KEY PREDICTORS OF SELF-RATED HEALTH AND THE USE OF HEALTH SERVICES AMONG VARIOUS ETHNIC GROUPS OF UNDERGRADUATE STUDENTS IN MARITIME CANADA: A SECONDARY ANALYSIS

by

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Abstract

Title: Key Predictors of Self-Rated Health and the Use of Health Services Among Various Ethnic Groups of Undergraduate Students in Maritime Canada: A Secondary Analysis

Background: Although an abundance of research exists on the racial/ethnic disparities in health and healthcare, there remains a paucity of studies examining key predictors of self-rated health and health service use among undergradaute students from various ethnic groups.

Methods: A secondary analysis of data collected during the *2012 Maritime Undergraduate Student Sexual Health Services Survey* (N = 10,512) examined the health and health service use of various ethnic groups of undergraduate students (n = 10,344).

Results: Statistical findings revealed that there are numerous potential predictors of both self-rated health and health service use that vary among ethnic groups.

Conclusion: It is hopeful that these findings will support the further development of inclusive health promotion strategies that target the distinct health needs of this population.

List of Abbreviations Used

AFMC – The Associations of Faculties of Medicine of Canada

AMHA – American College Health Association

BDI – Beck Depression Inventory

BMI – Body Mass Index

CCHS – Canadian Community Health Survey

CES-D12 – Centre for Epidemiological Studies' Depression Scale

CIHR – Canadian Institute of Health Research

CRRF – Canadian Race Relations Foundation

FNIGC – First Nations Information Governance Centre

GPA – Grade Point Average

HBS – Health Behaviors Survey

HIV/AIDS – Human immunodeficiency virus/ acquired immune deficiency syndrome

INAC – Indigenous and Northern Affairs Canada

LSIC – Longitudinal Survey of Immigrants to Canada

NSERCC – Natural Sciences and Engineering Research Council of Canada

NHS – National Household Survey

NIDDM – Non-insulin dependent diabetes mellitus

NPHS – National Population Health Survey

PHAC – Public Health Agency of Canada

RHS- Regional Health Survey

RKA, Inc. – Roslyn Kunin & Associates, Inc.

SES – Socioeconomic status

SREHC – Sexual Risk Event History Calendar

SSS – Sense of Support Scale

SSHRCC – Social Sciences and Humanities Research Council of Canada

STI – Sexually transmitted infection

SPSS – Statistical Package for Social Sciences

US – United States

WHO – World Health Organization

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Chapter One: Introduction

Multiculturalism has been a cornerstone of Canadian government for more than 40 years (Government of Canada, 2012). In 1971, Canada became the first country in the world to recognize multiculturalism as an official policy (Government of Canada, 2012), as a means of promoting respect for cultural diversity and grant ethnic groups the right to preserve and foster their own cultures and world views within Canadian society (Government of Canada, 2012). By 1981 however, Canada's racial diversity was shifting focus shifted from celebrating cultural differences to dealing with differing racial qualities ad inequities (Government of Canada, 2012). To counteract racial disparities, the Canadian Parliament passed the Canadian Multiculturalism Act in 1988, which aimed to go beyond simply guaranteeing equal opportunity for all Canadians regardless of their origin. This act protected the privilege of Canada's ethnic, racial and religious minorities to secure and share their cultural heritage, while also underlining the need to address and eliminate systemic imbalances (Government of Canada, 2012).

Despite these early interventions in Canadian government and policy however, marginalized groups continue to experience prejudice, racism and discrimination within their families, communities and society at large (Galabuzi, 2004). Minority ethnic/racial groups often encounter situations of poor and unfair treatment such as ignorance, intolerance and even violent hate crimes including verbal, physical, and sexual violence directed towards their ethnic origin (Banting, Courchene, Thomas, Seidle, & Institute for Research on Public Policy, 2007). Although reliable health-related research on different ethnic/racial populations in Canada is relatively rare, the chronic stress of living as an ethnic minority along with unequal opportunities for marginalized groups has been

associated with health disparities (Khan, Kobayashi, Lee, & Vang, 2015; Nestel, 2012; Shao, Rishie, & Bailey, 2015). For example, mental health concerns, such as depression and anxiety may be linked to the impact of racism and bigotry on the ethnic minority group's psychological functioning (Brondolo, Brady, Pencille, Beatty, & Contrada, 2009). The effects of chronic stressors triggered by multiple environmental confrontations resulting from racism and discrimination have been proven to "accelerate cellular aging … and can lead to wear and tear on the body that can deregulate multiple biological systems and lead to premature illness and mortality" (Williams & Mohammed, 2009, p. 40).

In addition, Canadian demographic data collected and analysed over many years through initiatives such as the National Household Survey [NHS] have revealed a growing trend that immigrants arriving in Canada tend to be relatively young (Statistics Canada, 2011a). According to the 2011 NHS, 58.6% of people who came to Canada between 2006 and 2011 were between the ages of 25 and 54 (Statistics Canada, 2011a); an age range that is considered within Canada to be the core working age group. Furthermore, immigrant children 14 years of age and younger accounted for 19.2% of the immigrant population, while another 14.5% were between the ages of 15 and 24 (Statistics Canada, 2011a). This trend may contribute substantially to the increasing ethnic diversity of not only Canada, but also to Canadian institutions and establishments such as universities. For minority students, surviving and succeeding academically despite multiple encounters with racism and stereotyping may require a different type of determination and resolve compared to the typical university-student struggles such as balancing work and class, or overcoming difficult assignments (Green, 2016). This psychology can create distinctive circumstances for minority students that may lead to

unidentified mental health problems (Green, 2016). By contrast, an emerging cohort of researchers from Canada, the United States, and several other developed countries argue that foreign-born groups have superior health profiles compared to native-born populations (Ali, McDermott, & Gravel, 2004; McKay, Macintyre & Ellaway, 2003; Perez, 2002). This health advantage is now being referred to as the *healthy immigrant effect* and includes lower mortality rates, fewer chronic diseases, disabilities, and hospitalizations (Nestel, 2012). However, Ng, Wilkins, Genderon, and Berthelot (2005) discovered that immigrants from non-European countries were twice as likely as their Canadian-born counterparts to report deterioration in health over the period of study. This self-reported deterioration was supported by data, which suggested an increase in the number of visits to a doctor (Ng, Wilkins, Genderon, & Berthelot, 2005). In addition, a recent study conducted by De Maio and Kemp (2010) further demonstrated that immigrant health begins to decline shortly following immigration to Canada. Data demonstrates that even after controlling for experiences of discrimination and for socioeconomic status, belonging to a visible minority group is a key factor in the decline of health (De Maio & Kemp, 2010).

In North America, the health care system is primarily shaped by standard scientific approaches and knowledge, therefore, various ethnic, racial, and indigenous groups accessing health care services can experience circumstances that are incongruent with their realities and are often left feeling marginalized. One of only a handful of recognized Canadian studies analyzing the effect of bigotry on quality of care was conducted by Women's Health in Women's Hands Community Health Centre (Gray, Calzavara, & Tharao, 2000). Nearly 1 in 5 of the study participants reported that they encountered prejudice in the health care system, including being exposed to racial slurs;

8.6% found clinicians to be culturally insensitive; and 6.2% reported receiving a mediocre level of care (Gray, Calzavara, & Tharao, 2000). As stated by a study participant,

> "They were coming from a completely different culture … They didn't understand my culture and it didn't seem like they made an effort either. It was more just like 'Well, it shouldn't be that way', and it's almost like my own culture was being put down." (Gray, Calzavara, & Tharao, 2000, p. 28)

These issues are concerning and may further contribute to the many physical and mental health disparities experienced by ethnic groups, in addition to creating barriers to accessing health care services. Furthermore, young emerging adults belonging to ethnic minority groups, including university undergraduate populations are at an increased risk for poor overall health outcomes and are often excluded from research sample populations (Arthur, 1997; Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; McLachlan & Justice, 2009; Tidwell, & Hanassab, 2007). As such it is imperative that we examine how factors such as ethnicity and race impact health and wellbeing of this population.

Background

Ethnicity and Race

Ethnicity is a term used to signify a group that shares some features of culture (Ward, 2003). However, ethnicity is multifaceted and its boundaries within society are fluid. The most current and widely accepted definition of ethnicity refers to this as a multidimensional and context specific social construct that is not separate from race but rather closely linked to race (Ford & Harawa, 2010). As such, ethnicity encompasses two distinct dimensions: the attributional dimension and the relational dimension (Ford &

Harawa, 2010). The attributional dimension recognizes and describes the distinct sociocultural characteristics of groups, such as culture and diet (Ford & Harawa, 2010). This dimension of ethnicity is reflected strongly in the standard definition of ethnicity, which includes: "subtle aspects such as culture, the arts, customs and beliefs, and even practices such as dress and food preparation" (Statistics Canada, 2015). While this dimension is valuable for understanding personal identity and characteristics of groups, it alone does not explain the location of a group within society or how societal forces can influence the health of ethnically characterized populaces (Ford & Harawa, 2010). Thus when research aims to gain an understanding of the relationship between an ethnically defined group and the society in which it is located, it is important to include the relational dimension of ethnicity which depicts the relationship between an ethnically defined group and the society in which it is situated (Ford & Harawa, 2010). Furthermore, the inclusion of the relational dimension of ethnicity in the definition helps to reduce the possibility of inappropriately and incorrectly attributing disparities to ethnic group characteristics instead of the group's relationship within the larger society (Ford & Harawa, 2010). Thus, the relational dimension aids in highlighting social hierarchies (Ford & Harawa, 2010).

Ethnic origin or ancestry is yet another feature of Canada's multicultural diversity. Ethnic origin denotes the ethnic or cultural roots of an individual's ancestors (a descendent usually more distant than a grandparent) (Statistics Canada, 2011a). Respondents of the 2011 NHS reported more than 200 ethnic origins with 57.9% of the population indicating one ethnic origin and the remainder, 42.1% reporting more than one (Statistics Canada, 2011a). Included in the list of ethnic origins found within Canada are cultural groups associated with Aboriginal peoples of Canada (First Nations, Metis and

Inuit) as well as European groups that first settled in Canada, such as the English, French, Scottish, and Irish (Statistics Canada, 2011a). This list has subsequently grown to include the origins of people who have since made Canada home during later waves of immigration such as German, Italian, Chinese, East Indian, Dutch, Somali, and Lebanese (Statistics Canada, 2011a). Moreover, data from the year 2011 indicated that 13 different ethnic origins had surpassed the 1-million mark (Statistics Canada, 2011a). The ethnic origin most commonly reported was Canadian (10,563,800) followed by English (6,509,500); French (5,065,700); Scottish (4,715,000); Irish (4,544,900); and German (3,203,300) while Italian, Chinese, First Nations, Ukrainian, East Indian, Dutch and Polish rounded out the list (Statistics Canada, 2011a).

Until recently, race was considered and defined as an unchangeable characteristic of individuals used to organize humans according to genetically-determined dimensions such as observable physical traits (Ford & Harawa, 2010). Too often, definitions and discourses of race and bigotry underestimated the idea of race, creating the impression that race is specific labels such as “Caucasian”, “Black”, “Asian” and so on, which reflects innate and hereditarily discrete categories. However, a growing body of work on race as a social, not biologic, construct is shifting the paradigm of many researchers and strengthening the cogency with which investigators examine the effects race has on population health (Freeman, 1998; Jones, 2001; LaViest, 1994; Senior & Bhopal, 1994; Sheldon & Parker, 1992). Within the structure which considers race as a social construct, race can be employed to understand discrepancies in factors such as health care quality, utilization and access, education, nutrition, employment and housing and the consequences these variations have on population health (Ford & Kelly, 2005). Furthermore, race as a social construct is considered multidimensional and a predictor of

health risks created by environmental, social, and behavioural factors (Freeman, 1998; Fullilove, 1994; Hahn & Stroup, 1994; LaViest, 1994). According to Freeman (1998), the biologic expression of race leads to social interactions, which in turn produce disparities in morbidity and mortality. Unlike the term "visible minorities" which Canada's Employment Equity Act defines as "non-Caucasian in race or non-white in shading", "racialized groups" clarifies that race is not an objective biologic fact, but instead a social and cultural concept that has the potential to expose people to racism.

Ethnic/Racial Groups

As a result of centuries of immigration, Canada has become a multicultural nation, which consists of a wide array of ethnic and cultural heritages (Statistics Canada, 2011a). Historically, most immigrants to Canada were of European decent, however more recently the largest group has come from Asia (including the Middle East) (Statistics, Canada, 2011a). Data from the 2011 NHS indicated that Canada's ethno-cultural mosaic can be attributed to a number of factors including its immigrant population, the ethno-cultural background of its people, the visible minority population, linguistic characteristics, and religious diversity (Statistics Canada, 2011a). According to data from the 2011 NHS, approximately 6,775,800 foreign-born individuals living in Canada arrived as immigrants (Statistics Canada, 2011a). Together, they represent 20.6% of the total population, an increase from 19.8% as indicated in the 2006 Census (Statistics Canada, 2011a). In addition, the 2011 NHS revealed that Canada's immigrant population reported close to 200 countries as a place of birth with Asia (including the Middle East) being the largest source of immigration between 2006 and 2011 (Statistics Canada, 2011a). Despite Asia being considered the largest source of immigrants to Canada, those

arriving from Africa, the Caribbean, Central and South America have also shown a slight increase (Statistics Canada, 2011a). Furthermore, as of 2011, the vast majority (94.8%) of Canada's foreign-born population resided in four provinces, which include Ontario, British Columbia, Quebec and Alberta (Statistics Canada, 2011a). Although Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland and Labrador are not considered the main settling areas for newcomers to Canada, the Atlantic Provinces also experienced an increase in their shares of immigrants (Statistics Canada, 2011a). As of 2011, 0.9% of immigrants made Nova Scotia their home, 0.6% in New Brunswick and 0.2% in both Prince Edward Island and Newfoundland and Labrador (Statistics Canada, 2011a).

Racism and Racialization in Canada

The right to equivalent treatment is a basic human right and not a privilege, as illustrated in the Canadian Human Rights Act (Department of Justice, 1985). Regardless of this, there has been a failure to recognize, both currently and historically, that racial discrimination and segregation is present across all dimensions of Canadian society (Canadian Race Relations Foundation [CRRF], 2008). This can be attributed in part to the fact that racism is commonly understood and comprehended at the individual level and not at the systems level. As such, while the vast majority of people may promptly protest direct articulations and acts of racism, they will frequently overlook or disregard the fundamental ways in which society's political, financial, and social organizations contribute to health and social inequalities among groups who are marginalized by race, ethnicity, religion, socioeconomic status, disability, gender, sexual orientation, and language.

Race and racism are considered sensitive topics for many people, however sensitivity and controversy should not be allowed to discourage candid discussions of serious social issues. The dictionary definition of racism defines it as a belief that race is the fundamental determinant of human traits and capacities and that racial distinction produces an innate superiority of a specific race (Merriam-Webster Dictionary, 2008). Furthermore, the Canadian Race Relations Foundation [CRRF] (2015) defines racism not only as an attitude, but also as actions that result from this attitude which have the ability to oppress and marginalize some individuals. Bigotry affects and influences individuals at an interpersonal level, as well as through the more extensive structures of society, most notably in the frameworks of education, justice, media, policing, immigration, and employment as well as through government policies and disdain actions (CRRF, 2008). Connecting the comprehension of race as a social construct, as previously highlighted, to the reality of racism is the concept of "racialization," which alludes to the social process whereby certain groups come to be assigned as different and thus subjected to differential and unequal treatment (Galabuzi, 2004). Lack of access to opportunities, marginalization, and exclusion among these groups implies that their apparent racial membership plays a significant role in shaping their shared experience, meaning they are racialized, as opposed to "simply" racial groups.

Racism, discrimination, and social exclusion represent shared experiences among Canada's Indigenous population as well. Historically, the ancestors of all three Indigenous groups within Canada endured colonization and experienced the commitment to colonial institutions and systems resulting in unimaginable disruptions to lifestyle and culture. For First Nations, Inuit, and Metis peoples, the colonial process has resulted in diminished self-determination and lack of influence in policies that are directly related to

Indigenous individuals and communities (National Collaborating Centre for Aboriginal Health, 2009). All Indigenous peoples have experienced losses of land, language, and socio-cultural resources.

University-aged ethnic/racial groups. In addition to appealing to young immigrants, Canada has also become a temporary home to a large number of international students. Canadian universities have become mosaics of cultural, ethnic, and racial diversity more so than ever before (Roslyn Kunin & Associates, Inc. [RKA, Inc.], 2012). The increasing diversity is attributed in part, to the doubling enrollment of international students between 1992 and 2008 (Statistics Canada, 2011b). Interestingly enough, this is particularly true for Maritime universities with New Brunswick, Nova Scotia, and Prince Edward Island accounting for the largest increase in international student populations during this time (Statistics Canada, 2011b). In 2013-2014, there were approximately 8,340 international students enrolled in Maritime universities at the undergraduate level, up from 3,303 in 2001 (Maritime Provinces Higher Education Commission, 2012).

For many of these students this is a period of transition, often characterized by recognition of an increased responsibility and independence, especially in relation to one's health and associated health behaviors (Lechner, Garcia, Frerich, Lust, & Eisenberg, 2013). In navigating this new independence and responsibility, some undergraduate university students are at increased risk for negative health outcomes, due to a combination of many behavioural and environmental factors (Eisenberg, Hannan, Lust, Lechner, Garcia, & Frerich, 2013). The majority of undergraduate university students fall within the emerging adulthood phase, which ranges from 18 to 25 years of age (Arnett, 2000). During this period, young adults develop the knowledge and skills necessary to transition successfully into adulthood (O'Connor et al., 2011). Emerging

adulthood involves self-exploration, as well as risk taking behaviours (O'Connor et al., 2011). During this developmental period, it is common for university students to engage in identity exploration and risky behaviours, such as multiple sexual partners, unprotected sex and concurrent substance use (Oswalt & Wyatt, 2013). In addition to experiencing challenges that go along with the emerging adulthood developmental period, literature suggests that university students who belong to different ethnic/racial backgrounds as well as international students face many other challenges during their transition to post-secondary education (Arthur, 1997; Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; McLachlan, & Justice, 2009; Tidwell, & Hanassab, 2007). Some of the challenges identified include difficulties adjusting to the social, academic, and cultural differences and these challenges have been linked to negative health outcomes (Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; Tidwell, & Hanassab, 2007).

More specifically, social supports, socioeconomic status, and health including depression risk were identified in the literature as challenges and barriers to academic success and transition among various ethnic groups of university students (Blake, Ledsky, Goodenow, and O'Donnell, 2001; Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; McLachlan & Justice, 2009; Russell, Thompson, & Rosenthal, 2008; Tidwell, & Hanassab, 2007). A study conducted by Russell, Thompson and Rosenthal (2008) revealed that international students underutilized health care services. Furthermore, the reasons most cited for underutilization of health services among international students include: 1) a belief that the problem is not serious enough to seek health care, and 2) a lack of knowledge about when services are available to them (Russell, Thompson, & Rosenthal, 2008). These findings suggest a lack of perceived

support among international students attending university in a country other than their own (Russell, Thompson, & Rosenthal, 2008). Moreover, a qualitative study conducted by McLachlan and Justice (2009) revealed that 75% of their international students were recipients of university scholarships, meaning that they have to achieve a particular Grade Point Average (GPA) to maintain the scholarship. Due to both academic and financial pressures, all participants of the study revealed that they were struggling to balance their academic and social life (McLachlan & Justice, 2009). During a time when students most needed to make social connections with peers, the pressure to perform academically to maintain the financial aid decreased their interaction with others and in turn, further increased their feelings of loneliness and isolation (McLachlan & Justice, 2009). In addition, there is consensus throughout the research literature that racial/ethnic minorities and/or international students are at a significantly higher risk for developing depression and anxiety (Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; Tidwell, & Hanassab, 2007). In a research study conducted by Han, Han, Luo, Jacobs, and Jean-Baptiste (2013) which sought to examine the prevalence of depression and anxiety symptoms in Chinese international students attending Yale university in the United States, it was reported that 45% of Chinese international students surveyed conveyed experiencing depressive symptoms, while 29% had anxiety (Han et al., 2013). Compared to findings from United States universities in general; which suggest that 12.8% and 13% of students reported being diagnosed with depression and anxiety respectively, the prevalence of these two mood disorders appears to be substantially higher among international students (Han et al., 2013).

Health

Just as ethnicity and race are complex concepts that are difficult to define, the notion of health is also broad and abstract. The definition of health is elusive and ways of thinking about health have evolved over many years. Early definitions of health focused mainly on the body and the ability to function anatomically, physiologically, and psychologically "normal" in the absence of disease (The Associations of Faculties of Medicine of Canada [AFMC], n.d.). Furthermore, according to the biomedical perspective, "normal" functioning within the previously mentioned domains resulted in the ability of individuals to perform valued roles within society, their family, work and community (AFMC, n.d.). This definition changed drastically in 1978 when the World Health Organization [WHO] put forth a definition of health that aimed to associate health and wellness and emphasized that health is a state of complete physical, mental, and social wellbeing; not just the absence of disease or infirmity (WHO, 1978). The definition of health advanced once again in 1986 when the WHO revised the definition to recognize that in order to be considered healthy, "an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment." (WHO, 1986). In this way, health can be viewed as a resource that helps one lead a productive and successful life (WHO, 1986). As the definition of health progressed to include wellness, the biomedical standpoint that dominated western medicine and ways of thinking about health began to lose validity. Instead, ecological models of health emerged which recognized the complex interactions between people, their personal attributes, and the environment, and how these interactions influence and shape health (AFMC, n.d.).

It is also important to acknowledge the distinct views, beliefs, and guiding principles related to health that many Indigenous individuals, families, and communities

share. For Indigenous Canadians, the concepts of balance and holism are central to their understanding of health and wellness (National Collaborating Centre for Aboriginal Health, 2009). In keeping with this understanding, balance of the four dimensions of life – the physical, mental, spiritual, and emotional – is generally viewed as the basis of wellness. Furthermore, the vital notion of interconnectedness of individuals, families, and communities indicates that individual, family, and community wellness must also be understood as being interlaced (National Collaborating Centre for Aboriginal Health, 2009). In addition, for many First Nations individuals, families, and communities, the medicine wheel symbolizes the cyclical nature of change and transformation and the interconnectedness of all beings and things. This conceptualization helps to understand human development as following successive life cycles associated with specific developmental tasks (National Collaborating Centre for Aboriginal Health, 2009).

Self-rated health. While much of the existing research examines the determinants of health based upon mortality data (Wilson, Jerrett, & Eyles, 2001), self-rated health is also known to be a reliable and valid indicator of physical and mental functioning. Although not a direct measure of health status, numerous studies have established that self-rated health is a good substitute for health status, including that of minority populations (Idler, Kasl, & Lemke, 1990; Kaplan & Comacho, 1993; Saravanabhavan & Marshall, 1994). Self-reported health is also highly correlated with mortality, morbidity, and health care utilization (Hoeymans, Feskens, Kromhout, & Van Den Bos, 1997; Miilunpalo, Vuori, Ola, Pasanen, & Urponen, 1997). Self-rated health is typically measured by asking individuals to rate their health as excellent, very good, good, fair, or poor compared with their peers and as such is a measurement of health which is based solely on an individual's subjective perception of their own health status (Newbold &

Danforth, 2003, Statistics Canada, 2010). Results from the 2008 Canadian Community Health Survey (CCHS) revealed approximately 60% of Canadian (ages 12 and over) rated their health as excellent or very good (Statistics Canada, 2008). Although factors such as education, socioeconomic status, and psycho-social characteristics may contribute significantly to difference in self-rated health, individuals who report a strong sense of community belonging and support were also more likely to report excellent or very good self-perceived health, compared with those whose sense of community belonging was weak, even when other potentially confounding factors were taken into account (i.e. age, sex, education, employment status, socio-economic factors etc.) (Statistics Canada, 2010). These findings are of particular interest with regards to the self-rated health status of ethnically diverse populations as research suggests that ethnic/racial minorities report a weak sense of community belonging due in part to the persistence of discrimination and social isolation, two factors that are negatively associated with belonging (Statistics Canada, 2011a).

A lack of population-based data stratified by ethnicity and race have left researchers and health care professionals oblivious and uniformed to the overall health status and experiences of inequalities by ethnically diverse communities within Canada. However, research that is available has determined that immigrants in Canada experience a deterioration in their self-assessed health as time spent living in Canada increases (Ali, 2002; Chen, Wilkens, & Ng, 1996; Dunn & Dyck, 2000; Health Canada ,1999; Perez, 2002). For example, Perez (2002) noted that the likelihood of reporting any chronic condition increased with time spent in Canada, despite initially reporting superior health relative to the Canadian-born. In addition to the lack of data regarding self-rated health stratified by ethnicity and race, most available research focuses on adults or the elderly

while far less is known about self-rated health during adolescence and/or emerging adulthood (Tremblay, Dahinten, & Kohen, 2003). Nevertheless, research evidence that does exist suggests a surprisingly large percentage of young Canadians describe their health as no better than "good" despite relatively low mortality and morbidity rates (Health Canada, 1999; McCreary Centre Society, 1999). Thus, at an age when very good or excellent health may be the expectation, this was not the case for one out of three adolescents (Tremblay, Dahinten, & Kohen, 2003).

Health of Ethnic Groups

As expressed in Canada's Population Health framework, many broad determinants impact the health of all Canadians, including gender, income and social status, employment and working conditions, health practices, social and physical environments, and culture (PHAC, 2013a). In addition, eleven social determinants of health were identified by Raphael (2004) which include: Aboriginal status, early life, education, employment and working conditions, food security, health care services, housing, income and its distribution, social supports, social exclusion, unemployment and employment security. It is a well-documented fact that racialized individuals in Canada experience disproportionate levels of poverty, inadequate housing, exposure to hazardous substances, barriers to or poor quality health care and social exclusion, all important social determinants of health (Hyman, 2001; Galabuzi, 2004; Halli & Kazemipur, 2003; Ornstein, 2001; Colour of Poverty, 2008).

