** (p. 53) variable had two responses – landed immigrant/non-permanent resident and non-immigrant (Canadian born). Canadian born was coded as 1, and those who were not born in Canada coded as 2. The **highest level of education attained** was represented by 1 if respondents had less than secondary school graduation, 2 for secondary school graduation, and 3 if they had post-secondary certification/diploma/university degree. Higher scores thus indicated higher levels of education.

Analysis Methods

The purpose of this study was to examine the extent to which variability in life satisfaction in older adults can be explained by perception of health (general and mental), health behaviours (indicative of health status), social supports, and socio-demographics among community dwelling older adults. Descriptive statistics were used to present baseline socio-demographic characteristics which include age, gender, marital status, country of birth, cultural/racial identity, total household income, and highest educational level. Univariate statistics were conducted on health-related and social support indicators. Normally distributed continuous variables are presented with means and standard deviations. Categorical data is presented as frequencies (percentages) and compared using Chi squared differences in proportions with 95% confidence interval (CI). The frequencies are noted. Missing data is described, and frequencies recorded (please see Table 2).

Data Preparation and Screening. Univariate descriptive statistics obtained were examined for accuracy of input and completeness of data. Frequency tables were reviewed for categorical and ordinal variables. The **daily consumption of fruits and vegetables** variable had an extreme outlier which was replaced with the next value in line before the data was analysed. The last three categories of the **living/family arrangements** variable were combined to create five categories and the 'former occasional smoker' and 'experimental smoker' categories of **smoking status** were combined to create five instead of six categories. These adjustments were done to make the variables more suitable for an ordinal regression.

An ordinal logistic regression was found to be a suitable model for the data being used for this study. Bivariate analyses for each independent variable were examined against the dependent variable **life satisfaction in general** (see Appendix C) prior to conducting the ordinal logistic regression analysis to determine if there was a relationship between each independent variable and the independent variable.

Sampling weights. The 2015-2016 CCHS used a random stratified sample based on two sampling frames: 1) an area frame for the population age 18 and older and 2) a frame of telephone numbers from the Canadian Child Tax Benefit (CCTB) records for those 12-17 years. The weighting strategy that was used treated both the area and the CCTB frames independently to come up with separate person-level weights for each of the frames (CCHS 2015-2016 Survey Documentation – Statistics Canada, 2019). According to this document, the adjustments applied to the initial weights are based on modeling probabilities of response for variables derived from characteristics of the units and other collected data. Groups of respondents and non-respondents were then created from those probabilities to transfer the weights from the non-respondents to respondents. A single frequency weight was then produced by combining the person-level

weights from both frames and adjusted by Winsorization and calibration to known population totals to become the final person-level weights.

For this study, the frequency weight was rescaled to a probability weight in order to obtain accurate standard errors based on the population. The estimated size of the population was 472,561, and the sample of 65 and older adults was 2,678. The re-scaled sampling weight was calculated by dividing the master weight by the population size and multiplying the results by the size of the sample respondents included in the analysis (WTS_M/472,561*2678).

Missing Data. For missing data, Little's MCAR (missing completely at random) test was conducted to demonstrate if the data was missing completely at random. A missing value analysis was carried out using SPSS and missing values replaced using the multiple imputation method in order to prevent non-response bias (Manly & Wells, 2014).

Findings from the Missing Data Analysis revealed that 15% (3) of the variables examined were complete and 85% (17) were incomplete. From the total cases reviewed, 71.65% were complete while 28.35% were incomplete. Of the total values, 95.92% were complete and 4.08% were incomplete. Each variable was examined for missing data. The dependent variable **satisfaction with life** was missing 9.4%. The independent variables **age**, **sex** and **total household income** had no missing values. Missingness from the demographic variables ranged from .0% to 4.1%. Missing cases from the social support variables were from .1% to 9.8%. The health-related variables missing values ranged from .3% to 10.6%, and the health behaviours variables from .8% to 14.6% (see Figure 3 below for analysis of missing data).

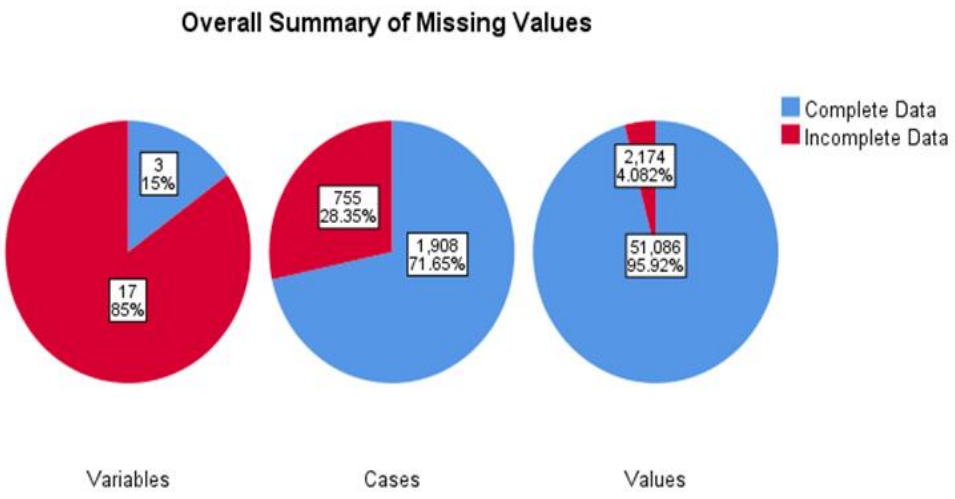


Figure 3 Missing Values Analysis

Figure 4 below depicts a diagram of the Pattern of Missing Values. The area of red represents missing values, while the white area represents non-missing. The pattern starts with those missing the least to those missing the most from left to right. The first three variables **sex, age**, and **total household income** have no missing values. Next is **marital status,** followed by the other varaibles. The **daily consumption of fruits and vegetables** variable had the largest amount of values missing, followed by the **BMI** variable, **sense of belonging to a local com**munity, and **strong emotional bond with at least one person**. No nonmonotone pattern exists after the reordering of the variables (IBM, 2019). Therefore, it can be concluded that the data is likely to be missing in a random pattern.

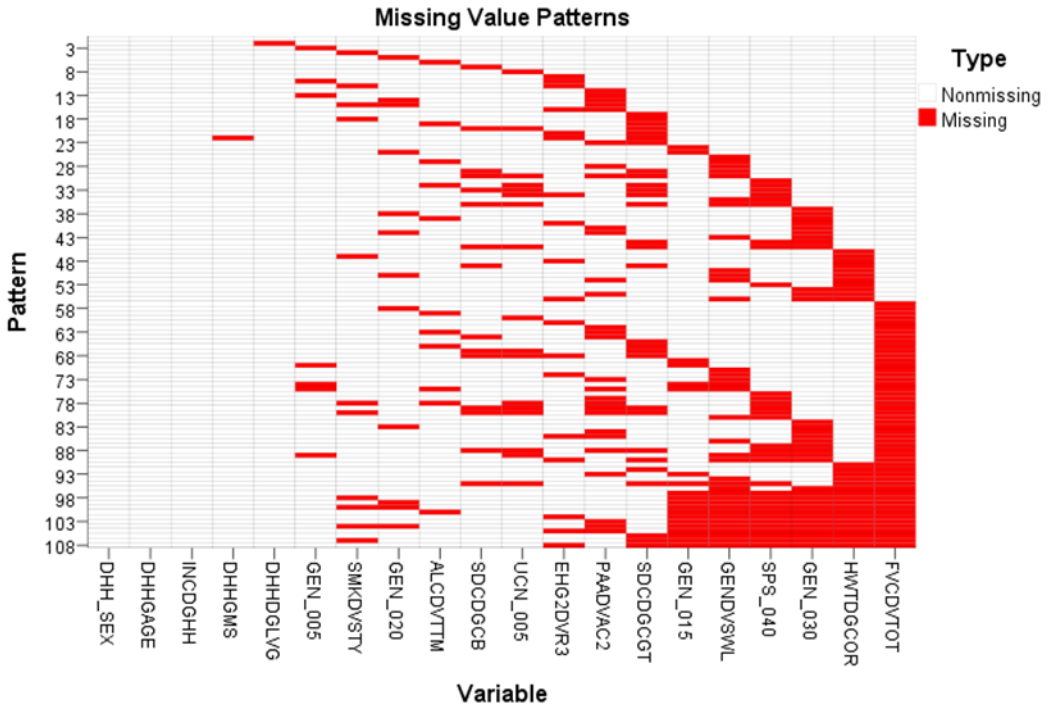


Figure 4 Pattern of Missing Values

Sex- DHH_SEX, Age - DHHGAGE, Total Household Income - INCDGHH, Marital Status - DHHGMS, Living/Family Arrangements - DHHDGLVG, Perceived Health - GEN_005, Smoking Status - SMKDVSTY, Perceived Life Stress - GEN_020, Type of Drinker - ALCDVTTM, Country of Birth - SDCDGCB, Unmet Healthcare Needs - UNC_005, Highest Educational Level Attained - EHG2DVR3, Alternate Physical Activity - PAADVAC2, Cutural/Racial Identity - SDCDGCGT, Perceived Mental Health - GEN_015, Satisfaction with Life in General - GENDVSWL, Strong Emotional Bond with at Least One Person - SPS_040, Sense of Belonging to a Local Community - GEN_030, Body Mass Index - HWTDGCOR, Daily Consumption of Fruits and Vegetables - FVCDVTOT.

The Missing Values Patterns Frequency graph (Figure 5) shows that pattern 1 was the most common pattern representing cases with no missing values. The other patterns were much less prevalent, and there does not appears to be a pattern as to how the values are missing. A number of patterns indicate that the missing values are located across multiple variables.

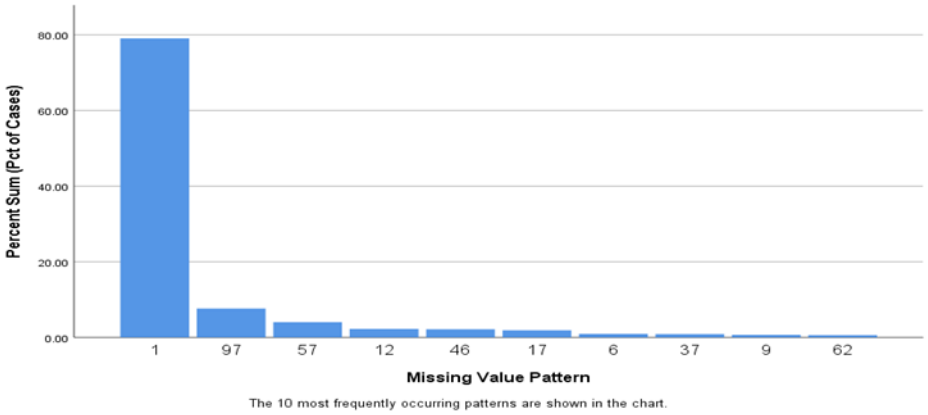


Figure 5 Missing Value Pattern Frequency Graph

Subsequently, SPSS was used to calculate Little's chi square statistic for testing whether values are missing completely at random (MCAR). Little's MCAR test tests the null hypothesis that the data is Missing Completely at Random (MCAR). A p-value less than 0.05 is usually interpreted as the missing data is not MCAR (IBM, 2019). Results of this statistic were χ^2 (19,844), df = 9, $p < .019$; therefore, the null hypothesis was rejected. There were no observed patterns in the missing data analysis. As a result, it is reasonable to assume that the missing data is missing at random (MAR). The reasons documented in the survey for missing values were primarily 'don't know,' 'not stated,' and 'refused.'

Sterne, White, Carlin, Spratt, Royston et al. (2009) stated that many researchers address missing data by only using complete cases, which leads to analyses that could be biased. These researchers cautioned that the effect of missing data in several variables often leads to exclusion of a substantial proportion of the original sample, which could in turn cause a notable loss of precision and power. Thus, it was imperative to handle the missing data efficiently. Multiple imputation was considered the best option for dealing with missing values for this study.

According to Graham (2012), multiple imputation is based on random draws from the population and reflects the randomness in each data set. The automatic method was selected for the procedure using SPSS Grad Pack Advanced version 26.0. All the predictor variables were included in the imputation procedure, and constraints were applied for the continuous variables **daily consumption of fruits and vegetables** and **BMI** using their minimum and maximum values. The dependent variable **satisfaction with life** was also included. Following recommendations by Graham (2012), 40 imputations were used for the final analysis to maximise imputation accuracy and minimize bias.

Descriptive Statistics. Descriptive statistics were used to summarize socio-demographic characteristics, social support variables, health perception variables, and health behaviours, including the health indicator BMI. Descriptive statistics were obtained using the imputed data. Frequencies, percentages, means, and standard deviations were reviewed to inspect the distributional properties of the data. Distributional properties were assessed for both unimputed and imputed dependent variables.

Bivariate Analysis. Bivariate analyses were conducted using the logistic procedure to examine associations between the outcome and predictor variables and to assess for multicollinearity among independent variables as this is an assumption of logistic regression.

Ordinal Logistic Regression. Ordinal Logistic Regression was undertaken to examine associations between satisfaction with life in general (the dependent variable) and 19 independent variables, including socio-demographic characteristics, health perceptions, health behaviours, and social supports. A goal of this analysis was to explore the extent that the above classification of variables explains variance in satisfaction with life in community dwelling older

adults. Referent categories were chosen for each categorical independent variable before entering into the model.

To determine if the model was a good fit, the likelihood-ratio test found in the model fitting information table was examined. The p-value should be < .05. The Deviance goodness-of-fit test was also examined for a significance of > .05. In addition, the Nagelkerke Pseudo R-square was utilized to evaluate the explained variance of the dependent variable in the final model (Laerd, 2015). See Appendix D for a table with the assumptions for regression models.

Evaluation of Assumptions of Logistic Regression. Assumptions of logistic regression were evaluated to ensure the results of the regression are valid. Four (4) assumptions are required: (a) there should be one dependent variable measured at an ordinal level, (b) there should be one or more independent variables at the continuous, ordinal, or categorical level, (c) there should be no multicollinearity (two or more independent variables highly correlated with each other), (d) there should be proportional odds. The proportional odds assumption means that each independent variable had an identical effect at each cumulative split of the ordinal dependent variable (Laerd, 2015). The ordinal dependent variable was recoded into three categories – very satisfied, satisfied, and neither satisfied nor dissatisfied/dissatisfied/very dissatisfied.

The study design allowed for the first two assumptions to be met. The test of multicollinearity using the linear regression procedure in SPSS statistics was conducted. All categorical variables with more than two categories were dummy coded to be made suitable to be entered into the model (Laerd, 2015). Tolerance levels were between .191 and .945 for the original data and between .146 and .932 for the imputed data. Variance Inflation Factors (VIF)

were 1.080 to 7.04 for the original data and 1.052 to 6.893 for the imputed data. To test for this assumption, the coefficients table must be examined. Tolerance values should be greater than 0.1 and/or the VIF less than 10 (Laerd, 2015).

A likelihood ratio test was conducted to evaluate whether the proportional odds assumption was met. While the original data met this assumption, the imputed data only met the criterion in 3 of the 40 imputations. As a result, I proceeded to examine cumulative splits of the proportional odds. Separate binomial logistic regressions were conducted on each cumulative split, which is the division or category of the ordinal dependent variable after it is dichotomized. This revealed the differences in the results for several of the cumulative splits. I then collapsed some categories and still found some differences in effects across the cumulative splits. However, the likelihood ratio test results indicated that the assumption was met in the original data (χ_2 (147) = 153.714, p = .336) and 3 of the 40 imputation files. I chose to be conservative with the full likelihood ratio test given that chi-square tests are known to produce small p-values in large samples. In addition, both the original data and 3 of the imputed datasets met the criterion.

Variable selection. Working with several independent variables can be quite daunting, especially when one desires to gain insight into which variables may be most important as predictors for the outcome variable. One must consider, am I going to retain all the variables or will I be trimming to retain the ones most relevant? Hosmer, Lameshow, and Sturdivant (2013) state that in selecting final variables, "the goal is to select those variables that result in 'best' model within the scientific context of the problem" (p. 89). A purposeful selection of variables is then required in order to proceed. Purposeful selection is the process by which investigators

examine a set of data and then build a multivariable regression model which gives the best fit (Hosmer and colleagues, 2013).

Hosmer and colleagues (2013) proposed that to achieve this goal of purposeful selection (i) there needs to be a basic plan for selecting the variables for the model, and (ii) a set of methods for assessing the adequacy of the model both in terms of its individual variables and its overall performance must be decided on (p. 89). The principles of Hosmer and Lemeshow's (2013) strategy guided the approach carried out in this study. All the covariates were entered into the ordinal logistic regression, the p-vales were examined, and the predictor variable with the highest p-value removed. The analysis was then redone, and the impact on the regression coefficients and p-values of the remaining variables were examined. The variable with the highest p-values was again removed, and whenever the removal of the last variable demonstrated a serious effect on the model, that variable was re-entered into the model. Hosmer and colleagues (2013) stated that we should be particularly concerned about any variable whose coefficients have changed markedly in magnitude - > 20%. They also suggested including all variables that are clinically and intuitively relevant in the model, regardless of statistical significance. Variables deemed useful to the model based on prominence in literature or usefulness of the information for this study were therefore retained. This iterative process of removing, examining, removing, and re-entering of variables was done until a model suitable containing essential factors was found (see Appendix E)

There is no perfect science in arriving at the final model. Hosmer and Lemeshow's (2013) technique offered a good strategy for purposeful selection, and this technique, though not comprehensively followed, guided my process of arriving at the final model. In the end my approach was a combination of different considerations, including a theoretical basis for

retaining certain variables. This approach led to arriving at the final model for this analysis. The final model consisting of 11 independent variables.

