A SECONDARY ANALYSIS OF SELF-RATED HEALTH AND HEALTH SERVICE USE OF FEMALE, BISEXUAL UNDERGRADUATE STUDENTS ON MARITIME CAMPUSES

by

Joelle Monaghan

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Abstract

Title: Secondary Analysis of Self-Rated Health and Health Service Use of Female Bisexual Undergraduate Students on Maritime Campuses

Background: Given the limited research on the health of bisexual women, findings suggest this population is experiencing disproportionate rates of health disparities and less protective factors.

Methods: Guided by the Prince Edward Island Conceptual Model for Nursing, a secondary analysis of cross-sectional data collected during the Maritime Undergraduate Student Sexual Health Services Survey 2012 (N = 10, 232) examined the health and health service use of bisexual female undergraduate students (n = 357) and answered: What are the predictors of self-rated health and use of health services for bisexual female students on Maritime University campuses?

Results: Statistical findings revealed that among bisexual female students, social support significantly increased (OR 1.04 [1.01, 1.06]) and depression risk significantly decreased (OR .303, [.109, .845]) odds of reporting good health ($p < .05$) in comparison to poor health, while forced sex (OR 2.23, [1.10, 4.53]) significantly increased odds of health service use ($p < .05$) in comparison to non-use.

Conclusion: It is hopeful that these findings will support the development of inclusive health promotion strategies that target bisexual women's psychosocial health needs on Maritime university campuses.

List of Abbreviations Used

ACHA-NCHA – American College Health Association-National College Health Assessment

CCHS – Canadian Community Health Survey

CES-D12 – Centre for Epidemiological Studies' Depression Scale

CIHR – Canadian Institute of Health Research

GP – General practitioner

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

LGBQ - Lesbian, gay, bisexual, and queer

NHIS – National Health Interview Survey

NSERCC - Natural Sciences and Engineering Research Council of Canada

PEI – Prince Edward Island

PHAC – Public Health Agency of Canada

PHC – Primary health care

SPSS – Statistical Package for Social Sciences

SSHRCC - Social Sciences and Humanities Research Council of Canada

SSS – Sense of Support Scale

STI – Sexually transmitted infection

WHO – World Health Organization

WSM – Women who have sex with men

WSW – Women who have sex with women

WSWM – Women who have sex with women and men

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Reflecting back on the past two years, it is hard for me to believe that my masters work has now come to an end. Reflecting back on this short period of time, I am so grateful to have met countless amazing women and men who have inspired me to be the best I can be. In particular, I am so grateful to those who have shaped my graduate school experience into something very positive and rewarding.

Chapter One: Introduction

Over the past two decades, there has been a positive shift in Canada towards sociopolitical recognition of the lesbian, gay, bisexual, and queer (LGBQ) communities. In 1996, the *Canadian Human Rights Act* altered Chapter 15 of the Canadian Charter of Rights and Freedoms to include sexual orientation, and for the first time, explicitly provided LGBQ individuals protection from unequal treatment and discrimination (Government of Canada, 2013). Then, in 2005 Canada's House of Commons legalized same-sex marriage nationwide (Hurley, 2005). Most recently, at the provincial and organizational level, health care and educational institutions have created diversity and inclusion strategies that recognize the LGBQ community as a unique culture with unique needs (Dalhousie, 2015; Nova Scotia Department of Health and Wellness, 2015).

Against this backdrop however, women who identify as LGBQ continue to experience stigma, prejudice, and discrimination by family, friends, domestic partners, and collective groups (Beagan, Fredericks, & Goldberg, 2012; Fish & Bewley, 2010). LGBQ women often encounter situations of poor and unfair treatment such as ignorance, intolerance and even violent hate crimes such as verbal, physical, and sexual violence directed towards their sexual identity (Fish & Bewley, 2010; Meyer, 2003). The chronic stress of living as a sexual minority has been linked to health disparities throughout the LGBQ community (Fredriksen-Goldsen, Kim, Barkan, Balsam, & Mincer, 2010; Kerr, Santurri, & Peters, 2013; Kuyper & Vanwesenbeeck, 2011; Molina et al., 2015; Meyer, 2003; Schauer, Berg, & Bryant, 2013). For example, mental health concerns, such as depression, substance abuse, and suicidal ideation may be attributed to the impact that stigma has on LGBQ women's psychological and social functioning, (i.e. anticipation of

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rejection by others and hypervigilance for harassment and violence) (Meyer, 2003). In addition, psychological stress is known to trigger the sympathetic nervous system and hypothalamic-pituitary-adrenal axis, increasing risk of chronic inflammation and cardiovascular disease (Everett, Rosario, McLaughlin, & Austin, 2014). Meyer (2003) conceptualized this chronic stress as minority stress, a specific form of stress that socially based and sexual minorities experience due to intentional and unintentional stigma and discrimination.

In North America the health care system operates in a predominantly heteronormative manner and therefore, LGBQ women accessing health services can experience situations that pose incongruences with their realities and are often left feeling marginalized (Meyers, 2003). LGBQ women have reported encountering health care providers who make assumptions about their sexual identity, lack knowledge on LGBQ health needs, and at times fail to provide accurate health information (Fish & Bewley, 2010; Mathieson, Bailey, & Gurevich, 2002). In more extreme cases, research findings have even revealed that some LGBQ women have encountered health care providers with negative attitudes towards their sexuality and have reported receiving rough physical exams and mentally abusive care; ultimately, these types of experiences may prevent women from disclosing their sexual identity to health care providers or avoiding health care provision all together (Johnson & Nemeth, 2014; Mathieson et al., 2002; Scherzer, 2000). These issues are concerning and may also contribute to the many physical and mental health disparities experienced by LGBQ women, in addition to creating barriers to needed health care services (Fish & Bewley, 2010; Scherzer, 2000).

Background

Sexual Orientation

The World Health Organization (WHO) has recognized the following definition of sexual orientation: "…a persistent tendency to experience sexual attractions, fantasies and desires and to engage in sexual behaviours with partners of a preferred sex" (Cochran et al., 2014, p. 674). Sexual orientation is an integral part of a person's sexual identity. However, sexual orientation is not always fixed and changes may occur throughout a person's lifespan (Cochran et al., 2014).

Sexual orientation is often described as a continuum or spectrum, ranging from 100% heterosexual to 100% homosexual with varying degrees of heterosexuality and homosexuality in-between, with bisexuality situated in the middle (Klein, 1993). One of the first scales created to measure sexual orientation was the Kinsey Scale (Klein, 1993). Alfred Kinsey developed a scale to help individuals identify or label their sexual orientation based on both sexual experiences and psychological reactions (Kinsey, Pomeroy, Martin, & Gebhard, 1953; Klein, 1993). This scale ranged from zero to six and included the following, "0 = entirely heterosexual. 1= largely heterosexual, but with incidental homosexual history. 2 = largely heterosexual, but with a distinct homosexual history. 3 = equally heterosexual and homosexual. 4 = largely homosexual, but with distinct heterosexual history. 5 = largely homosexual, but with incidental heterosexual history. 6 = entirely heterosexual" (Kinsey et al., 1953, p. 470). Interestingly, labeling individuals with a sexual orientation is a fairly new concept believed to only date back to the nineteenth century (Klein, 1993).