Health inequalities. Over the last decade, there has been a marked increase in research focused on health disparities. A substantial body of published research proposes that health disparities based on immigrant status, race and ethnicity persist, even after

controlling for age, gender, education level, income, severity of disease, and other variables (American College of Physicians, 2004; Karlsen & Nazroo, 2002; Lasser, 2006; Smedley, Stith, and Nelson, 2003). These and other health disparities have also been reported and documented in countries (including Canada) that function under a "universal health care" system (Ali et al., 2004; Chen, Ng, and Wilkins, 1996; Dunn and Dyck, 1988; Hyman, 2001, 2007; Wu and Schimmele, 2005).

Health status. In Canada, belonging to a racialized group does not automatically translate into poorer health status (Wu et al., 2003) and may actually be considered a health benefit for some groups (Prus & Lin, 2005; Wu & Schimmele, 2005; Kopec et al., 2001). For example, a review of Canadian census mortality between 1991-2001 revealed that "visible minority groups" experienced lower age-standardized mortality rates when compared to their non-visible minority counterparts (Wilkins et al., 2008). Age-standardized mortality rate refers to "a weighted average of the age-specific mortality rates per 100,000 persons, where the weights are the proportions of persons in the corresponding age groups of the standard population" (WHO, 2006).

There are exceptions, however, which suggest imperative intersections between race, immigration, gender, poverty and health. A comprehensive literature review conducted by Enang (2001) regarding the health needs of Black women in Nova Scotia identified diabetes, cardiovascular disease, HIV/AIDS and mental health as glaring concerns. Furthermore, racial and ethnic health inequities are increasingly being archived in recent cohorts of racialized immigrants. Immigrants from non-European nations, most commonly Asia, are twice as likely to report declining health as compared to those from European countries. Low-income and recent immigrants who are members of a racialized

group are at an increased risk of transitioning to poor health after sometime (Ng et al., 2005).

Access to health care. There is adequate evidence to suggest that in the United States racialized patients do not experience equal access to health care services and have more unmet needs than the general population (American College of Physicians, 2004; Bhugra, Harding and Lippett, 2004; Haas et al., 2004; Fiscella et al., 2002). Information on health care access by race or ethnic group is not routinely gathered in Canada. Nevertheless, despite Canada's universal health care approach, evidence suggests that racialized groups do not have equal access to health care compared to non-racialized groups. For example, the federal system of health care delivery for status First Nations people is typically made up of public health programs with limited availability, fragmented delivery, and jurisdictional uncertainty (National Collaborating Centre for Aboriginal Health, 2009). Likewise, social access to health care is limited or denied to Indigenous peoples through health systems do not account for culture or language, or the historical, social, or economic determinants of Indigenous peoples health. Furthermore, a study conducted by Quan et al (2006) examining ethnic variations in rates of physician contacts and hospital admission discovered that racialized group members were less likely to be admitted to the hospital compared to their non-racialized counterparts. Similarly, findings from the 2007 Canadian Community Health Survey indicated that newcomers to the country were significantly less likely to have access to a regular medical doctor such as a family doctor or General Practitioner than non-recent immigrants and the Canadian born population (Statistics Canada, 2008). Numerous studies also proposed that immigrants and racialized groups were less likely to utilize preventative cancer screening programs (Quan et al., 2006) and mental health services

(Steele et al., 2006; Gadalla, 2008). The failure to access health services and programs, especially those intended to maintain and promote health and prevent disease amplifies health risks and is associated with negative health outcomes.

Quality of health care. Evidence from the United States and elsewhere substantiates the assertion that racialized groups receive and perceive lower quality of health care when compared to non-racialized groups over an extensive variety of health services (Washington et al., 2008; Gonzales-Espada et al., 2006; Napoles-Springer et al., 2005); Blanchard & urie, 2004; Bhugra et al., 2004; Ngo-Metzer et al., 2004; Corbie-Smith et al., 2002; Smedley et al., 2003). For many racialized groups, language barriers firmly add to these differential encounters including diagnostic errors, adverse events, inordinate or unnecessary tests, prolonged hospital stays and inappropriate use of emergency departments (Wilson-Stronks et al., 2007; Divi et al., 2007; Gonzales-Espada et al., 2006).

The body of Canadian literature of racial and ethnic disparities in quality of health care is moderately thin. Among individual and organizational issues identified that impact quality of care are policies (i.e. lack of interpretation services, lack of representation), financial barriers, and health values that conflict with the predominant belief system of the health care framework and contribute to misunderstandings over the meaning of illness, its terminology and its appropriate treatment (Shahsiah & Yee, 2006; Oxman-Martinez & Hanley, 2005; Access Alliance, 2005: Whitley et al., 2006; Hrycak & Jacubec, 2006; Benjamin & David, 2003; Enang, 2001).

The current state of young ethnic/racial minority groups' health services access and utilization is a major cause for concern, as young adulthood is a period in which poor health behaviours are most modifiable and lifelong health practices are developed

(Marshall, 2011). Additionally, post-secondary academic environments represent a unique opportunity to reach young ethnic minorities, including international students, through health education and have been recognized as optimal locations for health care providers to implement health promotion and illness prevention efforts (Blake, Ledsky, Goodenow, & O'Donnell, 2001). Therefore, the proposed research will be pertinent for university based health care services and health services serving undergraduate and emerging adult populations.

Research Problem

In the Maritime Provinces, health promotion and illness prevention strategies for various ethnic/racial groups are predominately organized and led by community leaders and advocates and are focused on each individual community, such as the Nova Scotia Brotherhood Initiative, and the Native Council of Nova Scotia. Currently, there is a lack of strategies that specifically address the health needs of young ethnic/racial minorities. Racialized groups within Canada have been found to experience prolonged stimulation of the body's physiological stress response which in turn, effects physical health primarily by producing negative emotional states such as anxiety, depression, and lowered self-esteem/identity that have a direct impact on biological processes such as the immune system or patterns of behavior that affect disease risk and mortality (Kubzansky & Kawachi, 2000; Harris, 2006; Williams et al., 2003). The direct impact of bigotry and marginalization on health behaviours includes turning to high risk health behaviours, such as substance abuse and self-harm and other negative coping responses, as well as delays in seeking health care. These findings are particularly important for young ethnic/racial groups of university students who are already at an increased risk for negative health

outcomes associated with transitioning to university in addition to those related to marginalization.

To date, an abundance of research exists on the racial/ethnic disparities in health and health care, but there remains a paucity of studies thus far, that examine key predictors of self-rated health and the use of health services among undergraduate students from different cultural, ethnic, and racial groups in Canada, let alone within the Maritime Provinces (Cohen, 2003; Lau, Lin, & Flores, 2012; Patterson-Silver Wolf, VanZile-Tamsen, Black, Billiot, & Tovar, 2013). Thus, there is an obvious need to fill the research gap on what the most prevalent determinants of these health disparities are, and what the barriers/facilitators are to accessing care in the Maritime Provinces for various ethnic groups of undergraduate students.

Objectives

The proposed research study will seek to examine which determinants of health are key predictors for higher rating of self-reported health as well as the use of health care services among various ethnic groups of undergraduate students at eight universities located in the Maritime provinces, which include: Acadia, Cape Breton University, Dalhousie, St. Mary's, Mount Saint Vincent, St. Francis Xavier, the University of Prince Edward Island and the University of New Brunswick. Using the Social Ecological Model (Richard, Gauvin, & Raine, 2011) as the framework for understanding the factors that produce and maintain health and health related issues, the proposed research will utilize a secondary analysis of data previously collected from the *2012 Maritime Undergraduate Student Sexual Health Services Survey* (N = 10, 512) conducted by Drs. Steenbeek and Langille (funded by the Canadian Institute of Health Research and Nova Scotia Health

Research Foundation operating grants). Data will be extracted using the most theoretically important variables that may aid in the examination and explanation of the key determinants of self-rated health and the use of health services among various ethnic groups. This data will be used to meet the following objectives:

1) Examine and compare the self-rated health of various ethnic groups of undergraduate students from Maritime universities.
2) Examine and compare the university health care service use among various ethnic groups of undergraduate students, as well as determine predictors of university health care service use.
3) Determine whether self-rated health and use of health services among various ethnicities are affected differently by each of the theoretically important predictor variables.
4) Determine if a relationship exists between self-rated health and health service use among various ethnic groups of undergraduate students in Maritime Canada.

Research Questions

In attempts to align with the overall purpose and objectives of the research, the following research questions will be used to guide the process:

1) What are the key predictors of self-rated health among various ethnic groups of undergraduate students in Maritime university campuses?
2) What are the key predictors of university health care services use for various ethnic groups in Maritime university campuses?
3) What is the relationship and/or associations between self-rated health and use of health services among the various ethnic groups?

Significance

Currently, there is limited Canadian research that concentrates on the health of different ethnic/racial groups and more specifically among undergraduate population of ethnic groups. The findings of the proposed research will add to the existing body of knowledge on the health of various ethnic groups of undergraduate students in Canada. By discovering the determinants of the self-rated health of various ethnic groups from eight of the Maritime Province's universities, health care administrators, nurses and other health care providers both on and off campus will be better informed and better prepared to provide care in a culturally sensitive manner and enlighten providers on the wide range of health care needs required by such a culturally diverse university population (Russell, Thompson, & Rosenthal, 2007). Also, by incorporating a social ecological lens, this research will facilitate nurses working with young racial/ethnic groups to build better partnerships and develop inclusive health campaigns aimed at increasing awareness of available university health care services, thus increasing access to these services among students who belong to different ethnic/racial backgrounds (Russell, Thompson, & Rosenthal, 2007). Findings from the proposed research may also contribute to the promotion of diversity and inclusion strategies across Maritime universities. Academic institutions may have the opportunity to become better versed in the extent to which their campuses have become diverse with respect to culture, race and ethnicity. The findings could inform how well students from various ethnic/racial backgrounds are thriving of Maritime university campuses while also identifying the need for further resource assessment. Likewise, the findings may be used to help guide the development of an overall environment that is inclusive and reflective of the rich diversity found among Maritime university settings. Research suggests that academic institutions and

environments represent a unique opportunity to reach students who belong to different cultures and ethnic/racial groups through health education and that many opportunities to promote health and disease prevention programs exist in academic settings (Blake, Ledsky, Goodenow, & O'Donnelll, 2001). By welcoming students from diverse ethnic backgrounds and supporting their transition, academic institutions can ensure that education received in the Maritimes is a beneficial experience for all.

The chapter to follow will provide a review of the most current literature on various ethnic groups' health status and health service use. This will include a presentation of the strengths and limitations of the existing knowledge, as well as future research needs. Additionally, this chapter will examine the barriers and facilitators to young racialized groups health care access. The Social Ecological Model will provide the framework for the remainder of the proposed research and will highlight the health inequalities affecting various ethnic/racial groups of undergraduate students from the Maritime Provinces.

Chapter Two: Literature Review

The Social Ecological Model was used to guide this literature review under the following concepts: individual, interpersonal, organizational, community, and public policy. Based on the objectives of this proposed research, the following literature review will be organized to focus on the health of various ethnic groups of undergraduate students, including overall health, as well as physical, mental, and sexual aspects of health. The review will also be organized to focus on the environmental influences and specific determinants of health, which have an impact on health and the utilization of health care services (Richard, Gauvin, & Raine, 2011).

Literature Review Process

A literature review focusing on the health and use of health services of various ethnic groups was conducted through several databases (PsychINFO, CINAHL, Medline/PubMed), as well as relevant references from bibliographies. Within these databases, various search strategies were employed to achieve a broad perspective of the research knowledge available and to identify gaps in current research knowledge pertaining to the health of various ethnic groups and barriers to or facilitators of health care service use among this population. The Boonlean/Phrase search strategy was primarily used and included the following search terms in various combinations: ethnic* OR race OR racial OR minorit* OR diversity AND undergraduate* student OR college. An adequate search heading pertaining to self-rated health or self-perceived health could not be identified, therefore a keyword search was implemented using terms such as self-report AND health. Additional items that were used included, but are not limited to: Students OR International students AND Minority Groups OR Racial and Ethnic Groups

AND Cross Cultural Differences OR Multiculturalism OR Racial and Ethnic Differences; Health Care Utilization OR Health Care Seeking Behaviour OR Health Care Services OR Help Seeking Behavior OR Self-Referral OR Treatment Barriers (See Appendix A). Grey literature searches were also conducted using well-established government organization websites (Health Canada, Public Health Agency of Canada, Statistics Canada, Maritime Provinces Higher Education Commission, 2012).

Due to the scarcity of literature on the health of various ethnic groups in Canada and more so, on various ethnic groups of undergraduate students, the review was extended to include research from the United States, Europe, and the United Kingdom. Most of the literature originates from the Canada and the United States with an emphasis on descriptive research focusing on socio-demographic and socio-economic trends, discrimination, and mental health (Kinnon, 1999). Although it is important to distinguish the health disparities experienced by various ethnic groups, few studies have explored the overall health strengths, needs, and practices of young ethnically diverse university students. Therefore, in order to gain an in depth understanding of their health and health care utilization patterns or practices, this review covers a broad range of quantitative, mixed methods, and qualitative based research.

Visible Minority Health in Canada

Canada has experienced a significant growth in its visible minority population in the past decade (Abada, Hou, & Ram, 2009). According to the 2011 National Household Survey (NHS), approximately 19% of the Canadian population belongs to a visible minority group (Statistics Canada, 2011a), a 6% increase when compared to 2001 demographic data (Statistics Canada, 2011a). Yet, despite the demographic importance of

this population, there is a surprising absence of nationally representative health data on visible minorities. Much of what is known about visible minority health originates from research on immigrants, many of whom are members of visible minority groups (Edge & Newbold, 2013; Hyman & Jackson, 2010; Ng, Wilkins, & Gendron, 2005). However, it is important to acknowledge that not all visible minorities are immigrants. The 2011 NHS reports that 30% of visible minorities are Canadian-born (Statistics Canada, 2011a). Therefore, yielding conclusions about visible minority health from research on immigrants blends the role of race with specific immigration related factors on health. Visible minority immigrants differ from Canadian-born visible minorities in important ways, including language proficiency, cultural backgrounds, ad familiarity with Canadian society and institutions. As such, it is important to acknowledge and distinguish these differences among the various visible minority groups that will be explored in the proposed research.

Indigenous peoples. Indigenous peoples is "a collective name for the original people of North America and their descendants." (Indigenous and Northern Affairs Canada [INAC], 2015). As a whole, First Nations, Inuit and Metis comprise approximately 4.3% of the total Canadian population but signify three very distinct peoples with distinctive languages, cultural practices and spiritual beliefs (Statistics Canada, 2011c). The profoundly diminished health outcomes and health inequalities that are specific to Indigenous people and communities are deeply rooted in historical events such as colonialism, forced acculturation, and systematic marginalization – contexts which have contributed to lower life expectancy, higher incidences of chronic disease, higher rates of infectious disease, and higher rates of substance use and addiction than the non-Indigenous Canadian population (Adelson, 2005; First Nations Information

Governance Centre [FNIGC], 2012; Health Canada, 2009a; Kaspar, 2014; Kirmeyer et al., 2009; Lehti et al., 2009). Furthermore, the 2008-2010 First Nation and Inuit Regional Health Survey (RHS) confirmed that a greater percentage of non-Indigenous Canadians rated their health as thriving (i.e. "excellent" or "very good") when compared to First Nations adults (FNIGC, 2012). For example, 44.1% of on-reserve First Nations and Inuit adults (18 years or older) rated their health as thriving compared to 60% of the general Canadian population (FNIGC, 2012).

Underlying much of the ill health faced by Indigenous people today is the history of colonialism and oppressive control which has been manifested through the creation of the reserve system, the forced relocation of Indigenous communities to unfamiliar grounds, the forced removal and placement of Indigenous children into residential schools away from their families, the inadequate provision of services to those living on reserves, and the racist attitudes toward Indigenous peoples (Adelson, 2005; Hackett, 2005; Newbold, 1998). The societal inequities, political and economic disadvantages, and marginalization are known to reveal themselves in the form of disease, disability, violence, and premature death within the individual (Adelson, 2005). These factors are also components of the felt effects of historical losses that not only wear away at the individual as mentioned above, but also at the level of family, community, and nation (Adelson, 2005). To provide more specific examples, the disproportionate burden of chronic diseases such as non-insulin-dependent diabetes mellitus (NIDDM) among Indigenous Canadians is regularly attributed to genetics, yet the role of changing diets, changing or limited work options, poverty, limited access to resources, societal stressors, and cultural variations of food must all be carefully considered as pieces of the more complex puzzle of disease in today's modern-day context (Adelson, 2005). Furthermore,

rates of suicide, injury, drug and alcohol misuse, sexual abuse, and violence which again are all occurring in unequal numbers among Indigenous people and communities can be linked to the loss of land and resources, the loss of self-direction, and to the severe disturbance of cultural traditions and values (Adelson, 2005). For instance, the establishment of the residential school system in Canada as an attempt to assimilate Indigenous peoples, placed children in schools located far from their parents, homes, and communities (Kaspar, 2014). Children were prohibited from speaking their own language, expressing cultural and spiritual beliefs, and practicing traditional activities and rituals (Kaspar, 2014). Residential schools were also often underfunded, and the deprived physical environment in combination with the cruel treatment of students has had lasting negative effects on the Indigenous people who were forced to attend (Kaspar, 2014). The severe abuse and emotional trauma endured by residential school survivors can be associated with the negative mental health outcomes, violence, sexual abuse, and drug and alcohol misuse that are seen today (Kaspar, 2014). The examples offered above demonstrate health issues that translate across linguistic, cultural, social, and economic boundaries.

Immigrant/International minority groups. According to the 2011 NHS, one in five people living in Canada is foreign-born (Statistics Canada, 2011a). With 6.7 million immigrants currently living in Canada, and thousands more projected per annum (Statistics Canada, 2014), the health of immigrants and their descendants will play a key role in shaping the future health profile of Canadians.

Many studies have shown that immigrants are typically healthier than their native-born counterparts upon arrival in their new country. This foreign-born health advantage, also referred to as the “healthy immigrant effect” has been discovered among immigrants

to several developed countries, including Europe, the United States, and Canada (Beiser, 2005; Bollini & Siem, 1995; Cunningham, Ruben, & Narayan, 2008). In Canada, however, much of what is known about the healthy immigrant effect is based on studies of adult migrants. Thus, it remains uncertain whether immigrants' health advantage extends to foreign-born children and young adults. Of the little research that is available, one study conducted by Hamilton, Noh, and Adlaf (2009) analyzing psychosocial distress among first generation immigrant children in Ontario revealed that first generation children experienced more psychosocial distress than their second generation peers. Yet, national-level estimates indicated significantly better mental health for first generation children relative to their Canadian-born counterparts (Beiser, Hou, Hyman, & Tousignant, 2002). Furthermore, analysis of risky behaviours discovered lower adjusted risks of drinking and delinquency for first generation immigrant youth compared to second generation, suggesting a protective influence of foreign-born status (Hamilton, Noh, & Adlaf, 2009).

Current explanations for the healthy immigrant effect tend to centre on determinants of health that are specific to immigrants such as the process of acculturation, duration or time spent living in the new country, exposures to harmful post-migration environments, as well as social support, socioeconomic status, and neighborhood characteristics (Jasso, Massey, Rosenzweig, & Smith, 2004). Notably, Ng and colleagues' (2005) analysis showed significant deterioration in self-rated health over time for both recent (<10 years) and established (≥10 years) immigrants relative to the Canadian-born population. Recent immigrants were also more likely than the Canadian-born population to experience an increase in BMI over time. In addition, lack of access to healthcare has been proposed as a possible explanation for deterioration in immigrant health (Beiser,

2005; Newbold & Danforth, 2003). Immigrants may not receive the care they require despite universal health insurance due to linguistic and cultural barriers (Edge & Newbold, 2013; Newbold, 2009).

Canadian-born minority groups. Investigations of health inequalities among immigrants and racialized groups increasingly highlights the need to track racialized group's health outcomes by second/third generations. For example, literature from the United States indicates that the healthy immigrant effect mistakes findings that reveal Hispanic immigrants live longer than predicted despite their low socioeconomic status (Crimmins, Kim, Alley, Karlamangla, & Seeman, 2007; Hummer & Chinn, 2011; Williams, 2005). However, in succeeding generations of Hispanic immigrants, health discrepancies are comparable to those between Whites and Blacks (Crimmins et al., 2007; Hamilton, Cardoso, Hummer, & Padilla, 2011). The health patterns resulting from initial healthy immigrant effect and subsequent intergenerational health and mental health decline has also been observed in Caribbean born Black immigrants and successive generations born in the United States (Griffith, Johnson, Zhang, Neighbours, & Jackson, 2011; Green, 2012; Williams et al., 2007). However, these intergenerational effects are less distinct for immigrants of Asian origin, suggesting different processes of social stratification and experiences (Griffith et al., 2011). Some literature has suggested that the health and mental health transition of immigrants reflects and amplifies the social transition towards negative stereotypes experienced by second and third generations (Deaux et al., 2007). More specifically, it has been suggested that intergenerational patterns of immigrant racialized groups can be differentiated by distinct social trajectories and that these trajectories might be strongly influences by patterns of historical racism (Edberg, Cleary, & Vyas, 2011; Hamilton et al., 2011).

Currently, there is very little intergenerational research on health inequalities and racialized status in Canada. One study by Kobayashi, Prus, & Lin (2008) did observe that first generation Blacks are more likely to report good health, while second generation Blacks report poorer health status. Yet, similar to research originating from the United States, Canadian findings are mixed, which may be due to differential processes of social and racial stratification. Furthermore, given the increasing racial diversity of the Canadian population, there is a critical need to examine the intergenerational transmission of positive health status, including prudent separation of various racialized groups.

Health

Healthy behaviours, which result in healthier individuals, are thought to be amplified when environments and policies support healthy choices, and individuals are encouraged and educated to make those decisions (WHO, 1986). Currently, there are increasing concerns regarding the health of young Canadian adults. Results from a recent secondary analysis of data from the 2003 Canadian Community Health Survey (CCHS) discovered that young adults aged 18 to 30 years old (N = 27, 216) report unmet health needs at significantly higher rates than all other age groups (31 to 50, 51 to 64, and >65) (Marshall, 2011). Furthermore, in 2009/2010, 40% of emerging adults in Canada were enrolled in postsecondary education (Public Health Agency of Canada [PHAC], 2011); a population of over one million young men and women (Ruthig, Morrone, Hladkyj, & Robinson-Epp, 2011). This finding is important as undergraduate students have distinctive health needs compared to the general population. In addition to the majority of undergraduate students falling within the developmental period of emerging adulthood, characterized by identity exploration and risk taking behaviours (Arnett, 2000); they also

deal with additional stressors such as academic performance, financial constraints, and changing social groups (Ruthig et al., 2011), and less community connectedness (Marshall, 2011; PHAC, 2011). These stressors are known to impact undergraduate students' health, as exercise, nutrition, and sleep patterns are affected and poor coping behaviours and mechanisms such as binge drinking and substance use are developed (Ruthig et al., 2011).

Self-rated health. When studying health, it is common for researchers to measure how an individual perceives his or her own health. This is best measured using the five-point global health assessment scale: a self-reporting tool that ranges from excellent, very good, good, fair, to poor (Diamant, Wold, Spritzer, & Gelberg, 2000; Lau, Lin, & Flores, 2012; Patterson-Silver Wolf, VanZile-Tamsen, Black, Billiot, & Tovar, 2013). Although self-reported overall health is subjective in nature, it has been found to be an important predictor of actual health and health seeking behaviours, including that of minority populations (Chandola, & Jenkinson, 2000; Idler, Kasl, & Lemke, 1990; Kaplan & Camacho, 1993; Saravanabhavan & Marshall, 1994; Statistics Canada, 2010). However, very few studies have focused on the self-reported health of various ethnic/racial groups and those that are available are mainly derived from samples of the adult population, rather than young emerging adults or university-aged students (Adamson, Ben-Shlomo, Chaturvedi, & Donovan, 2003; Diamant et al., 2000; MacDonald, & Kennedy, 2004; Newbold, & Danforth, 2003; Newbold, 2005). The limited research available is concerning, as ethnic minority groups within Canada often experience a decline in perceived health, which corresponds with time spent living in Canada (Ali, 2002; Dunn, & Dyck, 2000; McKay, Macintyre, and Ellaway, 2003; Ng, Wilkins, Genderon, & Berthelot, 2005; Perez, 2002).

Singh Setia, Lynch, Abrahamowicz, Tousignant, & Quesnel-Vallee (2011) conducted a secondary analysis on data from the Longitudinal Survey of Immigrants to Canada [LSIC] (2001-2005), a national survey that collected information including self-reported overall health from a sample of immigrants who arrived in Canada between October 2000 and September 2001. The primary research objective of Singh Setia and colleagues (2011) involved determining the influence country of origin, individual characteristics, and post-migration experiences had on self-rated health of immigrants to Canada (N = 5, 082). More specifically, analyses were made across different genders (n(males) = 2, 468; n(females) = 2614) (Singh Setia et al., 2011). Results of this Canadian study indicated that all ethnic minority groups were more likely to rate their health as poor when compared to White immigrants (Singh Setia et al., 2011). Furthermore, Chinese immigrants (both male and female) were significantly more likely to report poor health after adjusting for other sociodemographic variables such as marital status, education, and employment (males: odds ratio [OR] 2.57, 95% Confidence Interval [CI] 1.40-4.72; females: OR 3.25, 95% CI 1.35-7.81) (Singh Setia et al., 2011). Similarly, previous research conducted by Newbold (2005) using data drawn from the longitudinal components of the 1994/95, 1996/97, 1998/99, and 2000/01 phases of the National Population Health Survey [NPHS], an on-going longitudinal survey administered by Statistic Canada, sought to identify differences in self-reported health between immigrants and native-born populations, as well as the factors that contribute to immigrant self-reported health, and factors associated with declining self-assessed health status. Results showed that 10.1% of immigrants reported fair or poor health, compared to 9.1% of the native-born population (Newbold, 2005). Although the difference is small, it is statistically significant ($p<0.05$) and thus suggestive of worse health among those not

born in Canada (Newbold, 2005). Furthermore, when age was controlled for, Newbold (2005) observed that greater than 8% of the foreign-born aged 20-34 reported fair or poor health, which was more than double that of the similarly aged native-born cohort (4.0%).