Ethical Considerations

Ethical consideration, guidance, and approval for this study was sought from the Research Ethics Board of Trinity Western University in Langley, British Columbia, in Canada; however, I was informed that this process was not necessary as the CCHS survey was a public use datafile. My study supervisors, first reader Dr. Sawatzky and second reader Dr. Wolff, reviewed this paper and provided guidance and support, ensuring ethical and other standards were met. According to the CCHS 2019 User Guide (Statistics Canada, 2019), participation in the survey interview was voluntary and verbal consent was obtained from each participant. Interviewers were well trained and personnel speaking multiple languages to enhance respondents' understanding of the process as well as the questions asked were employed. Secondary investigations are viewed as minimal risks.

Chapter Summary

In summary, data from the 2015-2016 CCHS public use file was utilized for this analysis. Descriptive, univariate, and bivariate analysis was used to display data. An ordinal logistic regression was conducted after assumptions were examined and the data found suitable. The missing data was significant and could not be ignored. Missing data was present in 85% of the variables, and 28.35% of the cases. Multiple imputation was carried out to deal efficiently with the missingness. A new dataset of 40 imputations was created to run the final analysis. A purposeful selection of variables led to the final model for this study. Ethical approval was not required from the Trinity Western University Research Ethics Board; however, ethical

considerations were considered throughout the process of this analysis. In the next chapter the findings of the analysis are described in detail.

Chapter Four: Findings

This investigation came about because of the desire to facilitate best outcomes for older adults in our society. In particular, it seeks to shed light on the factors that possibly explain or contribute to life satisfaction in this population. It is becoming more and more relevant to examine and consider the importance of these factors as we seek to mitigate impending challenges arising from an aging population. This study was designed to identify characteristics impacting LS in community dwelling older adults and to use a regression analysis to exhibit strengths of the associations. This chapter will describe the findings of the analysis which has been previously outlined. Sample description of the population is examined, followed by bivariate associations and the relationships of the covariates to the dependent variable life satisfaction. Assumptions pertinent to ordinal logistic regression are also discussed. The chapter closes with a summary of the overall findings.

Descriptive Statistics. In the sample of older adults, 53.3% were female and 46.7% male. There were four age cohorts. The age group 65-69 years made up the highest number with 36%, and 75-79 years old the lowest with18.7%. Among this population 65% had spouses. Of the 65% with spouses, 61.4% were married and 3.6% in common law relationships. Of those who were without spouses, 4.3% identified themselves as being single. Eighty-nine point nine percent of respondents identified as white and 72.4% of respondents were born in Canada. Twenty-three point five percent had less than secondary school education, and as many as 53.2% had achieved post secondary education, which includes certificates, diplomas, and university degrees. Only 4.7% of persons had less than $20,000 as total household income, with the largest group, 36.5%, reporting a total household income equal to or greater than $80,000 (See Table 2).

Table 2

Distribution of Socio-demographic Characteristics of Older Adults in Alberta from the Original Data

Variable	N	Valid %	Missing %
Sex			0
Female	1429	53.4	
Male	1249	46.6	
Age Category			0
65-69	964	36	
70-74	676	25.3	
75-79	500	18.7	
80 and older	538	20.1	
Marital status			0
Married	1630	60.9	
Common Law	93	3.5	
Separated/Divorced/Widowed	838	31.3	
Single	115	4.3	
Country of birth			1.5
Canada	1927	73	
Other	711	27	
Cultural/racial background			4.1
White	2311	90	
Non-White	258	10	
Highest level education attained			2.1
Less than Secondary School	622	23.7	
Sndry Sch Grad - no Post Sndry Ed	617	23.5	
Post Sndry Cert/Diploma/Degree	1384	52.8	
Total household income – all sources			0
No Income or < $20,000	134	5	
$20,000 to $ 39,999	607	22.7	
$40,000 to $59,999	566	21.1	
$60,000 to $79,999	394	14.7	
$80,000 and more	978	36.5	

Note. N = 2678. Sampling weights were used to produce population estimates (estimated population size = 3,510,293). Abbreviations: Sndry = Secondary. Sch = School. Grad = Graduation. Ed = Education. Cert = Certification.

The social support variables (Table 3) displayed 25.8% of 'unattached individuals living alone,' with the largest group of 55% 'living with spouse/partners.' For **sense of belonging to a local community**, 25.8% had a 'very strong' sense of belonging, and 47.3% 'somewhat strong'

sense of belonging. Forty-seven point one percent of persons 'strongly agreed' that they had a strong emotional bond to at least one person; 44.6% 'agreed' that they had a strong emotional bond with at least one person.

Table 3
Distribution of Social Supports Characteristics in Older Adults in Alberta using Original Data

Variable	N	Valid %	Missing %
Sense of belonging to a local community			9.8
Very strong	639	26.5	
Somewhat strong	1180	48.9	
Somewhat weak	392	16.2	
Very weak	204	8.4	
Living/family arrangements			.1
Unattached living alone	716	26.7	
Unattached living with others	88	3.3	
Individual living w spouse/partner	1457	54.4	
Parent living with spouse/partner & child (ren)	127	4.8	
Single parent living with child (ren)	84	3.2	
Child living w single parent w/out siblings	1	0	
Strong emotional bond with at least 1 person			9.5
Strongly Agree	1211	49.9	
Agree	1139	47	
Disagree	64	2.7	
Strongly Disagree	10	.4	

Note. N = 2678. Sampling weights were used to produce population estimates (estimated population size = 3,510,293).

In examining the descriptive statistics for the health perception variables, I observed that 15.5% of respondents reported perceived 'excellent' (general) health, and 33.9% 'very good.' Only 7.2% reported having 'poor' perceived health. Thirty-two point seven percent reported 'excellent' perceived mental health, and 36.2% 'very good.' Only 4.3% reported having 'poor' perceived mental health. Twenty-four point nine percent reported that they were 'not at all stressed' and 32.6% reported that life was 'not very stressful.' Eleven percent stated that life was

'quite a bit stressful,' and 2.1% as 'extremely stressful.' Only 1.8% of respondents perceived that they had unmet healthcare needs (see Table 4 for all the health variables).

Table 4
Distribution of Health Status Characteristics in Older Adults in Alberta using Original Data

Variable	N	Valid %	Missing %
Perceived health			.3
Excellent	408	15.3	
Very Good	900	33.7	
Good	836	31.1	
Fair	343	12.8	
Poor	182	6.8	
Perceived mental health			8.1
Excellent	850	34.5	
Very Good	928	37.7	
Good	550	22.3	
Fair	120	4.9	
Poor	15	.6	
Perceived life stress			.8
Not at all stressful	656	24.7	
Not very stressful	876	33.0	
A bit stressful	784	29.5	
Quite a bit stressful	287	10.8	
Extremely	54	2.0	

Note. N = 2678. Sampling weights were used to produce population estimates (estimated population size = 3,510,293).

Descriptive statistics for health behaviours variables revealed 8.6% of persons were currently daily smokers, and 2.1% were currently occasional smokers. Thirty-five point three percent reported that they were lifetime abstainers. Of this sample, 51.6% drank regularly, 17.4% drank occasionally, and 31.0% did not drink in the last 12 months of being interviewed. Sixty-two point six percent of respondents reported being active at various levels while 37.4% were sedentary. The mean number of fruits and vegetables consumed daily was 4.2, the minimum being .2, and the maximum 23.5 servings. The average **BM**I in this older adult population was 28.0, the minimum being 15.5, and maximum 51.34. Health Behaviours variables are outlined in

Table 5, except for the **daily consumption of fruits and vegetables** and **BMI** variables, which are described in Table 6.

Table 5

Distribution of Health Behaviour Characteristics in Older Adults in Alberta using Original Data

Variable	N	Valid %	Missing %
Unmet healthcare needs			2.1
Yes	49	1.8	
No	2573	96.1	
Alternate physical activity			4.2
Active	1010	39.4	
Moderately active	253	9.9	
Somewhat active	346	13.5	
Sedentary	957	37.3	
Type of drinker			1.3
Regular drinker	1350	51.1	
Occasional drinker	464	17.5	
Did not drink in last 12 months	830	31.4	
Smoking status			.8
Current daily smoker	235	8.8	
Currently occasional smoker	58	2.2	
Former daily smoker (now non-smoking)	979	36.8	
Former occasional smoker	91	3.4	
Experimental smoker (now non-smoker)	362	13.6	
Lifetime abstainer	934	35.1	

Note. N = 2678. Sampling weights were used to produce population estimates (estimated population size = 3,510,293).

Table 6

Distribution for Continuous Independent Variables

Statistics	**Daily Consumption of Fruits & Vegetables**	**BMI**
Mean (S.E.)	4.16 (.01)	27.98(.02)
Median	3.8	27.48
Variance	4.86	25.49
SD	2.20	5.05
Minimum	0	15.02
Maximum	23.5	51.34
Skewness (SE)	1.23 (.01)	.71 (.01)
Kurtosis (SE)	3.51(.02)	3.51(.02)
N	2032	2124
Missing	358	266

The ordinal dependent variable ***satisfaction with life*** had 39.7% being very satisfied with their life in general, 46.7% satisfied with their lives, 6.6% neither satisfied nor dissatisfied with their lives, 2.9% dissatisfied with their life, and 4.1% very dissatisfied. In essence, 85% of this population were categorized as being satisfied with their lives, and 15% were categorized as not being satisfied (consisting of very dissatisfied, dissatisfied and neither satisfied nor dissatisfied). Table 7 displays the distribution for this variable. Note Figures 6 and 7 also show the difference between the distribution for the original data and the imputed data. The imputed data showed a higher bar for the 'very dissatisfied' category than the 'dissatisfied' category versus the original data.

Table 7
Distribution of Dependent variable – Satisfaction with Life

Variable	N	Valid %	Missing %
(Categories 1-5)			9.4
Very Satisfied	1029	42.4	
Satisfied	1170	48.2	
Neither Satisfied nor Dissatisfied	152	6.6	
Dissatisfied	55	2.1	
Very Dissatisfied	20	.8	

Note. N = 2678. Sampling weights were used to produce population estimates (estimated population size = 3,510,293).

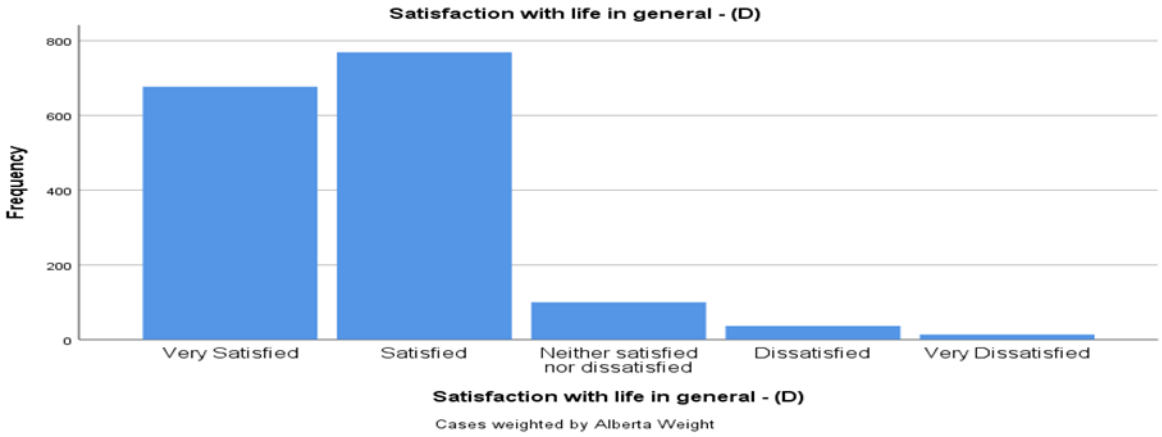


Figure 6. Distribution of SWL for Original Data

Figure 7. Distribution of SWL for Imputation x 40 Data

Associations Between Dependent and Independent Variables

Bivariate Associations. Bivariate analyses were conducted using the logistic procedure. The associations of all the health perception variables had p-values < .001, including perceived

mental health. Health Behaviours variables had p-values between .003 and .069, except **BMI** (p = .120) and **Smoking Status** (p = .950). All three social support variables had p-values < .001, including the **living/family arrangements** variable. Demographic variables p-values were between .005 and .747. These numbers were sometimes different when the categories were examined. Please see Table 8 below.

Table 8

Bivariate Associations of SWL Dependent Variable and Covariates using the Original Data

Variables	**Wald Chi-Square**	**df**	**P-value**
Demographics			
Sex	7.494	1	.006
Marital Status	10.641	3	.014
Age	11.782	3	.008
Highest Level of Education	8.864	2	.012
Country of Birth	.104	1	.747
Cultural/Racial Identity	7.801	1	.005
Total Household Income	7.194	4	.126
Health Perceptions			
Perceived Health	148.777	4	.000
Perceived Mental Health	77.297	4	.000
Perceived Life Stress	137.069	4	.000
Social Supports			
Living/Family Arrangements	24.351	5	.000
Sense of Belonging to a Local Community	58.066	3	.000
Strong Emotional Bond to at Least One Person	19.262	3	.000
Health Behaviours/Indicators			
Smoking Status	1.149	5	.950
Type of Drinker	10.514	2	.005
Alternate Physical Activity	10.490	3	.015
Body Mass Index (BMI)	2.413	1	.120
Daily Consumption of Fruits and Vegetables	8.949	1	.003
Perceived Unmet Healthcare Needs – 12 months	3.313	1	.069

Variable Selection. Variables for the final model were arrived at by purposeful selection (refer to Appendix E for details). According to Hosmer, Lemeshow et al. (2013), the goal was to select those variables that resulted in the best model. An ordinal logistic regression was run utilizing all nineteen (19) independent variables and the ordinal dependent variable **satisfaction with life**. Coefficients of all the categories of all 19 variables were carefully examined and p-values noted. As a result, the following five variables were identified as not explaining variation in LS: **smoking status**, **country of birth**, **BMI, total household income**, and **unmet healthcare needs** (self-perceived). As **smoking status** had the largest p-values, this variable was removed.

After removal of the mental health variable, a sizeable change was noted for several of the other variables, notably perceived general health. This suggests that the mental health variable had a non-ignorable impact on the model. Hosmer and Lameshow et al. (2013) suggest retaining variables when removal results in more than 20% change in coefficients of other variables. After the **perceived mental health** variable was re-entered, the **BMI** had the largest p-value and appeared to be non-contributory to the model and so was removed. The **living/family arrangement** variable was then removed from the analysis in Round 5, and the **marital status** variable from Round 6 using the same procedure.

The **country of birth** variable had the largest p-value in Round 7, and the **strong emotional bond variable** in Round 8, and both were removed, accordingly. Even though the p-value of **unmet healthcare needs** had decreased relative to previous rounds, this variable still had the largest and was subsequently removed in Round 9, and the **type of drinker** variable was removed in Round 10. After removal of the **cultural/racial identity** variable in Round 11, differences in coefficients from this round with the previous round were negligible. At this point

there was no category of the **total household income** variable with a small p-value, so it was removed in Round 12 in line with Hosmer and Lameshow's (2013) strategy.

After careful examination of all the rounds, it was noted that the difference in Rounds 5 and 6 as well as in Rounds 7 and 8 were of concern in the movement of coefficients of some of the variables. The models resulted in changes greater than 20% of coefficients for some of the variables. As a result, I was not convinced that the **marital status** and **strong emotional bond** variables should have been removed from the model. The **marital status** variable was reintroduced in Round 13, and the **strong emotional bond** variable in Round 14. I was then satisfied that all the variables that were relevant and had significant bearings on the outcome variable were retained.

Of interest to the researcher was the age variable, which was kept in the analysis despite large p-values. The differences between age cohorts in this study was be noted. The **perceived mental health** variable, as mentioned earlier, was also retained despite large p-values. **Perceived mental health** is a predictor much encountered in the literature regarding the study of satisfaction with life. The mental health of older persons is also of much concern. Furthermore, I observed that removal of this variable resulted in substantial changes (>20%) in the regression coefficients of other variables, notably perceived health. For these reasons, the mental health variable was also retained.

The variables **country of birth, cultural/racial identity, total household income, type of drinker, smoking status, unmet healthcare needs, BMI, and living/family arrangements** were excluded based on purposeful selection. The final model included the following predictor variables: **sex, age, marital status, highest level of education, perceived general health,**

perceived mental health, perceived life stress, alternate physical activity, daily consumption of fruits and vegetables, sense of belonging to a local community, and strong emotional bond to at least one person.

Ordinal Logistic Regression. An ordinal logistic regression with proportional odds was performed to determine the effect of socio-demographic characteristics, health perception, health behaviours, and social support variables on **satisfaction with life in general**. A likelihood ratio test provides support for the proportional odds assumption (χ_2 (90) = 74.003, p = .89). The Pearson goodness-of-fit test indicated that the model was a good fit for the observed data, χ_2 (5786) = 5559.189, p = .98 and Deviance χ_2 (5786) = 2859.331, p = 1.000 for the original data. For the imputed data, the Deviance goodness-of-fit was χ_2 (7282) = 4233.011, p = 1.000.

The final model statistically predicted the dependent variable over and above the intercept-only model, χ_2 (30) = 848.039, p < .001 (see Table 9). The Nagelkerke Pseudo R Square was 42.4% for the original data, and 35.7% - 54.2% for the imputed data. Of the 40 imputations the mean Nagelkerke Pseudo R-Squared was 43.8%. This result means together the independent variables in the final model predicted 43.8% (42.4% of original data) of the variance in the dependent variable. This also suggests that as much as 56.2 % of variance in our outcome variable could not be explained by the predictor variables selected in this model.