LGBQ was created as an umbrella term used to refer to individuals who identify with a sexual orientation that is not 100% heterosexual (the dominant sexual orientation

in western society), e.g. lesbian, gay, bisexual, and queer. There are multiple variations of this acronym, some with differing arrangements of the letters and some with additional letters to include those who identify as questioning, intersex, transgender two-spirited, asexual, and allies (Chase & Ressler, 2009). As a group, LGBQ individuals share similar concerns with regard to stigma and marginalization and together have a stronger voice for political action (Taylor, Jantzen, & Clow, 2013). However, there is a need to acknowledge the diversity and different challenges experienced within LGBQ communities (Taylor et al., 2013).

Bisexuality

In particular, bisexual individuals have encountered unique difficulties in being recognized as a distinct sexual orientation within LGBQ communities (Klein, 1993). Historically and still today, bisexual individuals are misunderstood, as they are often labeled by society as "in denial" or "confused" about their sexuality, as well as experience discrimination from both heterosexual and homosexual communities (Klein, 1993; Barker, Richards et al., 2012). Even within queer literature, bisexuality is a concept that can be difficult to define, but is often used to refer to an individual who has a sexual attraction or sexual desire for more than one gender (Barker et al., 2012; Klein, 1993). Bisexuality does not require an individual to be equally attracted to different genders, nor does it require an individual to maintain certain levels of attraction to different genders, as bisexuality is fluid and can change over time (Barker et al., 2012; Klein, 1993). Klein, author and founder of "The Journal of Bisexuality" wrote in his 1993 book, *The Bisexual Option,* that bisexuality could be episodic, temporary and experimental in nature and even a transitional state for some. To add to the complexity, it must also be noted that not

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every individual who has an attraction to more than one gender identifies as bisexual (Barker, Richards et al., 2012).

There are multiple different terminologies or labels that are used to encompass the same meaning as bisexuality, these include but are not limited to pansexual, polysexual, omnisexual, queer, nonmonosexual, heteroflexible, homoflexible, etc. (Barker, et al., 2012). As well, in health research the term women who have sex with women and men (WSWM) is commonly used to refer to women who are sexually active with both women and men, regardless of whether they identify as bisexual or not (Barker, Richards et al., 2012). Throughout this research, all efforts have been made to avoid categorizing or labeling women in a way that does not reflect their sexual identity. However, because there is no best practice for bisexual terminology (San Francisco Human Rights Commission, 2011), the term "bisexual" has be used throughout the research process. Additionally, this study has not specifically addressed trans* health, as the health needs and concerns related to gender identity minority status are outside the realm of bisexual health. However, it is acknowledged that trans* women can also identify as bisexual, as well there may have been trans* women who identified as bisexual and female during this study.

Since the 1800's, the term "bisexuality" has evolved from referring to having both male and female anatomical characteristics to describing more subjective traits such as masculinity and femininity, in reference to having both traditional male and female qualities (MacDowall, 2009). In the 1900s, bisexuality was first used to indicate having a sexual attraction to both male and female sexes (MacDowall, 2009) and by the 1980's, psychology and sociology researchers advanced the idea of bisexuality being a form of sexual attraction, to bisexuality being a legitimate sexual identity and sexual practice akin

to heterosexuality and homosexuality (MacDowall, 2009). During this time, North America was undergoing an HIV/AIDS (human immunodeficiency virus/ acquired immune deficiency syndrome) crisis and researchers were primarily focused on preventing the spread of HIV/AIDS between men who have sex with men (MSM) (Anderlini-D'Onofrio, 2003). Although this focus brought some recognition to the bisexual community, bisexual women's health needs remained overlooked and under addressed; a concern which continues today (Taylor et al., 2013).

Health

Health is not easily defined. It is a broad and abstract concept; possibly even more so than bisexuality. Depending on who you are, where you are from, your life experiences, and what values you hold, definitions of health will vary greatly. The Association of Faculties of Medicine of Canada (AFMC) provides an online briefing on population health beginning with the biomedical model's definition. This definition focuses on the ability of the anatomic, physiologic, and psychological aspects of the human body to function adequately and perform valued roles (AFMC, n.d.). The definition of health has since been altered, as the WHO emphasized the link between health and wellness, and determined that health is not just the absence of disease: but is a state of complete of physical, mental, and social wellbeing, as well as a fundamental human right (WHO, 1978). Following the First International Conference on Health Promotion in Ottawa 1986, the WHO refined the definition, recognizing health as a resource that enables individuals and/or groups to aspire and fulfil needs while adapting to changing environments (WHO, 1986). This WHO definition recognized the importance of social and personal resources in achieving a dynamic state of physical, mental, social,

and spiritual wellbeing, which inevitably provides individuals and groups such as bisexual women, with the means to function and perform valued roles (AFMC, n.d.).

The Canadian Nurses Association (CNA), the regulatory body of registered nursing practice in Canada, recognizes the WHO (2006a) definition of health, "A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (Canadian Nurses Association, 2007, p. 27). This CNA definition is reflective of the theoretical foundation of nursing practice, which is further guided by four interconnecting fundamental concepts; person, environment, nursing, and health (Canadian Nurses Association, 2007). Nursing practice involves understanding the broader context of what constitutes a person and health, including the biophysical, psycho-emotional, spiritual, and social aspects that determine wellness, illness, and quality of life (Canadian Nurses Association, 2007). As well, nursing practice involves understanding how the broader sociopolitical and physical environments can impact a person's health and their accessibility to care (Canadian Nurses Association, 2007).

Primary health care. The WHO (1978) defined primary health care (PHC) as, "…essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible…" (p. 3). The WHO identified that PHC was crucial to achieving equality in health for all and called for immediate development and implementation of PHC across the globe (WHO, 1978).

The Prince Edward Island Conceptual Model for Nursing by Munro and colleagues (2000) is guided by PHC, but from a nursing practice perspective; drawing on the principles of PHC (accessibility, public participation, health promotion, appropriate technology, intersectoral collaboration) and the social determinants of health (income, social status, education, social support, employment and working conditions, physical

environment, biopsychological endowment and genetics, personal health practices and coping, early childhood development, and health services), while emphasizing the importance of the nurse-client (individual, family, group, or community) partnership for the empowerment of vulnerable populations, such as young bisexual women (See Figure 1.1) (Munro et al., 2000). This model was optimally suited to guide this research study in describing the predictors of bisexual women's health and health service use and will be described in further detail throughout this research proposal.