From the available Canadian literature, an alarming consensus shows that in comparison to individuals who report a high household income or socio-economic status (SES), those who declare either a low household income, low SES, and/or unfinished secondary education are more likely to rate their perceived health status as poor and/or fair (Karlsen, & Nazroo, 2002; Laroche, 2000; Tremblay, Dahinten, & Kohen, 2003). These findings have implications for both ethnic/racial minority groups as well as university students who fall within the developmental stage of emerging adulthood. For example, job certification and recognition of skills and/or education remains problematic for newcomers to Canada, and many employers or organizations refuse to recognize the skill sets granted by foreign countries or institutions, which in turn limits economic opportunities and creates constraints or barriers to reaching a higher socioeconomic status (Bauder, 2003). Furthermore, financial constraints are an additional stressor to the majority of young adults pursuing a post-secondary education in Canada (McLachlan & Justice, 2009; Ruthig et al., 2011). While initial entrance scholarships and funding for university education is well-established within Canada, the pressure to maintain and achieve a particular Grade Point Average (GPA) in order to uphold financial aid is a reality for many undergraduate students (McLachlan & Justice, 2009).

As stated above, the majority of literature found pertaining to self-rated health was using samples of adult populations. However, research findings indicate that when compared to older age groups, a surprisingly large percentage of young Canadians (approximately 30%) describe their heath as no better than “good” despite relatively low

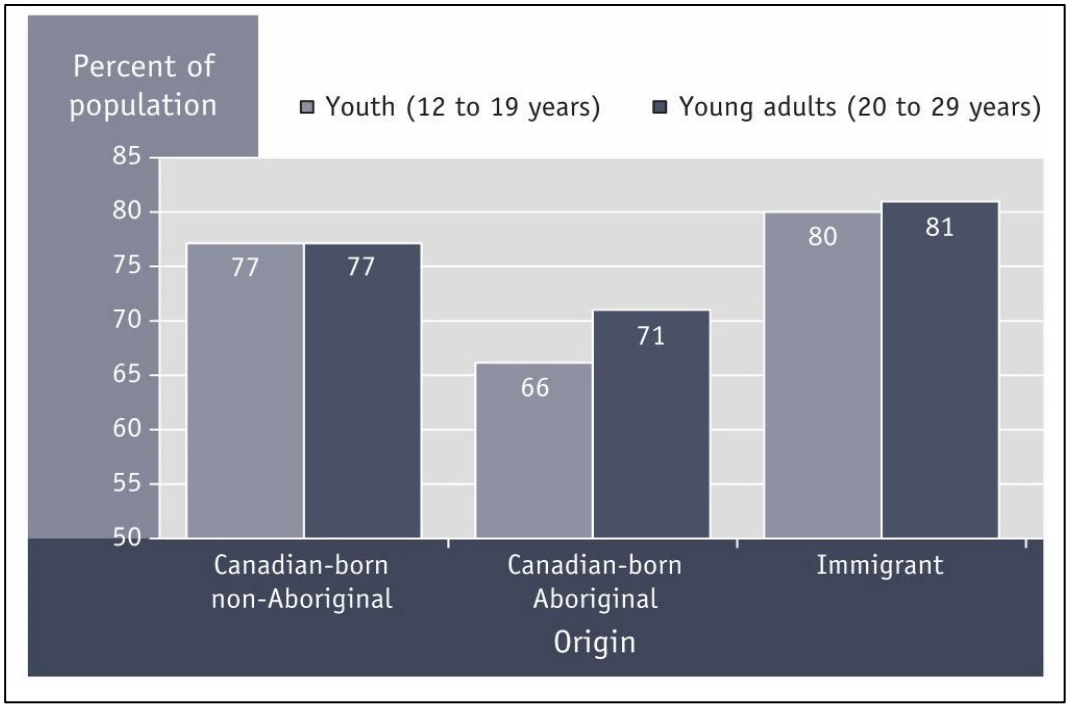
rates of mortality and morbidity (Tremblay, Dahinten, & Kohen, 2003) among this population. One U.S. study conducted by Bauldry, Shanahan, Boardman, Miech, & Macmillan (2012), using the National Longitudinal Study of Adolescent Health sought to determine if background characteristics, parental health conditions, and early health challenges predict self-rated health from adolescence through to young adulthood. Findings are consistent with research using adult sample populations and show that other races (i.e. Black, Hispanic, and Other) had lower self-rated health when compared to Whites (*b*: -0.138). Furthermore, health behaviours such as drinking, smoking, inactivity, as well as depressive symptoms had strong negative associations with self-rated health over time (Bauldry et al., 2012). The paucity of studies available pertaining to the self-rated health of various ethnic/racial groups, more specifically young Canadian ethnic minorities along with the established importance ethnicity has on an individuals' self-rated health status indicates a major knowledge gap in this area of research despite available research demonstrating and verbalizing this need (Tremblay, Dahinten, & Kohen, 2003).

Mental health. Unlike overall health, many studies have addressed the mental health status and needs of ethnic/racial minority groups. From this literature, a troubling quantity of research indicates that, in comparison to the general population, various ethnic/racial groups have significantly higher rates of mental health disparities, such as mental distress, poor perceived mental health, and stress (Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; Tidwell, & Hanassab, 2007), as well as deterioration in overall mental health relative to the amount of time spent living in Canada (Wu, & Schimmele, 2005; Xu, & MacDonald, 2010), and higher rates of self-harm, suicidal ideation and suicide attempts (Brownson, Swanbrow Becker, Shadick,

Jaggers, & Nitkin-Kaner, 2014). Although few studies have specifically addressed the mental health status or needs of ethnically diverse university students, literature that is available reports that young individuals belonging to ethnic/racial minority groups also have significantly higher rates of stress, symptoms of depression and anxiety, and self-harm (Chen, Liu, Zhao, & Yeung, 2015; Dion, & Giordano, 1990). These research findings do however contradict Statistics Canada data (PHAC, 2011), which suggest that more immigrant youth and young adults describe their mental health as being very good or excellent (80% and 81% respectively) when compared to the overall population (See Figure 2.1); as well as a smaller proportion of immigrant youth and young adults (0.8% and 2.5% respectively) self-report being diagnosed with mood disorders.

The inconclusive and/or contradictory results from this body of literature may be a result of several factors. First, data from Statistics Canada only measures the self-perceived mental health status of immigrant youth and young people at one point in time and thus does not speak to the research findings that suggest a deterioration in the mental health status of ethnically diverse populations over time (Wu, & Schimmele, 2005; Xu, & MacDonald, 2010.). Secondly, the proportion of immigrant youth and young adults diagnosed with a mood disorder(s) such as depression and/or bipolar disorder may be smaller when compared to the overall population as a result of issues pertaining to accessibility, underutilization, and quality of health care services (Shao, Richie, & Kennedy Bailey, 2015). Lastly, self-rated measures of health and mental health are subjective and self-reported, which poses a risk for socially desirable responses (Eriksson, Undén, & Elofsson, 2001).

Figure 2.1 *Very good of excellent self-perceived mental health, by origin, Canadian youth and young adults, 2009*



Adapted from Butler-Jones, D. (2011). The Chief Public Health Officer's report on the state of public health in Canada 2011: Youth and young adults – Life in transition (chapter 3). Retrieved from: http://www.phac-aspc.gc.ca/cphorsphc-respcacsp/2011/cphorsphc-respcacsp-06-eng.php

Depression. In both Canada and the U.S., depression and/or depressive symptoms are the most common presenting concern at college and community health clinics (Dion, & Giordano, 1990), and despite the majority of young adults in Canada rating their psychological wellbeing as excellent to very good, this age group has been found to have the highest incidence of depression (Association of Canadian Community Colleges, n.d.). When surveyed as a component of the 2002 Canadian Community Health Survey [CCHS], 4.8% of all Canadians aged 15 years and older met all measured criteria for having a major depressive episode in the previous 12 months (Statistics Canada, 2007). Furthermore, the proportion was highest among young adults, with more than 6.5% meeting the criteria (Statistics Canada, 2007). A systematic review conducted by Ibrahim,

Kelly, Adams, and Glazebrook (2012) exploring the prevalence of depression in undergraduate university students identified that the weighted mean prevalence of depressive disorders in this population was 30.6%, a rate that is considerably higher than rates reported in the general U.S. population (range 6-12%; average 9%). The systematic review included studies published between the years 1990-2010 reporting on depression among undergraduate university students (Ibrahim et al., 2012). Other findings from this review revealed that there is growing concern regarding the mental health of university students as evidenced by the increase in the quantity of publications over time, and that many studies using convenience sampling may actually underestimate the prevalence of depression in university samples because individuals suffering from depression are less likely to volunteer as participants (Ibrahim et al., 2012).

Whether various ethnic/racial groups of university students experience higher rates of depression compared to the general population is not clear because research findings show discrepancies. Some researchers report higher levels of depressive symptoms among specific ethnic groups such as Asian American, South Asian, and South European college and university students (Chen, Liu, Zhao, & Yeung, 2015; Dion & Giordano, 1990; Han, Han, Luo, Jacobs, & Jean-Baptiste, 2013). Dion and Giordano (1990) studied a sample of Canadian university students representing Anglio-Celtic, South European, North European, East European, South Asian and East Asian in Toronto, Ontario and determined that ethnic differences in the self-reported strength of depressive symptoms, as measured by the Beck Depression Inventory (BDI) existed. More specifically, students from South Asian and South European ethnic backgrounds scored higher on the BDI and were more likely to be classified as mildly depressed (Dion & Giordano, 1990). However, Herman, et al. (2011) and Mokrue and Acri (2015) found that

there were no differences among ethnoracial groups of college students in levels of depressive symptoms; data from Statistics Canada (2012) even suggest lower levels of depressive symptoms in minority groups of youth and young adults. These contradictory findings draw attention to the need to examine the relationship between ethnically diverse university students and depression more closely.

Sexual health. Although sexual health has been defined by the WHO (2006) as "a state of physical, emotional, mental, and social well-being in relation to sexuality … not merely the absence of disease, dysfunction or infirmity …" (p.5), recent research on the sexual health of young ethnically diverse populations is sparse and focuses mainly on risky sexual behaviours (Buhi, Marhefka, & Hoban, 2010; Davis, Powell, Gordon, & Kershaw, 2016; Munro-Kramer et al., 2016; PHAC, 2011), and sexual victimization (Gross, Winslett, Roberts, & Gohm , 2006; Krebs, Lindquist, Warner, Fisher, & Martin, 2007; Mohler-Kup et al., 2004). Therefore, current research has not addressed the wider health implications that ethnicity has on sexual health and how factors influencing sexual health may further impact the perceived health status of young ethnic minority groups. A literature review conducted by Serrant-Green (2005) sought to explore some of the reasons for the lack of focus on ethnicity and sexual health in nursing research. Findings from the review highlighted that nursing research into the associations between sexual health and ethnicity is rare and has been hindered by a variety of political and social constraints concerning the nature of sexual health practice in nursing, sexual health research, and ethnicity and health research (Serrant-Green, 2005). Likewise, as a result, there is a scarcity of research evidence to support the development of sexual health practice and the education of health care professionals to support and strengthen the care of ethnic minority groups (Serrant-Green, 2005). Without this evidence base, priorities to

improve sexual health among minority ethnic populations will remain undeveloped (Serrant-Green, 2005).

Risky sexual behaviours. Although sex and sexuality are a natural component of life, they are not without risk. Sexually active youth and young adults may participate in sexual behaviours that could put them at risk for negative sexual health outcomes, such as sexually transmitted infections (STIs) and their related consequences, or unplanned pregnancy (PHAC, 2011). Despite these known risks among youth and young adults, American researchers Buhi, Marhefka, & Hoban (2010) conducted one of the only studies to explore sexual health disparities among college students (aged 18-24) (N = 44, 165). Using data from the Spring 2007 American College Health Association – National College Health Assessment, analyses showed that Caucasians reported more experience in oral and anal sex, were less likely to use condoms for all types of sex, and were less likely to have been tested for Human Immunodeficiency Virus (HIV) compared to their African American counterparts (Buhi, Marhefka, & Hoban, 2010). However, students of African American decent reported more sexual partners, lower use of hormonal contraceptives, and higher rates of adverse sexual health outcomes, including: STIs and unintentional pregnancy (Buhi, Marhefka, & Hoban, 2010).

In addition, Munro-Kramer et al. (2016) conducted a secondary analysis using a mixed-methods design on a subset of Arab-American participants obtained from a randomized-control trial designed to test a Sexual Risk Event History Calendar (SREHC) intervention. Findings suggest and highlight the significant influence that traditional religious and family restrictions have on the discussion of sexual issues as evidenced by inconsistencies between participant report and clinical results of STI testing (Munro-Kramer et al., 2016). For example, although 70.2% of the Arab-American sample did not

report any type of sexual activity (i.e. oral, vaginal, or anal sex), 12.5% self-reported abstinent individuals received clinical recommendations from their health care provider for pregnancy and/or STI testing (Munro-Kramer et al., 2016).

Furthermore, one study conducted by Davis, Powell, Gordon, and Kershaw (2016) sought to understand the factors associated with sexting (sending/receiving sexually suggestive or explicit messages, photos, and/or videos using any form of social technology) among minority (i.e. African American, and Hispanic) emerging adult males and the association between sexting and sexual risk. Results indicated that 54% of participants sent a sext, while 70% received a sext (Davis, Powell, Gordon, & Kershaw, 2016). Participants were also more likely to sext with casual partners than with steady partners, and those who sent sexts to casual partners has significantly more partners (Davis, Powell, Gordon, & Kershaw, 2016). Likewise, young minority men who received sexts from casual partners had significantly more unprotected oral sex and sex while on substances (Davis, Powell, Gordon, & Kershaw, 2016).

In general, comparatively little health-based research has focused on sexual decision-making process and the factors influencing patterns of sexual activity among emerging adults belonging to ethnically diverse groups (Serrant-Green, 2005). Furthermore, research into sexual health in nursing has focused almost entirely on minimizing the effects of what are referred to as poor sexual choices, with little consideration of how or why those choices occur (Serrant-Green, 2005).

Sexual victimization. The WHO has recognized that in order to achieve overall sexual health, "… sexual health requires a positive and respectful approach to sexuality and sexual relationships …" as well as "… pleasurable and safe sexual experiences, free of coercion, discrimination, and violence." (WHO, 2006, p. 5). Although the role of

race/ethnicity as a risk factor for campus sexual assault or rape has not been well studied in the past, primarily due to the small number of ethnic minorities included in previous research, there is evidence to suggest that belonging to an ethnic/racial minority may be a risk factor of experiencing particular forms of rape and/or sexual victimization (Krebs, Lindquist, Warner, Fisher, & Martin, 2007). For example, the Harvard College Alcohol Study found that White undergraduate females were more likely to report experiencing rape when intoxicated than women of other races, nevertheless, in the same study, White women were less likely to report experiencing other types of rape including physically forced rape and threats of force (Mohler-Kup et al., 2004). Likewise, a study conducted by Gross, Winslett, Roberts, and Gohm (2006) found significantly higher rates of physically forced sexual intercourse for African American women compared with White women.

Environment

The determinants of health are those contextual forces that influence an individual's ability to achieve an optimal level of health (Richard, Gauvin, & Raine, 2011). Although the determinants of health collectively influence health (Richard, Gauvin, & Raine, 2011), there are specific determinants which may impact undergraduate ethnic minority groups' health more greatly than others. These include: health practices and coping, social support networks, and health services.

Personal health practice and coping. Individual health practices and coping behaviours go beyond eating healthy and exercising. Rather, these practices enable individuals, families, groups, and communities to maintain wellness and prevent illness through the management of day-to-day life as well as stressful life challenges (PHAC,

2013). Healthy problem solving skills promote independence and positive management of challenges, as opposed to the reliance on harmful coping practices, such as substance use (PHAC, 2013). Unfortunately, researchers have found conflicting evidence regarding the personal health practices and coping behaviours of various ethnic groups of undergraduate students, particularly around negative coping behaviours such as substance abuse (Blake, Ledsky, Goodenow, & O'Donnell, 2001; Brown, Langille, Tanner, & Asbridge, 2014; Morgan, 1995; Nguyen & Neighbors, 2013; Yan & FitzPatrick, 2016).

Substance abuse, a component of mental health, is often studied separately due to the problematic culture of excessive alcohol and illicit drug use on college campuses (Adlaf, Demers, & Gliksman, 2005; Canadian Centre on Substance Abuse, 2007; Paglia-Boak, Mann, Adlaf, & Rehm, 2009; Poulin & Elliot, 2007). Substance abuse involves a physiological and behavioural dependence on a substance that is hazardous to one's health and wellbeing (WHO, 2015). Steenbeek and Langille (2012) identified that alcohol and marijuana are substances used in excess among undergraduate university students in the Maritime Provinces, with 25.4% of students reporting marijuana use at least once in the previous 30 days and 47.9% reporting frequent binge drinking in the previous 30 days (measured as five or more drinks in one occasion) (Steenbeek & Langille, 2012).

Substance use. Findings from past literature regarding the use of substances such as alcohol and marijuana among various ethnic groups of university students appear to be inconsistent (Association of Canadian Community Colleges, 2006; Blake, Ledsky, Goodenow, & O'Donnell, 2001; Brown, Langille, Tanner, & Asbridge, 2014; Morgan, 1995; Nguyen and Neighbors, 2013; Yan & FitzPatrick, 2016). Among various ethnic groups of university students (n = 425) who participated in Randolph and colleagues (2009) Health Behaviors Survey (HBS) questionnaire assessing the role of gender and

ethnicity in the relationship between alcohol use and risky sexual behaviour, African American women reported less drinking and less positive expectancies related to alcohol consumption than other women belonging to other ethnic groups. Morgan (1995) obtained similar results with regard to drug use among high school students (N = 579); White students were more likely than Black students to have had exposure to legal and illegal drugs. As well, White students, more so than Black students were more likely to use tobacco, and White female students were more likely than the others to be alcohol users (Morgan, 2001). Nguyen and Neighbors (2013) also studied alcohol use among White and Asian American college students and derived similar results using self-reported measures of self-determination, perceived parental/peer norms, and drinking form 534 White and 198 Asian American participants (N = 732) who has at least one heavy drinking episode in the month prior to assessment. Asian American students tended to drink less when compared to their White counterparts, and also perceived their friends and parents as less approving of drinking (Nguyen & Neighbors, 2013). In addition, the sample breakdown of White (n = 534) and Asian American (n = 198) students may further add to the support that Asian American students drink less when compared to White students due to the fact that inclusion criteria for participation was having had experiences with a heavy drinking episode during the month prior to assessment (Nguyen & Neighbors, 2013).

Contrary to the research findings discussed above, other researchers have reported that substance use among young ethnic/racial minority groups is related to the process of acculturation and the amount of time spent residing in the current country (Association of Canadian Community Colleges, 2006; Blake, Ledsky, Goodenow, & O'Donnell, 2001; Brown, Langille, Tanner, & Asbridge, 2014; Yan & FitzPatrick, 2016). Brown, Langille,

Tanner, and Asbridge (2014) found that acculturation demonstrated strong direct effects on drinking and marijuana use among a sample of 3,400 high school students from Toronto, Ontario surveyed between 1998-2000. Similarly, a qualitative study conducted by Yan and FitzPatrick (2016) which sought to gain an in-depth understanding of the acculturation process of physical activity, diet, and drinking behaviour among international students (N = 18) in the U.S. also reports the effects acculturation has on drinking patterns and behaviours. Of the 18 students interviewed, only four considered themselves regular drinkers (i.e. drinking 2-3 times a week) before moving to the United States; and for those international students who started to drink after their arrival in the U.S., most reported they viewed drinking as a way to "experience American culture" and "socialize with American friends" (Yan & FitzPatrick, 2016, p. 61). Furthermore, some students revealed that they began drinking even though the practice was against their religion (i.e. Muslim) (Yan & FitzPatrick, 2016).

Social support networks. Social support has been identified as a key factor in maintaining and improving mental and physical health in addition to developing and influencing resiliency (Masten, 2001; O'Dougherty-Wright & Masten, 2006; Werner, 2005). As well, social support can cushion the effects of adverse life situations (PHAC, 2011). Social support can be derived from any positive interpersonal relationship with romantic partners, family, friends, and larger communities (Canadian Institute of Health Information, 2009). Regrettably, research has found that ethnic minority groups and immigrants often lack adequate social support (Runarsdottir & Vilhjalmsson, 2015), with young ethnic minorities reporting some of the lowest rates of peer, and community support (Fischer, 2007; Hurtado & Carter, 1997; Nagasawa & Wong, 1999; Smith & Moore, 2002).

A systematic review conducted by Derr (2016) on the utilization of mental health services among immigrants in the United States found that family, friends, and other social contacts were important influences of help seeking, problem recognition, and treatment initiation. For example, Chung (2010) observed that for Chinese immigrants who had a previous suicide attempt, family support was crucial to their help-seeking behaviour and that the loss of familial support was a factor in their suicide attempts. Other studies identified in the systematic review by Derr (2016) found that friends and family served as important referral sources into mental health treatment (Cabassa, 2007; Chow, Jaffee, Choi, 1999; Hansen, & Cabassa, 2012).

Related more specifically to college/university students, the development and maintenance of social support systems has been linked to college student retention rates and academic achievement (Baker, & Robnett, 2012). A theory of college student departure developed by Tinto (1993), stressed the importance of support from institutions of higher education. Tinto (1993) explains that when students drop out of school, do not do well academically, or are unsatisfied with school it is often a result of unsuccessful integration into the academic and social college communities. A case study conducted by Baker and Robnett (2012) provides supporting evidence to this theory. Findings suggest that social support within the college environment is important for the retention of minority students (Baker, & Robnett, 2012) and may explain the difference in retention rates among different ethnicities. For example, Black students were more likely than Latino students to have connections with peers on campus; more specifically, Black students were more likely than Latino students to study with other students and participate in student organizations (Baker, & Robnett, 2012). Associations between self-esteem/self-worth and school belonging have also been discovered among minority

college students (Gummadam, Pittman, Ioffe, 2016). Gummadam, Pittman, and Ioffe (2016) conducted a study using self-reports of N = 311 undergraduate students from ethnic minority backgrounds and discovered that minority college students reported the lowest levels of self-worth when they were neither connected to their college nor connected to the ethnic group.

Health services. Access to and utilization of essential health services has traditionally been understood as a key determinant of health (Raphael, 2004). However, ecological models have long been used to explain how social, physical, and cultural aspects of the environment have a cumulative effect on health (Stokols, 1992, 1996). Furthermore, ecological models also argue that the environment itself is multilayered, since organizations and neighbourhoods are entrenched in larger social and economic structures, and that the environmental context may impact the health of individuals differently, depending on their distinctive beliefs and practices (Stokols, 1996). More recently, the WHO has questioned the impact that access to health care services has on overall health and instead, has highlighted the importance of the physical environment, social support, and socioeconomic status on health (WHO, 2015a). Nevertheless, the WHO has stated that access to non-discriminatory and culturally appropriate health services are not only a determinant of health, but also a basic human right (WHO, 2015b). Yet, research addressing utilization of essential health care services among specific populations, such as young individuals belonging to ethnic minorities, is sparse and thus poorly understood.

Overall health care utilization. According to the American College Health Association [ACHA] (1993), approximately 10 million students make 20 to 25 million visits per year to student health centres. Despite this, research conducted by Grace (1997)

suggests that college students tend to use medical services in a manner that is different from the general population. Grace (1997) noted that students are likely to delay treatment of various acute medical conditions due to time constraints related to class schedule, which typically resulted in them accessing urgent care services for treatment. In addition, Talley and Rockwell (1985) suggest that the on-campus versus off-campus variable, as it relates to the utilization of services may be affected by the physical prominence of the service on campus and the length of time the service has been in operation. According to Talley and Rockwell (1985), a facility that has high physical visibility but is relatively new might be utilized more by on-campus students due to its ease of access, whereas a service that has been in operation for an extended period of time and is well-known or familiar with the student body as a whole may be more utilized by off-campus students. Furthermore, the utilization of university health services appears to be influenced by the living arrangements of students. For example, Davidson et al. (1991) concluded from their study of student health centres that students who resided off campus and commuted tended to have lower centre visit rates compared to students who lived on campus.

There still remains a paucity of research regarding the overall utilization of health care services among young ethnically diverse populations. However, research indicates that individuals belonging to ethnic minority groups have difficulty accessing culturally safe and congruent health care, and often lack a regular source of health care (Statistics Canada, 2008). Furthermore, the dearth of available research pertaining to the overall utilization of health care services among university students may reflect the health needs of this population. For example, the majority of students (75%) attending university are between 17 and 27 years of age (Statistics Canada, 2010). This is an age range that is

typically associated with optimal physical health (requiring few medical services) as well as the continuation of mental health development. In addition, psychiatric disorders are most prevalent from ages 18 through 25 (Blanco et al., 2008; Mclaughlin et al., 2015).

Mental health care utilization. Despite a high prevalence of psychiatric disorders (Blanco et al., 2008; Mclaughlin et al., 2015), university-aged ethnic and racial minorities are less likely than their White counterparts to seek mental health treatment (Broman, 2012). Furthermore, rates of mental health service use among community samples of ethnic/racial minority groups at risk for psychiatric disorders are relatively low (Abe-Kim et al., 2007; Alegria et a.l., 2008), with similar tendencies among adolescents exhibiting suicidal behaviour (Freedenthal, 2007; Wu, Katic, Liu, Fan, & Fuller, 2010). Davidson, Yakushka, and Sanford-Martens (2004) conducted a study to examine the utilization of a Midwestern university counselling centre's services by non-international racial and ethnic minority students (N = 242). Findings revealed that a very low percentage of racial and ethnic minority students (2.4%) sought services provided by the university's counselling centre (Davidson, Yakushka, and Sanford-Martens). Similar findings were conveyed by Wu and colleagues (2010) in their study of a community sample of teenagers who reported having made a suicide attempt in the previous 12 months. Wu et al. (2010) found that White teens (31%) were more likely than Black (16%) and Hispanic teens (17%) to have used outpatient mental health services. Interestingly, this trend extends to university students. A national survey from the U.S. of over 14,000 university/college students discovered that Black, Latino, and Asian individuals were less likely to seek mental health counselling (Eisenberg, Hunt, Speer, & Zivin, 2011).