All categories of the health perception variables had positive coefficients. Under **perceived general health**, ‘excellent,’ ‘very good,’ ‘good,’ and ‘fair’ had odds ratios ranging from 12.52 (p = < .01, 95% CI [4.73, 33.28]), to 2.24 (p = .07, 95% [0.93, 5.38]) (see Table 9). For those having ‘excellent health,’ the odds of being more satisfied with life were 12.51 relative to those who reported having poor health (OR = 12.52, p = < .01, 95% CI [4.73, 33.21]). Those

who reported ‘very good’ health were more likely to be satisfied with life than those with ‘poor health’ (OR = 6.44, p = < .01, 95% CI [2.48, 16.99]). For respondents who reported ‘good health,’ the odds were greater than those reporting ‘poor health’ to be at a higher level of the dependent variable (OR = 3.78, p = .01, 95% CI [1.54, 9.43]). Even those who only reported their health being ‘fair’ were more likely to be more satisfied with life than those reporting having ‘poor health’ (OR = 2.24, p = .07, 95% CI [0.93, 5.38]).

The **perceived mental health** variable had a somewhat surprising result based on the prevalence of mental health as an important variable explaining variation in life satisfaction among older adults in the literature. The p-values were actually quite large in the final model (p-values: .22-.96. See Table 9). This result means there is much uncertainty about the extent to which this variable explains variance in the dependent variable over and above the other variables that are included in the model. However, the **perceived mental health** variable was retained because its exclusion resulted in substantial changes in coefficients of several other independent variables.

In terms of minimal stress experienced by older adults, there is a positive effect on LS. For **perceived life stress**, for the categories ‘not at all stressful,’ ‘not very stressful,’ and a ‘bit stressful,’ respondents tended to fall on a higher level of the dependent variable than those who were ‘quite a bit/extremely stressful.’ Respondents who reported that life was ‘not at all stressful’ were more satisfied with life than those who reported ‘quite a bit/extremely stressful’ (OR = 4.98, p = < .001, 95% CI [3.10, 8.15]). Those who stated ‘not very stressful’ were at greater odds of being more satisfied with life than those in the referent categories (OR = 2.89, p = < .001, 95% CI [1.86, 4.5]). Those who reported that life was ‘a bit stressful’ were still more satisfied with life (OR = 1.71, p = < .001, 95% CI [1.71, 1.21]).

Objective #1 was to *examine whether a relative improved satisfaction with life is explained by better perceived general health, better perceived mental health, and lower perceived life stress.* All three variables were in the final model (see Table 9). A relative improved satisfaction with life was explained by better **perceived general health**, and better **perceived mental health**, as well as lower **perceived life stress**. Health has a positive relationship with LS in that better general and mental health were strongly associated with life satisfaction. Life stress was inversely predictive of LS in that higher stress predicted lower LS. However, although mental health was positively associated with life satisfaction in the bivariate analyses, the strength of association was not maintained in the context of all the other independent variables in the model.

Table 9

Health Perception Parameter Estimates

Pooled Parameters	**B**	**SE**	**P-value**	**Odds Ratio**	**95% Wald Lower**	**CI Upper**
Gen Health						
Excellent	2.53	.49	.00	12.52	4.73	33.28
Very Good	1.86	.48	.00	6.44	2.48	16.99
Good	1.33	.45	.01	3.78	1.54	9.43
Fair	.81	.44	.07	2.24	0.93	5.38
Poor (referent)						
Mental Health						
Excellent	1.81	1.46	.22	6.14	0.32	118.71
Very Good	1.12	1.46	.45	3.08	0.16	58.21
Good	.56	1.40	.69	1.75	0.10	29.92
Fair	.08	1.43	.96	1.08	0.06	19.18
Poor (referent)						
Life Stress						
Not at all Stressful	1.60	.24	.00	4.98	3.10	8.15
Not Very Stressful	1.06	.22	.00	2.89	1.86	4.50

A bit stressful	.54	.18	.00	1.71	1.21	2.48
Quite a Bit/Extremely Stressful (referent)						

B – Coefficients. SE – Standard Error. CI – Confidence Interval.

Objective # 2 was to *examine whether a relative higher satisfaction with life is explained by having fewer unmet healthcare needs and fewer indicators of poor health (i.e., cigarette smoking, high alcohol intake, low consumption of fruits and vegetables, and a high Body Mass Index (BMI)).* The regression analysis indicates that **unmet healthcare needs** did not predict life satisfaction. Although the **smoking status** and **type of drinker** variables were associated with decreased life satisfaction in the bivariate analyses, the association was not maintained in the context of all the other independent variables in the final model. **BMI** was non-contributory to the final regression model and thus not associated with LS. One predictor of life satisfaction was **daily consumption of fruits and vegetables** (see Table 10). Leaving them in the model was important in explaining LS; however, the behaviours of the predictive nature of these variables on LS remains unanswered. An increase in **daily consumption of fruits and vegetables** was associated with an increase in the odds of being more satisfied with life (OR 1.08, p = .01, 95% CI [1.02, 1.14]). This model demonstrated that a relative higher satisfaction with life was explained by greater **daily consumption of fruits and vegetables**. However, it did not demonstrate associations with **smoking status** and **type of drinker** variables, as well as with **BMI.**

Objective # 3 was to *examine whether a relative higher satisfaction with life is explained by being more physically active.* The variable for physical activity was **alternate physical**

activity, which was measured on a 4-point scale (active/moderately active/somewhat active/sedentary). The final model revealed that being physically active (highest rating) predicted satisfaction with life (see Table 10). Specifically, the odds ratio of those who were active being satisfied with life was 1.34 (p = .02, 95% CI [1.04, 1.72]). The moderately and somewhat active ratings, while positively associated with LS, were less conclusive as a predictor. For moderately active, the OR was 1.08 (p = .62, 95% CI [0.75, 1.59]), and for somewhat active, the OR was 1.34 (p = .11, 95% CI [0.93, 1.14]). Overall, the model demonstrated that a relative higher satisfaction with life was associated with being more physically active.

Table 10

Health Behaviours Parameter Estimates

Pooled Parameters	**B**	**SE**	**P-values**	**Odds Ratio**	**95% Lower**	**Wald CI Upper**
Alternate physical activity						
Active	.29	.13	.02	1.34	1.04	1.72
Moderately active	.09	.19	.62	1.10	0.75	1.59
Somewhat active	.29	.18	.11	1.34	0.93	1.92
Sedentary (referent)						
Daily consumption of fruits & vegetables	.08	.01	.01	1.08	1.02	1.14

B – Coefficients. SE – Standard Error. CI – Confidence Interval.

Socio-demographic characteristics (Table 11) had mixed results in explaining LS. Those meaningful in predicting LS were **sex** and **highest level of education**. Most of the literature reported older females having greater life satisfaction than males; thus, my study produced a

contrasting finding. Those attaining up to secondary school education were more likely to be satisfied with life than those with less than secondary, as well as those with greater than secondary school education. Being married as well as being younger than 80 years old had a positive association with being more satisfied with life. **The total household income, cultural/racial identity,** and **country of birth** variables were excluded from the final model of the regression analysis. Therefore, this study was not able to fully meet objectives containing those variables. Regarding all the socio-demographic variables, being male and having up to secondary school as **highest level of education** predicted satisfaction with life.

Specifically, objective # 4 relates to being female, lower age, and marital status (see table 11): *to examine whether a relative higher satisfaction with life is explained by being female, a lower age, and having a significant other/married.* In this sample males were more satisfied with life (OR = 1.45, p = .00, 95% CI [1.14, 1.18]). The odds of males being more satisfied with life were 1.45 that of females. In comparison to those 80 years or older, younger people had greater odds of being satisfied with their lives. However, the p-values and corresponding confidence intervals pertaining to these comparisons were large. The odds of married older adults being satisfied with life were also higher than those of seniors who were single (OR = 1.17, p = .74, CI [.46, 2.95]), and respondents who were in common law relationships or those who were divorced/widowed/separated were observed to be less likely to be satisfied with life as opposed to singles. However, again the p-values and confidence intervals pertaining to these comparisons were large.

Objective # 5 relates to income, and education: *to examine whether a relative higher satisfaction with life is explained by a higher level of education and higher income.* Higher income showed a positive correlation in the bivariate analyses; however, **total household**

income was not included in the final model and was not predictive of LS in the sample. Having a higher level of education was positively associated with greater LS. Having post secondary school education was also positively associated with LS in the bivariate analyses, though large p-values in the final regression analysis indicate that these variables are unlikely to explain variance over and above other independent variables. Educational attainment of less than secondary school was related to being less satisfied with life, as opposed to those with higher than secondary school level education (OR = 1.33, p = .04, 95% CI [1.02, 1.72]). In other words, higher levels of education were associated with greater life satisfaction. Those who had secondary school education were at greater odds of having a higher satisfaction with life in contrast with those holding post secondary school certificates/diplomas or degrees (see Table 12).

Objective # 6 is t*o examine whether a relative higher satisfaction with life is explained by self-identifying as White and being born in Canada*. These variables were not included in the final model after purposeful selection as they were unlikely to be associated with life satisfaction. In other words, the results suggest that ethnicity and country of birth are not predictive of LS in elderly Albertans.

Table 11

Sociodemographic Parameter Estimates

Pooled Parameters	**B**	**SE**	**P-value**	**Odds Ratio**	**95% Wald Lower**	**CI Upper**
Sex						
Males	.37	.12	.00	1.45	1.14	1.84
Female ((referent)						

Age						
65-69 years	.16	.20	.42	1.17	.79	1.72
70-74 years	-.01	.20	.98	0.99	.67	1.49
75-79 years	.31	.26	.23	1.36	.82	2.27
80+ years (referent)						
Marital Status						
Married	.16	.46	.74	1.17	.46	2.95
Common Law	-.423	.50	.40	0.66	.24	1.77
Wi d/div/sep.	-.23	.48	.64	0.80	.30	2.08
Single (referent)						
Highest Level Education						
< Secondary School	-.08	.16	.60	0.92	.68	1.26
Secondary School	.28	.13	.04	1.33	1.02	1.72
Post Secondary (referent)						

B – Coefficients. SE – Standard Error. CI – Confidence Interval. Wid/div/sep – Widowed/divorced/separated.

Objective # 7 made assumptions about the social support variables: *to examine whether a relative higher satisfaction with life is explained by having greater social support (i.e., sense of belonging to a local community, having a significant bond with at least one person, and living arrangements in a social environment).* This objective was partially met in that the social support variables demonstrated a positive association with being satisfied with life. The **living/family arrangements** variable, however, was removed during purposeful selection, and so was not evaluated in the final model. Having a **strong emotional bond to at least one person** and having a **strong sense of belonging to a local community** were strongly and positively

associated with being satisfied with life overall, and the latter was also a predictor as displayed in Table 12.

Respondents having a **strong sense of belonging to a local community** were more likely to be satisfied with life, while those who did not have a strong sense of belonging to a local community tended to be less satisfied with life. Those having a strong sense of belonging to a local community had an odds ratio of 3.32 ($p < .01$, 95% CI [1.83, 6.06]) in being more satisfied with their lives, relative to those who had a weak sense of belonging to their local community. Those who reported that their sense of belonging to a local community was 'somewhat strong' in regard to being satisfied with life were at 2.14 ($p = .02$, 95% CI [1.16, 3.96]) more odds than those with weak sense of belonging for being satisfied with life, and the odds of those whose sense of belonging was somewhat weak were 1.38 ($p = .32$, 95% CI [0.72, 2.66]) of those who had a weak sense of belonging to a local community. Respondents who strongly agreed that they had a **strong emotional bond to at least one person** tended to have a higher satisfaction level than those who did not. However, the p-values ranged from 0.09 to 0.48, which indicates there is much uncertainty about the extent to which this variable predicts life satisfaction over and above the other variables that are included in the model.

The **living/family arrangements** variable was excluded from the final model due to high significance levels. **Strong emotional bond to at least one person** and the **sense of belonging to a local community** were retained, with the sense of belonging showing statistical importance. I conclude that a relative higher satisfaction with life is explained by having a **strong emotional bond to at least one person,** and especially having a **strong sense of belonging to a local community**.

Table 12

Social Supports Parameter Estimates

Pooled Parameters	B	SE	P-value	Odds Ratio	95% Lower	Wald CI Upper
Sense of Belonging to a Local Community						
Strong	1.20	.30	.00	3.32	1.83	6.06
Somewhat Strong	0.76	.305	.02	2.14	1.16	3.96
Somewhat weak	0.32	.324	.32	1.38	0.72	2.66
Weak (referent)						
Strong Emotional Bond to at Least One Person						
Strongly agree	1.56	.897	.08	4.77	0.78	29.28
Agree	1.24	.867	.16	3.44	0.60	19.75
Disagree	0.73	1.032	.48	2.08	0.26	16.62
Strongly Disagree (referent)						

B – Coefficients. SE – Standard Error. CI – Confidence Interval.

Evaluation of Assumptions of Ordinal Logistic Regression. Evaluation of the assumptions of ordinal logistic regression was satisfactory to proceed with the analysis. The first and second assumptions were met based on study design, as the model consisted of one ordinal dependent variable and 19 independent variables, which were a combination of continuous and categorical. There was no multicollinearity as revealed by Variance Inflation Factors (VIF) of 1.080 to 7.04 for the original data, and 1.052 to 6.893 for the imputed data. According to Laerd (2015), VIF needs to be less than 10 to meet this assumption. The assumption of proportional

odds was not met as assessed by running binary logistic regression on separated dichotomous dependent variables as the odds ratios were not the same for each model ran.

Ordinal Dependent Variable. The ordinal level ***satisfaction with life*** variable has categories from 1-5 in descending order, thus meeting the first assumption for an ordinal logistic regression (Laerd, 2015). To make this variable more suitable for an ordinal logistic regression, the last three categories were combined to form the third category. In the end the dependent variable was entered into the model having three categories.

Independent Variables. The second assumption requires that the model be comprised of one or more independent variables, which could be continuous, ordinal, or categorical (Laerd, 2015). Nineteen (19) indicator variables were selected for the initial analysis, two were continuous, four nominal, and the remainder categorical. The choice of variables was based on study purpose and design and their availability in the CCHS datasets.

Multicollinearity. There was no evidence of multicollinearity as assessed by Variance Inflation Factors (VIF) less than 10 for the original data and across all 40 imputations. The highest correlation between predictors was .7042 for the original data and 6.893 for the imputed data; thus, multicollinearity was ruled out.

Proportional Odds. The assumption was not fully met based on a full likelihood ratio test of the imputed data. Interestedly, the results were met using the original data. Results: χ_2 (147) = 153.714, p = .34 and after arriving at the final model χ_2 (90) = 74.005, p = .89. Of the imputed data two (2) of the forty (40) datasets met this assumption. Due to the volume of datasets being used for the final analysis, I believe one can be conservative with this test given that the original dataset as well as some of the imputed datasets satisfied this assumption. A

pooled result was not provided. As this assumption was not clearly met on all or most of the imputed dataset, I would caution readers in evaluating the predictive acuity of the results.

Chapter Summary

In the current study, females numbered only slightly more than males. In 2015-2016 most older adults in the Province of Alberta were 65-69 (36%) years old, followed by the 70-74 (25.3%) age group. Most persons had spouse/partners, were White, born in Canada, had post secondary education, and had total household income above $39,999. More than half of respondents were living with spouses/partners, but as many as 25.8% were unattached and living alone. Most respondents believed they had good general and mental health and were 'not unduly stressed.' Many persons had quit smoking by this age but drank alcohol. Almost half were active; however, the percentage of those sedentary was as high as 37.4%. The mean servings of fruits and vegetables consumed daily were about four. These findings reveal 85% of respondents were satisfied with their lives while 15% were not.

This study examined life satisfaction in community dwelling older adults. The aim of the study was to determine the extent to which variability in the life satisfaction of older adults can be explained by general health (perception and other), health behaviours (that are indicative of health status), socio-demographic, and social supports variables. This aim was accomplished by conducting an ordinal logistic regression with the dependent variable ***satisfaction with life in general*.** The complete model accounted for a total of 43.8% variation in SWL, which equates to a medium effect size (Sullivan & Feinn, 2012).

Males and those between 65-69 and 75-79 years old were observed to have greater odds of being satisfied with life, as well as those with better **perceived general** and **mental health**

and those describing their lives as not very stressful. A ‘strong’ and ‘somewhat strong’ sense of **belonging to a local community** showed statistical importance for being satisfied with life. ‘Strongly agree,’ ‘agree,’ and even ‘disagree’ all contributed to higher odds of being satisfied with life than ‘strongly disagree.’ In having a **strong emotional bond to at least one person,** all contributed to higher odds of being satisfied with life. Being active as well as eating more fruits and vegetables daily was positively associated with being more satisfied with life with p-values less than 0.05. From this analysis, it can be seen that the model predicting 43.8 % of variance in satisfaction with life among older adults is explained by the explanatory variables present in the final model of this study.

The next chapter will discuss and summarize the findings according to the classifications of variables explored and in relation to existing literature. I will also raise theoretical arguments in light of the current results and appropriate Roy’s (1976) model of adaptation to the concept studied.

Chapter Five: Discussion

In this chapter, findings will be considered in the context of previous research. The aim of this study was to determine which factors explained life satisfaction in community dwelling older adults by examining health (perception and other), health behaviours (that are indicative of health status), socio-demographics, and social support variables. Findings from this study have shown that socio-demographics, social supports, health perceptions, and health behaviours contribute importantly to the LS of community dwelling older adults. I will compare these findings with existing literature and consider how the results relate to the theoretical framework of this paper.