Figure 1.1 *Person/Environment/Nursing Relationships: Primary Health Care Approach*
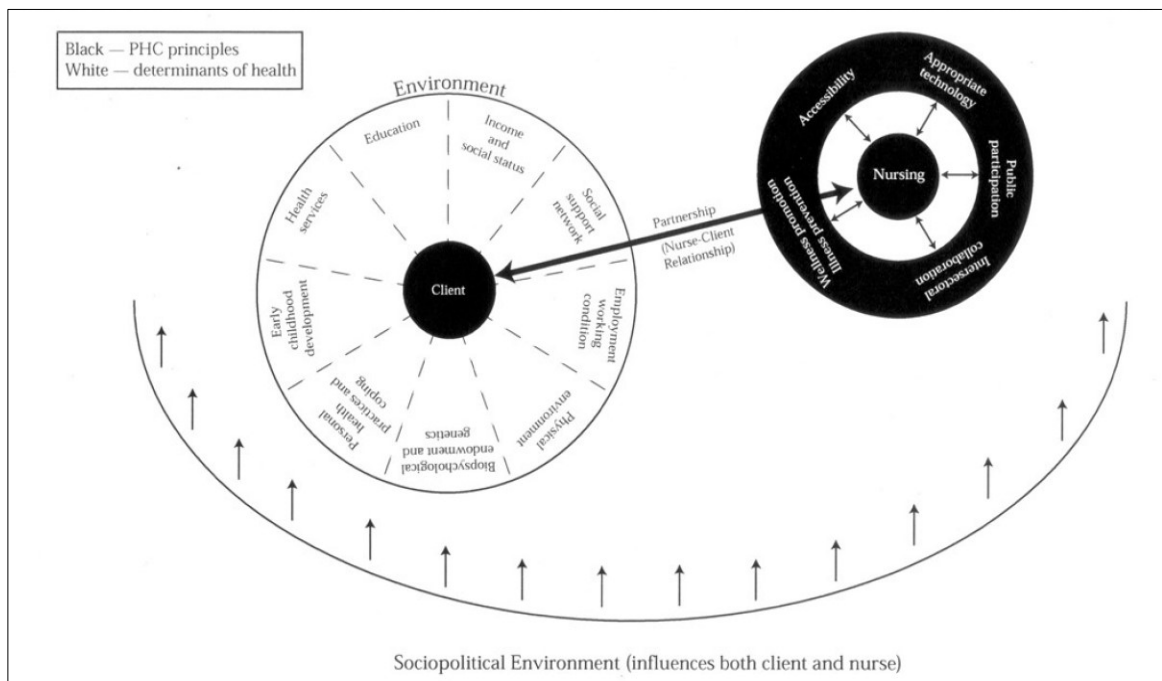
Adapted from "The Prince Edward Island conceptual model for nursing: A nursing perspective of primary health care," by M. Munro et al., 2000, *Canadian Journal of Nursing Research, 32* (1), p.14. Copyright 2000 by Canadian Journal of Nursing Research. Adapted with permission from Dr. M. Munro and the Canadian Journal of Nursing Research.

Bisexual Women

It is believed that bisexual individuals make up the largest sexual orientation group following heterosexuals, with women being more likely than men to identify as bisexual and to report sexual activity with both sexes (WHO, 2014). However, due to the

lack of census information on the number of Canadians who identify as LGBQ, there is currently little information on how many Canadian women identify as bisexual. However, Tjepkema (2008) was able to make an estimation by conducting one of the only secondary analyses to focus on LBGQ health using population based data from Canada (ages 12 to 59). This data was derived from the 2003 (N = 135, 573) and 2005 (N = 132, 947) Canadian Community Health Surveys (CCHS); cycles 2.1 and 3.1 respectively. Based on this combined data, it was estimated that approximately 0.9% of Canadian females, aged 18 to 59, identified as bisexual in 2003-2005; the second largest LGBQ group following homosexual males at 1.4% (Tjepkema, 2008). In comparison, Kerr, Ding, and Chaya (2014) conducted a secondary analysis on combined data from the 2009, 2010, and 2011 American College Health Association-National College Health Assessment II surveys (ACHA-NCHA II) (N = 65, 281). These surveys were administered in randomized classrooms, in self-selected schools, with analyses including participants ranging in age from 18 to 25. It was found that bisexual women were the largest LGBQ group in this data set (3.7%), followed by homosexual men (3.4%) (Kerr et al., 2014). In addition to the size of the bisexual female population, there was a trend in research for bisexual women to be considerably younger in age than heterosexual and LGBQ individuals. Tjepkema (2008) discovered that 35.9% of Canadian bisexual women who participated in the CCHS (2003, 2005) fell within the age range of 18 to 24, while in comparison, just 10.5% of lesbian women and 15.4% of heterosexual women fell within this same age range. Fredriksen-Goldsen et al.'s (2010) secondary analysis of population-based data from the Washington State randomized survey, Behavioral Risk Factor Surveillance System (2003 to 2007), also showed 48.6% of bisexual women fell within the age category of 18 to 29, compared to just 22.4% of lesbian women.

University-aged bisexual women. There are amplified health concerns for the emerging adult or university-aged population of bisexual women. For many women, emerging adulthood is a period of self-exploration and often encompasses a transition from home life to university living (Arnett, 2000; O'Connor et al., 2011). This is also a period when many young women gain independence from their parents for the first time; increasing the potential for risk taking behaviours (Oswalt & Wyatt, 2013). Research specific to undergraduate students populations has revealed that bisexual women have poorer health outcomes than their female peers, including significantly higher incidence of mental illness (Kerr, Santurri et al., 2013), substance abuse (Ford & Jasinski, 2006; Kerr, Ding, Burk, & Ott-Walter 2015; Kerr et al., 2014; McCabe, Hughes, & Boyd, 2004; Schauer et al., 2013), risky sexual behaviours, (Kerr, Ding et al., 2013; Lindley, Barnett, Brant, Hardin, & Burcin, 2008; Oswalt & Wyatt, 2013), and sexual assault (Martin et al., 2011).

From the literature, it could be deduced that these health disparities may be due to the additional stressors young bisexual women encounter during emerging adulthood, above and beyond what their female peers many encounter. Current research shows young bisexual women are at higher risk for poor adjustment to university life (Kerr, Santurri et al., 2013) and are greatly impacted by harassment, victimization and rejection inflicted by both heterosexual and homosexual communities within school environments (Peter, Taylor, Ristock, & Edkins, 2015). This may not only result in young bisexual women struggling more with self-identification, but may also result in young bisexual women feeling less connected to the school community and lacking the adequate social support needed during a period of turbulent life changes (Hartman, 2006).

A secondary analysis of data collected during ACHA-NCHA II (N = 27, 774) revealed the negative impact that health disparities could have on undergraduate bisexual women's academic success (Klein & Dudley, 2014). These authors found that the undergraduate bisexual female participants were more likely to report that ailments such as depression, anxiety, stress, viral/bacterial infections, homesickness, difficulty sleeping and relationship concerns, had negatively impacted their academic performance (e.g. failing a test, failing a course, significant disruption of thesis, dissertation or research) than bisexual men (Klein & Dudley, 2014). In comparison to heterosexual undergraduate students, bisexual women's academics were significantly more affected by all previously listed ailments, in addition to alcohol use, drug use, assault, eating disorders, chronic health problems, experiences of sexual assault, sexually transmitted infections, and finances ($p < 00.1$) (Klein & Dudley, 2014). Undergraduate bisexual women and lesbian women differed in that bisexual women's academics were more negatively affected by depression, anxiety, sexual assault, and concerns for friends or family and lesbian women's were only more affected by discrimination (Klein & Dudley, 2014).

Although these findings are concerning, the majority of this research knowledge on undergraduate bisexual women's health comes from the United States. Therefore, these findings may not be entirely reflective of bisexual women in Canada, as there are many societal and cultural differences between the countries, including dissimilar health care systems (Tjepkema, 2008). This further gives rise to and highlights the need for more research addressing the health and health needs of young bisexual Canadian women (Tjepkema, 2008).