As mentioned previously, not perceiving the need for health care is a well-documented barrier to seeking mental health treatment among the general population as

well as ethnic minority groups, and college/university students (Russell, Thompson, & Rosenthal, 2007). Eisenberg and colleagues (2011) found that 51% of students with a mental health problem (i.e. screened positive for major depression, and anxiety disorder, suicidal ideation, or non-suicidal self-harm) who thought they need help sought treatment, compared to 11% of students with a mental health concern who reported they did not need help. For college and university students with a history of suicidal ideation, the most commonly cited reasons for not seeking treatment included a preference for dealing with problems on their own, perceiving stress as normal, receiving support from other sources, and not having enough time to seek formal treatment and counselling (Arria et al., 2011; Downs, & Eisenberg, 2012).

Stigma-related concerns also deter mental health help seeking (Abe-Kim et al., 2007; Chen, Kwan, & Sevig, 2013; Conner, Koeske, & Brown, 2009; Nadeem et al., 2007). A study conducted by Chen, Kwan, and Sevig (2013) to explore the effects of psychological distress and psychocultural variables (i.e. ethnic identity, other-group orientation, perceived discrimination) among college students on perceived stigmatization by others and self-stigma for seeking psychological help (N = 609) found the perceived discrimination had a significant positive effect of perceived stigmatization by others across racial/ethnic minority groups, indicating that the more racial/ethnic minority students perceived discrimination, the more likely they were concerned with being stigmatized by others for seeking psychological treatment. In addition, Atkinson, Barbara, Jennings, & Liongson (1990) discovered that the unavailability of culturally similar or sensitive counsellors was also an important deterrent for ethnic-identified minority college students.

Another possible explanation found in the literature for lower utilization of traditional mental health services may involve seeking alternatives to traditional mental health treatment (Eisenberg, Hunt, Speer, and Zivin, 2011; Gong, Gage, & Tacata, 2003; Neighbors, Musick, & Williams, 1998). Gong and colleagues (2003) found that Filipino Americans were more likely to seek help for mental health concerns from family, friends, a priest or minister, a spiritualist, herbalist, or a fortune teller than from a mental health professional. Furthermore, an aforementioned national survey of college students found that 78% of students who screed positive for major depression and 81% of students who reported suicidal ideation in the previous 12 month sought help from nonclinical sources such as family and friends (Eisenberg, Hunt, Speer, and Zivin, 2011). Therefore, college students, and more specifically ethnic/racial minorities, who do not seek mental health treatment and counselling may, alternatively, seek help from other sources.

Critique of the Literature

The literature reviewed for this proposed study consisted mainly of secondary analyses of data derived from cross-sectional design questionnaires of both probability and non-probability-based samples. Non-experimental, cross-sectional design studies are suitable for research aiming to describe a phenomenon or describe a relationship between phenomena at one point in time (Polit & Beck, 2012). Additionally, secondary analyses are a common research design that allows the testing of new hypotheses, and exploring subgroups within an already existent data set (such as ethnic minorities) (Polit & Beck, 2012). However, these types of research designs do not allow researchers to draw cause and effect conclusions (Polit & Beck, 2012) and often limit health research findings, as

questions are not typically inclusive of specific health topics concerning ethnic minorities (Brownson, Swanbrow Becker, Shadick, Jaggers, & Nitkin-Kaner, 2014).

The majority of the research data were collected via surveys, an effective way to collect an extensive amount of information (Polit & Beck, 2012). A variety of survey methods were used throughout the literature, including face-to-face interviews, web-based questionnaires, pen and paper, mail in questionnaires, and telephone interviews. In particular, a large portion of university-based literature originated from secondary analyses of data from nation-wide surveys of Canada and the United States. Samples derived from entire populations of a country are all encompassing and are considered a "reference group" for the general university/college student population, however, they may lack generalizability to university students in the Canadian Maritime Provinces. This is particularly true for data originating from American based surveys. The only study to specifically address Canadian undergraduate students studying in the Maritime Provinces was the *2012 Maritime Undergraduate Student Sexual Health Services Survey* by Steenbeek and Langille (2012).

There were several limitations of research evidence throughout this review. The bulk of research was collected from convenience samples of various ethnic/racial groups and current literature may only be representative of self-identified ethnic minorities who are comfortable disclosing their ethnic origin and discussing sensitive topics, such as sexual behaviours, substance abuse, etc. In addition, much of the literature reviewed, on various topics of interest, was inconsistent. Conflicting evidence around mental health, rates of depression and substance abuse, as well as self-rated health of ethnically diverse university students suggests that a gap exists in what is currently known with regards to these subjects. Furthermore, inconsistent or incongruent evidence has implications for

health professionals such as nurses due to the inability of this research to inform and improve the education and practices of health practitioners. As well, self-reported data poses a risk for bias, as participants may provide responses that they deem to be more socially desirable (Polit & Beck, 2012) for example, not disclosing a mental health concern. Although the proposed study will have similar limitations, web-based surveys are believed to be more effective in reaching minority populations who are concerned about confidentiality and anonymity (Tourangeau, 2014).

Additionally, in the literature, samples of youth and young adults were relatively small in comparison to samples of adults. This may be a result of several factors. First, within the context of research, national guidelines such as the Canadian Tri-council Policy Statement on Research with Human Subjects, are frequently assumed to minimize the risks of participating in research and ensure that potential benefits are weighed against any potential risks. However, a large proportion of health research, especially that which employs emancipatory methods, does not fit neatly with ethical practices required by Research Ethics Boards (REBs). There is evidence to suggest that the activities and standardized procedures of REBs can prevent researchers from meeting the ethical standards that are promoted by youth, feminist, critical race, queer, and cultural studies (Swauger, 2009; Bray & Gooskins, 2006). Secondly, because many youth and young adults reside with parents or do not have their own fixed address, it becomes a challenge to reach youth and young adults for participation in research opportunities. Lastly, youth and young adults may not fully understand the importance and value of their contribution to research.

Overall, there is a knowledge gap in current literature on the health and health service utilization of various ethnic/racial groups of undergraduate students. Although there is a

small body of evidence on the health of emerging adults, the majority of evidence focuses on risky health behaviours and does not fully capture the health status of more marginalized groups. Ethnically diverse undergraduate students may differ greatly from non-students; therefore, there is a need to correct this knowledge gap and understand how various ethnic groups of undergraduate students perceive their health, as well as what psychosocial or behavioural factors may be impacting their perceived health and their uptake of university health services.

Chapter Three: Methodology

Young individuals belonging to ethnic/racial minority groups are at an increased risk for poor overall health outcomes and many experience barriers to accessing health services for these needs (Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; Tidwell, & Hanassab, 2007). Although there is a small amount of research available on the self-rated health of ethnic minority groups, the majority of this data is derived from adult samples. There is a gap in literature on young emerging adult ethnic minorities and how they perceive and rate their health. As well, there is a gap in our understanding on what factors determine or impact the self-rated health of young ethnic minorities and an even larger gap on their use of health services. This current lack of research and knowledge is even particularly more prevalent among undergraduate populations of ethnic groups.

The current study explored self-rated health and the use of university health services stratified by ethnicity among a sample of undergraduate students from the Maritime Provinces in 2012. Furthermore, this study aimed to identify predictors of self-rated health and university health service use and to determine a relationship between perceived health status and utilization of health services by various ethnic groups of undergraduate students from the Maritime Provinces. This was completed through a secondary analysis of descriptive, cross-sectional design study data previously collected from the *2012 Maritime Undergraduate Student Sexual Health Services Survey* (N = 10,512) conducted by Dr. Steenbeek and Dr. Langille (funded by the Canadian Institute of Health Research and Nova Scotia Health Research Foundation operating grants). The *2012 Maritime Undergraduate Student Sexual Health Services Survey* was an online survey administered to undergraduate students attending eight Maritime universities

(Dalhousie, St. Mary's, Mount Saint Vincent, Acadia, St. Francis Xavier, Cape Breton University, the University of Prince Edward Island, and the University of New Brunswick).

Conceptual Framework

The Social Ecological Model was utilized to assist in the identification of factors that influence health at the level of the individual, family, community and society. Social ecology offers a framework that aids in the understanding of how individuals and their environment mutually impact one another across a lifetime (Richard, Gauvin, & Raine, 2011). Consequently, human development, health and health behaviours can be viewed and understood as being the outcome of exposure to the shared influences family, community and society at large have on an individual (Glass & McAtee, 2006; World Health Organization [WHO], 2012). In their glossary, McLaren & Hawe (2004) define the ecological perspective as being "a conceptual framework designed to draw attention to individual and environmental determinants of behavior." (p.9).

Contrary to popular belief, social ecological models are not new to public health and health promotion (Richard, Gauvin, & Raine, 2011). Early ecological models within public health stem from the theoretical work of Lewin (1951) (i.e. suggested that behaviour can only be explained by taking into account the codependent dynamics of all the factors found within the "field"), Barker (1968) (i.e. concluded that behaviours are best predicted by the settings in which they occur), and Bronfenbrenner (1969) (i.e. advancement of the ecological framework of human development with emphasis on the micro, meso-, exo-, and macrosystem influences). Each added to the rich theoretical framework with their different perspectives, philosophies and dimensions including how

we define social ecology, the ways in which settings influence behaviour and processes of systems change. Currently, there has been a restored interest in the use of ecological frameworks and thought processes within public health, which may be the result of several factors (Richard, Gauvin, & Raine, 2011). By examining the social inequalities found in health and health care, the focus shifts to the role of larger contextual determinants of health, such as socioeconomic factors as well as other social and cultural influences (Richard, Gauvin, & Raine, 2011). Furthermore, in the pursuit of seeking an explanation to the increasing evidence that suggests place of residence significantly influences health, analysis of context is becoming a requirement (McLaren, & Hawe, 2004).

Following the Social Ecological Model, the current research will reflect the influence contextual factors such as culture, place of residence, perceived levels of support, access to services and resources and other social determinants of health have on health and health behaviours. Using this framework to guide the research ensured a holistic view of health was maintained and the many factors that determine health among different ethnic and racial groups of undergraduate students were considered.

Target Population

The *2012 Maritime Undergraduate Student Sexual Health Services Survey* sample population consisted of a total of 10,512 undergraduate students: 3,100 males, 7,313 females and 39 transgender individuals aged 17 to 35 years old. This sample was predominately females (69.6%), between the ages of 17 to 24 (80.8%) who self-reported their ethnicity as Caucasian (86.4%). These undergraduate students were recruited from eight universities located in Canada's Maritime provinces which include: Dalhousie

(Halifax, Nova Scotia), St. Mary's (Halifax, Nova Scotia), Mount Saint Vincent (Halifax, Nova Scotia), Cape Breton University (Cape Breton, Nova Scotia, St. Francis Xavier (Antigonish, Nova Scotia), Acadia (Wolfville, Nova Scotia), the University of Prince Edward Island (Charlottetown, Prince Edward Island), and the University of New Brunswick (Fredericton, New Brunswick). These universities were non-randomly chosen to guarantee a heterogeneous sample of the Maritime undergraduate student population. The survey excludes students attending francophone universities in the Maritime provinces due to concerns with language and translation (Steenbeek & Langille, 2012).

The target population for this study were the various ethnic groups of undergraduate students from the eight participating universities located in the Maritime Provinces of Canada. The sample population consisted of those participants who self-reported their ethnicity (n = 10,344) in the survey question: *What ethnic/racial background do you consider yourself to be?* Options to choose from included: White (Caucasian), African descent, Aboriginal (with option to specify), Asian, Middle Eastern, and/or Other (with option to describe or specify). This sample was considered a nonprobability, convenience sample and was congruent with the overall purpose and design of the proposed research.

The study sample was not restricted by any specific age range. Typically, undergraduate students fall within the developmental period referred to as emerging adulthood, defined as ages 18 to 25 (Arnett, 2000), however, it was felt that it would be unlikely that any outliers would have an impact the study findings. This was due to the fact that the age range of ethnically diverse participants of the 2012 Maritime Undergraduate Sexual Health Services Survey was 17 to 35. Participants from all eight Maritime universities who partook in the 2012 Maritime Undergraduate Sexual Health

Services Survey were included. Therefore, the current study sample of various ethnic groups of undergraduate students was derived from a heterogeneous sample of undergraduate students originating from a variety of large and small (with regards to size and enrolment), as well as urban and rural university settings (Steenbeek & Langille, 2012).

Instrumentation

The *2012 Maritime Undergraduate Student Sexual Health Services Survey* was an anonymous, web-based, English questionnaire. The survey took approximately 20 to 25 minutes to complete and included forty-two multiple choice questions pertaining to demographics, health, health knowledge, social well-being, health behaviours and the use of health services. In addition, the survey included two open-ended questions, which allowed participants to provided suggestions on how to improve their university health services (Steenbeek & Langille, 2012).

Survey development. The survey was developed and piloted between 2009-2010 with 220 undergraduate students from Dalhousie and Acadia University. Undergraduate students were continuously involved in the development of the survey tool. To begin, data collected during undergraduate student focus groups at Dalhousie and Acadia universities guided the development of survey content. This was further enhanced by data from other tested/validated sexual health surveys and past literature. Second, undergraduate students provided feedback regarding which improvements could be made to the survey content and format during the 2010 pilot survey administration. This was also supplemented by feedback from the research team members and knowledge users. Several items included in the survey were taken from a previously used survey tool,

which measured youth health and health service use (Langille, 2006). This survey tool was tested among high school students in Nova Scotia (Langille, 2006). A small number of questions that were developed specifically for the survey were also included despite the fact that they were nor pilot tested nor were assessed for test re-test reliability. Finally, the complete survey was piloted with a small sample of Dalhousie and Acadia undergraduate students, which yielded a high completion rate of survey items; Steenbeek and Langille also adjusted and/or eliminated survey items based on participant feedback.

Survey distribution. Survey distribution took place during the fall of 2012. Undergraduate students from the eight participating Maritime universities were able to access the online questionnaire through a web-based surveying program OPINIO (Object Planet, 2014). This programming is a commonly used tool for large-scale surveys at Dalhousie. In addition, this program also maintains high security standards, confidentiality and anonymity, and prevents participants from completing the survey more than once. At the time of the survey, OPINIO was hosted by Dalhousie, however, each university had its own interface for their survey website. Moreover, letters of collaboration were obtained from each university emphasizing the importance of their commitment to health the research team distribute the survey via student email list servers to all the undergraduate students at the participating universities.

Data Collection and Sampling

Data collected from the *2012 Maritime Undergraduate Student Sexual Health Services Survey* is currently being stored as an encrypted file with Dr. Langille in the Community Health and Epidemiology Department at Dalhousie University. According to Polit and Beck (2012), "secondary analysis involves the use of existing data from a

previous study to test new hypotheses or answer new questions" (p. 266) therefore, no new data collection will take place for the proposed research.

Steenbeek and Langille (2012) collected data in the fall of 2012 using the Dillman approach (Hoddinott & Bass, 1986). This included a series of emails to undergraduate student list servers obtained from each university's registrar's office prior to, and during survey administration. Undergraduate students were initially contacted via email one week before the survey was to be administered. The initial email included a detailed description of the study and survey including the overall purpose of the research. A second email was sent a week later containing a web-link to the online questionnaire. Two weeks after the first email questionnaire link was sent, a reminder containing another link to the survey was sent out along with a thank you to the students who had already participated and a request for those that had not participated to consider doing so. Steenbeek and Langille (2012) also posted advertisements for the survey on online notice boards and at each university's student's services and health services departments. Utilizing the registrar's office at each participating university for survey distribution maintained the anonymity and confidentiality of participants. Furthermore, each university used different incentive strategies to encourage student's participation in the online survey. For example, Dalhousie held a random draw for an iPad if the student wished to submit their name and contact information following completion of the survey. To ensure responses remained confidential and anonymous, student names and contact information were in no way connected to their completed surveys.

Study Variables

The following survey items were selected to align with the proposed study's research questions and objectives.

Demographic variables. The selected demographic variables helped to describe the ethnically diverse undergraduate population. See Appendix B for each demographic item as measured in the *2012 Maritime Undergraduate Student Sexual Health Services Survey*.

Age. Age was measured using results from the *2012 Maritime Undergraduate Student Sexual Health Services Survey* question, which asked participants "What is your age in years?" This variable has a reported Pearson's coefficient of 0.98 (Langille, 2006). This item remained a continuous variable in the current study.

Biological sex. Participants were asked to divulge their biological sex by responding to the question "What is your sex?" Response options included: male, female, transgender, and other. No test-re-test results are currently available for this demographic variable among undergraduate university students. Due to the limited frequencies of the transgender and other categories, only males and females were included in the statistical analyses of the current study. It is also important to note that there is a distinct difference between an individual's biological sex and gender. As it was worded in the original survey, this question is a better measure of biological sex (i.e. male and female) than gender (i.e. transgender).

Ethnicity/race. Ethnicity/race is an important predictor variable given the overall purpose of the proposed research and was measured using item number three of the survey which asked participants, "What ethnic/racial background do you consider yourself to be?" Options for response included: Caucasian, African decent, Aboriginal, Asian, Middle Eastern, and other. Participants were instructed to choose all that apply. No test-re-test results are currently available for this demographic variable among undergraduate university students. Because this question was a multiple response

question and participants had the option to choose more than one ethnicity to describe their ethnic/racial background, a seventh ethnic group "Multiracial" was computed to taken into consideration those participants who self-reported belonging to multiple ethnicities. This item remained a nominal variable in order to describe any ethnic or racial diversity among undergraduate students, as having intersecting minority statuses are known to impact overall health and access to health services (Veenstra, 2011; PHAC, 2011a).

Year of study. Participant's year of study will be measured using the survey item, which asked participants to identify the year of their undergraduate program they were currently enrolled in. Response options included first year, second year, third year, fourth year, and other. This item has a reported Cohen's Kappa of 1.0 (Langille, 2006) and was measured as a continuous variable. Responses of "other" were not included due to the lack of consistency of responses given by participants.

Living arrangements. Participants were asked to disclose their living arrangements by responding to the question "Who do you live with?" Response options included: alone, with one or more parent, with a sexual or romantic partner, and with roommates. This survey item received a Cohen's kappa of 0.93 (Langille, 2006) and was measured as a nominal variable.

Socioeconomic status. Research has shown family socioeconomic status to be a considerable predictor of healthy development during emerging adulthood (O'Connor et al., 2011). Socioeconomic status is also considered a key determinant of health in Canada (PHAC, 2011a). Therefore, participants were asked to rate their family's socioeconomic status in the *2012 Maritime Undergraduate Student Sexual Health Services Survey*. This item asked "*How wealthy do you see your family as being?*" Options for response were

presented on a five-point scale ranging from very wealthy to not wealthy at all. This item has a reported Cohen's kappa of 0.71 (Langille, 2006). Socioeconomic status was measured as an ordinal variable; however, in order to aid in simplifying the analyses process, very wealthy and quite wealthy were combined into one "wealthy" category and not so wealthy and not wealthy at all were combined into one "not wealthy" category for the purpose of statistical analyses.

Outcome variables. The main outcome variables of this study were self-rated health and use of university health services among various ethnic groups of undergraduate students. However, these variables were also included in analyses as potential independent/predictor variables of the other.

Self-rated overall health. The main outcome variable for the current research was "self-rated overall health" of all participants stratified by ethnicity. Self-rated overall health was measured by Steenbeek and Langille (2012) in the *2012 Maritime Undergraduate Student Sexual Health Services Survey* by asking participants "In general, would you say that your health is?" Options for response were given in the form of a five-point scale ranging from excellent health to poor health with very good, good and fair in between. Langille (2006) reported a Cohen's kappa coefficient of 0.56 after testing this scale for inter-observer agreement during an instrument development process with youth across Nova Scotia. Given that 0.6 is arguably the minimum value acceptable for research, the reported Cohen's kappa coefficient of 0.56 may not be considered to constitute good agreement (Polit & Beck, 2012). However, a commonly cited Kappa interpretation scale indicates that a Kappa of 0.4-0.6 falls within the "moderate" agreement range (Viera & Garrett, 2005). In addition, a search of the literature revealed similar self-rated health scales indicating they are a frequently used measure in

epidemiology research (Axelsson, Modén, Rosvall, and Lindström, 2013; Diamant et al., 2000; Fredriksen-Goldsen et al., 2010; Steele et al., 2009).

Self-rated health was dichotomized by collapsing the response of excellent, very good, and good into one category and responses of fair and poor into another (see Table 3.1). Although any form of data collapsing risks wasting information and effectively reducing the statistical power capability (Field, 2013), the choice to dichotomize self-rated health into two categories was based on past research establishing that the responses in the self-rated health scale are not evenly distributed and the largest distinction between responses is typically found between good and fair. Furthermore, examples of dichotomizing self-rated health scales can be found in past literature and therefore, it was felt that this would enhance comparisions between the study's findings and past literature (Axelsson et al., 2013 & Fredriksen-Goldsen et al., 2010).

Health service use. The use of health services among various ethnic groups of undergraduate university students was assessed using the results of *2012 Maritime Undergraduate Student Sexual Health Services Survey*. Steenbeek and Langille (2012) measured university health service use as a dichotomous variable by asking participants "Have you ever seen a doctor or nurse at your university health centre for any reason?" Response options included yes or no. Those participants who answered yes were then encouraged to specify the reason for the visit. This item did not receive reliability or validity testing prior to survey distribution; a search of the literature did not yield any results for reliability and/or validity of similar survey items among the undergraduate student population.

For the purpose of this research study, health service utilization remained a dichotomous variable; no: the participant has never accessed university health services for

assessment by a nurse or physician or yes: the participant has accessed university health services for assessment by a nurse or physician. The reason for last visit was excluded from the study due to is irrelevance to the study objectives.

Independent variables. The following independent variables were selected based on the larger contextual determinants of health as outlined in the Social Ecological Model (Richard, Gauvin, & Raine, 2011), as well as past literature on the health of various ethnic groups of undergraduate students. These variables were used to identify the most significant predictors of self-rated health and use of health services among different ethnic groups of undergraduate students attending the eight Maritime universities.

Depression risk. Depression risk was measured using scores from the survey item number sixteen. Steenbeek and Langille (2012) measured depression risk using a 12-point version of the Centre for Epidemiological Studies' Depression scale (CES-D12). This is a self-reported scale, which measures the frequency with which participant's experiences depressive symptoms the week prior to completing the survey (Poulin, Hand, & Boudreau, 2005). Scores can range between 0 and 36; with a score of 0 to 11 indicating minimal depressive symptoms, scores of 12 to 20 indicating elevated/moderate depressive symptoms, and scores of 21 to 36 indicating very elevated depressive symptoms.

The CES-D12 was tested among junior and senior high students throughout the Atlantic Provinces of Canada during the National Longitudinal Study of Children and Youth, achieving a Cronbach's Alpha coefficient of 0.85 (Poulin et al., 2005). However, it is important to note that the CES-D12 measures depression risk among the "general population", and may not fully capture depression risk related to minority groups, and stress among different ethnic/racial groups of undergraduate students.

Depression risk was the only scale on the survey related to mental health, which is a very important predictor of health among racial/ethnic minority students. There is consensus throughout the research literature that racial/ethnic minorities and/or international students are at a significantly higher risk for developing depression and anxiety (Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; Tidwell, & Hanassab, 2007). In a research study conducted by Han, Han, Luo, Jacobs, and Jean-Baptiste (2013) to examine the prevalence of depression and anxiety symptoms in Chinese international students attending Yale University in the United States, it was reported that 45% of Chinese international students surveyed conveyed experiencing depressive symptoms and 29% had anxiety (Han et al., 2013). Compared to findings from United States universities in general which suggest that 12.8% and 13% of students reported being diagnosed with depression and anxiety respectively, the prevalence of these two mood disorders appears to be substantially higher among international students (Han et al., 2013).

For the current study, depression risk was measured as a continuous variable to determine if a positive or negative relationship exists between depression risk and the two outcome variable, self-rated health and use of health services.

Social support. Social support will be measured using scores from the item of the *2012 Maritime Undergraduate Student Sexual Health Services Survey*, which asked participants to "Please describe how true you believe each of the following statements about your social relationships and support networks." Steenbeek and Langille (2012) administered the Sense of Social Support Scale (SSS) as a twenty-one item, five-point scale with response options ranging from "not true at all" to "completely true." Total scores have the potential to fall anywhere from 0 to 84, with a higher score indicating

more perceived social support. Dolbier and Steinhardt (2000) validated this scale with an undergraduate student population and reported a Cronbach's Alpha of 0.86 and test-retest reliability of R=0.91 ($p < .001$). Langille (2006) also validated this scale with Maritime high school students, reporting a Cronbach's Alpha score of 0.71. Cut off points for the SSS scores have not been validated in past literature, therefore participants' total score was measured as a continuous variable in the study.

Substance use. The *2012 Maritime Undergraduate Student Sexual Health Services Survey* measured two types of substance use in two questions on the survey. Steenbeek and Langille (2012) measured marijuana use by asking participants to identify the number of occasions they used marijuana in the past thirty days. Participants were provided six response options including: zero times, one to two times, three to nine times, ten to nineteen times, twenty to thirty times and forty or more time. This measurement is commonly used to measure marijuana use among undergraduate students and emerging adults (Kerr et al., 2014, Kerr et al., 2015; Schauer et al., 2013) and has been validated among youth in Nova Scotia, achieving a Cohen's kappa coefficient of 0.57 (Langille, 2006). Steenbeek and Langille (2012) also measured binge drinking as a form of substance use by asking survey participants "During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, this is, within a couple of hours?" Participants were given the following seven response options: zero days, one day, two days, three to five days, six to nine days, ten to nineteen days, and twenty or more days. This is a commonly used measure of binge drinking behaviours among populations of emerging adults (Kerr et al.,2014; Talley, Hughes, Aranda, Birkett, & Marshal, 2014; Shauer et al., 2013). This measurement has also been validated among youth in Nova Scotia, achieving a Cohen's kappa coefficient of 0.51 (Langille, 2006).