Summary of Findings

This study of a cross-section of community dwelling older adults living in Alberta in 2015-2016 found that the majority were satisfied with life (85%). The sample was comprised of both sexes with approximately two-thirds over 70 years of age (64%) and married (61%). Almost three-quarters were born in Canada (71%) and 90% identified as White. Just over half had post secondary education (53%) and had a household income greater than $60,000 (51%). According to Statistics Canada (2019), these results are representative of the population in Alberta. Of the 19 independent variables examined, eleven variables were retained in the final model, with six of the variables being uniquely predictive of LS (having p-values < .05): four socio-demographic, three perceived health, two health behaviors, and two social support variables. In this section, I will discuss the importance of each variable in consideration of the literature and explicate the theory being used in this study to explain life satisfaction.

Socio-demographics. The socio-demographic variables that predicted LS were **sex** and **highest level of education**. In terms of **sex**, males were more likely than females to be satisfied with their life (OR=1.44); that is, men had 1.44 greater odds of being more satisfied with their lives than women. Individuals who attained up to secondary school education had 1.32 odds of greater LS than those with higher than secondary school education. Respondents who had less than secondary school education tended to be less satisfied with life. Age and marital status were retained as important explanatory variables, even though their direct associations with life satisfaction could not be confirmed after accounting for all other variables in the final model. This was as a result of their accompanying p-values as reflected in table 11.

There were other socio-demographic variables from this study that did not show association with LS. These were **cultural/racial identity** and **country of birth**. Earlier rounds of analyses however showed that being modestly secure financially had a positive correlation to being satisfied with life. Although several socio-demographic variables were included as part of the final model, the findings were inconclusive in terms of their influence on life satisfaction. While **age** and **marital status** may play an important role in explaining LS, they could not be confirmed as independent predictors. Being male and having up to secondary school education were predictive of satisfaction with life in this sample.

Health Perception. All three health perception variables in the final model were associated with LS in the bivariate analyses, but only **perceived general health** and **perceived life stress** contributed to the explained variance in life satisfaction over and above all other independent variables in the final model. Recalling that most older adults in this sample reported excellent (15%) and very good (34%) health, this result was also a predictor of life satisfaction. Relative to those with poor health, those with excellent health had 12.5 and those with very good

health 6.4 greater odds of LS. It would appear that the impact of **perceived (general) health** on satisfaction with life in older adults is quite large.

Life stress can seriously impact one's health. More than half of the older adults in this sample reported their lives to be 'not at all stressful' (24.7%) or 'not very stressful' (33%). This result was also a predictor of LS. Those whose life was not at all stressful had 4.98 and those with not very stressful had 2.98 greater odds of LS than those who responded 'quite a bit/extremely stressful.' Older adults need to be considered and listened to in order for others to become aware of the issues that cause them distress. Enabling this population where there are deficits and supporting them in living full engaged lives will help to reduce their stress and maintain LS.

Older adults with 'excellent' **perceived mental health** (34.5%) and 'very good' **perceived mental health** (37.7%) had greater odds of having satisfaction with life than those having 'poor' **perceived mental health**. There is no doubt that **perceived mental health** is an important variable in explaining the dependent variable and has a positive association with life satisfaction despite its large p-values in the final model. This importance was demonstrated by the sizeable change noted in the parameter estimates of the other variables in the model when this variable was removed during the variable selection process, notably in **perceived general health**. As a result, this variable was immediately re-entered back into the analysis. In addition, the **perceived mental health** variable had a p-value of .00 in the bivariate analysis depicted in table 8. However, the significance level was not maintained through to the final model in the regression analysis. On account of these findings, it can be summed up that most of these community dwelling older adults were in good general and mental health and were experiencing

low levels of life stress. In this study having excellent/very good general health and a lower stress level were predictive of older adults being satisfied with life.

Health Behaviours and Mobility. In terms of various health behaviours, I sought to examine the influences on LS in older adults in terms of physical activity, fruit and vegetable intake, smoking and drinking habits, **BMI**, and **perceived unmet healthcare needs**. Those that were predictive of LS included **daily consumption of fruits and vegetables** and **alternate physical activity**. Being active was predictive of LS; compared to those who were sedentary, older adults who were active (39.4% of sample) had 1.34 odds of having greater LS. Based on this information, physical activity is important for achieving higher satisfaction with life.

An increase in daily consumption of fruits and vegetables was also associated with being satisfied with life. **Type of drinker** and **smoking status** did not demonstrate an important bearing on satisfaction with life and thus the variables representing these health behaviours were excluded from the final model as was **perceived unmet healthcare needs**. Of the variables representing health behaviours and mobility, **alternate physical activity** proved to be an important predictor.

Social Support. In this study, only two of the three variables for social support showed important associations with LS. First, having a **strong sense of belonging to a local community** was predictive of being satisfied with life among these older adults. With 26.5% of persons having a '**strong' sense of belonging to a local community** and 48.9% having a 'somewhat' **strong sense of belonging**, most older adults had 3.32 to 2.14 odds of having greater LS than those who lacked this sense of belonging. In addition to social networks that older adults immerse themselves in, such as attending places of worship and volunteering for a cause, support

could be developed by helping them get connected to senior groups in the community involving various activities such as exercise, art, crafts, and other form of leisure. Older persons also want to give back to society and could be utilized in various industries where the relationship could be mutually beneficial.

The second social support variable, having a **strong emotional bond to at least one person,** was also associated with LS in the bivariate analyses. Half of the respondents strongly agreed they had a **strong emotional bond to at least one person**. In the final model, relative to those who 'strongly disagreed' with having a **strong emotional bond to at least one person**, those who 'strongly agreed' had 4.77 times and those who agreed had 3.44 times greater odds of having higher LS. However, the p-values and confidence intervals of these odds ratios were large, indicating that direct associations with life satisfaction were not confirmed after accounting for all other variables.

Relationship to Literature

The available literature on LS in older adults is ample, and studies have examined various predictors in different parts of the world. This paper gives insight into the factors found to explain life satisfaction in one of North America's older adult populations. Much of the findings support what was found in the literature review, while some results are dissimilar. I will discuss the findings that were similar, dissimilar, and inconclusive. Comparison to literature is done according to the classification of variables examined in this study.

Socio-demographic Variables. Some of the findings for the socio-demographic variables were dissimilar to what was uncovered during the literature review, in particular, the variable. Uppal and Barayandema (2016) found that women had higher LS than men among

seniors. That was not the case for the subpopulation in this study, with older men being more satisfied than their female counterparts. Males also reported less wellbeing in a study by Miret and colleagues (2014). Macia and colleagues (2015) among others found older women to be more satisfied with life than older men. In my study, being male was associated with greater odds of LS; men were 45% more satisfied with life ($p = .00$, CI [1.14, 1.84]).

The literature showed mixed findings for education as a predictor of LS. Education can place persons in better economic positions and can be related to healthy behaviours as well as happiness. A fair amount of studies included education as an explanatory variable for life satisfaction. In this study, education was predictive of LS. It is interesting to note also that the group which had only up to secondary school education had greater LS than those attaining post secondary school education. Uppal and Barayandema (2016) reported that higher levels of education were associated with lower LS. These findings would indicate that while education was important it did not necessarily guarantee a higher level of LS in older adults. Lee and Lee (2013) found in their study of older adults in South Korea that the wellbeing of less educated respondents was influenced by demographic factors. In this study most respondents had post secondary education, yet this group was less likely to be satisfied with life as opposed to those who had only up to secondary school education. This finding is somewhat similar to existing literature as Miret, Caballero et al. (2014), in a cross-sectional study involving households from Finland, Poland, and Spain, found that respondents with higher education reported less wellbeing. In contrast, Jeangros and Zimmerman-Sloutskis (2016) found higher education to be a positive and significant predictor of LS in elderly women living in Switzerland. Chehregosha, Bastamina, Vahidian, Mohammadi, Aghaeinejad et al. (2016) purported that higher levels of education provide aged individuals with better economic conditions, a feeling of efficacy, and a

more realistic outlook on life processes, which in turn affects LS. In my study, education predicted satisfaction with life, but the group attaining the highest level of education were not more satisfied than those attaining education only up to secondary school level.

Marital status and companionship are often included in studies as part of the socio-demographic characteristics of the population being studied as it is useful to determine if they elicit a causal effect. Some of these variables can act as mediators to the construct under study. In the current study, I found that married seniors were likely to be more satisfied with their lives; however, this association was not supported in the final model, with p-values ranging from .40 to .74. A greater LS was also noted among married seniors in the literature. Studies indicate that the lack of a spouse or partner is associated with lesser wellbeing in a variety of settings (Litwin and Stoeckel, 2012), and a satisfying relationship appears to have a powerful protective role of high wellbeing (Waldinger, 2016). In summary, generally persons who are married have higher satisfaction with life. Chehregosha, Bastamina, Vahidian et al. (2016) reported that Fernandez-Alfonzo (2012) found that older women who did not have a stable partner had lower scores on the life satisfaction scale and that a higher degree of LS was observed among the married elderly. As people age social losses become part of the milieu, often including loss of a spouse. One can understand how those widowed/divorced/separated would be less satisfied with life.

Even with increased social losses and reduced physical abilities, and sometimes cognitive and functional decline, these older adults were still mostly satisfied with life. Some studies reported a lower LS score among the older seniors. Studies examining LS on the whole usually report higher LS among older adults. In this study 85% of older adults reported being satisfied with life.

Health Perception Variables. Prevalent in literature is the correlation of health, self-perceived or otherwise, with satisfaction with life. These variables are commonly examined in older adults. Many social determinants of health can have bearings on people's physical and psychological health; however, this study explored if perceived general and mental health as well as perceived life stress explained satisfaction with life.

Having good general health increased satisfaction with life in the population studied. Strine and colleagues (2007) found that as the level of LS decreased, the prevalence of fair/poor general health and disability increased. Other researchers also reported good self-perceived health predicting satisfaction with life and that significant differences in LS scores were found by number and type of disease and subjective health (Burton-Jeangros and Zimmerman-Sloutskis, 2014; Dumitrache, Rubio, et al., 2016; Pintoa, Fontaineb, Liberalesso Neri, 2016; Lim, Min, Thorpe, et al., 2016; Kim and Sok, 2013). Poor health is often accompanied by pain, suffering, activity limitations, and even inability to socialize and enjoy life. Strine et al. (2007) also reported that the level of LS decreased with the mean number of days in the past 30 days of physical distress, sleep insufficiency, and pain. In addition, those with chronic illnesses were significantly more likely to report life dissatisfaction. Gana, Bailly et al. (2013) reported that poor health significantly predicted subsequent levels of life dissatisfaction but LS did not predict subsequent levels of health. Consistent with the results of this study, perceived general health is universally a strong predictor of life satisfaction in older persons.

Mental illness is prevalent among all age groups in our society. Having good mental health is important to satisfaction with life, including for older adults. Puvill, Lindenberg, de Craen, Slaets, and Westendorp (2016) found that poor mental health was strongly related to lower LS. In this study mental health was strongly and positively associated with satisfaction

with life but was not predictive. In a US study, mental distress, anxiety symptoms, and depressive symptoms were found by Strine and colleagues to decrease LS, and in a Brazilian study, Luchesia, Alves de Olivera, de Moraisb et al. (2018) found that psychological factors and age influence the levels of happiness in older adults living in the community. Findings from a Dublin Healthy Aging Study revealed that depression and loneliness were among some of the independent predictors of LS in their elderly sample. Several researchers including Lombardo, Jones, Wang, Shen, and Goldner (2018) reported that LS was strongly associated with self-reported mental health and that mental health was predictive of LS in many samples, even after considering factors such as income, general health, and gender. Despite the results of my study, mental health as a strong predictor of LS is well represented in existing literature.

Older adults are also at risk for stressful events in life. While depression is examined in many studies exploring LS in older adults, examining perceived life stress was less common. One could assume that those who struggle with depression also experience greater levels of stress; however, perceived life stress is not explicit to depressive states. Orpana, Vachon et al. (2016) reported in their study that lower levels of perceived life stress and higher levels of perceived coping were associated with higher levels of wellbeing. Though the population studied was not limited to older adults, the writers argued that their findings contribute to evidence that wellbeing is achievable even in the presence of mood and or anxiety disorders. In my study, perceived life stress was not only strongly associated with satisfaction with life but was also predictive of LS.

The aforementioned forms the basis of my conclusion that health influences LS and LS can also influence health. This relationship appears to be bidirectional. All health perspective

variables (whether general, mental, levels of stress or other factors indicative of health status), appear to be important determinants of LS, especially so among older adults.

Health Behaviours and Mobility. Health behaviours influence the state of one's health at any age and become especially significant as individuals gets older. Healthy behaviours increase functional and cognitive abilities and contribute in an important way to longevity. Conversely, unhealthy behaviours have been known to lead to poorer health, decreased mobility, and increased disability. Health behaviours explored in this study were smoking, alcohol intake, physical activity levels, and fruit and vegetable intake. **BMI** as indicative of health status was eliminated in the early part of the analysis, so too was **perceived unmet healthcare needs**. Strine and Chapman et al. (2007) reported health behaviour variables such as smoking, obesity (denoted by one's BMI), and heavy drinking as deterrents to life satisfaction. The results of this study, however, did not confirm that smoking, heavy drinking, and BMI were predictors of LS in an older adult population.

Findings of this study indicate that physical activity was an important predictor of LS among respondents. The literature shows that the prevalence of physical inactivity increased with decreasing levels of LS (Strine et al., 2007). An English study by Allerhand, Gale, and Deary (2014) found that exercise protected cognitive performance against the adverse effects of lower wellbeing. In the current study, those who were quite active were more likely to be satisfied with life. This finding is concerning considering that 37.3% of the older adults were sedentary. Since there is overwhelming evidence that as physical activity is decreased or is limited LS decreases, it is pivotal to get and keep older adults moving. Physical activity showed a positive association with satisfaction with life and was an important predictor.

Eating practices affect the state of one's immune system and overall health. The **daily consumption of fruits and vegetables** variable was incorporated to capture some aspects of the respondents' eating habits. This variable was not located in studies reviewed; however, it was found to have a positive though not a strong correlation with being satisfied with life. Those who had higher consumption of fruits and vegetables tended to be more satisfied with life. The average daily servings of fruits and vegetables consumed on a daily basis was 4 (with a median of 3.8). Those who were engaged in healthy lifestyle practices including good eating habits were more likely to have high LS.

Since persons who are satisfied with their lives tend to have better health overall, it could appear that people who have a higher LS take better care of their health. Thus, one could postulate that for this category of variables the relationship could also be bidirectional. This would suggest that emphasizing and encouraging healthy lifestyle practices earlier in life could contribute to older adults aging well and could improve and sustain their satisfaction with life. In summary, in this study, an increase in physical activity and daily consumption of fruits and vegetables is predictive of LS in the elderly.

Social Support Variables. Social connections are important at any age, but especially for the elderly. The literature is loaded with reports on correlation of social networks with satisfaction with life in this age group. According to the findings of this study, life satisfaction is positively and strongly associated with increased social supports. Although the **living/family arrangement** variable was excluded from the final model, it showed a bivariate association with LS. Litwin and colleagues (2010), in a study of older Americans, found that respondents exhibited greater wellbeing in terms of less loneliness, less anxiety, and greater happiness when they were ingrained in network types characterized by greater social capital. A sense of

belonging to a local community is important to older adults. In the current study, respondents who had a strong sense of belonging to local community were more likely to be satisfied.

It is not a surprise that social support remains an important predictor of life satisfaction especially among older adults. Cheng et al., 2009; Ryff, 1995; Steverink and Lindenberg, 2006; and Beutel, Glaesmer et al., 2010, are among researchers who demonstrated this well. **Strong emotional bond to a least one person** showed a positive association with LS in this current study, as evidenced by the large odd ratios in table 12. This finding reinforces the need to keep older adults connected and engaged in order to maintain and even increase their satisfaction with life. Efforts should be made to connect older adults with interest groups within their community and to facilitate their involvement, for example, by providing assistance with transportation where needed. Healthcare and community social services workers can be instrumental in facilitating these connections. While all the social support variables utilized in this study showed positive associations with LS, the **strong sense of belonging to a local community** variable stands out as an important predictor.

Theoretical Arguments

Theoretical arguments for this study are embedded within the theories that provided structure and brought to life the explanation and utilization of the primary concept of this paper – ***Satisfaction with Life***. Does LS matters? Not only does LS matter to the older adult, but I will present one of the ways this construct could be used as the core to plan for and attend to this population going forward.

The theoretical framework for this study includes Roy's (1976) adaptation model of nursing as well as Carstensen's (1999) socioemotional selectivity theory. Carstensen (1999)

argues that greater emotional saliency will motivate people to regulate their emotions to maintain high levels of subjective wellbeing. As persons get older, they often pay more attention to or have a greater need for emotional connections. The review of literature unfolded several reports on the importance of socioemotional needs among older persons. This study has demonstrated the same. A high importance is placed on being connected to others and having persons to rely on for support, whether it be family, friends, neighbours, or social groups. A lack of social support will significantly cause a decrease in satisfaction with life in this group, leading to loneliness, decreased sense of purpose, and depression.

Application of Roy's Adaptation Model

In employing Roy's (1976) adaptation model of nursing, one is reminded that a person is a bio-psycho-social being in constant interaction with a changing environment and uses innate and acquired mechanisms to adapt. As proposed earlier in this paper, the aging body involves a significant change for an individual and could be perceived as one of the changing environments to which people need to adapt. Roy's (1976) model states that adaptation occurs when people respond positively to changes in their environment. This finding gives rise to consideration as to what makes a person respond positively to change or what are some of the barriers hindering change – change within all their environments. According to Roy (1976), the goal of nursing is to promote adaptation for individuals and groups and in so doing contribute to their health, LS, quality of life, and dying with dignity. Nurses accomplish this goal by assessing behaviours and factors that influence adaptive abilities and by intervening to enhance environmental interactions (Petiprin, 2016).