Biphobia. A common and emerging theme in queer literature is the lack of acceptance, the exclusion, and the stereotypes against bisexual persons by both the

heterosexual and homosexual communities, also known as biphobia (Barker, Richards et al., 2012; Borver, Gurevich, & Mathieson, 2001; Bostwick & Hequembourg, 2014; Klein, 1993). Multiple qualitative studies have found that bisexual women have repeatedly had their sexual identity dismissed, i.e. being told they were in denial of their true homosexuality, in a transitional phase towards homosexuality, or in an experimental phase of their sexuality (Borver et al., 2001; Bostwick & Hequembourg, 2014). This has also lead to stereotypes that bisexual women identify as bisexual because they want to maintain some "heterosexual privilege" (Barker, Richards et al., 2012; Borver et al., 2001, p.36). While the bisexual women in Borver and colleagues (2001) study expressed the very opposite reality; that it was often easier to identify as a lesbian in order to avoid isolation and to belong to a supportive community.

Bisexual women have also experienced immense push back from LGBQ communities when seeking romantic relationships (Borver et al., 2001; Bostwick & Hequembourg, 2014). In one qualitative study, 22 bisexual women from Nova Scotia discussed the difficulty of dealing with stereotypes that label bisexual women as promiscuous, incapable of monogamous relationships, and carriers of sexually transmitted infections (STIs) (Borver et al., 2001). Furthermore, bisexual women may experience additional stereotypes that males do not, as society has socially constructed female bisexuality into something that is hypersexualized for the pleasure of heterosexual men (Borver et al., 2001). As a result, female bisexuality has been stereotyped as merely a "trendy" or "chic" way for young women to experiment sexually, rather than being recognized an authentic and legitimate sexual orientation (Borver et al., 2001, p.40; Bostwick & Hequembourg, 2014). This is also evident in popular culture (e.g. television, movies, etc.), as bisexual female characters are generally portrayed as attractive women,

who have unstable personal lives and are exploring their self-identity through sexual experimentation (Meyer, 2010). Female bisexual characters rarely identify as bisexual; instead bisexual behaviours are just inserted into plot lines, further contributing to the harmful stereotypes related to bisexuality (Meyer, 2010).

In organized focused groups conducted in Chicago, Illinois, 10 bisexual women (average age 39) expressed their frustrations and discussed the burdens associated with having to continuously defend their sexual identity and the sheer existence of their sexual orientation (Bostwick & Hequembourg, 2014). This supports previously mentioned concerns that living with stressors, such as exclusion and invisibility, is undoubtedly detrimental to bisexual women's health (Bostwick & Hequembourg, 2014).

Bisexual Women's Health

Despite being one of the largest LGBQ communities, bisexual women are often overlooked in health research. For example, when reviewing literature, bisexual women are often mentioned in the titles and abstracts of research studies however, upon further inspection, it becomes apparent that the health needs and experiences of bisexual women are often not fully addressed or captured (Estrich, Gratzer, & Hotton, 2014; Johnson & Nemeth, 2014; Mathieson et al., 2002; Mravcak, 2006; Zuzelo, 2014). One reason for this lack of acknowledgement is that often researchers combine bisexual and lesbian women in data collection and analyses, or even aggregate the entire LGBQ community as a whole (Taylor et al., 2013). As a result, this has left our understanding of bisexual women's health experience distorted and poorly understood (Fredriksen-Goldsen et al., 2010; Steele, Ross, Dobinson, Veldhuizen, & Tinmouth, 2009).

Presently, research addressing health and health needs of bisexual women is limited, but growing. The majority of research that does exist originates from Australia, Europe, and the United States. Just as research specific to undergraduate populations of bisexual women, research across the board shows that bisexual women of all ages are experiencing profound health disparities, including higher rates of mental health disorders, suicidal ideation, sexual assault, and substance abuse (Fredriksen-Goldsen et al., 2010; Hughes, Szalacha, & McNair, 2010; McNair, Kavanagh, Aguis, & Tong, 2005; McNair, Szalacha, & Hughes, 2011; Kerr, Santurri et al., 2013; Koh & Ross, 2006; Martin, Fisher, Warner, Krebs, & Lindquist, 2011; Przedworski, McAlpine, Karaca-Mandic, & Vankim, 2014; Schauer et al., 2013; Steele et al., 2009; Volpp, 2010). Although few studies compare and/or contrast the health experiences of bisexual women with those of bisexual men, research does show that health disparities are more common among LGBQ women than LGBQ men – with the exception of HIV/AIDS (Elliot et al., 2014). As well, health inequities experienced by bisexual women compared with lesbian and/or heterosexual women, is much more pronounced than the differences in health between bisexual men and heterosexual and/or homosexual men (particularly when HIV positive participants are excluded from analyses) (Cochran & Mays, 2007; Eisenberg & Wechsler, 2003; Kerr et al., 2014; Schauer, Berg, & Bryant, 2013).

Additionally, past research on bisexual female undergraduate students' health has mainly focused on risky behaviours. This has left a gap in our knowledge on the broader context of bisexual women's health and wellness, particularly during the undergraduate years. Research solely on undergraduate bisexual women is scarce, as current university based research has not always adequately reached this invisible population. Therefore, as

previously mentioned, there is a need for more research directed towards bisexual undergraduate women in order to understand their unique health needs.

Self-rated health. Self-rated health is a common measurement of health based on an individual's subjective perception of their own health status (Statistics Canada 2010). In 2008 approximately 60% of Canadians (ages 12 and over) rated their health as excellent or very good during the CCHS (Statistics Canada, 2010). From these results, men and women did not differ significantly in their self-rated health; however, among emerging adults (18 to 25), men were more likely than women to rate their health as excellent or very good (Statistics Canada, 2010). Although factors such as education, socioeconomic status, and psycho-social characteristics most likely contributed to these findings, it is also interesting to note that those participants who reported a greater sense of community belonging had the greatest odds of rating their health as excellent or very good (Statistics Canada, 2010). This is concerning as bisexual women have been found to lack a sense of community belonging (Borver et al., 2001; Bostwick & Hequembourg, 2014).

Although there is a lack of population-based data stratified by sexual orientation, available research from outside Canada has shown that bisexual women often rate their health poorer than heterosexual, gay, and lesbian men and women (Elliot et al., 2014; Fredriksen-Goldsen et al., 2010; Gorman et al., 2015; McNair et al., 2011; Steel et al., 2009; Tjepkema, 2008). This finding may be of crucial importance, as self-rated is known to be an accurate assessment of actual health status (Statistics Canada, 2010). Self-rated health is believed to reflect the dimensions of health that are difficult, if not impossible, to measure upon clinical assessment, e.g. psychosocial, emotional functioning and lifestyle conditions (Statistics Canada, 2010). Self-rated health is also considered a strong

predictor of future mortality (Eriksson, Unden, & Elofsson, 2001; Steel et al., 2009), and an indicator of individual health seeking behaviours, such as use of health services (Statistics Canada, 2010).

Additionally, individuals typically perceive their health based on the context of their own life and therefore, self-rated health is believed to be greatly influenced by the health status of peers (Statistics Canada, 2010). With this, there is a need to understand how young bisexual women perceive their health and what predicts this perception, as it may be quite different from the general population of women in Canada due to differing socio-political factors (Munro et al., 2000).