Research shows that substance use is an important predictor of health, because it can have detrimental effects on cardiovascular health, liver disease and cancers (Arbour-Nicitopoulos, Kwan, Lowe, Taman, & Faulkner, 2010). Additionally, substance use among the Canadian undergraduate student population has become a perceived social norm (Arbour-Nicitopoulos et al., 2010). A national survey of Canadian university students in 2004, found that 77.1% of undergraduate students (both male and female) used alcohol one month prior to the survey (Adalf, Demers, & Gliksman, 2004). More specifically, research conducted by Blake, Ledsky, Goodenow, and O'Donnell (2001) found that immigrant youth living in the United States for six years or less were more likely to report peer pressure to use substances and less parental support to avoid substance use risk behaviours when compared to lifetime residents.

For the current study, both marijuana use and binge drinking were analyzed as dichotomous variables: no marijuana use in the past 30 days or marijuana use in the past 30 days and no binge drinking in the past 30 days or one or more occasions of binge drinking in the past 30 days.

Sexual victimization. Sexual victimization was measured using survey item number 28 of the *2012 Maritime Undergraduate Student Sexual Health Services Survey*, which specifically asks participants to identify yes of no to the following "Since you have been at university, have you ever been forced to have sex of any type against your will?" Although Steenbeek and Langille (2012) included this item in the pilot study conducted with Dalhousie University and Acadia University, they did not perform test-re-testing; therefore, there is no known Cohen's kappa coefficient at this time. However, similar surveys such as the Juvenile Victimization Questionnaire have included items to address both attempted and completed rape by asking participants "In the last year, did anyone try

to force you to have sex; this is, sexual intercourse of any kind, even if it didn't happen?" Construct validity of this particular item demonstrated test-re-test reliability showed 100% agreement among youth aged 10 to 17 (Finkelhor et al., 2005).

The role of ethnicity and race as a risk factor for campus sexual assault or rape has not been well studied in the past, primarily due to the small number of minorities included in previous research however, the role of ethnicity and race as a risk factor for sexual assault may differ based on the type of assault. For example, the Harvard College Alcohol Study found that white undergraduate females were more likely to report experiencing rape when intoxicated than women of other race, nevertheless, in the same study, white women were less likely to report experiencing other types of rape including physically forced rape and threats of force (Mohler-Kuo et al., 2004). Likewise, a study conducted by Gross, Winslett, Roberts, and Gohm (2006) found significantly higher rates of physically forced sexual intercourse for African American women compared with white women. This variable was analyzed as a dichotomous variable: never experienced forced sex during university and experienced forced sex during university.

Confounding variables. Due to the nature of the current research study, it was important to identify and control for particular variables, as there was a risk that certain variables were correlated (Field, 2013). More specifically, socioeconomic status and biological sex are two variables that are found to be significantly related to self-rated health and the other predictor variables (PHAC, 2001a). The PHAC (2011a) has identified that socioeconomic status has the largest impact on the health of Canadians and that of individuals. Furthermore, from the literature reviewed above, it has been determined that biological sex has an impact on self-rated health status and access to health services. Additionally, Steenbeek and Langille (2012) also found a trend for

Maritime university students who were in their third and fourth years to have higher rates of university health service use compared to first and second year students (48%, 42%, 36%, 14% respectively). This is likely due to the amount of time spent on campus and opportunity to use the university health services (Steenbeek & Langille, 2012). Therefore, because it was highly likely that these variables would impact the results of the study, they were controlled for during multivariable statistical analyses if found to be significant predictors during univariable analyses.

Data Analyses

Analyses were conducted using the Statistical Packages for Social Sciences (SPSS) version 23. Beginning with descriptive statistics, all variables of interest were measured in order to describe the various ethnic groups of undergraduate students who participated in the *2012 Maritime Undergraduate Student Sexual Health Services Survey*. Results from these analyses were also used to describe the distribution of the various ethnic groups across each variable of interest. Before beginning the inferential statistical analyses, the data was examined using contingency tables to ensure that when each independent variable crossed with the dependent variable, there were at least five cases for each cell.

Logistic regression. Inferential statistical analyses were conducted by running several logistic regression models (univariable and multivariable). These models were used to examine and predict the probability of various ethnic groups of undergraduate students rating their health as excellent/very good/good versus fair/poor based on the values and relationships with the independent/predictor variables. Also, the two phases of logistic regression were used to examine and predict the probability of the study

population's use of university health services or not based on the values and relationships with the independent/predictors variables (Field, 2013). These statistical tests were performed at a standard alpha of .05 (Hosmer & Lemeshow, 2000).

Logistic regression was chosen as the method of analysis for this study because it expresses categorical variable relationships on a linear fashion and both outcome variables are dichotomous (Field, 2013). This is performed through logarithmic transformation of data, which entails transforming the probability of the dependent variable "occurring" versus "not occurring" into a new variable with a probability range of minus infinity to plus infinity (Polit, & Beck, 2012). The new variable is called the logit (or logistic probability unit), and the maximum likelihood procedure calculates the change associated with one unit change in an independent/predictor variable (Polit, & Beck, 2012). Therefore, dummy codes were assigned to represent the categorical dependent and independent variables of interest (See Table 3.1).

Table 3.1 *Variable codes for analyses*

Variables	**Survey Item**	**Logistic Regression Dummy Codes**
Self-rated health	In general, would you say your health is?	poor, fair = 0, good, very good, and excellent = 1
Health service utilization	Have you ever seen a doctor or nurse at your university health centre for any reason?	Did not access health services = 0 Did access health services =1
Age	What is your age in years?	Continuous variable
Biological sex	What is your sex?	Male =1 Female = 2
Year of study	What year of your undergraduate program are you in?	Continuous variable

Variables	Survey Item	Logistic Regression Dummy Codes
Race/Ethnicity	What ethnic/racial background do you consider yourself to be?"	Caucasian = 1 African descent = 2 Aboriginal = 3 Asian = 4 Middle Eastern = 5 Other = 6 Multiracial = 7
Socioeconomic Status	How wealthy do you see your family as being?	Not so wealthy and not wealthy at all = 0 Average = 1 Very wealthy and wealthy = 2
Living Arrangements	Who do you live with?	Alone = 0 Parent(s) = 1 Sexual/Romantic partner = 2 Roommates = 3
Depression risk	We would like to know how you have been feeling about yourself and your life generally. Below is a list of the ways you might have felt or behaved. Please indicate how much of the time you felt this way during the past week checking the appropriate response.	Continuous variable
Social support	Please describe how true you believe each of the following statements about your social relationships and support networks.	Continuous variable
Binge drinking (in past 30 days)	During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple hours?	No occasions = 0 One or more occasions = 1
Marijuana use (in past 30 days)	During the past 30 days, how many times did you use marijuana?	No days of use = 0 One or more days of use = 1
Sexual Victimization	Since you have been at university, have you ever been forced to have sex of any type against your will?	No = 1 Yes = 2

To answer the first two research questions: What are the key predictors of self-rated health among various ethnic/racial groups of undergraduate students in Maritime university campuses? What are the key predictors of university health care service use for various ethnic groups on Maritime university campuses?, two phases of logistic regression were utilized for each outcome variable stratified by ethnicity.

Univariable logistic regression phase. Univariable logistic regression was first utilized to examine and predict the individual relationships between self-rated health and use of health services with each of the independent variables (Field, 2013). The results of each model were presented as odds rations, 95% confidence intervals, and *p* values in order to determine which independent variables would be included as potential predictor variables in the multivariable logistic regression models. These results were also used to help determine whether the theoretically selected confounding variables (i.e. socioeconomic status, biological sex, and year of study) had a significant association with either of the dependent variables. For the intention of parsimony, only those confounding variable(s) that proved to be significantly associated with the outcome variables at the $p<.05$ level were controlled for during multivariable logistic regression.

Multivariable logistic regression. Multivariable logistic regression was then used to examine and predict relationships and interactions between self-rated overall health and health services use with the independent variables. According to Field (2013), multivariate logistic regression breaks up the interactions between variables into multiple comparisons to identify the most significant interactions. In addition, Polit and Beck (2012) state that logistic regression is an appropriate choice for clinical questions such as those guiding the proposed research study. When conducting analyses in SPSS, the forced entry method was used to break up the individual interactions between variables into

multiple comparisons in order to identify the *most* significant associations (Field, 2013). Furthermore, the forced entry method was the most appropriate method for this study, as the independent variables were all selected based past research and the guiding conceptual framework (Field, 2013). Only those variables identified as potential predictors ($p<.05$) during the univariable logistic regression phase were included in the final models.

The results of the multivariable logistic regression were also be presented as odds ratios, 95% confidence intervals, and *p* values. To further ensure analyses results were accurate and applicable, the Homer-Lemeshow goodness of fit tests (Field, 2013) and the Omnibus Tests of Model Coefficients were utilized to ensure that the fit of the model had improved relative to a baseline model with no predictor variables (Field, 2013).

Pearsons chi-square. To end the analyses, a series of chi-square tests were conducted to answer the final research question (What is the relationship and/or associations between self-rated health and use of health services among the different ethnic/racial groups?), and determine the relationship between self-rated health and use of health services among the ethnically diverse undergraduate population within the Maritimes. This final step began by determining whether there was a significant difference in the self-rated health and health service use of various ethnic groups of undergraduate students within the Maritime Provinces. Associations were determined by Pearson's chi-square test ($p < .05$), which is an appropriate test when analyzing relationships between categorical variables (Field, 2013). Cramer's V and Phi were used to determine the strength of such associations (Field, 2013).

A second Pearson's chi-square test then determined whether there is a significant difference in the health service use of various ethnic groups and Caucasian undergraduate

students based on similar need, such as perceiving their health as fair/poor. However, in order to ensure that comparative analyses were run as equivalent as possible, need was defined as poor self-rated health due to the important role that perceived health has on an individual's health seeking behaviours (Statistics Canada, 2010). Associations and their strength were also determined by Pearson's chi-square tests ($p < .05$), Cramer's V, and Phi (Field, 2013).

Sample and effect size. Currently, there is little to no agreement on how to determine sample sizes for logistic regression (Hosmer & Lemeshow, 2000). However, general guidelines do exist including the most well-known rule by Peduzzi, Concato, Kemper, Holford, and Feinstein (1996). These authors discovered that ten participants (or event) per predictor variables is an acceptable number to prevent issues of overestimation and underestimation of variances (Peduzzi et al., 1996), while other have found that ten to twenty participants (or events) per variable is required (Courvoisier, Combescure, Agoritsas, Gayet-Ageron, & Perneger, 2010; Vittinghoff and Mcculloc, 2007). However, given the fact that this study entailed a secondary analysis of data, the sample size for the population of interest was fixed. Although power and its subsequent calculations are important to consider and acknowledge, given the numerous variables the current study sought to explore, there is not one single power analysis for the study. Thus, rather than conducting a power analysis, an a-priori sample size for multiple regression was calculated. Using the desired probability level ($p = 0.05$), the number of predictors in the model (8), the anticipated effect size ($f^2 = 0.15$ for a medium effect), and the desired statistical power level (0.8), the minimum required sample size for the proposed study is $N = 108$. Therefore, the available sample size of ethnically diverse undergraduate students from the *2012 Maritime Undergraduate Student Sexual Health Services Survey* ($n = 10$,

512) was considered adequate enough to detect differences in variables with a reasonable degree of statistical power.

Ethical Considerations

Steenbeek and Langille (2012) were granted ethic approval by each participating university's Research Ethics Board in accordance with the most recent Tri-Council Policy Statement and the Declarations of Helsinki (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada, 2010). Ethics approval for a secondary analysis was obtained from Dalhousie University Research Ethics Board and also abided by the Tri-Council Policy Statement Edition 2: Ethical Conduct for Research Involving Humans (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada [CIHR, NSERCC, SSHRCC], 2010). However, due to the study design ethics approval from the other participating universities was not required.

Informed consent. Informed consent is a requirement for all research studies that involve human subjects. The informed consent process ensures that participants are fully aware of the purpose and design of the study as well as the expectations of both the participants and the researcher (Creswell, 2013). The initial email distributed to the undergraduate list-servers at each university included a description of the study purpose, and also explained the confidential and anonymous nature of the survey. This information was also included in the consent disclaimer at the beginning of each survey. Prior to participating in the survey, participants were required to review and accept the details of this consent disclaimer. Participants indicated their agreement by selecting a button that

stated “I Agree”. Consent disclaimers were submitted separately to each participating university’s research ethics board. Each disclaimer ensured that participants were aware that their participation was fully voluntary and that they had the right to exit the survey at any given time, without consequence. Furthermore, participants were made aware that once the survey was completed, there were no means of deleting or withdrawing responses due to the anonymous nature of the responses. Meaning consent was further implied by the completion and submission of the survey.

Given the potential sensitive nature of the survey topic, sexual health services and sexual health care needs, the consent disclaimer also stated the survey topic and explained that the results would be used to better inform and improve sexual health services at the universities. Although this study did not address sexual health services and sexual health care needs directly, it addressed health services and health care needs in a broader sense. The intended use of the study results will be used to inform and improve health services offered on Maritime university campuses for a subpopulation of undergraduate students, i.e. various ethnic groups who are often marginalized based on their ethnic origin. While the study was clearly distinct from the original study, it was felt that the purpose and intended use of the survey data closely aligned with the purpose in which participants originally consented to.

There were no foreseeable risks to conducting the outlined secondary analysis, and in an attempt to safeguard the potential vulnerability of the population of interest, I strategically formed my committee to include experts in cultural diversity and inclusiveness. Additionally, neither I, nor any member of my research committee had any conflicts of interest in the results of this study.

Chapter Four: Results

The overall goal of this thesis research was to examine, describe, and compare the predictors of both self-rated health and health service use for various ethnic groups of undergraduate students from eight Maritime universities, using data collected during the *2012 Maritime Undergraduate Student Sexual Health Services Survey.* In addition, this research aimed to determine whether the use of health services differed among various ethnic groups of students and to understand the relationship between self-rated health and use of health services for this culturally diverse population. The following analyses were conducted using the statistical software program, Statistical Package for Social Sciences (SPSS) version 23.

Maritime Undergraduate Student Demographics

A detailed table of the demographic characteristics of the 10, 344 participant sample collected at eight participating universities are presented in Appendix E. More than twice as many females (n = 7, 279) participated in the survey than did males (n = 3,065). The sample was predominately Caucasian (84.7%), with the remaining 15.3% of the sample reporting their ethnicity as follows: Asian (5.1%), Indigenous (2.5%), Multiracial (2.2%), African (2.1%), Other (1.8%), and Middle Eastern (1.7%). Overall, 90.3% of participants were between the ages of 17 and 25 years old with a mean age of 21 (*SD* = 3.6). The sample was equally represented among different years of undergraduate studies, with each year of study making up approximately one quarter of the sample. However, a small majority of the participants reported being in their first year (28.3%). Just over half of the undergraduate students had reported perceiving their family's wealth as average (57.3%), while only 19.2% reported perceiving their family's

wealth as below average. Living with a roommate was the most common living arrangement among this sample of ethnically diverse undergraduate students (41.2%), this was followed by living with parent(s) (23.5%), living alone (20.3%), and the least common living arrangement, living with a romantic partner (14.8%).

Table 4.1 *Descriptive statistics of variables included in the study for ethnically diverse population*

Maritime Undergraduate Students (10,344)	**Frequency (n)**	**Percentage (%)**	**Mean (SD)**
Demographics			
Age[a]			21(3.6)
Sex			
Male	3065	29.6%	-
Female	7279	70.4%	-
Ethnicity			
Caucasian	8764	84.7%	-
African	214	2.1%	-
Indigenous	260	2.5%	-
Asian	524	5.1%	-
Middle Eastern	172	1.7%	-
Other	184	1.8%	-
Multiracial	226	2.2%	-
Year of program			
First Year	2935	28.3%	-
Second Year	2355	22.8%	-
Third Year	2143	20.7%	-
Fourth Year	2149	20.8%	-
Living arrangement[b]			
Alone	2100	20.3%	-
With parent(s)	2432	23.5%	-
With partner	1529	14.8%	-
With roommate	4259	41.2%	-
Family wealth			
Not wealthy	1988	19.2%	-
Average	5926	57.3%	-
Wealthy	2430	23.5%	-

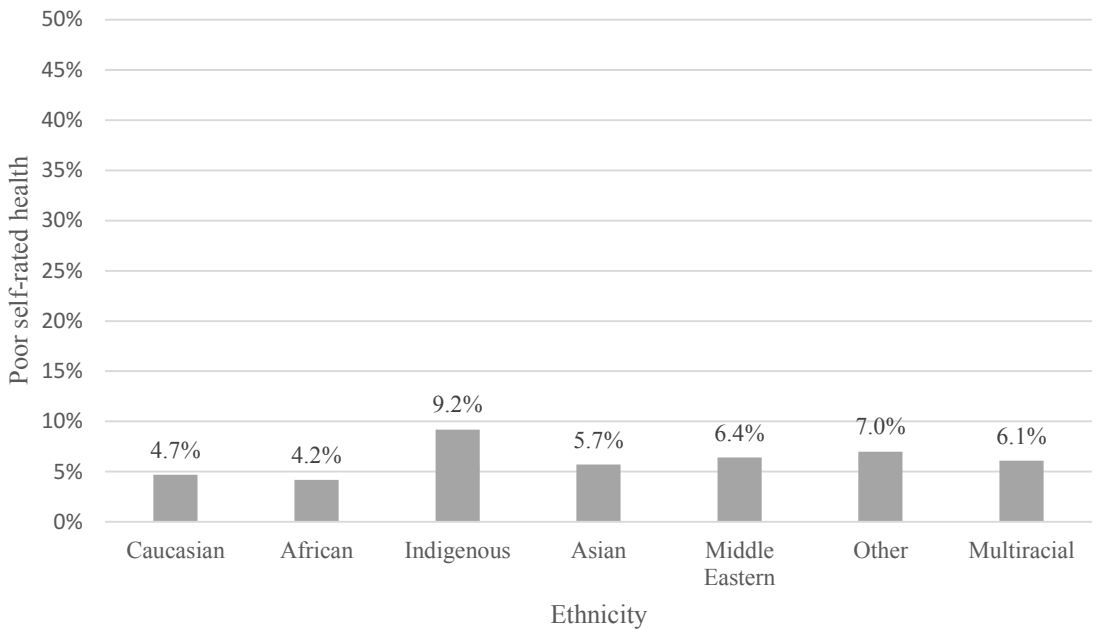
Note: [a]Missing cases (n=44, .4%). Valid percentages displayed. [b]Missing cases (n=24, .2%). Valid percentages displayed.

Health and Health Behaviours

With regards to the health and health behaviours, binge drinking alcohol at least once a month was a common occurrence among the ethnically diverse sample with 63.2% of the participants reporting having had five or more alcoholic drinks (in a time frame of only a few hours) in the 30 days prior to responding to the survey. Contrary to the use of alcohol, marijuana use was less common, with 72.9% of the sample reporting no use in the past 30 days. The Center for Epidemiological Studies Depression Scale – 12 (CES-D12) scores indicated that 65.3% of undergraduate students had minimal depressive symptoms, while 26.8% had elevated risk for depression. Furthermore, scores from the Sense of Support Scale (SSS) indicated that Maritime undergraduate students had just below median social support, with scores ranging from 0 to 84 out of a possible 84 (M = 58.2, SD = 12.7). Among the sample population, 493 undergraduate students (4.8%) reported having experienced sexual victimization in the form of forced sex since beginning university; 154 participants chose not to respond to this question.

Finally, when asked to rate their health on the five-point global health scale, 95.1% (n = 9832) of the ethnically diverse undergraduate student population reported good self-rated health (excellent, very good, or good), while only 4.9% (n = 512) rated their health as poor (fair or poor). When broken down by ethnicity, the percentage of students who perceived their health as poor was greatest among Indigenous students (9.2%), while students self-identifying as African were least likely to report poor self-rated health (4.2%) (Figure 4.1). With respect to the undergraduate students' use of health services, more than half (61.2%) of the study population reported not having accessed the university health services on their campus.

Figure 4.1 *Percentage of undergraduate students with poos self-rated health (per ethnicity)*



Logistic Regression

Prior to beginning the logistic regression phase of the statistical analyses, contingency tables were formulated and reviewed to ensure that the observed frequencies for each variable of interest were adequate. Field (2013) recommends that each cell should have an expected frequency of no less than five cases. Contingency tables for both self-rated health and use of health services revealed that all independent variables met the frequency requirement (See Appendix F and G). Although the independent variables age, year of study, depression risk, and social support are shown in both contingency tables as categorical variables, these variables were measured as continuous during the logistic regression analyses (See Appendix F and G).

Univariable logistic regression. The first phase of logistic regression involved running unadjusted univariable models for both self-rated health and health service use with each individual independent variable stratified by ethnicity. These unadjusted

models were used to determine which variables were potential predictors of each of the outcomes variables and therefore, determine which variables were appropriate to include in the multivariable logistic regression models (Bursac, Gauss, Williams, & Hosmer, 2008).

The unadjusted univariable logistic regression models showed that there were numerous potential predictors of both self-rated health and health service use that varied among ethnic groups. There were however, fewer potential predictors of self-rated health compared to health service use. As highlighted in Table 4.2, depression risk and social support occur most frequently as potential predictors of self-rated health among the various ethnic groups. Furthermore, substance use (both binge drinking and marijuana use), year of study, living arrangement, and social economic status (family wealth) were only found to be significant predictors of self-rated health among Caucasians. Sexual victimization in the form of forced sex also proved to be a significant predictor of self-rated health for those participants who self-identified as Caucasian, African, Asian, and Other. It is also important to note that biological sex was a significant predictor of self-rated health only among participants of Asian descent. Lastly, none of the theoretically important predictor variables were found to be significant predictors of the self-rated health of Middle Eastern undergraduate students, representing a distinct area for further discussion. As well, the unadjusted univariable logistic regression model showed that year of study was significant in every ethnic group as a predictor of health service use. Living arrangement, more specifically, living alone was also a common finding. Much like biological sex, depression risk was only found to be a significant predictor of health service use among individuals belonging to the Asian ethnic group. Both models were run

with a significance level of $p < .05$. Tables 4.2 and 4.3 highlight the most significant predictor variables for self-rated health and health service use respectively.

Table 4.2 *Unadjusted univariable logistic regression results for self-rated heath (per ethnic group)*

Ethnicity	Independent variable	N	Odds ratio Exp(B)	95% CI	P Value
Caucasian	Year of study	8109	1.120	1.022, 1.228	.016*
	Living arrangement				
	Roommate	3645	1.319	1.013, 1.716	.039*
	Family wealth				
	Not wealthy	1651	1.00	-	.000*
	Average	5057	1.593	1.266, 2.005	.000*
	Wealthy	2088	2.266	1.668, 3.077	.000*
	Binge drinking	5859	1.916	1.571, 2.336	.000*
	Forced sex	433	.495	.349, .702	.000*
	Depression risk	8796	.885	.873, .897	.000*
	Social support	8796	1.051	1.044, 1.059	.000*
African	Forced sex	8	.093	.015, .558	.009*
	Social support	216	1.072	1.017, 1.131	.010*
Indigenous	Depression risk	260	.891	.841, .943	.000*
	Social support	260	1.053	1.019, 1.087	.002*
Asian	Sex	524	.414	.181, .948	.037*
	Depression risk	526	.895	.843, .951	.000*
	Forced sex	22	.244	.077, .775	.017*
Other	Forced sex	9	.111	.024, .518	.005*
	Depression risk	186	.890	.823, .963	.004*
	Social support	186	1.093	1.042, 1.148	.000*
Multiracial	Depression risk	228	.863	.800, .931	.000*
	Social support	186	1.067	1.024, 1.111	.002*

Note: *Italics* indicate reference category. *Indicates significant *p* value < .05.

Table 4.3 *Unadjusted univariable logistic regression results for health service use (per ethnic group)*

Ethnicity	Independent variable	N	Odds ratio Exp(B)	95% CI	Sig.
Caucasian	Age (per year)	8654	1.017	1.005, 1.029	.007*
	Year of study	8017	1.745	1.672, 1.820	.000*
	Sex	8660	1.661	1.503, 1.835	.000*
	Living arrangement				
	Alone	1746	1.00	-	.000*
	Parent(s)	2039	.302	.259, .351	.000*
	Roommate	3600	1.774	1.579, 1.993	.000*
	Family wealth				
	Not wealthy	1640	1.00	-	.000*
	Wealthy	2056	1.333	1.167, 1.522	.000*
	Binge drinking	5785	1.539	1.401, 1.690	.000*
	Marijuana use	2386	1.291	1.173, 1.421	.000*
	Forced sex	432	2.480	2.035, 3.022	.000*

Ethnicity	Independent variable	N	Odds ratio Exp(B)	95% CI	Sig.
	Social support	8692	1.017	1.013, 1.021	.000*
African	Year of study	195	2.448	1.811, 3.307	.000*
	Living arrangement				
	Alone	63	1.00	-	.000*
	Parent(s)	48	.277	.107, .717	.008*
	Roommate	77	2.285	1.156, 4.516	.017*
	Depression risk	208	1.059	1.012, 1.109	.013*
Indigenous	Year of study	237	1.687	1.299, 2.190	.000*
	Living arrangement				
	Alone	54	1.00	-	.020*
	Parent(s)	45	.339	.127, .905	.031*
Asian	Age (per year)	514	1.088	1.020, 1.160	.010*
	Year of study	493	1.468	1.209, 1.783	.000*
	Sex	514	1.564	1.035, 2.362	.034*
	Living arrangement				
	Parent(s)	96	.489	.243, .987	.046*
	Forced sex	22	2.705	1.139, 6.424	.024
Middle Eastern	Year of study	164	1.734	1.210, 2.486	.003*
	Living arrangement				
	Alone	39	1.00	-	.010*
	Binge drinking	47	3.197	1.543, 6.626	.002*
	Marijuana use	26	2.779	1.171, 6.595	.020*
Other	Year of study	171	1.487	1.126, 1.964	.005*
	Living arrangement				
	Alone	48	1.00	-	.004*
	Parent(s)	31	.268	.097, .740	.011*
	Partner	27	.322	.115, .902	.031*
	Binge drinking	91	2.115	1.164, 3.841	.014*
Multiracial	Year of study	209	2.141	1.626, 2.818	.000*
	Living arrangement				
	Alone	42	1.00	-	.000*
	Parent(s)	70	.303	.124, .742	.009*
	Roommate	88	2.347	1.104, 4.989	.027*

Note: *Italics* indicate reference category. *Indicates significant p value < .05.