This study utilized Roy's (1976) adaptation model for nursing as a theoretical foundation. From the literature, I determined that LS could be an important public health construct, especially in older adults. This was the first step. Second, I embarked on this investigation to determine which variables explain variation in LS of older adults. Study findings suggest that in this sample, perceived health, inclusive of general and mental health, life stress, social supports, especially having a strong sense of belonging to a local community, physical activity, educational level, and being male were the important variables explaining satisfaction with life. **Perceived general health, perceived life stress**, and a **strong sense of belonging to a local community** were important predictors. Third, I then had to consider the meaning of these findings. I believe that assessing for and reducing factors that could potentially reduce LS are pivotal to ensuring wellbeing and quality of life for older adults.

Fourth, as a result of the findings of this study I propose the following goals: (i) maintenance of health, prevention of illness, and achievement of early and complete recovery from injuries and ailments in older adults; (ii) facilitating and maintaining good perceived general and mental health among older adults, including identification and treatment of mental illness; (iii) helping older adults adapt to changes in the external and internal environments (educate, counsel, role model, reinforce, and remind); (iv) reduction and alleviation of life stress in older adults; (v) keeping older adults connected and engaged for as long as possible; (vi) encouraging, facilitating and maintaining physical activity in older adults; (vii) ensuring older adults are knowledgeable about and practice healthy eating habits (this may require meal delivery).

The fifth step entails the actions to be taken to meet the outlined goals. This action can be taken at various levels, and includes (i) boosting health promotion among various age groups so

that good habits can be formed; (ii) involving all industries and giving incentives to those who excel; (iii) considering longevity and aging-well concepts in town planning and development of health services; (iv) advocating for increased funding to communities and Long-term Care facilities to enable realization of goals; (v) strategically tracing, locating, and connecting older adults to recreational and other social services within their communities; (vi) consider providing social and other assistance to older adults to reduce life stress; (vii) frequently checking barometers to assess effectiveness of programs and services. As was stated before, these actions can be both direct and indirect, at individual and at community level, and local, provincial, or national levels.

The sixth step underscores evaluating whether goals are attained. Adjustments and revisions can be made where necessary and incorporated. This process can be ongoing and should translate into decreased healthcare spending over time and increased LS and happiness among older adults. Promotion of adaptation as people age is a life-long process.

Roy's (1976) model asks the following questions: who is the focus of nursing care? what is the target of nursing care? and when is nursing care indicated? In answering these questions in the context of this study, the focus is older adults and the target is older adult's LS. Nursing care is indicated (i) for those who are already old; (ii) for those who are approaching old age; and (iii) for those who will eventually be old. Based on the findings of this study, I propose emphasizing health promotion that requires adaptation leading to successful aging, which makes LS attainable for older people. The adaptation model states that health is an inevitable dimension of a person's life and is represented by a health-illness continuum (Petiprin, 2016). Where one falls on the continuum has a bearing as to how satisfied one is with life. The key concepts of Roy's

adaptation model are made up of four components: person, health, environment, and nursing (Petiprin, 2016).

Roy's (1976) model includes people as individuals as well as groups such as families, organizations, communities, and society (bio-psycho-social beings). According to the model, a *'person'* is the older adult or any of the groups mentioned above as the focus of care. *'Environment'* is the environment of the older adult or category of people described as the '*person*' and consists of focal stimuli, affecting stimuli, and potential stimuli (Dixon, 1999). Environment consists of living arrangements, shelter, and community, as well as circumstances older adults find themselves in. *'Health'* is the restoration of the physical, social, psychological, and spiritual balance of those who are suffering from injuries and chronic diseases, as well as the maintenance of good health with a focus of wellness. *'Nurse'* is the person who will collaborate with and support the 'person' in the four adaptive fields by administering care while assessing and intervening to remove barriers to adaptation, thereby facilitating and increasing environmental interactions, leading to satisfaction with life.

Adaptive Modes

Roy (1976) identifies four adaptive modes for individuals: physiological, self-concept, role function, and interdependence; when applied to groups, self-concept is replaced by group identity (Roy, 2011). Roy's (1976) adaptive modes serve as a basis to ensure holistic care in nursing (Clarke, 2011). I will now examine the variables, explaining LS in this study in the context of these adaptive modes.

Physiological Mode. Promoting adaptation in the physiological mode attends to the body. This encompasses various physical functioning and physiological feedbacks maintaining

homeostasis. Actions such as managing pain, promoting sleep, attending to hygiene, using hearing aids and glasses, exercising, and eating nutritious meals which are low in saturated fats and high in fibre are encouraged and facilitated. For older adults who suffer from common chronic diseases, risk factor modification, consulting with an interdisciplinary team to optimize health in various care settings, and encouraging self-efficacy are pivotal. General health will be maintained or restored, which in turn increases the likelihood of the individual being satisfied with life. Although **smoking status, type of drinker,** and **BMI** variables were not carried through to the final model in this study, these represent important behaviours and areas where actions need to be taken. Smoking cessation, reduction of alcohol, and healthy body weight maintenance would be targets to promote adaptation in the physiological mode.

Self-concept Mode. Self-concept relates to the physical self and the personal self. Areas of adaptation pertaining to the physical self include healthy body weight (BMI), consumption of fruits and vegetables, mobility and activity, ability to carry out ADLs, and the other areas mentioned under the physiological mode. The person's self-esteem, mental health, stress level, and social support system are evaluated and attended to. Socio-demographic characteristics such as sex, educational level, and marital status also define sense of self. Therefore, the nurse makes an assessment and intervenes to remove barriers and champion self through the promotion of adaptation. The healthcare provider should help the client to make informed decisions and respect and support them in their decision for care. Persons also define themselves in relation to spirituality and culture. Clinicians should be culturally aware and culturally competent. Assessing for and managing mental illness, delirium, and depression, and promoting mental health through self reflection and social connectedness as well as assessing for and intervening to reduce stress are vital considerations in the promotion of adaptation.

Role Function Mode. This mode reflects the sense of purpose that an older adult feels in the roles they play – in the family/home, in groups, and in the community at large (Clarke, 2011). This mode may affect the person's performance and or ability to carry out the established or expected roles. Role function may be impacted by physical or mental health, economic status and income, quality of relationships, and social supports. Assessing behaviours as well as identifying stimuli and intervening to promote adaptation will help the older adult to understand and be able to fulfill roles or adapt in redefining and learning new roles. Clinicians can facilitate access to social services, refer to or perform counseling, facilitate and connect persons to culturally and age appropriate social networks, and encourage engagement.

Interdependence Mode. The interdependence mode involves social supports. Older adults have a great need for social support as seen in this study's findings. Having a **strong emotional bond to at least one person** and having a **strong sense of belonging to a local community** were strongly and positively associated with LS, with the sense of belonging variable being an important predictor. Social isolation places older adults at risk for physical, mental, and cognitive decline. Assessing for and working with the older adult to identify and remove barriers to effective communication and ability to give and receive love, and even assessing coping mechanisms and the presence of perceived life stress, will aid clinicians in promoting adaptation which will in turn lead to a greater satisfaction with life.

Summary. Utilizing the above adaptive modes in the context of health and social practices which promote satisfaction with life, tangible results will become apparent: increased awareness and responsibility; practicing of healthy behaviours; greater risk factor modification; later onset of chronic debilitating diseases; stabilization of chronic diseases; decreased complications arising from these conditions; decreased hospitalization; reduced stress on patient

and family; increased use of community recourses available for seniors; and reduced spending on healthcare. Nurses and other healthcare personnel can initiate and maintain lifestyle adaptation leading to optimal integration of humans and the environment for good outcomes for communities and nations. Emphasis has to be on health promotion and disease prevention.

I attempted to apply Roy's (1976) adaptation model to the study of LS in older adults. It is crucial to attend to factors that have been shown to threaten LS. Actions are required at every stage of the human cycle. It is pivotal that purposeful practices and interventions aimed to bring about positive aging and greater satisfaction with life as people age are taken seriously and implemented. Key components will be policies and services which serve this cause. In turn, older adults will feel safe, enjoy good health, enjoy a good life, be engaged in their community, and be socially connected and supported. This is in fact is what having a satisfied life looks like in old age.

Impact of Findings

What could be some possible impacts of these findings? Though the findings of this investigation are by no means surprising and are in concert with previous research, this paper seeks to generate a greater discussion on the awareness and utilization of life satisfaction as an outcome or endpoint to intervention strategies for the health and happiness of older adults. It could also lead to prioritization of interventions and funding. Information provided by this study will support healthcare providers and policy makers to revitalize and re-energize health promotion as a strategy to increase the likelihood of successful aging, increased life satisfaction as people age, decreased morbidity and disability, reduction of spending on healthcare dollars, and decrease in destructive health trends such as earlier onset of cardiovascular disease and

increased morbidity and mortality. This study's findings and discussion can set the stage for future research to elicit richer details of factors and dynamics influencing LS in older adults.

Another possible benefit of these arguments is to provide a basis from which to consider and include satisfaction with life as health outcomes in designs of care for persons of all age groups, but especially for older adults. What matters to them directly and indirectly impacts their level of life satisfaction. Though community dwelling older adults were studied, much of the data also relates to and can be utilized for older adults who are in long-term care.

Chapter Summary

This study confirmed findings from previous research, suggesting that LS is associated with several socio-demographic characteristics including gender and educational level. Factors such as marital status, gender, and education have frequently been demonstrated as predictors of LS in other studies. Having good **perceived general** and **mental health** was positively associated with satisfaction with life while high **perceived life stress** was inversely associated. Like previous research, social support proved to be important to older adults. The **strong sense of belonging to a local community** variable was strongly and positively associated with LS. Physical activity and healthy eating habits also importantly contribute to life satisfaction.

I argue that older adults do appear to have a greater emotional saliency as they show a great need for social engagement and connection. Roy's adaptation model of nursing (1976) was employed to propose utilization of the findings and implications of this study. Actions that may be taken to meet set goals include boosting health promotion; involving industries to utilize models that support increase of LS; considering longevity and aging-well concepts in town planning and development of health services; advocating for increased funding for communities

and long-term care facilities to promote activities and services that increase LS; strategically locating and connecting older adults to recreational and other services within their communities; and considering providing social and other assistance to reduce life stress. Overall, this study hope to increase awareness of the concept of satisfaction with life and the utilization of LS as an outcome and indicator for care strategies designed and employed for older adults.

Chapter Six: Conclusions and Recommendations

Older adults' satisfaction with life is high overall and the score of the subpopulation studied is comparable to Canada's national score. In fact, 85% of older adults studied were satisfied with their life. In this study, I have found that life satisfaction in this age group (65 years and older) is positively associated with being male, having higher educational levels, having excellent/good general and mental health, having low levels of life stress, being physically active, having a strong sense of belonging to a local community and having someone to count on. Those with good eating habits were also more likely to be satisfied with life. Having excellent/good general health, low life stress, increased physical activity, a strong emotional bond to a local community, up to secondary school education, and being male were predictive of LS in older adults. In this chapter, I will briefly describe the study, outline study limitations, and offer recommendations based on the findings.

Summary of Study

This study began with introducing LS as the cognitive aspect of subjective wellbeing. Ellison, Gay and Glass (1989) described life satisfaction as "a cognitive assessment of an underlying state {*of being*} thought to be relatively consistent and influenced by social factors." I proposed that satisfaction with life is a health outcome and indicator and could possibly be a public health construct, especially in relation to the older adult population. Background to this study provided information on this aging demographic and the rising concerns in healthcare, and by social services personnel, governments, and society overall about the growing number of older adults.

Life expectancy and the number of people 65 years and older is steadily increasing worldwide. In Canada, the number of older adults in the population was one in seven in 2014 but is projected to be one in four by the year 2030 (Statistics Canada, 2016). As we prepare for this eventuality, a key component will be to consider LS in this age group as it relates to healthcare, social services and assistance, community infrastructure and policy drivers. To understand, appreciate, and be amenable to incorporate this concept as we go forward, it must be first demonstrated that this argument is valid and that the utility of LS as an outcome and indicator for care strategies in the elderly is useful and advantageous. Thus, the SWL Project was developed. The aim of this study was to explore factors explaining life satisfaction by examining health perception, health behaviours, social supports, and socio-demographic characteristics of community dwelling older adults in the Province of Alberta, Canada, and to determine which variables were predictive of LS.

In my literature review (Chapter 2), I explored theories of life satisfaction and successful aging. The selective optimization and compensation (SOC) theory by Baltes and Baltes (1990) was one of those, where maximizing potential gains and minimizing losses enables an individual to successfully navigate the changes within their internal and external environments and have greater LS and age successfully. Flood's (2005) mid-range theory of successful aging reflected an enhancement to Rowe and Khan's (1998) successful aging theory. Flood (2005) proposed that adaptation and transcendence are the primary predictors of successful aging (McCarthy, 2011). An individual's perceived satisfaction in adapting to the physical and functional changes of aging while experiencing spiritual connectedness and a sense of meaning and or purpose in life can be viewed as aging successfully (Flood, 2005, as cited by McCarthy, 2011).

The socioemotional selectivity theory by Carstensen (1999) was used to explain how older people direct their efforts towards maintaining emotional wellbeing and engaging in successful emotion regulation strategies (Gana et al., 2012). Roy's (1976) adaptation model of nursing set the theoretical foundation for this study. Adaptation is the process and outcome of individuals who use conscious awareness, self-reflection, and choice to create human and environmental interaction (Petiprin, 2016). According to Roy's (1976) model, nursing provides support to enable others in this adaptation. Previous research has shown that general and mental health as well as social ties are important predictors of LS in older adults. Socio-demographic characteristics such as age, sex, education, and marital status have shown mixed results.

Building on these theoretical foundations, I embarked on an analysis using data from the CCHS 2015-2016 Microdata file. The Province of Alberta in Canada was selected, and persons age 65 and older made up the sample. Nineteen independent variables were studied against the outcome variable ***Satisfaction with life***: these encompassed health perception, health behaviours, social supports, and socio-demographics. After purposeful selection guided by Hosmer and Lameshow's (2013) method, eleven variables were retained for the final model. An ordinal logistic regression was conducted in order to answer the research question and meet study objectives.

The findings corroborate previous research which suggests that LS in older adults is strongly correlated with good general and mental health, low stress levels, and strong social networks. Older males in this sample had higher life satisfaction than the older females. Those who had up to secondary school education also were more likely to have a greater LS. Interestingly, respondents who had post secondary school education appeared to be less satisfied with life as opposed to those who had only up to secondary school education. Older adults who

exhibited healthy lifestyle practices were more likely to be satisfied with life in comparison to those who did not; both the **daily consumption of fruits and vegetables** and **the alternate physical activity** variables showed positive associations with having greater satisfaction with life. This was evidenced by eating habits and activity levels, which were represented by the **alternate physical activity** and **daily consumption of fruits and vegetables** variables in this investigation.

I discussed the findings of this study considering existing literature and have provided possible impacts and recommendations for practice, policy, and future research. These will be outlined below. Limitations to this study included the data source, survey design, statistical analysis, missing data problems, and possibly generalizability. Despite the limitations, this study contributes to the body of knowledge on LS in older adults, consistent with what many other researchers have found in other populations, as well as providing unique information about the group investigated.

Limitations

Data Source. The study has several limitations. The first is that it was limited to the CCHS (2015-2016) variables and to a secondary analysis of the data. Other limitations include use of a single-item scale for the dependent variable. Despite the use of interpreters, we cannot ascertain if respondents, especially some older adults, had a good understanding of the questions being asked of them. Also, as this is an analysis of existing data, there is no way of qualifying responses or obtaining further explanations or other supporting information. A mixed method study on LS in this population might be more useful to gather rich data to support and accentuate possible findings. Another limitation is that the variables being utilized are limited to the ones

present in the CCHS data files in this wave of the survey. However, benefits of using this data files include less cost and time and decreased errors from having such a huge sample size.

Survey Design. The CCHS dataset utilized for this project is a cross-sectional survey for the years 2015-2106. Cross-sectional studies are known to be quicker, easier, and cheaper to perform. They are designed to provide correlated data that can be used to draw conclusions about population groups; however, they are not designed to detect cause and effect (Sedgwick, 2014). As the information is collected at one point in time, one is not able to observe the effect of one variable against another over time as in longitudinal studies.

Another limitation to this study was the survey design and questions asked of respondents. As the data utilized for this project is a secondary source, researchers had no input in the questions asked of respondents nor is there any way to find out if the interviewers elaborated or gave further details or explanations during the process. An example of a question with limited or ambiguous meaning would be the following: have you drank alcohol in the last 12 months? There is no way of knowing if a respondent drank all their life prior to the 12 months leading up to the interview. Again, suppose a respondent had had a strong emotional bond to one person who recently passed or moved away. How would the response be different? A mixed or qualitative inquiry could provide more specific results.

Statistical Method/Analysis. For the statistical method/analysis used for this study, it was not possible to obtain all the information desired on pooled data using an ordinal logistic regression analysis in SPSS. Though I was able to have an idea of the relative importance of variables, further analysis is needed to determine the percentage explained variance that can be

attributed to each predictor variable in the final model. This would have allowed ranking of the predictors.

Missingness. The data had significant missing values in 85% of the selected variables. Missing data can skew findings and cause a loss of statistical power (Graham, 2012); however, in this study the missing data was accounted for and dealt with efficiently. Multiple imputation was conducted to replace these values. A data set of 40 imputations was used to improve the accuracy of the analysis, and the information reported on was from the pooled data. Employing the technique of multiple imputation is considered an appropriate method of dealing with missingness and is the best scenario when actual responses are missing in a large study.

Generalizability. This investigation utilized data from the CCHS 2015-2016 Public use data files. The subpopulation of Alberta was selected. Provinces across Canada consist of different demographics. I believe that with the information shared inferences can be made generally to most older adults in Canada; however, this may not be the case for some large metropolitan areas with greater diversity. The findings in these areas could possibly be different. Other countries and regions may also provide a different experience for older adults, related to the availability of social services, poverty lines, and various living arrangements impacting health and contentment. These issues could have a greater association to life satisfaction then the variables outlined in this study.