Mental health and substance abuse. Mental health has been deemed a major contributor to the overall health of bisexual women (Fredriksen-Goldsen et al., 2010; Meyer, 2003). Bisexual female undergraduate students are no exception and have been found significantly more likely to report mental health concerns. For example, a secondary analysis of data from the ACHA-NCHA II conducted in the fall of 2008 and in the spring of 2009 (N = 6, 689), found that in comparison to heterosexual female peers, bisexual undergraduate women had significantly higher odds of experiencing feelings of hopelessness (OR 2.08, 95% CI [1.85, 2.33]), of being diagnosed with depression (OR 3.1, 95% CI [2.8, 3.6]), and of reporting self-injury (ORD 4.7, 95% CI [4.0, 5.7]), suicidal ideation (OR 4.9, 95% CI [4.1, 5.9]), and attempted suicide (OR 5.1, 95% CI [3.4, 7.8]) within the last twelve months (Kerr, Santurri et al., 2013)**.** Whether a preceding factor or a result of poor mental health, substance abuse is a common occurrence among university age women. An example of substance abuse is that of binge drinking. Peak prevalence of binge drinking occurs during university; with over 50% of female university students in Canada's Maritime Provinces reporting binge drinking on one or more occasion per

month, with marijuana and other drug use also being quite prevalent (Schauer et al., 2013; Steenbeek & Langille, 2012).

Sexual health. High risk behaviors, such as alcohol and drug use, can be linked to risky sexual health practices among bisexual university students. Three separate secondary analyses of different years of the ACHA-NCHA II found that bisexual female undergraduate students were more likely to participate in risky sexual behaviors, such as having multiple sexual partners and not using a protective barrier during sexual contact, with the exception of anal sex (Kerr, Ding et al., 2013; Lindley, Barnett, Brandt, Hardin, & Burcin, 2008; Oswalt & Wyatt, 2013). Researchers found that bisexual female undergraduate students were more likely than their female heterosexual and lesbian peers to have contracted a sexually transmitted infection (STI) in the past year (Kerr, Ding et al., 2013; Lindley et al., 2008). In addition to these health concerns, the clinical guidance offered to bisexual women with regards to their sexual health has often proven inadequate (Taylor et al., 2013). For instance, it can often be a common misconception among some health care providers that sexual activity between women is free of risk as it does not constitute "real sex" (Formby, 2011; Taylor et al., 2013). This misconception may possibly be due to the lack of research on women's sexual health issues, clinicians and WSWM do not have adequate information regarding the risk of sexually transmitted infections (STIs) and HIV/AIDS, as well as information on safe sexual health practices (Formby, 2011; Taylor et al., 2013).

Sexual assault. Several studies have reported that bisexual undergraduate women are at increased risk for sexual coercion and assault. In particular, a 2010 cross-sectional study on American female college students' sexual assault experiences (N = 5, 439), found that bisexual, female undergraduate students had a significantly higher incidence of

sexual assault (24%) during university than heterosexual (13%) and lesbian (17%) women (Martin et al., 2011). However, hypotheses on causative or precipitating factors and lifetime effects have remained untested.

Health beliefs. Canadian and American researchers have found that a holistic approach to health care is highly valued by some LGBQ women (Mathieson et al., 2002; Scherzer, 2000). In one mixed methods study, Canadian self-identified bisexual (n = 9), lesbian (n = 67), gay (n = 12), and non-identified sexual orientation (n = 10) women reported that alternative medicine and therapy were important components of their health regime, though they rated routine health screenings by health care professionals as their number one health priority (Mathieson et al., 2002). Being able to manage one's own health, well-being, and safety were also highly valued by participants in Scherzer (2000) qualitative study conducted in San Francisco, California. Scherzer, through face-to-face, semi-structured interviews, explored young lesbian and bisexual women's experience accessing the health care system (2000). The women in this study, aged 18 to 21, placed emphasis on the importance of knowing how to take care of oneself and relying on health care professionals only when an illness was unmanageable or there was a life-threatening emergency (Scherzer, 2000). Although the current research study did not explore the health beliefs of bisexual women, it is still important to acknowledge that underpinning values and beliefs about health and illness will differ for every person, community, group, and culture. Furthermore, it is important to understand how experiences of marginalization may influence young bisexual women's trust of the health care system and its providers.

Heteronormativity. Both consciously and unconsciously, humans develop bias and prejudice. While most are unaware of the way they are portraying these biases and

prejudices, or how they are being conveyed to others, the LGBQ community is all too often affected by unconscious prejudice actions (Barker, Richards et al., 2012; Beagan et al., 2012). Canadians are predominantly heterosexual and this results in a heteronormative society with heteronormative environments, including the health care system. Heteronormativity is defined by Barker and colleagues (2012) as, "The assumption that heterosexuality is normal and that anything other than heterosexuality is abnormal..." (p. 38). As well, the term heteronormativity is often used in reference to the "…omnipresence of heterosexual images and representations and the assumption that people will desire the other gender" (Barker, Richards et al., 2012, p. 38). Heteronormativity, although most often unintentional, results in the marginalization of LGBQ individuals. Despite the improved awareness and visibility of the LGBQ community and the unique challenges they face, bisexual individuals continue to exist as a relatively invisible population (Barker, Richards et al., 2012; Bostwick & Hequembourg, 2014).

Very few studies have looked exclusively at the health care experiences of female bisexual undergraduate students. Research that is available mainly combines LGBQ as one population or combines bisexual women and lesbians (Estrich et al., 2014; Johnson & Nemeth, Mathieson et al., 2002). Additionally, other research studies are not specific to the university population (Diamant, Wold, Spritzer, & Gelberg, 2000; Elliot et al., 2014; McNair et al., 2011; Mulligan & Heath, 2007; Tjepkema, 2008; Steel et al., 2009). Regardless of how LGBQ populations were stratified, previous research has emphasised concerns around heteronormativity and how it is embedded within health care environments and within the practices of providers, both unintentionally and intentionally

(Beagan et al., 2012; Eliason & Schope, 2001; Mathieson et al., 2002; Stover, Hare, & Johnson, 2014).

Health care environment. More specifically, heteronormativity in the context of the health care system can be understood as "…assumptions and institutional practices that construct everyone as heterosexual unless shown otherwise" (Beagan et al., 2012, pg. 47). An example of heteronormativity in the health care environment is the presence of intake/health history forms that do not include options to identify a sexual orientation or the gender of sexual partners (Beagan et al., 2012; Elaison & Schope, 2001; Stover et al., 2014). As well, heteronormative health care environments often contain educational materials, such as pamphlets, posters or magazines, which are directed towards heterosexuals (Beagan et al., 2012; Stover et al., 2014). In one American study, the physical environment of primary health care clinics was a major concern. Researchers conducted online focus groups with 19 LBGQ university students, aged 19 to 24 (Stover et al., 2014). The students declared the importance of LGBQ symbols in health care environments, e.g. a rainbow flag, a Human Rights Campaign equals sign, a SafeSpace pink triangle. Students explained that the mere presence of such symbols created an environment where they felt safe and felt comfortable to discuss their sexuality (Stover et al., 2014). However, not captured in this research is bisexual women's specific perspective of heteronormativity or biphobia in health care environments, as the inclusion of LGBQ health related resources may still exclude their needs.