Multivariable logistic regression. The next phase consisted of logistic regression analyses using the forced entry method to identify the most significant predictors of self-rated health and health service use. As mentioned in Chapter Three, for the purpose of parsimony, these models included only those variables identified as potential predictors during the univariable logistic regression phase (Bursac et al., 2008; Field, 2013).

Self-rated health. As discussed in Chapter Three, socioeconomic status and biological sex were identified in the literature as having potential confounding effects on

self-rated health. Therefore, because these variables were either found to have significant association with self-rated health during the univariable logistic regression models or were identified in the literature as having potential confounding effects, the final multivariable logistic regression model was adjusted for socioeconomic status and biological sex (Table 4.3). Results showed that Caucasian participants were more likely to rate their health as good (OR 1.018, 95% CI [1.008, 1.028], p = .000) with each unit increase in their sense of social support score (SSS). The model also revealed that the odds of Caucasian undergraduate students rating their health as good decreased as their depression risk score, according to the CES-D12 scale, increased (OR .899, 95% CI [.884, .914], p = .000). In addition, the multivariable logistic regression model indicated that the Caucasian participants who engaged in binge drinking were more likely to perceive their health as good (OR 1.640, 95% CI [1.306, 2.061], p = .000). Similar to Caucasian participants, students who self-identified as African were more likely to rate their health as good (OR 1.089, 95% CI 1.022, 1.160, p = .009) as their sense of social support score increased. Additionally, sexual victimization in the form of forced sex appeared to have a negative association with the self-rated health of African undergraduate students (OR .052, 95% CI [.005, .515], p = .012). Results of the multivariable logistic regression model indicated that depression risk was the most significant predictor of self-rated health for Indigenous undergraduate students. A negative association was found between depression risk (OR .904, 95% CI [.844, .969], p = .004) and self-rated health, signifying that the odds of Indigenous participants rating their health as good decreased as their risk of depression increased. For Asian participants, being female correlated with lower self-rated health compared to that of males (OR .389, 95% CI [.165, .917], p = .031). In addition, depression risk (OR .849,

95% CI [.839, .953], p = .001) was discovered to have negative associations with the self-rated health of Asian participants. The adjusted logistic regression model revealed that students belonging to the "other" ethnic category were more likely to rate their self-rated health as good (OR 1.096, 95% CI [1.023, 1.175], p = .009) as their perceived sense of social support increased. Also, sexual victimization showed a negative association with self-rated health for students in the "other" ethnic group (OR .133, 95% CI [.015, .850], p = .034). Lastly, after adjusting for socioeconomic status and biological sex, depression risk was the only predictor variable found to be a significant predictor of self-rated health for multiracial undergraduate students. Once again, multiracial students were less likely to rate their health as good as their depression risk score increased (OR .892, 95% CI [.812, .980], p = .017).

With regards to the overall fit of the model, the Omnibus Tests of Model Coefficients revealed significant model and block chi-square statistics ($p < .05$). This indicated that the predictor variables improved the fit of the model relative to a baseline model with no predictor variables (Field, 2013). The Hosmer-Lemeshow goodness-of-fit test revealed a nonsignificant chi-square statistic ($p > .05$); indicating failure to detect inadequacy of the model (See Table 4.4).

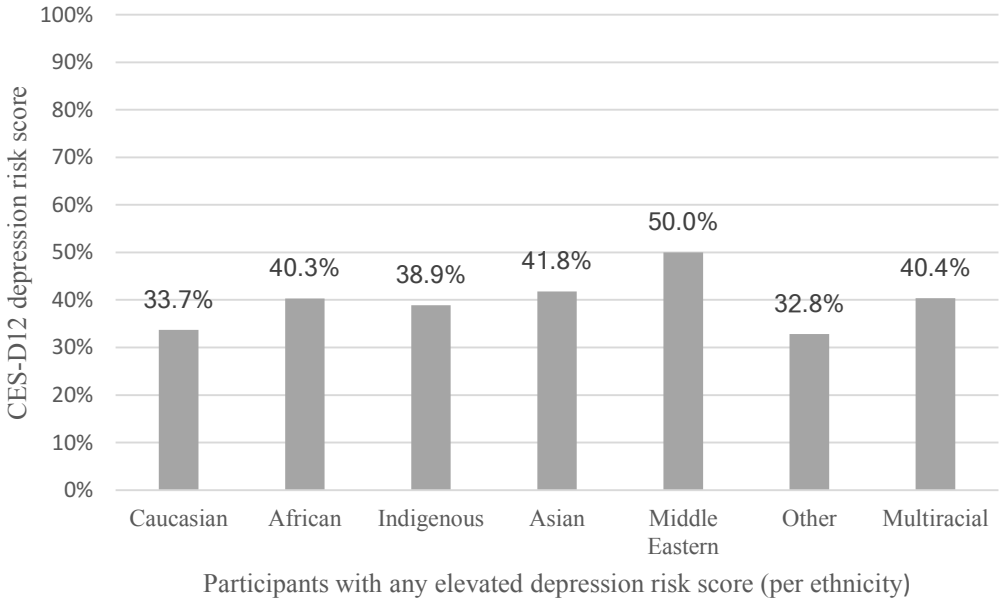
Table 4.4 *Final multivariable logistic regression results for self-rated health (per ethnic group)*

Ethnicity	**Independent variable**	**Odds ratio Exp(B)**	**95% CI**	**P Value**
Caucasian	Social support	1.018	1.008, 1.028	.000*
	Depression risk	.899	.844, .914	.000*
	Binge drinking	1.640	1.306, 2.061	.000*
Omnibus Test of Model Coefficients		$X^2 = 356.483$	df = 11	$p = .000$
Hosmer-Lemeshow Test		$X^2 = 6.433$	df = 8	$p = .599$
African	Social support	1.890	1.022, 1.160	.009*
	Forced sex	.052	.005, .515	.012
Omnibus Test of Model Coefficients		$X^2 = 16.499$	df = 5	$p = .006$
Hosmer-Lemeshow Test		$X^2 = 3.625$	df = 8	$p = .899$
Indigenous	Depression risk	.904	.844, .969	.004*

Ethnicity	Independent variable	Odds ratio Exp(B)	95% CI	P Value
Omnibus Test of Model Coefficients		$X^2 = 19.542$	df = 5	$p = .002$
Hosmer-Lemeshow Test		$X^2 = 8.887$	df = 8	$p = .352$
Asian	Sex	.389	.165, .917	.031*
	Depression risk	.894	.839, .953	.001*
Omnibus Test of Model Coefficients		$X^2 = 22.322$	df = 6	$p = .000$
Hosmer-Lemeshow Test		$X^2 = 8.621$	df = 8	$p = .375$
Other	Forced sex	.113	.015, .850	.034*
	Social support	1.096	1.023, 1.175	.009*
Omnibus Test of Model Coefficients		$X^2 = 20.455$	df = 6	$p = .002$
Hosmer-Lemeshow Test		$X^2 = 6.235$	df = 8	$p = .621$
Multiracial	Depression risk	.892	.812, .980	.017*
Omnibus Test of Model Coefficients		$X^2 = 17.342$	df = 5	$p = .004$
Hosmer-Lemeshow Test		$X^2 = 3.435$	df = 8	$p = .904$

Note: *Italics* indicate reference category. *Indicates significant p value < .05.

Figure 4.2 *Percentage of undergraduate students with elevated/very elevated depression risk score by ethnicity*



Health service use. Similar to self-rated health, biological sex and year of undergraduate program were identified as having potential confounding effects on health service use, and were adjusted for in the multivariable logistic regression model (Table 4.5). Results for Caucasian participants revealed that being female was a significant predictor of university health service use (OR 1.762, 95% CI [1.564, 1.986], $p = .000$). As

suspected, based on the univariable results and findings by Drs. Steenbeek and Langille, a positive association was found between student year (OR 1.855, 95% CI [1.564, 1.986], p = .000) and health service use signifying that students of Caucasian decent are more likely to use health services as they progress through each year of undergraduate study. Also, positive associations were discovered between marijuana use (OR 1.141, 95% CI [1.014, 1.283], p = .028), having experienced sexual victimization (OR 1.657, 95% CI [1.311, 2.096], p = .000), and social support (OR 1.007, 95% CI [1.003, 1.012], p = .001) indicating that as the likelihood of each predictor variable increases, the use of health services also increases. In contrast, age (per year) (OR .956, 95% CI [.939, .974], p = .000) was a significant predictor of health service use, but was shown to have a negative association, meaning as students of Caucasian decent get older, they are less likely to use university health services. Furthermore, findings from the multivariable logistic regression model revealed that the odds of Caucasian students having accessed the health services on campus were lower for those who lived with parent(s) (OR .223, 95% CI [.188, .266], p = .000) and romantic partners (OR .669, 95% CI [.557, .804], p = .000) at the time of the survey. Similar to Caucasian participants, the multivariable logistic regression model revealed that student year is a predictor of university health service use among African undergraduate students. A positive association between student year (OR 2.979, 95% CI [2.068, 4.291], p = .000) and health service use was discovered. Also, living with parent(s) (OR .184, 95% CI [.059, .573], p =.004) appeared to reduce the odds that students of African descent utilize university health care services. In addition, results indicated that the odds of African undergraduate students utilizing health care services increased as their risk of depression increased (OR 1.079, 95% CI [1.020, 1.142], p = .008). For Indigenous students, year of study also remained a significant predictor of

health service use with a positive association between year of study (OR 1.828, 95% CI [1.371, 2.436], p =.000) and the utilization of university health care services. Similar to findings for both Caucasian and African students, Indigenous students appeared to be less likely to use on campus health services if living with parent(s) (OR .259, 95% CI [.090, .744], p = .012) or a romantic partner (OR .342, 95% CI [.138, .848, p = .020). Moreover, the use of marijuana (OR 2.003, 9% CI [1.047, 3.832], p =.036) had a positive association with health service use among Indigenous undergraduate students. Also interesting to note, biological sex, more specifically, being female did show significance as a predictor of health service use of Indigenous students (OR 2.153, 95% CI [.943, 4.913], p = .069). However, an association could not be concluded due to the 95% confidence interval containing one. Results of the multivariable logistic regression model revealed that year of study (OR 1.457, 95% CI [1.181, 1.797, p = .000) was the most significant predictor of university health care service use among participants who self-identified as Asian. Also, being female (OR 1.588, 95% CI [1.013, 2.488], p =.044) was a significant predictor of health service use among undergraduate students of Asian descent. Not unlike Caucasian, African, or Indigenous students, living with parent(s) (OR .418, 95% CI [.193, .904], p =.027) showed a negative association with health service use for Asian students. Living with a romantic partner (OR .478, 95% CI [.207, 1.104] p = .084) also showed significance as a predictor of health service use among Asian students, but no further association can be concluded. Student year of study (OR 1.602, 05% CI [1.088, 2.359], p =.017) was the only significant predictor of university health service use among Middle Eastern students. Similar to the findings for other ethnic groups, results revealed that as students of Middle Eastern descent progress through their undergraduate studies, the odds of them utilizing university health care services increases. The results of the adjusted

multivariable logistic regression model showed that year of study (OR 1.485, 95% CI [1.093, 2.018], $p = .011$) was the most significant predictor of university health care service use of students belonging to the "Other" ethnic group. Furthermore, living with parent(s) (OR .200, 95% CI [.064, .622], $p = .005$) and living with a romantic partner (OR .232, 95% CI [073, .735], $p = .013$) were negatively associated with accessing health care services for students belonging to the "other" category. Binge drinking (OR 2.309, 95% CI [1.149, 4.640], $p = .019$) showed significance as a predictor of health service use, however no association can be concluded. Finally, student year of study (OR 2.064, 95% CI [1.533, 2.778], $p = .000$) was the most significant predictor of university health care service use among Multiracial students, and revealed a positive association. In addition, the odds of Multiracial students having accessed university health care services were lower for students living with their parent(s) (OR .294, 95% CI [.110, .790], $p = .015$).

Once again, the Omnibus Tests of Model Coefficients revealed significant model and block chi-square statistics ($p < .05$). This indicated that the predictor variables improved the fit of the model relative to a baseline model with no predictor variables (Field, 2013). Also, the Hosmer-Lemeshow goodness-of-fit test revealed a nonsignificant chi-square statistic ($p > .05$); for all models except the model of Caucasian participants which did reveal a significant chi-square statistic ($p < .05$) indicating that an inadequacy of the model was detected (Filed, 2013) (See Table 4.5).

Table 4.5 *Final multivariable logistic regression results for health service use (per ethnic group)*

Ethnicity	**Independent variable**	**Odds ratio Exp(B)**	**95% CI**	**P Value**
Caucasian	Sex	1.762	1.564, 1.986	.000*
	Year of study	1.855	1.764, 1.952	.000*
	Age (per year)	.956	.939, .974	.000*
	Living arrangement			
	Alone	1.00	-	.000*
	Parent(s)	.223	.188, .266	.000*

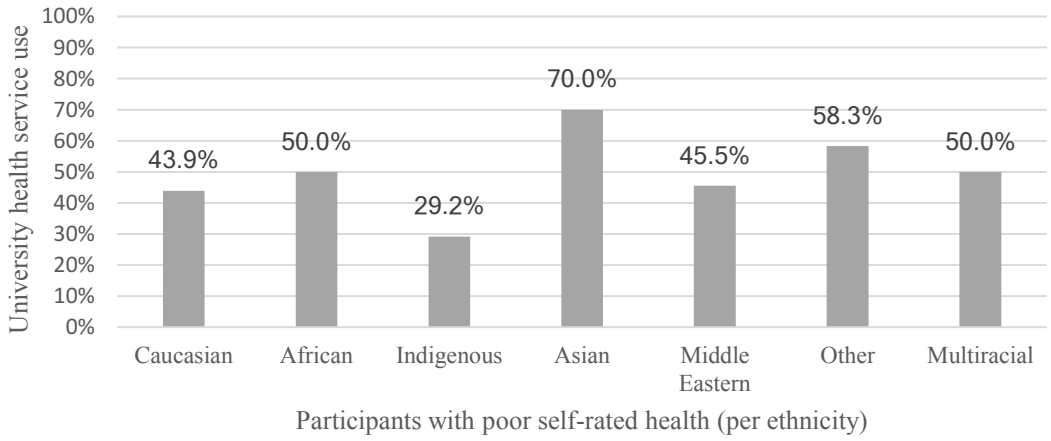
Ethnicity	Independent variable	Odds ratio Exp(B)	95% CI	P Value
	Romantic partner	.669	.557, .804	.000*
	Roommate	1.239	1.085, 1.416	.002*
	Family wealth			
	Not wealthy	1.00	-	.043
	Marijuana use	1.141	1.014, 1.283	.028*
	Forced sex	1.657	1.311, 2.096	.000*
	Social support	1.007	1.003, 1.012	.001*
Omnibus Test of Model Coefficients		$X^2 = 1587.055$	df = 12	$p = .000$
Hosmer-Lemeshow Test		$X^2 = 38.027$	df = 8	$p = .000$
African	Year of study	2.979	2.068, 4.291	.000*
	Living arrangement			
	Alone	1.00	-	.000*
	Parent(s)	.184	.059, .573	.004*
	Depression risk	1.079	1.020, 1.142	.008*
Omnibus Test of Model Coefficients		$X^2 = 77.632$	df = 6	$p = .000$
Hosmer-Lemeshow Test		$X^2 = 3.908$	df = 8	$p = .865$
Indigenous	Year of study	1.828	1.371, 2.436	.000*
	Living arrangement			
	Alone	1.00	-	.018*
	Parent(s)	.259	.090, .744	.012*
	Romantic Partner	.342	.138, .848	.020*
	Marijuana use	2.003	1.047, 3.832	.036*
Omnibus Test of Model Coefficients		$X^2 = 36.317$	df = 6	$p = .000$
Hosmer-Lemeshow Test		$X^2 = 9.466$	df = 8	$p = .304$
Asian	Sex	1.588	1.013, 2.488	.044*
	Year of study	1.457	1.181, 1.797	.000*
	Living arrangement			
	Parent(s)	.418	.193, .904	.027
Omnibus Test of Model Coefficients		$X^2 = 28.790$	df = 7	$p = .000$
Hosmer-Lemeshow Test		$X^2 = 2.335$	df = 8	$p = .969$
Middle Eastern	Year of study	1.602	1.088, 2.359	.017*
Omnibus Test of Model Coefficients		$X^2 = 24.398$	df = 7	$p = .001$
Hosmer-Lemeshow Test		$X^2 = 3.022$	df = 8	$p = .933$
Other	Year of study	1.485	1.093, 2.018	.011*
	Living arrangement			
	Alone	1.00	-	.009*
	Parent(s)	.200	.064, .622	.005*
	Romantic partner	.232	.073, .735	.013*
	Binge drinking	2.309	1.149, 4.640	.019*
Omnibus Test of Model Coefficients		$X^2 = 29.214$	df = 6	$p = .000$
Hosmer-Lemeshow Test		$X^2 = 5.935$	df = 7	$p = .547$
Multiracial	Year of study	2.064	1.533, 2.778	.000*
	Living arrangement			
	Alone	1.00	-	.000*
	Parent(s)	.294	.110, .790	.015*
Omnibus Test of Model Coefficients		$X^2 = 54.019$	df = 5	$p = .000$
Hosmer-Lemeshow Test		$X^2 = 6.355$	df = 7	$p = .499$

Note: *Italics* indicate reference category. *Indicates significant p value < .05.

Pearsons chi-square. To answer the third and final research question and determine the relationship or association between self-rated health and use of health services among the ethnically diverse undergraduate population within the Maritimes, a series of Pearson chi-square tests were conducted. Results of the first chi-square test, to determine the relationship between ethnicity and self-rated heath revealed that there is a significant relationship between ethnicity and self-rated health, X^2 (6, N = 10,384) = 14.946, p = .021). The effect size for this finding, Cramer's V and Phi, was moderate, .038 (Cohen, 1988). In addition, the chi-square test conducted to determine the relationship between ethnicity and health service use revealed that a relationship also exists between ethnicity and health service use, X^2 (6, N = 10,253) = 63.103, p = .000). The effect size for this finding, Cramer's V and Phi, was strong, .078 (Cohen, 1988).

Finally, to determine if there is a relationship between ethnicity and health service use based on need, defined as self-rating health and poor/fair, a third chi-square test was conducted. Results indicated that no relationship exists between ethnicity and health service use based on need, X^2 (6, N = 514) = 5.684, p = .459). The effect size for this findings, Cramer's V and Phi, was weak, .105 (Cohen, 1988).

Figure 4.3 Percentage of undergraduate students accessing health services by ethnicity and poor self-rated health



In summary, these results have revealed important information regarding the health of various ethnic groups of undergraduate students in the Maritime provinces. The findings have indicated that the most significant predictors of both self-rated health and use of health service vary considerably among the assorted ethnic groups found on Maritime university campuses. However, student year of study as a predictor of health service use was the only independent variable found to be significantly consistent among all ethnic groups of undergraduate students Also, both self-rated health and use of university health services have shown to be associated with ethnicity. Finally, these results have further indicated that this ethnically diverse university population may in fact, use health services much differently even though their perceived health status is similar.

The chapter to follow will further discuss and examine these results, highlighting both the statistically significant findings of this research and the clinically significant findings while also making reference to past research and the Social Ecological Model.

Chapter Five: Discussion

The overall purpose of this study was to explore and predict the self-rated health and health service use of the various ethnic groups of undergraduate students enrolled in eight universities throughout the Maritime Provinces. Using the Social Ecological Model as the guiding theoretical framework, the investigator explored key predictors of self-rated health and health service use among the various ethnic groups of undergraduate students attending university within the Maritime Provinces of Canada. As well, this study was used to determine the similarities and differences in health services us among the various ethnic groups of undergraduate students with similarly perceived health.

The following chapter offers a critical interpretation of the research findings in relation to known literature about the health of various ethnic groups. The ethnically diverse undergraduate student sample is first described and compared to past study samples of similar demographics. This will be followed by a discussion of the significant predictors for, and the relationship between self-rated health and health service use. Finally, this chapter will conclude by highlighting the study strength and limitations, suggestions and recommendations for nursing practice as supported by the Social Ecological Model, and areas for future research.

Ethnically Diverse Undergraduate Student Sample

The study sample consisted of 10,344 participants, with the majority being Caucasian females, between the ages of 17 to 25 years old, and in their first year of undergraduate studies. This developmental period is referred to as emerging adulthood (Arnett, 2000) and is the typical age group of most post-secondary education students within Canada (PHAC, 2011b). These demographics are comparable to the bulk of past

research conducted in Canada, and the United States (US) with undergraduate students (Dion, & Giordano, 1990; Juang, Ittel, Hoferichter, & Miriam Gallarin, 2016; Miranda, Soffer, Polanco-Roman, Wheeler, & Moore, 2016; Smith, Chesin, & Jeglic, 2014)

With regard to overall response rate, the response rate of the pooled sample across all eight universities in the *2012 Maritime Undergraduate Student Sexual Health Services Survey* was 21.8%. Although this response rate may initially be considered low, research pertaining to survey response rates indicates that response rates to online surveys are often lower than the response rates to surveys using other data collection methods such as postal questionnaires, or face-to-face interviews (Couper, 2000; Dillman & Bowker, 2001, Petchenik & Watermolen, 2011). Overall, the literature indicates that the response rates for web-based surveys are approximately 30%, however the studies are limited in number (Sue & Ritter, 2007). More specifically, Nulty (2008) reports that the online response rates typically drop 23% when compared to in-class collection response rates among university students. Despite online survey response rates being relatively low, it is considered an inexpensive and fast way to collect information from fairly large and widely distributed (geographically) target populations (Sue & Ritter, 2007). Furthermore, online surveys are useful when the questionnaire deals with sensitive information (i.e. sexual health), and when the target respondents are known to have email or Internet access such as students attending university (Sue & Ritter, 2007). Although the response rate to the *2012 Maritime Undergraduate Student Sexual Health Services Survey* was low, an a-priori sample size calculation helped to determine that the sample was adequate enough to detect differences in variable with a reasonable degree of statistical power.

As for the ethnic make-up or distribution, the ethnic minority undergraduate population in this study made up 15.3% of the total undergraduate sample from the *2012*

Maritime Undergraduate Student Sexual Health Services Survey (N = 10,512), including those who identified as African, Indigenous, Asian, Middle Eastern, Other, and Multiracial. Because many universities within Canada do not collect race-based data, it is difficult to determine how the ethnic make-up of the study sample originating from the eight participating Maritime universities compared to other universities in Canada. However, when examining the ethno-cultural portrait of Canada, an estimated 16.2% of the total population are members of a visible minority group (Statistics Canada, 2008). This ethnic distribution is relatively close to that of the *2012 Maritime Undergraduate Student Sexual Health Services Survey*. Nevertheless, when comparing Canada's visible minority population, by province and territory, the 2006 Canadian Census data reveals that provinces such as Quebec, Ontario, and other more Western provinces (excluding Manitoba) contain a much higher density of visible minorities than the three Maritime Provinces (Nova Scotia, New Brunswick, and Prince Edward Island) combined (Statistics Canada, 2008). Therefore, it may be inferred that university campuses across Canada would reflect national population data. What is known however, is that Maritime universities are becoming much more diverse with respect to ethnicity and race, and have accounted for the largest increase in international student enrolment between 1992 and 2008 (Statistics Canada, 2011b). Furthermore, the ethnic diversity of Maritime university campuses is projected to continue its growth for years to come (Maritime Provinces Higher Education Commission, 2012).

Self-Rated Health

This is one of the first studies using Canadian data to address self-reported health status of an ethnically diverse sample of undergraduate students, and one of only a few to

explore the self-rated health of Canadian ethnic groups in general (Dunn, & Dyck, 2000; Newbold, 2005). Health is a multifaceted process that incorporates physical, mental, spiritual, and social well-being, as well as the socio-political environments (Canadian Nurses Association, 2007; McLaren, & Hawe, 2004; Richard, Gauvin, & Raine, 2011). Study analyses revealed higher percentages of "good" 95.0% (n = 9,867) than "poor" 5.0% (n = 517) self-rated health among the study population; although distinct differences in the percentage of students who rated their health as "poor" were discovered when each ethnicity was examined separately (See Figure 4.1). In addition, the percentage of "poor" self-rated health among the study population was less than that of a longitudinal study conducted by Newbold (2005) using immigrant data drawn from the 1994/95, 1996/97, 1998/99, and 2000/01 phases of the Canadian National Population Health Survey [NPHS], where 8% of young immigrants (aged 20-34) reported "poor" health. This finding may support the "healthy immigrant effect" theory and/or reflect the differences among the various forms of visible minorities within Canada (i.e. immigrants, Canadian-born visible minorities, and Indigenous peoples) that could not be explored in the current study. To date, no other studies have measured the self-rated health of young ethnic groups of undergraduate students; therefore, it is difficult to determine how representative the current study findings are outside the Maritime area.