Recommendations

From each study conducted and the insights gleaned, the researcher comes to certain conclusions and makes recommendations for consideration. I have put forward recommendations from this study in consideration of practice, policy, and future research.

Recommendation for Practice. Ni'Mhaolain, Gallagher et al. (2012, p.316) quoted Ferring et al. (2004) as saying, since "life satisfaction is likely to be multi-factorial," it was "important to approach it from a bio-psycho-social level." The variables selected for this investigation allowed me to do just that as LS was examined in relation to health perspectives, health behaviours, social supports, and the socio-demographic features of an older adult population. The discussion chapter outlined a six-level nursing process to Roy's (1976) adaptation model in the utility of LS as a health outcome and indicator. For clinicians, this process can be applied to individuals as well as groups: consider factors that may impact a client's wellbeing; help the client to make informed decisions; incorporate client preferences in plan of care; consider the client's evaluation of care outcomes; revise plan of care when necessary involving the client; when possible monitor and control factors impacting and or known to predict satisfaction with life. In other words, incorporate clients' input in all aspects of care.

Clinicians should receive education on the importance of wellbeing and LS in order for them to incorporate these concepts in designing care for older adults, in particular, including a basic understanding of the concepts, the main factors known to impact LS in the age group of the population being served, and how the determinants of LS are inter-related. Most of all, there should be emphasis on what is best for the clients from their perspectives, and the plan of care should not take away from their satisfaction with life as a whole.

LS takes into account the individual's perspective and is the person's overall evaluation of their life. It is not just for the moment nor is it others' evaluation of a person. As "life satisfaction is a subjective expression of wellbeing and successful aging" and is believed to be "a

major determinant of health outcomes in older people" (N'Mhaolain, Gallagher, et al., 2012, p.316), it should be considered a basis for care designs.

Recommendation for Policy. I have identified the most important predictors of life satisfaction in our older adult population by way of purposeful selection of variables available in the CCHS data file. They are health related or involve social connectivity. It is now known that an older adult's perception of their health (general or mental) and stress level impacts their satisfaction with life in a significant manner. Having support and feeling a sense of belonging are important to their wellbeing and their ability to thrive. I believe the findings here could also be useful for seniors in long-term care facilities, although community dwelling older adults made up this sample. All intervention strategies addressing the variables most important in this study can be operationalized to various clinical and community settings, as the basic principles remain the same. Incorporation of these findings into care models will often require consideration and inclusion in policies.

We should ensure adequate recreational spaces for community dwelling older adults and support their mobility and transportation. They need to be assisted to be connected to culturally appropriate social networks and activities. Nurses, pharmacists, social workers, and others within care facilities and the community should keep a sharp eye out for any situation observed or arising that could compromise the health and wellbeing of older adults. There should be policies in place to allow seamless and timely investigations, interventions, and evaluations once issues are identified. Overall, LS should be considered as a goal and outcome for health, social, and other policies that are put in place for the wellbeing of the older adult population.

Recommendations for Research. According to N'Mhaolain, Gallagher et al. (2012, p.316), "life satisfaction is widely accepted to be a key aspect of human welfare and is a central concept in research on subjective quality of life." LS is an increasing area of study and more researchers will be looking into it as various aspects of the human condition are studied. The findings of this study indicate that other populations also need to be studied as differences in group of variables are examined and compared. More details of the experiences of older adults and how they determine their satisfaction with life scores could elicit greater and richer data that could be considered and utilized as we set goals for the future. A qualitative or mixed method study would be ideal.

Variables assessing the effect of self care capacity, ability to carry out ADLs, frailty, income, cultural identity, and even specific disease conditions on LS could also prove useful as this population is studied. When the data allows, other statistical methods could be utilized to produce additional details and specificities. In addition, other provinces within Canada and other regions could be studied using similar variables, and the findings compared. There are interesting possibilities related to the diversity of different populations. Another angle researchers could consider is a longitudinal study to observe changes and dynamics of LS among various age group cohorts of older adults over time.

Conclusion

LS in older adults is an important construct for nurses who work alongside the older adult population in both acute and community care settings. Along with quality of life, satisfaction with life in general among the older adult population remains pivotal and is an area of interest to individuals, communities, and health and social services. LS is a desired goal, as nurses plan and

work to care for these valued members of our society. Globally, people are living longer; each society needs to determine and attend to the factors predicting LS in the elderly. Aging well starts today for every individual. The choices we make now have implications as to how we age. Governments, healthcare, and social policy drivers should support successful aging by ensuring equity, bridging gaps of social injustice, lending support to citizens in need throughout the life span, and especially attending to the factors that are related to LS in our older adults.

This study suggests that LS is an important public health concept and indicates that clinicians should consider and utilize this construct in designing, implementing, and evaluating care strategies. Since health perception, physical activity, eating habits and social supports show primacy as predictors of life satisfaction in this age group, priority should be given to efforts that maintain health, maintain activity/mobility, encourage good eating practices, and facilitate engagement and connectedness. Since LS judgements are based on one's own subjective criteria, rather than reflecting outward conditions (Shin & Johnson, 1978), we simply must not only take LS into consideration but incorporate satisfaction with life as an outcome for our interventions as we plan to care for this aging population.

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Appendix A

Literature Review Search Strategies

Factors affecting life satisfaction and quality of life in older adults

Limited to 2008-2019, age 65+, journal articles

Database: PsycINFO <2002 to March Week 1 2019>

Search Strategy:

---

1 life satisfaction/ (6713)

2 limit 1 to (all journals and yr="2008 -Current") (4400)

3 limit 2 to (aged <age 65 yrs and older>" or very old <age 85 yrs and older>") (1168)

4 exp Mental Health/ (48879)

5 3 and 4 (73)

6 limit 5 to English language (68)

7 from 6 keep 1-2,5,9,20,35-37,47-48,54 (11)

8 exp Chronic Illness/ (20504)

9 1 and 8 (57)

10 limit 9 to (all journals and English language and yr="2008 -Current") (40)

11 limit 10 to (aged <age 65 yrs and older>" or very old <age 85 yrs and older>") (15)

12 from 11 keep 7,10-11 (3)

13 exp Lower Income Level/ or exp Food Deprivation/ (6789)

14 1 and 13 (12)

15 from 14 keep 6-7,9 (3)

16 exp "Quality of Life"/ (33473)

17 limit 16 to (all journals and English language and yr="2008 -Current") (20118)

18 limit 17 to ("aged <age 65 yrs and older>" or very old <age 85 yrs and older>") (6650)

19 4 and 18 (247)

20 8 and 16 (1207)

21 limit 20 to (all journals and English language and yr="2008 -Current") (691)

22 limit 21 to ("380 aged <age 65 yrs and older>" or "390 very old <age 85 yrs and older>") (244)

23 from 19 keep 2,8 (2)

24 from 22 keep 1,10,29,109,122,175 (6)

25 7 or 12 or 15 or 23 or 24 (25)

Factors affecting life satisfaction or quality of life in older adults

Limited to age 65+, English, and Canada, 2010-2019

March 12, 2019

Database: Ovid MEDLINE(R) <1996 to March 11, 2019>

Search Strategy:

---

1 Personal Satisfaction/ (14059)

2 Happiness/ (3271)

3 "Quality of Life"/ (158808)

4 well-being.mp. (48065)

5 self actualization.mp. (207)

6 1 or 2 or 3 or 4 or 5 (206921)

7 Food Supply/ (8566)

8 Health Status/ (66601)

9 Chronic Disease/ (146219)

10 belonging.mp. (57475)

11 Social Identification/ (7717)

12 Income/ (18148)

13 Employment/ (27419)

14 Cognition/ (72581)

15 Mental Health/ (25294)

16 "Activities of Daily Living"/ (47893)

17 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 (447848)

18 6 and 17 (46111)

19 limit 18 to (English language and yr="2010 -Current") (24293)

20 "Aged, 80 and over"/ or Aged/ (2032266)

21 19 and 20 (10808)

22 exp Canada/ (101615)

23 21 and 22 (265)

****

All results listed without being reviewed

Factors affecting Life satisfaction or quality of life in older adults

Limited to age 65+, English, 2008-2019, Canada & U.S locations

Database: Ovid MEDLINE(R) <1996 to March 11, 2019>

Search Strategy:

---

1 Personal Satisfaction/ (14059)

2 Happiness/ (3271)

3 "Quality of Life"/ (158808)

4 well-being.mp. (48065)

5 self actualization.mp. (207)

6 1 or 2 or 3 or 4 or 5 (206921)

7 Food Supply/ (8566)

8 Health Status/ (66601)

9 Chronic Disease/ (146219)

10 belonging.mp. (57475)

11 Social Identification/ (7717)

12 Income/ (18148)

13 Employment/ (27419)

14 Cognition/ (72581)

15 Mental Health/ (25294)

16 "Activities of Daily Living"/ (47893)

17 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 (447848)

18 6 and 17 (46111)

19 limit 18 to (English language and yr="2010 -Current") (24293)

20 "Aged, 80 and over"/ or Aged/ (2032266)

21 19 and 20 (10808)

22 exp Canada/ (101615)

23 21 and 22 (265)

24 from 23 keep 3,13,20,31,42,59,69,73,86,100,105-106,115,117,132,157-158,161,169,172,185,188,193-194,235 (25)

25 1 or 2 (16785)

26 Social Class/ (25565)

27 7 or 8 or 9 or 11 or 12 or 14 or 15 or 16 or 26 (389105)

28 25 and 27 (3576)

29 20 and 28 (1567)

30 limit 29 to (English language and yr="2010 -Current") (930)

31 exp United States/ (795977)

32 22 or 31 (886193)

33 30 and 32 (122)

34 from 24 keep 1-25 (25)

35 from 33 keep 9-10,19,24,28,30,33,42-43,62,83-84,92,95,97,102 (16)

36 *personal satisfaction/ (6841)

37 *quality of life/ (73178)

38 36 or 37 (78974)

39 8 or 15 or 16 (129294)

40 38 and 39 (17885)

41 20 and 40 (9011)

42 limit 41 to (English language and yr="2008 -Current") (5715)

43 36 and 39 (1115)

44 20 and 43 (593)

45 limit 44 to (English language and yr="2008 -Current") (442)

46 32 and 45 (65)

47 from 46 keep 4,12-13,20,40-41,53,62,65 (9)

48 9 and 38 (3365)

49 20 and 48 (1584)

50 32 and 49 (194)

51 limit 50 to (English language and yr="2008 -Current") (120)

52 from 51 keep 66-67,73,83,103-104,120 (7)

53 20 and 36 (2062)

54 32 and 53 (312)

55 limit 54 to (English language and yr="2008 -Current") (223)

56 from 55 keep 21,27,30,44,46,55,62,205 (8)

57 35 or 47 or 52 or 56 (28)

****

Canada

Subset of 265 citations – chose 25

CINAHL Search Strategy – May 24, 2019

Line Number	**Strategy**	**Limits/Expanders**	**Results**
1	MH "Personal Satisfaction"	Apply related words	10087
2	"Life Satisfaction"	Apply related words	4155
3	S1 OR S2	Apply related words	11736
4	(MH "Aged") OR (MH "Aged, 80 and over")	Apply related words	713292
5	S3 AND S4	Apply related words	3472
6	(MM "Health Status")	Apply related words	23234
7	S5 AND S6	Apply related words	294
8	S5 AND S6	Published date: 20080101-20191231; English Language; Peer Reviewed Apply related words	210
9	(MM "Quality of Life")	Published date: 20080101-20191231; English Language; Peer Reviewed Apply related words	31635
10	S5 AND S9	Published date: 20080101-20191231; English Language; Peer Reviewed Apply related words	447
11	(MM "Cognition")	Published date: 20080101-20191231; English Language; Peer Reviewed Apply related words	18339
12	S5 AND S11	Apply related words	38
13	(MM "Psychological Well-Being")	Apply related words	9377
14	S5 AND S13	Apply related words	333
15	S5 AND S13	Published date: 20080101-20191231; English Language; Peer Reviewed Apply related words	250

MH=subject heading

MM=subject heading was focused to be one of the main topics of article

EBSCOhost – CINAHL *Tuesday, March 12, 2019 3:20:48 PM*

#	Query	Limiters/Expanders	Results
1	(MH "Personal Satisfaction")	Expanders – Apply related words	9795
2	(MH "Theory)	Expanders – Apply related words	218633
3	S1 AND S2	Expanders – Apply related words	1298
4	(MH "Nursing Theory")	Expanders – Apply related words	3613
5	S1 AND S4	Expanders – Apply related words	9
6	(MH "Nursing Models, Theoretical") OR (MH "Models, Theoretical")	Expanders – Apply related words	43815
7	S1 AND S6	Expanders – Apply related words	297
8	S1 AND S6	Limiters – English Language Expanders – Apply related words	289
9	S1 AND S6	Limiters – Age Groups: All Adult; English Language Expanders – Apply related words	189
10	(MM "Quality of Life")	Limiters – Age Groups: All Adult; English Language Expanders – Apply related words	24865
11	S6 AND S10	Expanders – Apply related words	401
12	S4 AND S10	Expanders – Apply related words	10
13	S6 AND S10	Limiters – Age Groups: All Adult; English Language Expanders – Apply related words	401
14	"Self Determination Theory"	Limiters – Age Groups: All Adult; English Language Expanders – Apply related words	329

15	S1 OR S10	Expanders – Apply related words	33822
16	S14 AND S15	Expanders – Apply related words	44
17	S2 AND S10	Expanders – Apply related words	1360
18	S2 AND S10	Limiters – Published Date: 20080101-20191231; Age Groups: All Adult; English Language Expanders – Apply related words	880
19	(MH “Sociological Theory”) OR (MH “Psychological Theory”) OR (MH “King’s Theory of Goal Attainment”)	Limiters – Age Groups: All Adult; English Language Expanders – Apply related words	3910
20	S10 AND S19	Expanders – Apply related words	42

Appendix B

Most Relevant Articles to Thesis Area of Focus

Author/Citation: Veenhoven, Ruut. (1996). The study of life-satisfaction **Research Method**: Synthesis **Sample**: Numerous articles & reports **Purpose**: 6 questions are considered: 1) What is the point of studying life-satisfaction? 2) What is life-satisfaction? 3) Can life-satisfaction be measured? 4) How satisfied are we? 5) What causes us to be satisfied or dissatisfied with life? 6) Can the level of life-satisfaction be increased? **Relevant Findings/Conclusion**: There is sense in trying to make life more satisfying for a greater number of people. Although it is not quite clear *how* this can be achieved, there is nevertheless little doubt that it is *possible* in principle. **Rationale**: Veenhoven is one of the pioneers and authorities on Life Satisfaction study. Outlined theories and historical background.
Author/Citation: Diener, E., Inglehart, R., Tay, L. (2012). Theory and Validity of Life Satisfaction Scales. **Research Method**: Review & Synthesis **Sample**: Dozens of articles **Purpose**: An evaluation of life satisfaction measures **Relevant Findings**: Supports the use of life satisfaction measures to inform policies but spoke to the limitations and recommends that additional subjective and objective indicators be included **Rationale**: Possibly the most comprehensive material written on life satisfaction
Author/Citation: Felix Cheung and Richard E. Lucas. 2014. Assessing the Validity of Single-item Life Satisfaction Measures: Results from Three Large Samples **Research Method**: Comparison of measures **Sample**: Two large samples from Washington (N=13,064) and Oregon (N=2,277) recruited by the Behavioral Risk Factor Surveillance System (BRFSS) and a representative German sample (N=1,312) recruited by the Germany Socio-Economic Panel (GSOEP) **Purpose**: To assess the validity of single-item life satisfaction measures by comparing single-item measures to the Satisfaction with Life Scale (SWLS) - a more psychometrically established measure **Relevant Findings**: Consistent across three samples, single-item life satisfaction measures demonstrated substantial degree of criterion validity with the SWLS **Rationale**: Gained confidence for using a single-item measure of LS as with the CCHS data, which will be utilized for this study
Author/Citation: James D. Stowe, & Teresa M. Cooney .2014. Successful Aging: Examining Rowe and Kahn's Concept of Successful Aging: Importance of Taking a Life Course Perspective **Research Method**: Review & Synthesis **Sample**: N/A **Purpose**: Critiques Rowe and Kahn's conceptualization of successful aging using tenets of the life course perspective

Relevant Findings: Discussion questions the relatively static nature of Rowe and Kahn's successful aging model, its emphasis on personal control over one's later-life outcomes, and neglect of historical and cultural context, social relationships, and structural forces in influencing later-life functioning. **Rationale**: Strengthens my position that older adults LS ought to be considered to determine successful aging
Author/Citation: Margolis, Schwitzgebel, Ozer & Lyubomirsky. (2018). A New Measure of Life Satisfaction: The Riverside Life Satisfaction Scale **Research Method**: 3 studies. Testing of psychometric properties of the Riverside Life Satisfaction Scale. **Sample**:(N = 504- UK) + (N = 303-US) + (N = 407-UK) **Purpose**: To develop an improved measure that includes indirect indicators of life satisfaction **Relevant Findings**: SWLS and RLSS showed almost identical levels of internal consistency. Increases bandwidth. The RLSS Should be given consideration as a measure of LS. **Rationale**: Rich information on measures of LS, theories of LS, as well as definitions & explanations of LS
Author/Citation: Mc Carthy, V., (2011). A New Look at Successful Aging: Exploring a Mid-range Nursing Theory among Older Adults in a Low-income Retirement Community **Research Method**: Cross-sectional study using questionnaires **Sample**: Random stratified. Non-demented older adults. N= 112 **Purpose**: preliminary investigation of a mid-range nursing theory (Flood, 2005) of successful aging **Relevant Findings**: Flood's (2005) theory offers a new view of successful aging, merging both biomedical and psychosocial perspectives on aging, while adding the perspectives of older adults and incorporating a spiritual or existential dimension. **Rationale**: Supports theoretic construct of study

Appendix C

Variables to be examined in Analysis. Variables obtained from the CCHS 2015-2016 Survey.