Health care providers. Heteronormativity is also evident in the verbal and nonverbal communication used by nurses and other health care providers (Beagan et al., 2012; Eliason & Schope, 2001). Most recently, in web-based focus groups, LGBQ students discussed their experiences with health care providers and the comfort their

providers exhibited in providing care for them (Stover et al., 2014). The students explained that more positive health care experiences involved health care providers who directly asked about sexuality, sexual orientation, sexual behaviours, etc. rather than placing responsibility on the patients (Stover, et al., 2014). This is not always the reality that is experienced by young LGBQ women. Qualitative research conducted in Eastern Canada found that some health care providers, specifically registered nurses, purposefully avoided focusing on patients' sexual orientation, often out of fear of unintentionally stigmatizing or insulting their patients (Beagan et al., 2012; Goldberg, Harbin, & Campbell, 2011). Although these nurses had compassionate motives, they did not acknowledge the negative societal patterns that may greatly impact the health of their LGBQ patients, including bisexual women (Beagan et al., 2012).

Similar findings also emerged from in-depth interviews with 24 general practitioners (GPs) from Halifax, Nova Scotia and Vancouver, British Columbia (Beagan, Fredericks, & Bryson, 2015). These researchers explored physicians' beliefs on how sexual orientation was relevant to providing optimal care to women (Beagan et al., 2015). Just as the registered nurses in Beagan and colleagues' (2012) study, the GPs also talked in length about the importance of treating all patients equally as unique individuals and their fears around making inaccurate assumptions about sexual orientation (Beagan et al., 2015). However, a few GPs alluded to the fact that knowing a women's sexual orientation helped them understand the context of their patient's life, as well as noted the importance of being sensitive to the social and cultural issues that affect LGBQ women (Beagan et al., 2015).

Additionally, LGBQ community members have reported more harmful heteronormative or heterosexist encounters with health care providers. For example,

LGBQ college students in an American qualitative study recalled health care providers who refused to provide care, used unwarranted safety precautions, and blamed health issues on their sexuality (Stover et al., 2014). As well, LGBQ women have recalled health care providers who have used abusive language, and were physically rough during exams; bisexual women further reported that health providers dismissed their sexual identity as merely "a phase" (Mathieson et al., 2002; Scherzer, 2000; Stover et al., 2014).

These research findings have reiterated the fact that nurses and other health care providers may not be providing best care to LGBQ patients due unintentional heteronormative assumptions, i.e. assuming that patients are heterosexual unless said otherwise acknowledged (Beagan et al., 2012; Scherzer, 2000; Stover et al., 2014), and may have inaccurate beliefs around the relevance of sexual orientation (such as bisexuality) in providing optimal care (Beagan et al., 2015).

Provider education. Previous research on heteronormative health care environments and heteronormative assumptions by providers have resulted in further questions around the heteronormativity in nurses and health care providers' education. However, there are few studies which address the LGBQ curriculum and education provided to nurses. One recent study conducted in San Francisco assessed the current knowledge of fourth-year nursing students ($N = 112$) regarding LGBQ health, and implemented a course assignment that focused on this subject (Carabez, Pellegrini, Mankovitz, Eliason, & Dariotis, 2015). The authors reported that 85% of nursing students felt their current curriculum did not effectively prepare them to practice with LGBQ individuals, and that the course assignment improved their knowledge and made them aware of their own biases (Carabez et al., 2015).

Additionally, Obedin-Maliver and colleagues (2011) conducted a cross-sectional web-based study which addressed the current LGBQ curriculum in 11 medical schools from Canada and 121 from the United States; Deans from each of the schools filled out the web-based survey. Out of the 132 participating schools, there was a median of five hours combined curriculum and clinical hours dedicated to LGBQ curriculum (Obedin-Maliver et al., 2011). Five of the schools reported zero combined hours, with Canadian schools reporting significantly more zero combined hours than the American schools. Similar concerns were raised by participants in Beagan and colleagues' (2015) qualitative study; of the 24 physicians, 19 reported learning little to nothing about LGBQ health in medical school (Beagan et al., 2015). Instead, what knowledge they did have was attained by learning from their patients, colleagues, and at continued learning events (e.g. conferences) (Beagan et al., 2015).

To my knowledge, there is currently no research addressing health care providers' knowledge on bisexual women exclusively. Therefore, it is unclear whether health care providers are aware of the double marginalization (biphobia), which is often experienced by bisexual women.

Health service use. It may not be surprising to learn that LGBQ women are less likely to reach out to health services and often wait until their health issues are exacerbated before seeking care (Mathieson et al., 2002). This may be a result of the heteronormative environments and assumptions made within the health care system. As research shows health care providers generally do not inquire about sexual orientation, further constructing an environment in which heterosexuality is the norm (Baker & Beagan, 2014; Dysart-Gale, 2010; Johnson & Nemeth, 2014). This puts the onus on young LGBQ women to disclose their sexual orientation in order to receive appropriate

and relevant care (Dysart-Gale, 2010; Johnson & Nemeth, 2014). However, research also shows that LGBQ women frequently have difficulty disclosing their sexual orientation to health care providers out of fear of disapproval, judgment, rejection, and to protect their overall wellbeing (Mulligan & Heath, 2007; Polonijo & Hollister, 2011).

In Australia, young LGBQ women report more utilization of clinics and sexual health services than family physicians (McNair et al., 2011; Mulligan & Heath, 2007). Bisexual women, in particular, have expressed a belief that these types of services are often more queer friendly and sex positive than their family physicians (e.g. have nonjudgmental attitudes regarding casual sex and number of sex partners) (Mulligan & Heath, 2007). This may explain why in Canada, bisexual women are the least likely to report having a family physician (Tjepkema, 2008). In fact, bisexual women have expressed a greater need for queer friendly health services in order to avoid assumptions regarding their sexual orientation or sexual behaviours being based on the sex of their current partner (Mulligan & Heath, 2007).

Thirty-eight percent of the lesbian and bisexual women in Mathieson and colleagues (2002) study reported they had avoided routine health screenings in the past for fear of poor treatment by providers. Although this study was conducted over 14 years ago, current research continues to identify major concerns around the existence of heteronormative assumptions and marginalization of LGBQ women within the Canadian health care system (Baker & Beagan, 2014; Beagan et al., 2012; Beagan et al., 2015; Goldberg, Harbin, & Campbell, 2011). Even more concerning, is that the effects of this fear and discomfort may be more prominent for young bisexual women, such as undergraduate students. A qualitative research study from San Francisco found that several lesbian and bisexual participants felt health care providers had dismissed their

sexual orientations, stating they were not old enough to know their true sexual identity (Schauer, 2000). This finding may lead to the creation of additional barriers in accessing health services for those young bisexual undergraduate students who may be less comfortable with or exploring their sexual identity (O'Connor et al., 2011; Stover et al., 2014).

The current state of young bisexual women's health service 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 behaviours are developed (Marshall, 2011). Additionally, post-secondary academic institutions have been recognized in Healthy People 2010 (as cited in Struble, Lindley, Montgomery, Hardin, & Burcin, 2010), as optimal locations for health care providers to implement health promotion and illness prevention efforts aimed at risky and poor health behaviours among young adults. Therefore, this research study quite timely and pertinent for health care providers, administrators, and policy makers working within university based health services and health services serving undergraduate and emerging adult populations.