The current study findings also indicate that differences in self-rated health existed among the various ethnic groups of undergraduate students in the Maritime Provinces. As highlighted in Figure 4.1 all ethnic minority groups, excluding students of African descent, had a higher percentage of "poor" self-rated health compared to their Caucasian peers. Interestingly, the highest percentage of "poor" self-rated health was among Indigenous students (9.2%). This finding corresponds with current literature that

suggests Indigenous Canadians (18 years of age or older) are less likely than non-Indigenous Canadians to rate their health as "excellent" or "very good" (First Nations Information Governance Centre [FNIGC], 2012) and reflects the diminished health outcomes and health inequalities specific to Indigenous Canadians and their communities (Adelson, 2005; FNIGC, 2012; Health Canada, 2009a; Kaspar, 2014; Kirmeyer et al., 2009; Lehti et al., 2009).

Predictors of self-rated health. Multiple demographic, behavioural, and psychosocial variables were analyzed as potential predictors of self-rated health for the ethnically diverse undergraduate student population in the Maritime Provinces. Of these variables, social support, depression risk, and sexual victimization were the most common variables to reach statistical significance ($p < .05$) among the various ethnic groups. Binge drinking and biological sex also reached statistical significance, but was exclusive to Caucasian and Asian ethnic groups respectively.

In addition, the absence of statistically significant predictor variables of self-rated health among students of Middle Eastern descent is a finding that is also worth further thought and discussion. Based on past research, this may be a result of education acting as a confounding variable for this particular ethnic group. As Daoud, Soskolne, and Manor's (2009) analyses of 902 randomly selected Arab adults (aged 30-70) in Israel revealed; education was significantly associated with self-rated health (OR = 3.86, 95% CI [2.30-6.47]). In the current study, however, education could not be exclusively explored as a potential predictor variable or controlled for given that all participants were enrolled in undergraduate education. Therefore, education may be significantly related to the self-rated health of Middle Eastern students attending Maritime universities and impacting the results/findings of the current study.

Social support. Perceived social support was measured using Dolbier and Steinhardt (2000) Sense of Support Scale (SSS) and was a common predictor of self-rated health among Caucasian (OR 1.018, 95% CI [1.008, 1.028], $p = .000$), African (OR 1.890, 95% CI [1.022, 1.160], $p = .009$), and Other (OR .113, 95% CI [.015, .850], $p = .034$) ethnic groups. Although no available literature has explored social support as a predictor of health among various ethnic groups, this finding was supported by past research indicating that social support enhances mental and physical health, self-efficacy, and resiliency (Masten, 2001; O'Dougherty-Wright & Masten, 2006; Werner, 2005), and can decrease negative health effects related to unfavourable life situations (PHAC, 2011a).

This finding was also supported by past research, which found peer support could improve adjustment during transitionary life events, such as beginning post-secondary education (Friedlander, Reid, Shupak, & Cribbie, 2007). Researchers have found that social support networks are positively associated with college student retention and academic achievement (Baker & Robnett, 2012). Additionally, research has led to the understanding that social interactions can influence the way a person perceived their self and their wellbeing (Meyer, 2003). As such, social support systems can act as a buffer to psychologically harmful situations, decrease the negative effects of minority stress, and promote overall wellness (Friedlander et al., 2007; Meyer, 2003).

For ethnic minority groups, past research has indicated that a sense of social support is more difficult to achieve. The descriptive findings of the current study have shown that the mean social support score (SSS) reported by entire sample population of ethnically diverse undergraduate students was 58.2. Yet when ethnic groups were examined individually, difference in mean SSS was found. Students of Middle Eastern

descent had the lowest mean SSS, 52.9; while Caucasian students had the highest, 58.7. Although the difference between ethnic groups is not large, findings from the current study support past research that shows young ethnic minorities groups and immigrants often lack adequate social support, and also report some of the lowest rates of peer and community support (Fischer, 2007; Hurtado & Carter, 1997; Nagasawa & Wong, 1999; Runarsdottir & Vilhjalmsson, 2015, Smith & Moore, 2002). Furthermore, social support networks, including friends, family, romantic partners, and other social contacts have been found to play an important role in influencing the help seeking behaviours, problem self-identification, and treatment initiation among ethnic minority groups and immigrants (Derr, 2016). This is an important consideration when assessing the health needs of undergraduate students in the Maritime Provinces belonging to ethnic minority groups and planning for future health promotion strategies.

Depression risk. Depression risk was measured using the Centre for Epidemiological Studies' Depression scale (CES-D12) and was also found to be significantly predictive of self-rated health among Caucasian (OR .899, 95% CI [.884, .914], p = .000), Indigenous (OR .904, 95% CI [.844, .969], p = .004), Asian (OR .849, 95% CI [.839, .953], p = .001), and Multiracial (OR .892, 95% CI [.812, .980], p = .017) students. More specifically, having a higher depression risk score decreased the odds of reporting good self-rated health among the various ethnic groups.

Descriptive findings showed that only 8% of the ethnically diverse undergraduate population met the CES-D12 criteria for "very elevated depression risk" (a score of 21 of over); 26.8% had met the criteria for "elevated depression risk" (a score of 12 to 20); and 65.2% had "minimal depression risk" (a score under 12). However, when assessing depression risk among the various ethnic groups, analyses revealed that all ethnic

minority groups (excluding those who self-identified as Other) had much higher rates of *any* elevated depression risk compared to their Caucasian peers (See Figure 4.2). Similarly, among Nova Scotia high school students in grades 10 and 12 (n = 4365), just 33.7% of female students and 16.5% of male students met the CES-D12 criteria for elevated/very elevated depression risk (Langille, Ashbridge, Cragg, & Rasic, 2015).

To my knowledge, the CES-D12 has not been employed in any studies with various ethnic groups of undergraduate students, nor has depression risk been assessed as a predictor of self-rated health. Nevertheless, as discussed throughout Chapters One and Two, conflicting or contradictory evidence around the rates of depression among various ethnic groups of university students when compared to the general population suggests the need to examine the relationship between ethnically diverse university students and depression more carefully. Findings of the current study are well supported by research that proposes higher levels of depressive symptoms among certain ethnic groups such Asian Americans, South Asian, and South European college and university students (Chen, Liu, Zhao, & Yeung, 2015; Dion & Giordano, 1990; Han, Han, Luo, Jacobs, & Jean-Baptiste, 2013).

A large-scale secondary analysis of data drawn from the World Health Organization [WHO] survey (N = 245, 404) revealed that depression in adults was significantly associated with a reduction in health status (Moussavi et al., 2007). When compared with other chronic conditions, such as angina, asthma, arthritis, and diabetes, depression had the most negative impact on health status (Moussavi et al., 2007). Participants with depression had the lowest health statuses among all participants with chronic illnesses and those with chronic conditions in addition to depression had even lower health statuses (Moussavi et al., 2007). However, it is important to take into

consideration that depression and health status were measured differently from the current study. These authors employed an algorithm of past year symptoms from the International Classification of Diseases and health status was measure using responses to sixteen health related questions (i.e. vision, mobility, pain, affect, self-care, etc.) and two questions on overall perceived health (Moussavi et al., 2007).

The CES-D12 primarily measures affective symptoms, as well as some somatic symptoms and anhedonia (Poulin, Hand, & Boudreau, 2005). Therefore, because ethnic minority groups often lack sufficient social support (i.e. the buffer to psychological harm), they may have more difficulty dealing with their symptoms of depression (Fischer, 2007; Hurtado & Carter, 1997; Nagasawa & Wong, 1999; Runarsdottir & Vilhjalmsson, 2015, Smith & Moore, 2002). This combination may have resulted in ethnic minority undergraduate students' perceived health being more influenced by these depressive symptoms and the impact the symptoms have on their day-to-day functioning.

Sexual victimization. Having experienced sexual victimization in the form of "forced sex" since beginning university was also a significant predictor of self-rated health among African (OR .052, 95% CI [.005, .515], $p = .012$), and Other (OR .133, 95% CI [.015, .850], $p = .034$) ethnic groups. Descriptive statistics showed that only 4.8% of the ethnically diverse undergraduate students reported having experienced forced sex since starting university, however, when converted from a percentage, this finding translates to 500 students. In addition, 156 participants chose not to provide an answer for this question. Furthermore, this finding is less than the 6.2% of the total female undergraduate sample from the same survey who reported having experienced sexual victimization. However, this finding aligns well with past research. Mohler-Kup's et al. (2004) American based study on the prevalence of rape while intoxicated among female

university and college students (N = 23, 980) revealed that women belonging to ethnic minority groups were less likely than White women to report experiencing rape when intoxicated. Notably, these reports of sexual victimization were considerably higher than those reported during the *2012 Maritime Undergraduate Student Sexual Health Services Survey.* This is understandable, as Mohler-Kup and colleagues (2004) defined rape using three individual questions providing very specific examples: 1) rape while forced, 2) rape while threatened, and 3) rape while intoxicated, while Steenbeek and Langille (2012) used only the phrase "forced sex". As such, the current research findings are dependent on how the participants of various ethnicities perceived their experience of forced sex (i.e. their level of understanding of what constitutes forced sex). Additionally, many people are hesitant to disclose such information; therefore, the reported rates of sexual victimization among the ethnically diverse undergraduate population may be an underestimation.

Although not specific to ethnic minority groups, or ethnically diverse sample populations, the negative associations found between sexual victimization and self-rated health are also well supported by past research findings. Research conducted by Burton, Halpern-Felsher, Rehm, Rankin, and Humphreys (2016) using a mixed methods approach to examine the experiences and health of young adult women living in a rural setting (N = 100) who self-reported past experience of physical, emotional, verbal, sexual, and relational abuse in adolescence found that self-rated health was inversely associated with having experienced abusive behaviours in a relationship. In addition, Bonomi, Cannon, Anderson, Rivara, and Thompson (2008) also reported that health status was negatively affected by having experienced both physical and sexual abuse in their sample of women (aged 18 to 64) (N = 3, 568) with a history of physical and sexual assault before age 18.

Binge drinking and biological sex. Binge drinking, defined in the current study, as "one occasion of having five or more drinks of alcohol in a row during the past 30 days" was a significant predictor of self-rated health among Caucasian students. Interestingly, despite the well-known harmful health effects associated with alcohol use, binge drinking was positively associated with self-rated health among Caucasian students. In other words, engaging in binge drinking increased the odds of Caucasian students reporting good self-rated health. Although this finding seems unusual, it does support previous research that indicates substance use has become a perceived social norm among Canadian undergraduate student populations (Arbour-Nicitopoulos et al., 2010). In addition, a qualitative study conducted by Russell and Arthur (2016) to explore how students construct meanings and values for the role of alcohol in university life, revealed that students often justified alcohol's role as a natural remedy for reducing stressors associated with university life. Therefore, if students perceive alcohol consumption as a means of relieving stress, those students who engage in binge drinking behaviours may in fact be more likely to perceive lower levels of stress which in turn leads to higher ratings of self-health. Furthermore, alcohol was also associated with more positive and enhanced social experiences among university students (Russell & Arthur, 2016). This finding suggests that if university students perceive alcohol as a "social lubricant", its increase use may lead to broader social networks, which in turn may produce higher self-rated health.

Finally, biological sex, and more specifically, being female was a significant predictor of self-rated health among Asian undergraduate students. Being female was associated with lower odds of reporting good self-rated health for students self-identifying as Asian. This finding corresponds with findings from the total undergraduate

student sample in the original survey, which indicates that male students (72.2%) were more likely to rate their health as excellent/very good than their female counterparts (68.7%) (Steenbeek & Langille, 2012). Also, a study conducted by Singh Setia et al. (2011) exploring the self-rated health of Canadian immigrants found that differences in self-rated health existed between male and female immigrants. In particular, Chinese and South Asian women were more likely to report their health as poor when compared to White immigrant women, suggesting that biological sex is an important predictor of self-rated health (Singh Setia et al., 2011).

University Health Service Use

There is very little available research on university health service use among ethnically diverse samples of undergraduate populations in Canada, let alone the Maritime Provinces. As well, there is a relatively small body of Canadian research with has explored patterns of health service use among various ethnic groups at all (Blanco et al., 2008; Statistics Canada, 2008; 2010). Results of the current study showed that among the ethnically diverse undergraduate student population, 37.6% had accessed their university's health service department. Interestingly, this rate was higher than the total population of the *2012 Maritime Undergraduate Student Sexual Health Services Survey*, where 34.9% reported having used their university health services (Steenbeek & Langille, 2012). One the one hand, this finding does not align with past research which indicates that close to two thirds (i.e. approximately 66%) of higher education students visited their college health centre (Delene & Brogowicz, 1990); however, this report was not specifically using a sample of ethnically diverse students.

On the other hand, the rates of university health service use from the current study were greater than findings from an American based study which examined the actual use of counselling for emotional problems and the assumptions that ethnicity, sex, social class, and psychological distress are associated with disparities in use of counselling among 1,773 diverse undergraduate students at an urban university (Rosenthal & Wilson, 2008). Results indicated that students' level of counselling was only 10% and was similar to estimates of a national college sample (Rosenthal & Wilson, 2008). It is possible that the differences in rates of health service use found between the current study and the American based study are related to some of the predictors explored in the current study, such as living arrangements and year of study. For example, the sample of college students in the American based study resided off-campus as both colleges included in the study were commuter colleges (Rosenthal & Wilson, 2008).

Predictors of university health service use. As mentioned, no previous research has examined the predictors of health service use among various ethnic groups of undergraduate students prior to this one. Hypotheses have been drawn by past researchers, that ethnic minority groups' lower rates of health service use were related to the inability to find and receive culturally safe and competent care, stigma-related concerns, and the use of nonclinical or culturally traditional alternatives (Abe-Kim et al., 2007; Conner, Koeske, & Brown, 2009; Eisenberg, Hunt, Speer, and Zivin, 2011; Gong, Gage, & Tacata, 2003; Nadeem et al., 2007; Neighbors, Musick, & Williams, 1998; Statistics Canada, 2008). In addition, a nationally representative study (N = 1,020) found that among Canadian adolescents (aged 12 to 19) being female, from a single parent family, socially involved (i.e. participation in volunteer and religious organizations),

having psychological distress, and smoking were all significantly ($p < .001$) correlated with the use of physician provided health services (Vingilis, Wade, & Seeley, 2007).

Among the ethnically diverse sample of undergraduate students in the current study, year of study and various living arrangements (i.e. alone, with parent(s), with romantic partner) were found to be the most significant predictors of university health service use. In addition, marijuana use and biological sex also reached statistical significance, but were specific to Caucasian and Indigenous students and Caucasian and Asian students respectively. However, due to the lack of available literature on the topic, it is difficult to say for certain how reflective these findings are of other Canadian undergraduate students from various ethnic backgrounds.

Year of study. As expected, year of study remained the most common predictor of university health services use among all ethnic groups of undergraduate students. Similar to the trend identified by Steenbeek and Langille (2012) in the original survey, year of study was positively associated with health service use. As reported by Steenbeek and Langille (2012), Maritime university students who were enrolled in their third and fourth year of undergraduate training had higher rates of university health service use compared to first and second year students (48%, 42%, 36%, 14% respectively). As discussed in Chapter Three, this trend is likely due to the amount of time spent on campus and the opportunity to become familiar with and use the university health services (Steenbeek & Langille, 2012; Yorgason, Linville, & Zitzman, 2008). Furthermore, for international students and students belonging to ethnic minorities, past research has determined that peer-pairing programs have beneficial effects on the experience of first-year undergraduate international students (Quintrell & Westwood, 2006). More specifically, Quintrell and Westwood (2006) found that facilitating structured contact between host

students and first-year international students resulted in increased use of university services, more positive descriptions of their first year, and more gains in language proficiency.

Living arrangement. Living alone was found to be a statistically significant predictor of university health service use among students of Caucasian, African, Indigenous, Other, and Multiracial descent. However, given that living alone was the reference category during the multivariate logistic regression analysis, a conclusion regarding association cannot be made. In addition, living with parents significantly decreased the odds of Caucasian (OR .223, 95% CI [.188, .266], p = .000), Indigenous (OR .259, 95% CI [.090, .744], p =.012), Asian (OR .418, 95% CI [.193, .904], p = .027), Other (OR .200, 95% CI [.064, .622], p = .005), and Multiracial (OR .294, 95% CI [.110, .790], p = .015) students accessing university health services after adjusting the model for biological sex and year of study. Living with parents was the second most common living arrangements reported by the ethnically diverse sample population, as 23.4% reported living with one or more parent(s) compared to 41.1% reporting living with a roommate, 20.4% reporting living alone, and 14.8% reporting living with a romantic partner. Similarly, living with a romantic partner was found to significantly decrease the odds of Caucasian, Indigenous, and Other students accessing university health services.

This may be one of the first studies to include living arrangement as a predictor variable of health service use for any undergraduate population. It is quite plausible that undergraduate students who live alone typically reside on campus in resident facilities such as dorm rooms and their close proximity to university health services increases utilization. Furthermore, undergraduate students who lived with their parent(s) at the time of the survey may have had access to their family's health care provider and thus, had no

reason to access the health services available on campus. In addition, research suggests that young adults who live with their parents have better access to emotional and financial support and are less likely to report food insecurity than those who rent, board, or share housing (Hughes, Serebryanikova, Donaldson, & Leveritt, 2011; Statistics Canada, 2012). Likewise, students who reported living with a romantic partner may also tend to live off campus due to co-ed university rooming being a controversial and relatively new living arrangement option on university campuses. Once again, the on-campus versus off-campus variable, as it pertains to the living arrangements of students and their use of university health services may be at play.

Marijuana use and biological sex. Marijuana use, defined in the current study, as "one or more occasions of marijuana use in the past 30 days" was a significant predictor of self-rated health among Caucasian and Indigenous students. Although not as common as alcohol use, 26.3% of students reported marijuana use. Interestingly, marijuana use was positively associated with health service use for both Caucasian and Indigenous students. In other words, engaging in marijuana use increased the odds of Caucasian students and Indigenous students using health services. Similar to the associations found between alcohol use and self-rated health, the positive relationship between marijuana use and health service utilization did initially appear odd. However, research has demonstrated that substance use experimentation is a common occurrence in adolescence and young adulthood with marijuana being the most frequently used illicit substance (Compton, Thomas, Conway, & Colliver, 2005). Furthermore, a number of negative social, emotional, psychological, educational, health, and legal consequences have been associated with substance use during this developmental period (Degenhardt & Hall, 2006; Gruber & Pope, 2002; Khalsa, Genser, Francis, & Martin, 2002). More specifically,

regular and heavy marijuana use have been linked to engagement in risky sexual behaviours (Grossman, Kaestner, & Markowitz, 2004; Tapert, Aarons, & Sedilar, 2001), delinquency (D'Amico, Edelen, Miles, & Morral, 2008; Mason & Windle, 2002), and mental health issues (Lynne-Landsman, Bradshaw, & Lalongo, 2010; Fergusson, Poulton, Smith, & Boden, 2006). Given the numerous negative outcomes associated with marijuana use among adolescence and young adults, it can be argued that marijuana use may have indirectly led to increased university health service use.

Lastly, biological sex, and more specifically, being female was a significant predictor of university health services use among Caucasian and Asian undergraduate students. Being female was associated with increased odds of accessing university health services for students self-identifying as Caucasian and Asian. This finding corresponds with findings from the total undergraduate student sample in the original survey, which indicates that female students (39.3%%) were more likely to use university health services than their male counterparts (28.8%) (Steenbeek & Langille, 2012). As previously stated, being female has been recognized as a significant predictor of health service use among Canadian adolescents (Vingilis, Wade, & Seeley, 2007), and several explanations have been identified. Differences in health care utilization among men and women may be associated with reproductive biology and conditions specific to biological sex (Mustard, Kaufert, Kozyrskyj, & Mayer, 1998; Waldron, 1983), differences in health perceptions and the reporting of symptoms and illness (Cleary, Mechanic, & Greenley, 1982; Hibbard & Pope, 1983; Waldron, 1983), or greater likelihood that females seek help for prevention and illness (Cleary, Mechanic, & Greenley, 1982; Hibbard & Pope, 1983; Waldron, 1983). As for findings specific to Asian females, there are no other studies to my knowledge that have reported these findings among undergraduate students.

Relationship Between Self-Rated Health and University Health Service Use

To determine the relationship between self-rated health and university health service use, self-rated health was included as a potential predictor of university health service use, while university health service use was included as a potential predictor of self-rated health in the logistic regression analyses. As such, the analyses were unable to determine any relationships between the two variables. However, this may be related to a particular methodological issue (i.e. the self-rated health item measured the perceived health of participants at the time of the survey, while the university health service use item measured participants past use). It is possible that the past use of health services impacted the participants' perceived health status at the time of their participation (Sutton, Carr-Hill, Gravelle, & Rice, 1999), as the various ethnic groups of undergraduate students may have been influenced by external, internal, and socio-political factors between the two time periods (Richard, Gauvin, & Raine, 2011).

A series of Chi-square tests were conducted to answer the last research objective: to determine the relationship and/or associations between self-rated health and use of health services among the ethnically diverse undergraduate population within the Maritime Provinces. As discussed in Chapter Four, findings showed that a significant relationship exists between ethnicity and self-rated health, X^2 (6, N = 10,384) = 14.946, p = .021, as well as ethnicity and university health service use X^2 (6, N = 10,253) = 63.103, p = .000. The Cramer's V and Phi indicated moderate and strong effect sizes respectively (Cohen, 1988). Although each ethnic group was not explored separately in this stage of the analyses, these findings further explain the variations in self-rated health and use of university health services among the various ethnic groups. As past research and the Social Ecological Model highlight, intersections between race, immigration, gender,

poverty, and health exist and subsequently, generate distinct health outcomes and health behaviours among individuals and groups (Ng et al., 2005; Richard, Gauvin, & Raine, 2011; Wu & Schimmele, 2005).

In addition, a third Chi-square test revealed that there was no relationship between ethnicity and health service use based on need (i.e. poor self-rated health), X^2 (6, N = 514) = 5.684, p = .459. Yet, despite this finding, clear differences exist in university health service use based on need when each ethnic group is examined independently as shown in Figure 4.2. What's more interesting is that regardless of past literature implying ethnic minority students are less likely than Caucasian students to utilize health services despite similar need (i.e. suicide attempt, risk for psychiatric disorders, etc.) (Abe-Kim et al., 2007; Davidson, Yakushka, and Sanford-Martens; Wu, Katic, Liu, Fan, & Fuller, 2010), findings from the current study revealed Caucasian students with poor self-rated health exhibited the second lowest percentage of university health service use (43.9%). This finding may reflect the fact that the ethnic diversity found within Maritime universities is due in large part to the recruitment and enrolment of international students who are usually new to Canada and therefore may only be familiar with the health care services available on campus. Furthermore, this finding may support past research which indicates that individuals belonging to ethnic minority groups often lack a regular source of health care such as a family physician, forcing them to seek health care from university based services.

Finally, a concerning finding from the current study in relation to the associations between self-rated health and health service use was that Indigenous students were least likely to access university health services based on need when compared to the other ethnic groups. Therefore, in addition to having the highest percentage (per ethnic group)

of "poor" self-rated health, Indigenous students also had the lowest percentage of university health care service use. An explanation for this result is likely found in the history of colonialism, oppressive control, and marginalization that continues to impact Indigenous Canadians, their communities, and their overall health (Adelson, 2005; Hackett, 2005; Newbold, 1998). Having a sound knowledge base on the health outcomes and inequalities specific to Indigenous Canadians is required to provide culturally safe and competent care, yet many health care providers are deficient in this information. However, this is important for university health care providers, as past research suggests the unavailability of culturally similar, sensitive, or competent health care providers is an important deterrent of health care utilization for ethnic minority students, including Indigenous students. (Atkinson, Jennings, & Liongson, 1990).

Study Limitations

There are several limitations of this study that should be taken into consideration when interpreting the findings. First, data for the current study was drawn from the *2012 Maritime Undergraduate Student Sexual Health Services Survey* and it must be acknowledged that certain conditions may be different since initial data collection. For example, the ethnic make-up of the eight university campuses included in the original survey may have changed. Also, given the amount of time since the original survey data was collected to when the analyses for the current study took place may have been enough time to result in a change in response to certain questions. For example, given the recent announcement of the legalization of marijuana in Canada, the frequency of marijuana use among Canadian and Maritime undergraduate students may be higher now (2017) compared to 2012. In addition, the *2012 Maritime Undergraduate Student Sexual*

Health Services Survey achieved a relatively low response rate of just 21.4% which has the potential to create selection biases. However, past research using web-based surveys with university student populations have also only achieved response rates ranging from 20.1% to 44% (Adalf, Demers, & Eliksman, 2005).

Using secondary data encompasses additional limitations, as data sets are often deficient in some way (Polit & Beck, 2012). This limitation is apparent in the current study as the original survey design, including data collection and sampling methods, was intended for the general undergraduate student population and may not have been successful in reaching more marginalized subgroups of Maritime undergraduate students. As well, the survey items were designed and selected with the general undergraduate student population in mind. Therefore, the survey items and responses may not have been able to portray the distinct experiences of the Maritimes' ethnically diverse undergraduate students. For example, the concepts of health, including social support and depression risk may be viewed and thus measured differently among Indigenous undergraduate students. Indigenous ideologies embrace a holistic view of health that reflects the physical, spiritual, emotional, and mental elements and the interconnectedness of these dimensions (National Collaborating Centre for Aboriginal Health, 2009). Therefore, measuring these perceptions in a "silo" approach, addressing each component individually, may not have been conducive to Indigenous ways of thinking and knowing. Furthermore, when referring specifically to social support, past research on social support within Canadian Indigenous communities suggests that Indigenous concepts of health are shaped by larger social dynamics, including family, community, nature, and Creator (Boyd & Associates, 2002; Svenson, & Lafontaine, 1999). In the current study however, the Sense of Social Support Scale (SSS) by Dolbier and Steinhardt (2000) did not

necessarily assess these culturally-sensitive items. In addition to the limitations associated with secondary data use, the study findings may also lack generalizability to the Maritimes' population of ethnically diverse undergraduate students due to the use of convenience sampling, and increased risk of sample bias (Polit & Beck, 2012). The undergraduate students who participated in the survey are likely representative of young men and women who are comfortable with their ethnic identity, sexual health, and health behaviours. This is believed to impact health and health behaviours. This also may have impacted the sample size for some ethnic minorities. Furthermore, the current study was unable to distinguish between foreign students coming to Canada by themselves, versus first generation ethnic minorities with parents who live in Canada, versus second generation immigrants, thus lacking the ability to differentiate the factors of health related to race as opposed to those specifically related to immigration. Likewise, because the survey written and distributed in English-only and not translated to other languages, only students who were able to read and write English could participate. In addition, being able to read and write English does not necessarily translate to comprehension and understanding.