Variable	**Code Name/Category**	**Page (2019 CCHS Survey Documentation)**	**Comments**
Satisfaction with life in general	GENDVSWL (D)	29/79	Dependent variable Ordinal – 1-5 (descending)
Demographics			
Age	DHHGAGE (D)	23/74	Independent Variable. 4 Groups. Referent – 80 years and older
Sex	DHH_SEX (D)	23/71-72	Independent Variable Referent - male
Marital Status	DHHGMS (D)	23/72	Independent Variable. Single – referent
Highest Level of Education Attained	EHG2DVR3 (D)	26/76	Independent Variable Post Secondary Education – referent
Country of Birth	SDCDGCB (D)	53/406	Independent Variable Referent – Other (than Canada)
Cultural/Racial Identity	SCDCGCGT (D)	53/406	Independent Variable Referent – Non-White
Total Household Income	INCDGHH (D)	35/417	Independent Variable Referent - < $20,000
Heath Status Variables			
Perceived Health	GEN_005 (D)	31/77	Independent Variable Referent - Poor
Perceived Mental Health	GEN_015 (D)	31/77-78	Independent Variable Referent - Poor
Perceived Life Stress	GEN_020 (D)	31/78	Independent Variable Referent – Quite a bit/Extremely stressed
Body Mass Index (BMI)- as a health indicator	HWTDGCOR (C)	35/82	Independent Variable

Health Behaviour/Mobility Variables			
Alternative Physical Activity	PAADVAC2 (D)	44/171	Independent Variable Referent - Sedentary
Daily Consumption of Fruits and Vegetables	FVCDVTOT (C)	30/124	Independent Variable
Type of Drinker (Alcohol Consumption)	ALCDVTTM (D)	16/151	Independent Variable Referent – Regular Drinker
Smoking Status	SMKDVSTY (D)	54/137-138	Independent Variable Referent - Regular Smoker
Unmet Health Care Needs	UCN_005 (D)	59/389	Independent Variable Referent - Yes
Social Support Variables			
Sense of belonging to a local community	GEN_030 (D)	31/78	Independent Variable Referent – Very Weak
Living/Family Arrangements	DHHDGLVG (D)	23/73-74	Independent Variable Referent – Unattached living alone
Strong Emotional Bond with at Least One Person	SPS_040 (D)	55/282	Independent Variable Referent – Strongly Disagree
Technical Variables			
Weight - Master	WTS_M	66/420	
Province of Residents	GEO_PRV (D)	31/68	Alberta (value 48)

Key: D – Discrete. C – Continuous

For page numbers – location on variable list/description of variable

Appendix D

Regression Assumptions

Table D1

Ordinal Logistic Regression

Numbers	Assumptions	Met	Findings	Concerns/Comments
1	Have 1 DV measured at ordinal level	Yes	SWL- ordinal level	Categories 1-5
2	Have 1 or more IVs (Continuous/ordinal/categorical)	Yes	19 IVs (includes 2 continuous)	None
3	There should be no multicollinearity	Yes	All Tolerance > 0.1 (.191-.945 for original data and .146-.932 for imputed data). All VIF < 10 (1.080- 7.042 for original data and 1.052-6.893 for imputed data).	Dummy coded IVs were used as per Laerd. Multicollinearity of independent variables was ruled out.
4	You have proportional odds	No	Inspection of the similarities between the odds ratios for each slope coefficient revealed that this assumption was not met.	Separate binomial logistic regression was run on each split of the dichotomous DV. Each IV did not have identical effect at each cumulative split of the ordinal DV. The odds ratios were all different and sometimes markedly different, especially as it relates to the categories with fewer numbers of respondents.

			This assumption was not met using a full likelihood ratio test on the imputed data. Interestedly, the results were met using the original data. Results: χ_2 (147) = 153.714, p = .336 for original data. Only 3 of 40 imputed datasets met the assumption.	The assumption of proportional odds was not met, as assessed by a full likelihood ratio test comparing the fit of the proportional odds model to a model with varying location parameters. Due to the volume of datasets being used for the final analysis I believe we can afford to be conservative with this test given that the original dataset satisfied this assumption, as well as some of the imputed datasets. A pooled result was not provided.

SWL -Satisfaction with Life. IV -Independent variable. DV – Dependent variable. VIF – Variance Inflation Factor

Table D2

Binary Logistic Regression

Numbers	Assumptions	Met	Findings	Concerns/Comments
1	Have a dichotomous DV	Yes	Categories 1-2 Categories 3-5	None
2	Have 1 or more IVs (continuous/nominal)	Yes	19 IVs, including 2 continuous	None
3	There should be independence of observation.	Yes	There is independence of observations.	Based on study design
3b	The categories of the dichotomous DV and all nominal IVs should be mutually exclusive & exhaustive.	Yes	There is no relationship between each category of the DV nor each category of nominal IVs.	Based on Study design
4	There should be a bare minimum of 15 cases/DV.	Yes	2768 cases were examined in this subpopulation. Each category has > 15 cases.	None
5	There needs to be a linear relationship between the continuous IVs and the logit transformation of the DV.	Yes	Linearity of the continuous variables with respect to the logit of the DV was assessed via the Box-Tidwell (1962) procedure. A Bonferroni correction was applied using all 53 terms in the model resulting in statistical significance being accepted when $p < .005$ and $p < .015$ respectively (Tabachnick &	The interaction terms BMI*Ln_BMI and FVCDVTOT*LN_FVCDVTOT are statistically significant; therefore, the original continuous IVs BMI and Daily Consumption of Fruits & Vegetables are linearly related to the logit of the DV.

			Fidell, 2014). Based on this assessment both continuous IVs were found to be linearly related to the logit of the DV.	
6	Data must not show multicollinearity.	Yes	Diagnostics run during the testing of assumptions for OLR demonstrated that there was no multicollinearity.	Tolerance were > .1 and VIF < 10.
7	There should be no significant outliers, high leverage points or highly influential points.	No	There were numerous significant outliers, high leverage points, and influential points present in the data.	It was not feasible to delete all the cases with standardized residuals greater than 2.5.

SWL -Satisfaction with Life. IV -Independent variable. DV – Dependent variable. VIF – Variance Inflation Factor. OLR – Ordinal Logistic Regression

Appendix E

Final Process in Purposeful Selection according to Hosmer & Lameshow et al (2013)

	Round 1			Round 2			Round 3		
Variable	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**
Demographics									
Sex									
Male	**.321**	**.114**	**.005**	**.350**	**.113**	**.002**	.319	**.112**	**.005**
Age									
65-69	**.192**	**.200**	**.339**	**.169**	**.200**	**.389**	**.284**	**.198**	**.154**
70-74	**.060**	**.217**	**.784**	**.015**	**.214**	**.942**	**.140**	**.211**	**.507**
75-79	**.388**	**.216**	**.074**	**.377**	**.214**	**.079**	**.392**	**.210**	**.603**
Marital Status									
Married	**.019**	**.397**	**.962**	**.028**	**.396**	**.944**	**.225**	**.381**	**.555**
Common-law	**-.814**	**.493**	**.100**	**-.788**	**.492**	**.110**	**-.436**	**.470**	**.355**
Wid/Div/Sep	**-.395**	**.286**	**.168**	**-.424**	**.285**	**.137**	**-.286**	**.278**	**.303**
Country of Birth									
Canada	**.134**	**.148**	**.367**	**.147**	**.147**	**.319**	**.125**	**.146**	**.390**
Cultural/Racial Identity									
White	**-.635**	**.288**	**.029**	**-.585**	**.296**	**.051**	**-.605**	**.286**	**.037**
Highest Level Education									
< Secd. Sch Ed.	**-.431**	**.181**	**.017**	**-.411**	**.181**	**.015**	**-.452**	**.179**	**.012**
Secd. Sch. Ed.	**.071**	**.142**	**.617**	**.077**	**.142**	**.587**	**.058**	**.135**	**.668**
Total Household Income									
$20,000-$39,999	**.170**	**.258**	**.510**	**.181**	**.256**	**.479**	**.263**	**.255**	**.303**
$40,000-$59,999	**.361**	**.308**	**.242**	**.390**	**.306**	**.203**	**.434**	**.291**	**.138**
$60,000-$79,999	**.116**	**.288**	**.686**	**.160**	**.282**	**.571**	**.306**	**.277**	**.268**
=/>$80,000	**.564**	**.291**	**.053**	**.604**	**.284**	**.034**	**.688**	**.284**	**.016**
Health Perception									
Gen. Health									
Excellent	**2.533**	**.442**	**.000**	**2.589**	**.433**	**.000**	**3.388**	**.412**	**.000**
Very Good	**1.838**	**.422**	**.000**	**1.873**	**.419**	**.000**	**2.399**	**.396**	**.000**
Good	**1.238**	**.402**	**.003**	**1.256**	**.399**	**.002**	**1.687**	**.378**	**.000**
Fair	**.784**	**.385**	**.045**	**.807**	**.380**	**.036**	**1.058**	**.358**	**.004**
Mental Health									
Excellent	**1.968**	**1.566**	**.216**	**1.930**	**1.568**	**.225**	**	**	**
Very Good	**1.221**	**1.553**	**.436**	**1.201**	**1.556**	**.445**	**	**	**
Good	**.674**	**1.499**	**.655**	**.654**	**1.502**	**.666**	**	**	**
Fair	**.174**	**1.525**	**.910**	**.194**	**1.530**	**.900**	**	**	**
Life Stress									

Not at all stressed	**1.677**	**.257**	**.000**	**1.685**	**.257**	**.000**	**1.812**	**.253**	**.000**
Not very stressed	**1.102**	**.210**	**.000**	**1.105**	**.210**	**.000**	**1.198**	**.209**	**.000**
A bit stressed	**.633**	**.184**	**.001**	**.653**	**.184**	**.000**	**.711**	**.181**	**.000**
Unmet Healthcare Needs									
Yes	**.511**	**.370**	**.169**	**.503**	**.369**	**.174**	**.538**	**.370**	**.147**
Health Behaviours									
Alternate Physical Activity									
Active	**.348**	**.132**	**.008**	**.346**	**.130**	**.008**	**.366**	**.130**	**.005**
Moderately Active	**.088**	**.193**	**.648**	**.093**	**.192**	**.630**	**.080**	**.188**	**.670**
Somewhat Active	**.303**	**.182**	**.097**	**.302**	**.182**	**.009**	**.274**	**.177**	**.122**
Type of Drinker									
Occ. Drinker	**.318**	**.149**	**.034**	**.320**	**.149**	**.032**	**.303**	**.144**	**.036**
Has not drank alcohol in last 12 months	**.147**	**.153**	**.337**	**.149**	**.153**	**.333**	**.144**	**.146**	**.324**
Smoking Status									
Current Occasional Smoker	**-.676**	**.358**	**.059**	**	**	**	**	**	**
Former Regular Smoker	**-.031**	**.202**	**.876**	**	**	**	**	**	**
Former Occ./Experimental	**.067**	**.220**	**.760**	**	**	**	**	**	**
Lifetime Abstainer	**.093**	**.220**	**.672**	**	**	**	**	**	**
BMI	**.008**	**.012**	**.534**	**.005**	**.012**	**.666**	**.002**	**.012**	**.885**
Daily Consp. of Fruits & Vegs.	**.081**	**.030**	**.008**	**.076**	**.030**	**.011**	**.071**	**.030**	**.019**
Social Supports									
Living/Fam. Arrangements									
Unattached Living w Others	**.627**	**.384**	**.103**	**.584**	**.380**	**.125**	**.578**	**.374**	**.123**
Living w Partner/Spouse	**-.003**	**.365**	**.993**	**-.030**	**.363**	**.935**	**-.214**	**.328**	**.515**
Parent w Spouse & Children	**-.480**	**.387**	**.218**	**-.499**	**.384**	**.197**	**-.561**	**.360**	**.122**
Child Living w parent(s)/Other	**.424**	**.421**	**.316**	**.407**	**.421**	**.337**	**.352**	**.415**	**.399**
Sense of Belonging to a Local Community									

Strong	**1.319**	**.291**	**.000**	**1.310**	**.289**	**.000**	**1.370**	**.288**	**.000**
Somewhat Strong	**.795**	**.281**	**.006**	**.769**	**.280**	**.007**	**.859**	**.276**	**.002**
Somewhat Weak	**.399**	**.304**	**.192**	**.370**	**.303**	**.226**	**.428**	**.292**	**.145**
Strong Emotional Bond to at Least 1 Person									
Strongly Agree	**1.688**	**.914**	**.071**	**1.666**	**.915**	**.075**	**2.000**	**1.084**	**.072**
Agree	**1.298**	**.899**	**.156**	**1.276**	**.899**	**.163**	**1.440**	**1.064**	**.183**
Disagree	**.807**	**1.016**	**.431**	**.785**	**1.014**	**.442**	**.842**	**1.176**	**.477**

	Round 4			**Round 5**			**Round 6**		
Variable	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**
Demographics									
Sex									
Male	**.351**	**.113**	**.002**	**.344**	**.113**	**.002**	**.298**	**.122**	**.015**
Age									
65-69	**.156**	**.198**	**.433**	**.136**	**.203**	**.504**	**-.220**	**.194**	**.260**
70-74	**.004**	**.213**	**.986**	**.020**	**.211**	**.923**	**-.034**	**.203**	**.867**
75-79	**.369**	**.214**	**.086**	**.345**	**.216**	**.112**	**-.360**	**.254**	**.160**
Marital Status									
Married	**.021**	**.396**	**.957**	**-.005**	**.286**	**.986**	**	**	**
Common-law	**-.791**	**.492**	**.109**	**-.828**	**.379**	**.029**	**	**	**
Wid/Div/Sep	**-.428**	**.248**	**.132**	**-.373**	**.290**	**.198**	**	**	**
Country of Birth									
Canada	**.147**	**.147**	**.318**	**.150**	**.144**	**.298**	**.111**	**.143**	**.441**
Cultural/Racial Identity									
White	**-.576**	**.294**	**.053**	**-.597**	**.292**	**.044**	**-.576**	**.295**	**.054**
Highest Level Education									
< Secd. Sch Ed.	**-.440**	**.181**	**.015**	**-.426**	**.184**	**.021**	**-.090**	**.169**	**.593**
Secd. Sch. Ed.	**.080**	**.142**	**.576**	**.083**	**.140**	**.555**	**.284**	**.138**	**.040**
Total Household Income									
$20,000-$39,999	**.191**	**.256**	**.456**	**.214**	**.257**	**.404**	**.234**	**.248**	**.346**
$40,000-$59,999	**.401**	**.306**	**.190**	**.447**	**.305**	**.144**	**.488**	**.283**	**.086**
$60,000-$79,999	**.170**	**.282**	**.548**	**.202**	**.285**	**.478**	**.223**	**.268**	**.406**
=/>$80,000	**.617**	**.283**	**.029**	**.647**	**.291**	**.027**	**.628**	**.272**	**.023**
Health Perception									
Gen. Health									

Excellent	**2.610**	**.434**	**.000**	**2.546**	**.456**	**.000**	**2.520**	**.470**	**.000**
Very Good	**1.887**	**.422**	**.000**	**1.798**	**.445**	**.000**	**1.832**	**.464**	**.000**
Good	**1.267**	**.401**	**.002**	**1.213**	**.418**	**.005**	**1.289**	**.436**	**.004**
Fair	**.813**	**.381**	**.036**	**.728**	**.400**	**.072**	**.760**	**.423**	**.077**
Mental Health									
Excellent	**1.928**	**1.569**	**.226**	**1.930**	**1.544**	**.218**	**1.815**	**1.462**	**.221**
Very Good	**1.202**	**1.557**	**.444**	**1.207**	**1.533**	**.436**	**1.125**	**1.458**	**.445**
Good	**.654**	**1.502**	**.666**	**.654**	**1.477**	**.660**	**.609**	**1.393**	**.664**
Fair	**.196**	**1.531**	**.898**	**.206**	**1.511**	**.892**	**.093**	**1.426**	**.948**
Life Stress									
Not at all stressed	**1.683**	**.257**	**.000**	**1.653**	**.262**	**.000**	**1.566**	**.243**	**.000**
Not very stressed	**1.106**	**.210**	**.000**	**1.089**	**.215**	**.000**	**1.022**	**.224**	**.000**
A bit stressed	**.657**	**.184**	**.000**	**.629**	**.185**	**.001**	**.540**	**.182**	**.003**
Unmet Healthcare Needs									
Yes	**.500**	**.369**	**.176**	**.463**	**.365**	**.205**	**.528**	**.365**	**.148**
Health Behaviours									
Alternate Physical Activity									
Active	**.345**	**.130**	**.008**	**.324**	**.132**	**.014**	**.339**	**.128**	**.008**
Moderately Active	**.090**	**.192**	**.641**	**.083**	**.192**	**.666**	**.165**	**.188**	**.378**
Somewhat Active	**.299**	**.182**	**.101**	**.295**	**.181**	**.103**	**.304**	**.185**	**.102**
Type of Drinker									
Occ. Drinker	**.312**	**.147**	**.035**	**.288**	**.145**	**.047**	**.277**	**.146**	**.058**
Has not drank alcohol in last 12 months	**.148**	**.153**	**.334**	**.145**	**.151**	**.308**	**.204**	**.156**	**.193**
Smoking Status									
Current Occasional Smoker	**	**	**	**	**	**	**	**	**
Former Regular Smoker	**	**	**	**	**	**	**	**	**
Former Occ./Experimental	**	**	**	**	**	**	**	**	**
Lifetime Abstainer	**	**	**	**	**	**	**	**	**
BMI	**	**	**	**	**	**	**	**	**
Daily Consp. of Fruits & Vegs.	**.076**	**.030**	**.011**	**.073**	**.029**	**.013**	**.074**	**.030**	**.015**
Social Supports									
Living/Fam. Arrangements									