Research Problem

In the Maritime provinces of Canada, there is a lack of strategies that specifically address the health needs of young bisexual women, which is a major area of concern. Bisexual women have been found to live with significantly higher rates of poor self-rated health, mental health disorders, suicidal ideation, sexual assaults, binge drinking, and illicit drug use than heterosexual and lesbian women (Eisenberg & Wechsler, 2003; Fredriksen-Goldsen et al., 2010; Koh & Ross, 2006; Martin et al., 2011; Schauer et al., 2013; Steele et al., 2009). Concurrently, there are increasing concerns around the health

of young Canadian adults, aged 18 to 30 years old, who have reported significantly higher rates of unmet health needs than all other adult age groups (31 to 50, 51 to 64, and > 65) (Marshall, 2011). Among university students, those who identify as bisexual women have been found to be at the highest risk for poor health outcomes and health disparities (Bostwick et al., 2007; Kerr, Ding et al., 2013; Martin et al., 2011; Oswalt & Wyatt, 2013; & Schauer et al., 2013). It is also quite likely that these increased concerns may be related to the additional stress of being marginalized from peers while also adjusting to university life.

To date, no past research has focused directly on the undergraduate bisexual female population in Canada, let alone the Maritime Provinces of Eastern Canada. Recently, Canadian researchers have indicated a need for more epidemiological studies on bisexual women in order to fully establish the prevalence of health concerns among this population, i.e. mental health issues (Persson & Pfaus, 2015). As well, these same researchers specified a need for more studies focused on health risk and resiliency factors among Canadian bisexual women (Persson & Pfaus, 2015). Therefore, there is a definite need to fill the gap in research knowledge on what determines the health and health service use of young bisexual women in the Maritime Provinces.

Objectives

This study explored the determinants of bisexual females' self-rated health and health service use at eight universities in the Canadian Maritimes, including: Acadia, Dalhousie, University of New Brunswick, Cape Breton University, Mount Saint Vincent University, University of Prince Edward Island, Saint Mary's University, and Saint Francis Xavier University. Guided by the PEI Conceptual Model of Nursing (Munro et

al., 2000), the study entailed a secondary analysis of data collected from a descriptive, cross sectional research study. Data was extracted using the most theoretically important factors that would help to explain the demographic, behavioral, and psychosocial predictors of self-rated health, as well as the predictors for accessing health care services among bisexual female undergraduate students. Data from the *Maritime Undergraduate Student Sexual Health Services Survey 2012* (N = 10, 232) by co-lead investigators, Drs. Steenbeek and Langille (funded by the Canadian Institute of Health Research and Nova Scotia Health Research Foundation) was used to meet the following objectives:

1) Examine and describe the self-rated health of the bisexual female undergraduate student population from the Maritime universities, as well as the demographic, behavioural, and psychosocial predictors of self-rated health.

2) Examine and describe the university health service use among the bisexual female undergraduate student population, as well as determine the behavioural, and psychosocial predictors of university health service use.

3) Determine the relationship between self-rated health and health service utilization among the Maritime's undergraduate bisexual female population.

Research Questions

In order to meet the study's objectives, the following questions guided the research process:

1) What are the predictors of self-rated health for bisexual female students on Maritime University campuses?

2) What are the predictors of university health service use for bisexual female students on Maritime University campuses?

3) Based on need, is there a difference between bisexual female students' university health service use and the university health service use of heterosexual and lesbian female students?

Significance

Presently, there is little Canadian literature available on the health of bisexual women and even less Canadian literature available on undergraduate populations of bisexual women. The findings of this research have added to current knowledge gap on the health of bisexual female undergraduate students in Canada. By uncovering the determinants of the self-rated health of bisexual women from eight of the Maritime Province's universities, nurses and other health care providers will be better informed and better prepared to conduct health assessments, discuss sexual orientation, and address the health needs of this unique population. As well, by adding a primary health care lens, this research will enable nurses working with young bisexual women to build better partnerships and enable these women to take an active role in determining their own health needs within the university environment (Munro et al., 2000).

Health is a product of social, economic, and political factors, and by better understanding the predictors of health service use among bisexual women, nurses, health care providers, and administrators will have better direction for planning and improving bisexual females' access to quality primary health care on Maritime university campuses (Munro et al., 2000). This knowledge could include the development and implementation of health promotion strategies that are inclusive and relevant to the health needs of bisexual women, ultimately leading to the improvement in the unmet health needs of bisexual females on Maritime campuses (Kerr, Ding et al., 2013).

Nurses care for the whole person, rather than segmented body systems as do other health care professionals. Nurses also spend a great amount of time with patients and are in an optimal position to advocate for bisexual women's health needs to the rest of the health care team (Stover et al., 2014). As well, nurses are key in the uptake and utilization of research evidence and can facilitate the changes to health policies and practices in order to improve care provision for their patients (Canadian Nurses Association, 2007). Furthermore, the findings of this research may also enable nurses to play a lead role in the education and empowerment of bisexual women, as they themselves will be better educated around the barriers which prevent bisexual women from achieving optimal health (Munro et al., 2000). By focusing on bisexual women as a distinct population from the rest of the LGBQ community, findings from this research will create awareness around the specific health concerns of this population.

The following chapter will provide a review of the most current available literature on bisexual women's health and health service utilization at the time of this study. This will include an overview of the strengths and limitations of the current research knowledge, will identify the current knowledge gaps, and will bring to light the potential predictors of self-rated health and health service use for the bisexual female undergraduate population in the Maritime provinces.

Chapter Two: Literature Review

The Prince Edward Island (PEI) Conceptual Model for Nursing Practice guided this literature review following the metaparadigm concepts of: person, health, environment, and nursing. Bisexual female undergraduate students are understood as the "person"; a group of individuals who are holistic and complex, meaning they are individually affected by internal and external factors differently but collectively have shared characteristics (Munro et al., 2000). Based on the objectives of this research, the following literature review has been organized to focus on the health of female bisexual undergraduate students, including overall, physical, mental and sexual aspects of health. The review has also been organized to focus on the environmental influences and specific determinants of health, which impact young bisexual women's health and health service utilization (Munro et al., 2000).

Literature Review Process

A review of the literature was conducted on bisexual women's health and use of health services through several databases (CINAHL, Cochrane Library, ERIC, Gender Studies, Joanna Briggs Institute, Medline/Pub Med, PsychINFO, Social Work Abstracts), as well as using relevant references from bibliographies. Within these databases, various search strategies were used to achieve a broad perspective of the research knowledge available and to identify specific research gaps in both bisexual women's health overall and barriers to/facilitators of health care services for this population. The Boolean/phrase search strategy was primarily used and included the following search terms: "bisexual OR bisexuality OR pansexual OR non-monosexual AND women OR female AND health OR health care OR health care." Additional terms that were used include, but are not entirely

limited to: "college OR university", "mental health", "sexual health", and "social support". Keyword searches of subject terms were used in Medline/Pub Med and grey literature searches were also conducted using well-established government organization websites (American Institute of Bisexuality, Bisexual.org, Rainbow Health Ontario, and Statistics Canada). Searches were limited to literature published from present time to the year 2000 and written in or translated to English. LGBQ literature published before 2000 would have been too dated to remain relevant.