Furthermore, all data used was derived from participants' self-reported information, which is known to increase risk of response bias, can lead to responses that are more socially desirable (Polit & Beck, 2012), and are unverifiable. Particularly, many survey items involved sensitive topics (i.e. substance use, sexual victimization, depression, etc.), which may have prompted some participants to answer questions untruthfully to align better with perceived social values and norms (Polit & Beck, 2012). However, this risk may have been reduced because the original survey data was collected anonymously and online (Pealer, Weiler, Pigg, Miller, & Dorman, 2001). Additionally,

the use of self-rated health as an outcome variable also produces limitations on the findings of this study. Self-rated health is a subjective measure of health that is based on an individuals' personal perspective. Therefore, it is difficult to determine which constructs or elements of health the ethnically diverse undergraduate population had reflected on to assess their health, and whether these constructs were consistent among all participants (Jylha, 2009). Additionally, research has revealed that self-assessments of health are often made in reference to peers, previous health experiences, and expectations for health: none of which could be determined or controlled for in the current study (Jylha, 2009). Nevertheless, it is commonly understood that self-perceived health assessments are not made arbitrarily and provide important information that cannot be obtained from a clinical assessment (Jylha, 2009).

Lastly, the cross-sectional design of the *2012 Maritime Undergraduate Students Sexual Health Services Survey* poses some limitation on the current study, because cause and effect relationships cannot be determined (Polit & Beck, 2012). Consequently, only associations between self-rated health, health service use, and other variables of interest could be determined and could only reflect one point in time (Polit & Beck, 2012).

Future Implications

Despite the limitations of this research, this is the first study known to address the health status and needs of the ethnically diverse undergraduate student population in the Maritime Provinces. This study brought forth both clinically important and statistically significant findings regarding the need for social support, the risk of depression, and the history of sexual victimization among groups of young ethnically diverse men and women. As well, this research was successful identifying many knowledge gaps and

highlighting the need for additional research on various ethnic/racial groups within Canada.

The Social Ecological Model and clinical implications. The Social Ecological Model has great potential for guiding the practical application of study findings in nursing practice, as it emphasizes the consideration of larger contextual determinants of health and health behaviours (i.e. socioeconomic factors, culture, social environments and policies, etc.) at the level of the individual, family, community and society. Based on the findings of this research, the various levels identified by the Social Ecological Model and their shared influences may be key principles to guide holistic nursing practice with ethnically diverse undergraduate students.

Individual. The Social Ecological Model recognizes that health and health behaviours are the result of both the various interacting domains influencing the individual and the direct influence from the individual themselves; therefore, it is imperative that undergraduate students from all ethnic backgrounds are also aware of and educated regarding the research findings (McLaren, & Hawe, 2004; Richard, Gauvin, & Raine, 2011). To ensure that the ethnically diverse undergraduate population in the Maritimes are aware of the research findings, it is recommended that undergraduate health information sessions are developed and delivered in collaboration with all ethnic groups of students and/or alumni and diversity support groups across campuses. Collaboration is critical, as messengers of research evidence must be viewed as credible by the target audience (Grimshaw, Eccles, Lavis, Hill, & Squire, 2012), as well should be sensitive and familiar with the unique needs of the target audience (Barker, Yockney, Richards, Jones, Bowes-Catton, & Plowman, 2012). These sessions would help to ensure that various ethnic groups of undergraduate students are knowledgeable about the

potential threats to their health and thus, are able to proactively participate in promoting their own health and preventing illness.

University community, society, and policy. The research findings highlight the need for Maritime university health care services to be culturally accessible to young ethnically diverse students, such as through the provision of resources and services designed to address the distinct health needs and strengths of various ethnic groups. I recommend that nurses should be provided with more education on the health of ethnic minority groups, as well as the internal, external, and socio-political environmental influences that can impact their health (i.e. depression risk, sexual victimization, marginalization, and minority stress).

This recommendation is timely and has great potential for successful knowledge translation given the current climate to enrich and promote diversity and inclusiveness of university campuses in the Maritime Provinces (Dalhousie, 2015). In Halifax, Nova Scotia the committee for Dalhousie University's Strategic Initiative on Diversity and Inclusiveness has already recommended that the nursing and other health profession programs include curriculum on ethnic diversity, and inclusivity (Dalhousie, 2015). Therefore, it is imperative that the current research findings are disseminated to similar diversity committees across Maritime university campuses through written materials, such as peer reviewed publications and a brief report summarizing the research findings (Grimshaw et al., 2012). This will help to ensure curriculums reflect the distinct health needs of various ethnic groups, thus improving initial training and education for nurses and other health care providers to be better prepared to advocate for and develop partnerships with ethnic minorities. Furthermore, this recommendation also aligns with the Truth and Reconciliation Commission of Canada: Calls to Action (2015) on health

and education including: recognition of the value of Aboriginal healing practices their use in the treatment of Aboriginal patients, the collaboration between Aboriginal and non-Aboriginal leaders to identify and close the gaps in health outcomes between Aboriginal and non-Aboriginal communities, and the requirement of nursing and medical school to make mandatory courses dealing with Aboriginal health issues, including skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.

As stated in Chapter One, the current research findings can give direction to health service directors and policy makers in the development of health promotion/illness prevention strategies that target the needs of ethnically diverse undergraduate student populations in the Maritime Provinces. As social support, depression risk, and sexual victimization were identified as key predictors of perceived health and year of study and living arrangements were identified as key predictors of university health service use, it is recommended that health promotion/illness prevention strategies are developed to target these health issues among students of all ethnicities across Maritime university campuses.

Once again, to ensure that the Maritime universities' health service directors, policy makers, and providers are aware of and use the knowledge generated from this study to develop targeted health promotion/illness prevention strategies, written materials (i.e. a brief report summarizing the study findings) should be distributed in combination with educational outreach (Grimshaw et al., 2012) To be most effective, educational outreach should be done in collaboration with students or alumni of various ethnic backgrounds, in order for the findings and recommendations to be presented to reflect real-life experiences. This is crucial to ensure administrators, directors, policy makers, and providers translate this knowledge into practice, because research suggests that supplementing quantitative evidence with narrative is known to humanize research

findings, increase awareness, and improve uptake and commitment to recommendations (Stamatakis, McBride, & Brownson, 2010).

Lastly, it is also recommended that health care providers and policy makers working in university based health service departments encourage the active participation of ethnic groups in all aspects of planning, organizing, and implementing health promotion/illness prevention strategies aimed at increasing social support for various ethnic groups on campus. This is also the most effect way to ensure the uptake of evidence by those who require it most.

Recommendations for Future Research. This is one of the first quantitative studies to address the health of various ethnic groups of undergraduate students in Canada. The current research findings associate closely with a small body of American based literature which has reported undergraduate students belonging to various ethnic groups have specific health needs, risks, and disparities, such as higher rates of stigmatization and depression risk (Blake, Ledsky, Goodenow, and O'Donnell, 2001; Hyun, Quinn, Madon, & Lustig, 2007; Lu, Dear, Johnston, Wootton, & Titov, 2013; McLachlan & Justice, 2009; Russell, Thompson, & Rosenthal, 2008; Tidwell, & Hanassab, 2007). This close alignment with previous studies, highlights a need for more targeted research on ethnic minority populations in Canada and the Maritimes. In addition, the alignment with past research highlights the need to continue filling the knowledge gap on the health of young Canadian ethnic minori**ty** groups and address important topics that were not included in the current study, such as sexual risk taking and suicidal ideation.

This study revealed that access to health services on university campuses within the Maritime Provinces differed among ethnic groups, despite similar perceived health

(i.e. poor self-rated health). However, due to the cross-sectional nature of the survey data it was not possible to determine any cause and effect relationships. Future research should aim to understand the perceived needs, the health seeking behaviours of various ethnic groups. As well as learn where, how, and why various ethnic groups access health care services. Furthermore, it may be advantageous for future research to asses and determine the "racialization" of Maritime university health service departments. Finally, conducting a qualitative research study using any of the following research methodologies: critical theory, ethnography, or phenomenology would allow for deeper social and political ideologies, hierarchies, and themes to emerge that may be impacting the health of ethnic minority groups.

Conclusion

In summary, this research has succeeded in its goal to fill the gap in research knowledge on the health and health services use of young ethnically diverse university students in the Maritime Provinces. An in-depth review of the literature clearly established that ethnic minority health (i.e. not limited to immigrant health) is an area of interest that has been dramatically under researched in the past, more specifically within Canada. As such, the findings from this research have shed light on demographic and psychosocial factors that impact young ethnic minority groups, their health, and their access to culturally congruent health care in the Maritime Provinces.

This was one of the first studies to examine and measure the self-rated health among various ethnic groups of undergraduate students from Maritime universities. Using data from the *2012 Maritime Undergraduate Student Sexual Health Services Survey*, this secondary analysis revealed that ethnic minority groups (excluding students of African descent) reported higher within groups averages of poor-self rated health, particularly

when compared to the results of the original survey among all undergraduate students. Furthermore, this is one of the first studies to measure and compare the use of health services among various ethnic groups of undergraduate students with similarly perceived health. The findings differed from past research, revealing that students from various ethnicities access health services just as often or in some cases more often than their Caucasian peers when the need for services is similar (i.e. poor self-rated health).

Out of the theoretically selected demographic, behavioural, and psychosocial predictors of self-rated health and health service use, findings revealed that numerous predictors of self-rated health and use of health services exist and vary among ethnic group. More specifically however, social support, depression risk, and sexual victimization were found to be the most common statistically significant factors impacting self-rated health of the ethnically diverse sample of undergraduate students. As well, year of study and living alone or with parents were identified as the most common statistically significant factors impacting university health service use among various ethnic groups. Students belonging to ethnic minority groups (excluding students of African descent) also reported higher ratings of very elevated depression symptoms compared to their Caucasian peers. Additionally, larger percentages of students belonging to ethnic minority groups appeared to perceive their social support as lower than that of Caucasian students. These findings have validated that undergraduate students belonging to ethnic minority groups in the Maritime provinces are not exempt from the negative effects of racism, racialization, and minority stress, as found in past research with ethnic minority groups across North America, Europe, and Australia.

Overall, this study has provided sufficient evidence for health care providers, policy makers, and administrators to target the specific health needs of young ethnic

minority groups. Although not considered a ‘nursing framework’ the utilization of the Social Ecological Model should provide nurses, administrators, and other health care providers with a clear foundation for the practical application of these research findings in practice and in future research. Nurses can play a lead role in enhancing and enriching the health of various ethnic minorities by recognizing that these individuals are distinct groups, with specific health needs and differences, and by advocating for the exclusive health concerns of this diverse population.

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Appendix A

Literature Review Boonlean/Phrase Search Strategy

#	Query	Limiters/Expanders	Last Run Via	Results
S12	S2 AND S4 AND S11	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	1,047
S11	DE "Health Care Utilization" OR DE "Health Care Seeking Behavior" OR DE "Health Care Services" OR DE "Help Seeking Behavior" OR DE "Self-Referral" OR DE "Treatment Barriers"	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	55,034
S10	S1 AND S6 AND S9	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	351
S9	DE "Racial and Ethnic Groups" OR DE "Cross Cultural Differences" OR DE "Minority Groups" OR DE "Multiculturalism" OR DE "Racial and Ethnic Differences"	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	98,606
S8	(S1 AND S6) AND (S4)	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	796
S7	S1 AND S6	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	8,301
S6	DE "Students" OR DE "Business Students" OR DE "Classmates" OR DE "College Students" OR DE "Dental Students" OR DE "Elementary School Students" OR DE "Graduate Students" OR DE "High School Students" OR DE "International Students" OR DE "Junior High School Students" OR DE "Kindergarten Students" OR DE "Law Students" OR DE "Medical Students" OR DE "Postgraduate Students" OR DE "Preschool Students" OR DE "Reentry Students" OR DE "Seminarians" OR DE "Transfer Students" OR DE "Vocational School Students"	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	197,633
S5	S3 AND S4	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	2,789
S4	ethnic* OR race OR racial OR minorit* OR diversity	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	205,767
S3	S1 AND S2	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	32,006
S2	undergraduate* student OR college* OR student OR universit* student	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	834,720
S1	self rated health OR self perceived health OR self report*	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search	119,110

Appendix B

Demographic Survey Items from the 2012 Maritime Undergraduate Student Sexual Health Services Survey

2. What is your age in years? _____

3. What ethnic/racial background do you consider yourself to be? (*Check all that apply.)*
   - ☐ White (Caucasian)
   - ☐ African descent
   - ☐ Aboriginal (*specify*) _____
   - ☐ Asian
   - ☐ Middle Eastern
   - ☐ Other (*describe*) _____

5. What year of your undergraduate program are you in?
   - ☐ First
   - ☐ Second
   - ☐ Third
   - ☐ Fourth
   - ☐ Other (*explain*) _____

7. Who do you live with?
   - ☐ I live alone
   - ☐ I live with one or both of my parent(s)
   - ☐ I live with my partner (i.e., sexual or romantic partner, spouse or girlfriend/boyfriend)
   - ☐ I live with a roommate(s) (not a sexual or romantic partner)

10. How wealthy do you see your family as being?
    - ☐ Very wealthy
    - ☐ Quite wealthy
    - ☐ Average
    - ☐ Not so wealthy
    - ☐ Not wealthy at all

Appendix C

Dependent Variable Survey Items from the 2012 Maritime Undergraduate Student Sexual Health Services Survey

13. In general, would you say that your health is? (C*heck one.*)

- □ Excellent
- □ Very good
- □ Good
- □ Fair
- □ Poor

30. Have you ever seen a doctor or a nurse at your university health centre for any reason?

- □ No *(Skip to Question 36.)*
- □ Yes

(R*eason for last visit*) _____

Appendix D

Independent Variable Survey Items from the 2012 Maritime Undergraduate Student Sexual Health Services Survey

16. We would like to know how you have been feeling about yourself and your life generally. Below is a list of the ways you might have felt or behaved. Please indicate how much of the time you felt this way during the past week checking the appropriate response.

During the past week:	Rarely or none of the time (less than 1 day)	Some or a little of the time (1–2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5–6 days)
I did not feel like eating: my appetite was poor	☐	☐	☐	☐
I felt that I could not shake off the blues even with help from my family or friends	☐	☐	☐	☐
I had trouble keeping my mind on what I was doing	☐	☐	☐	☐
I felt depressed	☐	☐	☐	☐
I felt like I was too tired to do things	☐	☐	☐	☐
I felt hopeful about the future	☐	☐	☐	☐
My sleep was restless	☐	☐	☐	☐
I was happy	☐	☐	☐	☐
I felt lonely	☐	☐	☐	☐
I enjoyed life	☐	☐	☐	☐
I had crying spells	☐	☐	☐	☐
I felt that people disliked me	☐	☐	☐	☐

18. Please describe how true you believe each of the following statements about your social relationships and support networks, where 1 = not at all true and 5 = completely true

	1	2	3	4	5
I participate in volunteer/service projects	☐	☐	☐	☐	☐
I have meaningful conversations with my parents and or/siblings	☐	☐	☐	☐	☐
I have a mentor(s) in my life I can go to for support/advice	☐	☐	☐	☐	☐
I seldom invite others to join me in my social and or/recreational activities	☐	☐	☐	☐	☐
There is at least one person I feel a strong emotional tie with	☐	☐	☐	☐	☐
There is no one I can trust to help solve my problems	☐	☐	☐	☐	☐
I take time to visit my neighbours	☐	☐	☐	☐	☐
If a crisis arose in my life, I would have the support I need from family and/or friends	☐	☐	☐	☐	☐
I belong to a club (e.g., sports, hobbies, support group, special interests)	☐	☐	☐	☐	☐
I have friends from work that I see socially (movie, dinner, sports etc)	☐	☐	☐	☐	☐
I have friendships that are mutually fulfilling	☐	☐	☐	☐	☐
There is no one I can talk to when making important decisions in my life	☐	☐	☐	☐	☐
I make an effort to keep in touch with friends	☐	☐	☐	☐	☐
My friends and family feel comfortable asking me for help	☐	☐	☐	☐	☐
I find it difficult to make new friends	☐	☐	☐	☐	☐
I look for opportunities to help and support others	☐	☐	☐	☐	☐
I have a close friends(s) who I feel comfortable sharing deeply about myself	☐	☐	☐	☐	☐
I seldom get invited to do things with others	☐	☐	☐	☐	☐
I feel well supported by my friends and/or family	☐	☐	☐	☐	☐
I wish I had more people in my life that enjoy the same interests and activities as I do	☐	☐	☐	☐	☐
There is no one that shares my beliefs and attitudes	☐	☐	☐	☐	☐

21. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

- □ 0 days
- □ 1 day
- □ 2 days
- □ 3 to 5 days
- □ 6 to 9 days
- □ 10 to 19 days
- □ 20 or more days

20. During the past 30 days, how many times did you use marijuana?

- □ 1 or 2 times
- □ 3 to 9 times
- □ 10 to 19 times
- □ 20 to 39 times
- □ 40 or more times

Appendix E

Descriptive Statistics of Variables Included in the Study for Ethnically Diverse Population

Maritime Undergraduate Students (n=10,344)	**Frequency (n)**	**Percentage (%)**	**Mean(SD)**
Demographics			
Age[a]	-	-	21(3.6)
Sex[b]			
Male	3065	29.6%	-
Female	7279	70.4%	-
Ethnicity			
Caucasian	8764	84.7%	-
African	216	2.1%	-
Indigenous	260	2.5%	-
Asian	526	5.1%	-
Middle Eastern	172	1.7%	-
Other	186	1.8%	-
Multiracial	228	2.2%	-
Year of program			
First Year	2935	28.3%	-
Second Year	2365	22.8%	-
Third Year	2146	20.7%	-
Fourth Year	2156	20.8%	-
Living arrangement[c]			
Alone	2115	20.4%	-
With parent(s)	2433	23.4%	-
With partner	1537	14.8%	-
With roommate	4272	41.1%	-
Family wealth			

Maritime Undergraduate Students (n=10,344)	**Frequency (n)**	**Percentage (%)**	**Mean(SD)**
Not wealthy	1999	19.3%	-
Average	5948	57.3%	-
Wealthy	2437	23.5%	-
Survey Items			
Self-rated health			
Poor	517	5.0%	-
Good	9867	95.0%	-
Health service use[d]			
No	6352	61.2%	-
Yes	3901	37.6%	-
Binge drinking[e]			
No binge drinking	3774	36.3%	-
Binge drinking	6552	63.1%	-
Marijuana use[f]			
No marijuana use	7563	72.8%	-
Marijuana use	2731	26.3%	-
Forced sex[g]			
No	9728	93.7%	-
Yes	500	4.8%	-
Depression risk			
Minimal risk	6775	65.2%	-
Elevated risk	2781	26.8%	-
Very elevated risk	828	8.0%	-
Sense of support	-	-	58.2(12.7)
0-12	15	.1%	-
13-24	68	.7%	-
25-36	496	4.8%	-
37-48	1749	16.8%	-

Maritime Undergraduate Students (n=10,344)	Frequency (n)	Percentage (%)	Mean(SD)
49-60	3204	30.9%	-
61-72	3535	34.0%	-
73-84	1317	12.7%	-

Note: [a]Missing cases (n=51, .5%). Valid percentages displayed. [b]Missing cases (n=40, .4%). Valid percentages displayed. [c]Missing cases (n=27, .3%). Valid percentages displayed. [d]Missing cases (n=131, 1.3%). Valid percentages displayed. [e]Missing cases (n=58, .6%). Valid percentages displayed. [f]Missing cases (n=90, .9%). Valid percentages displayed. [g]Missing cases (n=156, 1.5%). Valid percentages displayed.

Appendix F

Contingency Table for Self-Rated Health

Independent Variables	Observed cell counts for self-rated health	Percentage with poor self-rated health	Percentage with good self-rated health
Age			
17	215	3.3%	96.7%
18	1832	5.0%	95.0%
19	1768	5.6%	94.4%
20	1698	4.4%	95.6%
21	1667	4.0%	96.0%
22	1006	5.9%	94.1%
23	535	6.0%	94.0%
24	340	4.4%	95.6%
25	238	5.0%	95.0%
26	183	6.0%	94.0%
27	145	3.4%	96.6%
28	108	3.7%	96.3%
29	94	8.5%	91.5%
30	58	5.2%	94.8%
31	46	2.2%	97.8%
32	45	4.4%	95.6%
33	34	0.0%	100.0%
34	34	8.8%	91.2%
35	254	5.5%	94.5%
Sex			
Male	3065	4.5%	95.5%
Female	7279	5.1%	94.9%
Ethnicity			
Caucasian	8764	4.7%	95.3%

Independent Variables	Observed cell counts for self-rated health	Percentage with poor self-rated health	Percentage with good self-rated health
African	214	4.2%	95.8%
Indigenous	260	9.2%	90.8%
Asian	524	5.7%	94.3%
Middle Eastern	172	6.4%	93.6%
Other	184	6.5%	93.5%
Multiracial	226	5.8%	94.2%
Year of program			
First Year	2923	5.2%	94.8%
Second Year	2355	5.6%	94.4%
Third Year	2143	4.4%	95.6%
Fourth Year	2149	5.4%	94.6%
Living arrangement			
Alone	2100	5.3%	94.7%
With parent(s)	2432	4.9%	95.1%
With partner	1529	5.2%	94.8%
With roommate	4259	4.6%	95.4%
Family wealth			
Not wealthy	1988	7.2%	92.8%
Average	5926	4.9%	95.1%
Wealthy	2430	3.3%	96.7%
Health service use			
No	6334	4.6%	95.4%
Yes	3880	5.6%	94.4%
Binge drinking			
No binge drinking	3755	6.6%	93.4%
Binge drinking	6533	4.0%	96.0%
Marijuana use			
No marijuana use	7541	5.0%	95.0%
Marijuana use	2715	4.8%	95.2%

Independent Variables	Observed cell counts for self-rated health	Percentage with poor self-rated health	Percentage with good self-rated health
Forced sex			
No	9697	4.7%	95.3%
Yes	493	9.7%	90.3%
Depression risk			
Minimal risk	6755	2.4%	97.6%
Elevated risk	2769	7.4%	92.6%
Very elevated risk	820	17.7%	82.3%
Sense of support			
0-12	15	26.7%	73.3%
13-24	66	27.3%	72.7%
25-36	491	14.1%	85.9%
37-48	1739	8.7%	91.3%
49-60	3193	4.5%	95.5%
61-72	3524	2.8%	97.2%
73-84	10344	4.9%	95.1%

Appendix G

Contingency Table for Health Service Use

Independent Variables	Observed cell counts for self-rated health	Percentage did not access health services	Percentage accessed health services
Age			
17	212	82.1%	17.9%
18	1811	85.3%	14.7%
19	1754	60.9%	39.1%
20	1677	53.8%	46.2%
21	1646	49.6%	50.4%
22	991	49.9%	50.1%
23	528	54.5%	45.5%
24	336	53.9%	46.1%
25	234	60.3%	39.7%
26	180	61.7%	38.3%
27	145	66.9%	33.1%
28	106	64.2%	35.8%
29	94	71.3%	28.7%
30	57	70.2%	29.8%
31	45	98.9%	31.1%
32	44	70.5%	29.5%
33	34	76.5%	23.5%
34	33	72.7%	27.3%
35	245	82.9%	17.1%
Sex			
Male	3017	69.9%	30.1%
Female	7197	58.7%	41.3%
Ethnicity			
Caucasian	8660	61.1%	38.9%

Independents Variables	Observed cell counts for self-rated health	Percentage with poor self-rated health	Percentage with good self-rated health
African	207	59.9%	40.1%
Indigenous	259	68.7%	31.3%
Asian	514	75.5%	24.5%
Middle Eastern	169	73.4%	24.5%
Other	180	55.6%	44.4%
Multiracial	225	58.7%	41.3%
Year of program			
First Year	2889	84.8%	15.2%
Second Year	2329	59.7%	40.3%
Third Year	2117	53.4%	46.6%
Fourth Year	2120	46.8%	53.2%
Living arrangement			
Alone	2079	62.1%	37.9%
With parent(s)	2401	84.0%	16.0%
With partner	1505	63.5%	36.5%
With roommate	4207	48.9%	51.1%
Family wealth			
Not wealthy	1971	64.2%	35.8%
Average	5849	63.2%	36.8%
Wealthy	2394	57.2%	42.8%
Self-rated health			
Poor	509	57.2%	42.8%
Good	9705	62.3%	37.7%
Binge drinking			
No binge drinking	3719	68.9%	31.1%
Binge drinking	6452	58.0%	42.0%
Marijuana use			
No marijuana use	7465	63.9%	36.1%
Marijuana use	2676	56.6%	43.4%

Independent Variables	Observed cell counts for self-rated health	Percentage with poor self-rated health	Percentage with good self-rated health
Forced sex			
No	9679	63.1%	36.9%
Yes	492	41.1%	58.9%
Depression risk			
Minimal risk	6662	62.4%	37.6%
Elevated risk	2739	61.1%	38.9%
Very elevated risk	813	62.1%	37.9%
Sense of support			
0-12	15	86.7%	13.3%
13-24	65	70.8%	29.2%
25-36	487	69.2%	30.8%
37-48	1720	69.4%	30.6%
49-60	3152	63.7%	36.3%
61-72	3485	58.2%	41.8%
73-84	10214	62.0%	38.0%