Unattached Living w Others	**.593**	**.380**	**.118**	**	**	**	**	**	**
Living w Partner/Spouse	**-.031**	**.363**	**.932**	**	**	**	**	**	**
Parent w Spouse & Children	**-.501**	**.384**	**.195**	**	**	**	**	**	**
Child Living w parent(s)/Other	**.402**	**.422**	**.344**	**	**	**	**	**	**
Sense of Belonging to a Local Community									
Strong	**1.308**	**.288**	**.000**	**1.251**	**.298**	**.000**	**1.317**	**.301**	**.000**
Somewhat Strong	**.770**	**.280**	**.007**	**.736**	**.289**	**.013**	**.833**	**.300**	**.007**
Somewhat Weak	**.370**	**.303**	**.224**	**.289**	**.308**	**.350**	**.423**	**.320**	**.190**
Strong Emotional Bond to at Least 1 Person									
Strongly Agree	**1.662**	**.914**	**.075**	**1.662**	**.908**	**.074**	**1.504**	**.895**	**.100**
Agree	**1.271**	**.898**	**.164**	**1.272**	**.890**	**.160**	**1.138**	**.862**	**.193**
Disagree	**.779**	**1.012**	**.445**	**.806**	**.996**	**.422**	**.553**	**1.023**	**.592**

	Round 7			**Round 8**			**Round 9**		
Variable	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**
Demographics									
Sex									
Male	**.298**	**.122**	**.015**	**.326**	**.116**	**.005**	**.324**	**.116**	**.006**
Age									
65-69	**-.215**	**.194**	**.271**	**-.333**	**.192**	**.084**	**-.342**	**.192**	**.076**
70-74	**-.029**	**.203**	**.885**	**-.132**	**.199**	**.490**	**-.151**	**.199**	**.450**
75-79	**-.353**	**.255**	**.169**	**-.414**	**.256**	**.109**	**-.434**	**.254**	**.091**
Marital Status									
Married	**	**	**	**	**	**	**	**	**
Common-law	**	**	**	**	**	**	**	**	**
Wid/Div/Sep	**	**	**	**	**	**	**	**	**
Country of Birth									
Canada	**	**	**	**	**	**	**	**	**
Cultural/Racial Identity									
White	**-.499**	**.276**	**.075**	**-.532**	**.276**	**.058**	**-.538**	**.277**	**.056**

Highest Level Education									
< Secd. Sch Ed.	**-.085**	**.168**	**.614**	**-.053**	**.165**	**.755**	**-.055**	**.165**	**.740**
Secd. Sch. Ed.	**.285**	**.138**	**.039**	**.287**	**.136**	**.036**	**.277**	**.136**	**.042**
Total Household Income									
$20,000-$39,999	**.238**	**.248**	**.337**	**.171**	**.245**	**.485**	**.188**	**.244**	**.442**
$40,000-$59,999	**.480**	**.282**	**.090**	**.450**	**.279**	**.107**	**.475**	**.280**	**.091**
$60,000-$79,999	**.213**	**.267**	**.425**	**.171**	**.263**	**.516**	**.193**	**.264**	**.465**
=/>$80,000	**.620**	**.275**	**.025**	**.550**	**.275**	**.046**	**.577**	**.274**	**.036**
Health Perception									
Gen. Health									
Excellent	**2.522**	**.469**	**.000**	**2.578**	**.487**	**.000**	**2.575**	**.485**	**.000**
Very Good	**1.828**	**.463**	**.000**	**1.901**	**.477**	**.000**	**1.890**	**.475**	**.000**
Good	**1.282**	**.436**	**.005**	**1.333**	**.446**	**.004**	**1.331**	**.445**	**.004**
Fair	**.758**	**.422**	**.077**	**.804**	**.437**	**.071**	**.802**	**.435**	**.070**
Mental Health									
Excellent	**1.805**	**1.459**	**.223**	**2.332**	**1.443**	**.114**	**2.335**	**1.439**	**.112**
Very Good	**1.114**	**1.455**	**.448**	**1.583**	**1.433**	**.276**	**1.580**	**1.429**	**.275**
Good	**.600**	**1.390**	**.668**	**1.042**	**1.364**	**.449**	**1.039**	**1.360**	**.449**
Fair	**.083**	**1.424**	**.954**	**.425**	**1.410**	**.765**	**.426**	**1.407**	**.764**
Life Stress									
Not at all stressed	**1.570**	**.243**	**.000**	**1.527**	**.248**	**.000**	**1.551**	**.249**	**.000**
Not very stressed	**1.021**	**.224**	**.000**	**.954**	**.230**	**.000**	**.989**	**.228**	**.000**
A bit stressed	**.544**	**.182**	**.003**	**.481**	**.181**	**.008**	**.524**	**.179**	**.005**
Unmet Healthcare Needs									
Yes	**.537**	**.365**	**.142**	**.542**	**.351**	**.123**	**	**	**
Health Behaviours									
Alternate Physical Activity									
Active	**.329**	**.127**	**.010**	**.356**	**.128**	**.006**	**.355**	**.128**	**.006**
Moderately Active	**.154**	**.188**	**.412**	**.203**	**.183**	**.269**	**.178**	**.184**	**.333**
Somewhat Active	**.290**	**.186**	**.121**	**.305**	**.192**	**.113**	**.300**	**.193**	**.122**
Type of Drinker									
Occ. Drinker	**.277**	**.146**	**.058**	**.264**	**.147**	**.073**	**.259**	**.147**	**.079**
Has not drank alcohol in last 12 months	**.202**	**.156**	**.198**	**.163**	**.152**	**.284**	**.165**	**.152**	**.278**
Smoking Status									
Current Occasional Smoker	**	**	**	**	**	**	**	**	**

Former Regular Smoker	**	**	**	**	**	**	**	**	**
Former Occ./Experimental	**	**	**	**	**	**	**	**	**
Lifetime Abstainer	**	**	**	**	**	**	**	**	**
BMI	**	**	**	**	**	**	**	**	**
Daily Consp. of Fruits & Vegs.	**.073**	**.030**	**.016**	**.061**	**.032**	**.056**	**.062**	**.031**	**.049**
Social Supports									
Living/Fam. Arrangements									
Unattached Living w Others	**	**	**	**	**	**	**	**	**
Living w Partner/Spouse	**	**	**	**	**	**	**	**	**
Parent w Spouse & Children	**	**	**	**	**	**	**	**	**
Child Living w parent(s)/Other	**	**	**	**	**	**	**	**	**
Sense of Belonging to a Local Community									
Strong	**1.318**	**.301**	**.000**	**1.488**	**.338**	**.000**	**1.484**	**.336**	**.000**
Somewhat Strong	**.830**	**.299**	**.007**	**.964**	**.334**	**.005**	**.963**	**.333**	**.005**
Somewhat Weak	**.413**	**.320**	**.195**	**.595**	**.347**	**.091**	**.598**	**.346**	**.089**
Strong Emotional Bond to at Least 1 Person									
Strongly Agree	**1.495**	**.897**	**.102**	**	**	**	**	**	**
Agree	**1.132**	**.864**	**.197**	**	**	**	**	**	**
Disagree	**.556**	**1.027**	**.591**	**	**	**	**	**	**

	Round 10			**Round 11**			**Round 12**		
Variable	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**
Demographics									
Sex									
Male	**.349**	**.114**	**.002**	**.359**	**.113**	**.002**	**.313**	**.114**	**.006**
Age									
65-69	**-.340**	**.191**	**.077**	**-.326**	**.188**	**.085**	**-.377**	**.182**	**.040**
70-74	**-.148**	**.198**	**.457**	**-.134**	**.195**	**.494**	**-.177**	**.191**	**.356**
75-79	**-.433**	**.253**	**.091**	**-.398**	**.253**	**.120**	**-.435**	**.252**	**.088**

Marital Status									
Married	**	**	**	**	**	**	**	**	**
Common-law	**	**	**	**	**	**	**	**	**
Wid/Div/Sep	**	**	**	**	**	**	**	**	**
Country of Birth									
Canada	**	**	**	**	**	**	**	**	**
Cultural/Racial Identity									
White	**-.502**	**.278**	**.075**	**	**	**	**	**	**
Highest Level Education									
< Secd. Sch Ed.	**-.061**	**.165**	**.711**	**-.078**	**.161**	**.631**	**-.047**	**.157**	**.762**
Secd. Sch. Ed.	**.289**	**.133**	**.031**	**.272**	**.132**	**.041**	**.286**	**.132**	**.031**
Total Household Income									
$20,000-$39,999	**.181**	**.243**	**.456**	**.167**	**.244**	**.492**	**	**	**
$40,000-$59,999	**.456**	**.279**	**.104**	**.435**	**.280**	**.122**	**	**	**
$60,000-$79,999	**.175**	**.264**	**.507**	**.169**	**.264**	**.523**	**	**	**
=/>$80,000	**.542**	**.271**	**.046**	**.499**	**.277**	**.073**	**	**	**
Health Perception									
Gen. Health									
Excellent	**2.512**	**.484**	**.000**	**2.613**	**.505**	**.000**	**2.619**	**.497**	**.000**
Very Good	**1.840**	**.477**	**.000**	**1.938**	**.500**	**.000**	**1.955**	**.492**	**.000**
Good	**1.299**	**.445**	**.005**	**1.389**	**.465**	**.004**	**1.395**	**.456**	**.003**
Fair	**.791**	**.437**	**.075**	**.874**	**.454**	**.059**	**.842**	**.449**	**.065**
Mental Health									
Excellent	**2.327**	**1.436**	**.113**	**2.360**	**1.428**	**.106**	**2.290**	**1.428**	**.116**
Very Good	**1.579**	**1.426**	**.274**	**1.623**	**1.416**	**.258**	**1.547**	**1.417**	**.281**
Good	**1.036**	**1.357**	**.449**	**1.078**	**1.350**	**.429**	**1.004**	**1.354**	**.463**
Fair	**.428**	**1.404**	**.762**	**.435**	**1.403**	**.758**	**.392**	**1.398**	**.781**
Life Stress									
Not at all stressed	**1.546**	**.249**	**.000**	**1.528**	**.248**	**.000**	**1.525**	**.243**	**.000**
Not very stressed	**.977**	**.229**	**.000**	**.963**	**.228**	**.000**	**.977**	**.230**	**.000**
A bit stressed	**.511**	**.180**	**.005**	**.475**	**.181**	**.009**	**.480**	**.181**	**.008**
Unmet Healthcare Needs									
Yes	**	**	**	**	**	**	**	**	**
Health Behaviours									
Alternate Physical Activity									
Active	**.349**	**.126**	**.006**	**.329**	**.126**	**.010**	**.337**	**.125**	**.007**
Moderately Active	**.175**	**.184**	**.342**	**.159**	**.183**	**.387**	**.133**	**.183**	**.468**
Somewhat Active	**.305**	**.191**	**.113**	**.327**	**.193**	**.093**	**.311**	**.194**	**.112**

Type of Drinker									
Occ. Drinker	**	**	**	**	**	**	**	**	**
Has not drank alcohol in last 12 months	**	**	**	**	**	**	**	**	**
Smoking Status									
Current Occasional Smoker	**	**	**	**	**	**	**	**	**
Former Regular Smoker	**	**	**	**	**	**	**	**	**
Former Occ./Experimental	**	**	**	**	**	**	**	**	**
Lifetime Abstainer	**	**	**	**	**	**	**	**	**
BMI	**	**	**	**	**	**	**	**	**
Daily Consp. of Fruits & Vegs.	**.062**	**.031**	**.049**	**.064**	**.031**	**.042**	**.062**	**.031**	**.047**
Social Supports									
Living/Fam. Arrangements									
Unattached Living w Others	**	**	**	**	**	**	**	**	**
Living w Partner/Spouse	**	**	**	**	**	**	**	**	**
Parent w Spouse & Children	**	**	**	**	**	**	**	**	**
Child Living w parent(s)/Other	**	**	**	**	**	**	**	**	**
Sense of Belonging to a Local Community									
Strong	**1.459**	**.333**	**.000**	**1.458**	**.339**	**.000**	**1.441**	**.339**	**.000**
Somewhat Strong	**.940**	**.331**	**.006**	**.970**	**.336**	**.005**	**.977**	**.335**	**.005**
Somewhat Weak	**.578**	**.342**	**.095**	**.574**	**.346**	**.102**	**.585**	**.346**	**.095**
Strong Emotional Bond to at Least 1 Person									
Strongly Agree	**	**	**	**	**	**	**	**	**
Agree	**	**	**	**	**	**	**	**	**
Disagree	**	**	**	**	**	**	**	**	**

	Round 13			Round 14			Round 15		
Variable	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**	**Est.**	**S.E.**	**p-value**
Demographics									
Sex									
Male	**0.40**	**0.12**	**0**	**0.37**	**0.12**	**0**			
Age									
65-69	**0.28**	**0.19**	**0.14**	**0.16**	**0.19**	**0.42**			
70-74	**0.10**	**0.19**	**0.59**	**0**	**0.20**	**0.42**			
75-79	**0.37**	**0.25**	**0.15**	**0.31**	**0.26**	**0.23**			
Marital Status									
Married	**0.23**	**0.47**	**0.63**	**0.16**	**0.46**	**0.74**			
Common-law	**-0.28**	**0.51**	**0.59**	**-0.42**	**0.50**	**0.40**			
Wid/Div/Sep	**-0.15**	**0.48**	**0.76**	**-0.23**	**0.48**	**0.64**			
Country of Birth									
Canada	**	**	**	**	**	**			
Cultural/Racial Identity									
White	**	**	**	**	**	**			
Highest Level Education									
< Secd. Sch Ed.	**-0.05**	**0.15**	**0.74**	**-0.08**	**0.16**	**0.60**			
Secd. Sch. Ed.	**0.28**	**0.13**	**0.03**	**0.28**	**0.13**	**0.04**			
Total Household Income									
$20,000-$39,999	**	**	**	**	**	**			
$40,000-$59,999	**	**	**	**	**	**			
$60,000-$79,999	**	**	**	**	**	**			
=/>$80,000	**	**	**	**	**	**			
Health Perception									
Gen. Health									
Excellent	**2.61**	**0.50**	**0**	**2.53**	**0.49**	**0**			
Very Good	**1.96**	**0.50**	**0**	**1.86**	**0.48**	**0**			
Good	**1.41**	**0.46**	**0**	**1.33**	**0.45**	**0**			
Fair	**0.87**	**0.46**	**0.06**	**0.81**	**0.44**	**0.07**			
Mental Health									
Excellent	**2.36**	**1.45**	**0.11**	**1.81**	**1.46**	**0.22**			
Very Good	**1.62**	**1.44**	**0.27**	**1.12**	**1.46**	**0.45**			
Good	**1.04**	**1.37**	**0.46**	**0.56**	**1.40**	**0.69**			
Fair	**0.46**	**1.42**	**0.75**	**0.08**	**1.43**	**0.96**			
Life Stress									
Not at all stressed	**1.56**	**0.25**	**0**	**1.60**	**0.24**	**0**			
Not very stressed	**0.99**	**0.23**	**0**	**1.06**	**0.22**	**0**			
A bit stressed	**0.48**	**0.18**	**0**	**0.54**	**0.18**	**0**			

Unmet Healthcare Needs									
Yes	**	**	**	**	**	**			
Health Behaviours									
Alternate Physical Activity									
Active	**0.32**	**0.13**	**0.01**	**0.29**	**0.13**	**0.02**			
Moderately Active	**0.15**	**0.18**	**0.43**	**0.09**	**0.19**	**0.62**			
Somewhat Active	**0.31**	**0.19**	**0.10**	**0.29**	**0.18**	**0.11**			
Type of Drinker									
Occ. Drinker	**	**	**	**	**	**			
Has not drank alcohol in last 12 months	**	**	**	**	**	**			
Smoking Status									
Current Occasional Smoker	**	**	**	**	**	**			
Former Regular Smoker	**	**	**	**	**	**			
Former Occ./Experimental	**	**	**	**	**	**			
Lifetime Abstainer	**	**	**	**	**	**			
BMI	**	**	**	**	**	**			
Daily Consp. of Fruits & Vegs.	**0.07**	**0.31**	**0.02**						
Social Supports									
Living/Fam. Arrangements									
Unattached Living w Others	**	**	**	**	**	**			
Living w Partner/Spouse	**	**	**	**	**	**			
Parent w Spouse & Children	**	**	**	**	**	**			
Child Living w parent(s)/Other	**	**	**	**	**	**			
Sense of Belonging to a Local Community									
Strong	**1.38**	**0.34**	**0**	**1.20**	**0.30**	**0**			
Somewhat Strong	**0.9**	**0.34**	**0.01**	**0.76**	**0.30**	**0.01**			
Somewhat Weak	**0.52**	**0.35**	**0.14**	**0.32**	**0.32**	**0.32**			
Strong Emotional Bond to at Least 1 Person									

Strongly Agree	**	**	**	**1.56**	**0.90**	**0.08**			
Agree	**	**	**	**1.23**	**0.87**	**0.16**			
Disagree	**	**	**	**0.73**	**1.03**	**0.48**			

Wid/Div/Sep – Widowed/Divorced/Separated. Secd. Sch Ed - Secondary School Education. Consp. Consumption. Est. – Estimates. E.E. – Standard Errors