Due to the dearth of literature on the health of bisexual women in Canada and more so, on bisexual female undergraduate students, this review was extended to include research from the United States, Australia, New Zealand, United Kingdom, and European Union countries and covered a broad range of quantitative, mixed methods, and qualitative based research.

Health

"Health is conceptualized as a dynamic process incorporating both wellness and illness and influenced by political, economic, social, and biological factors" (Munro et al., 2000, p.43). Wellness and illness are believed to co-exist and overlap; wellness as a resource for life and illness as a response to social and political circumstances or disease and dysfunction (Munro et al., 2000). Presently, there are increasing concerns around the health of young Canadian adults. A recent secondary analysis of data from the 2003 Canadian Community Health Survey (CCHS) found 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). Additionally, in 2009/2010, 40% of emerging adults in Canada were enrolled postsecondary education (Public Health

Agency of Canada [PHAC], 2011b); a population of over one million young men and women (Ruthig, Morrone, Hladkyj, & Robinson-Epp, 2011). This is important as undergraduate students have unique health needs from the general population. Not only do they fall within the developmental period of emerging adulthood, characterized by identity exploration and risk taking behaviours (Arnett, 2000), but often deal with additional stressors; e.g. academic performance, financial constraints, changing social groups (Ruthig et al., 2011), and less community connectedness (Marshall, 2011; PHAC, 2011b). These stressors are known to impact undergraduate students' health, as exercise, nutrition, and sleep patterns are disturbed and poor coping behaviours, 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 their own health. This is often measured using the five-point global health assessment scale: a self-reporting tool that ranges from excellent, very good, good, fair, to poor (Diamant et al., 2000; Fredriksen-Goldsen et al., 2010; Steele et al., 2009; Tjepkema, 2008). Although self-reported overall health is a subjective interpretation, it has been found to be an important predictor of actual health and health seeking behaviours (Statistics Canada, 2010). However, few studies have focused on bisexual's women's self-reported health status and those that are available, are derived from adult sample populations, rather than young emerging adults or university students (Diamant et al., 2000; Elliot et al., 2014; Fredriksen-Goldsen et al., 2010; Gorman, Denney, Dowdy, & Medeiros, 2015; McNair, Szalacha, & Hughes, 2011; Steele et al., 2009; Tjepkema, 2008; Ward, Dahlhamer, Galinsky, & Joestl, 2014). The limited research we have is concerning, as bisexual women often rate their health poorer than the

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heterosexual, gay and lesbian population (Elliot et al., 2014; Fredriksen-Goldsen et al., 2010; Gorman et al., 2015; McNair et al., 2011; Steele et al., 2009; Tjepkema, 2008).

Steele and colleagues (2009) and Tjepkema (2008) conducted a secondary analysis on data from the CCHS, Canada's main health survey, which included self-reports of perceived health. The primary research objective of Tjepkema (2008) was to determine if access to and/or utilization of health care providers' services differed among the various sexual orientations using aggregated data from the 2003 and 2005 surveys (N = 159, 824). However, comparative analyses were not made between genders. Steele and colleagues (2009) also used data from the 2003 CCHS survey cycle 2.1 to explore whether the sexual orientation of women determined health status and health risk behaviours (N = 61, 715). Results of these Canadian studies showed that bisexual women were significantly *more* likely than heterosexual or lesbian women to perceive their health as poor or fair ($p < .05$) and significantly *less* likely to perceive their health as excellent or very good ($p < .05$) (Steele et al., 2009; Tjepkema, 2008). See Table 2.1 for a summary of statistical results.

In contrast, there was some conflicting evidence from the United States (US) which suggested that bisexual women may not have the poorest perceived health among adult men and women (Diamant et al., 2000; Gorman et al., 2015; Ward et al., 2014). Ward and colleagues (2014) reported from the 2013 National Health Interview Survey (NHIS) (N = 34, 557), the US's primary source of health related data, that bisexual women reported the second lowest rates of excellent/very good health among heterosexual men and women, bisexual men, as well as gay/lesbian men and women. In fact, it was lesbian women who reported the lowest rates (See Table 2.1). However, these

authors did not report whether any of these differences reached statistical significance (Ward et al., 2014).

Additionally, Gorman and colleagues (2015) conducted a secondary analysis using aggregated data from the 2005-2010 Behavioral Risk Factors Surveillance System (N = 415, 273), a nation-wide survey. This data was used to assess the intersecting effect that gender and sexual orientation can have on health by using heterosexual males as the comparative group in analyses (Gorman et al., 2015). Results showed that bisexual men and women reported the highest rates of poor self-rated health among heterosexual and gay/lesbian men and women. However, bisexual men had the highest rates among all groups (See Table 2.1). Again, these authors did not report whether the differences reached statistical significance (Gorman et al., 2015).

There is evidence which suggests that women were more likely to report poorer health than men (Eriksson, Unden, & Elofsson, 2001; Statistics Canada, 2010). However, a report from Statistics Canada (2010) specified that statistically significant differences only existed among emerging adults (18 to 24) (Statistics Canada, 2010). Therefore, the contradictory results of Gorman and colleagues (2015) study may be due to the fact that the female and male bisexual participants were adults (mean ages of 33.3 and 38 respectively).

Table 2.1 *Self-rated health summary of results*

Perceived Health	N	Bisexual Women	Bisexual Men	Hetero Women	Hetero Men	Lesbian Women	Gay Men
Tjepkema, 2008							
Excellent/Very Good Health Status	159, 824	51.6%	57.1%	63.8%	63.9%	63.2%	65.4%
Fair/Poor Health Status		16.2%	12.0%	8.7%	7.1%	9.8%	8.5%
Steele et al., 2009							
Fair/Poor Health Status	61, 715	17.6%	N/A	12.4%	N/A	8.9%	N/A
Ward et al., 2014							
Excellent/Very Good Health Status	34, 557	56.6%	62.3%	63.3%	64.9%	54%	66%
Gorman et al., 2015	415, 273	18.5%	19.5%	15.6%	14.6%	10.6%	11.9%
Poor Health Status							

The inconclusive and/or contradictory results from this body of literature may have been a result of several factors. First, data from the Global Health Scale was coded differently in each study; Ward and colleagues (2014) dichotomized results into excellent and very good self-rated health versus good, fair, and poor self-rated health. Steele and colleagues (2009) dichotomized results into excellent, very good, and good versus poor and fair, and Tjepkema (2008) used three categories, i.e. excellent/very good, good, and fair/poor. Secondly, Canadians and Americans share similar determinants of health, but it has been suggested that determinants of self-rated health differ in each country (Prus, 2011). Canadians' self-rated health is believed to be impacted by age, marital status,

physical activity and unmet health care needs (Prus, 2011), while Americans' self-rated

health is thought to be impacted more by gender, ethnicity, education, BMI, health

behaviours, and life satisfaction (Prus, 2011). Lastly, self-rated health is subjective and

self-reported, which poses a risk for socially desirable responses (Eriksson et al., 2001).

Additionally, none of the above studies explicitly included undergraduate

students. However, one cross-sectional survey among undergraduate students (N = 10,

232) attending eight different universities in the Maritime Provinces of Canada did

measure overall health and included bisexual women (n = 357) (Steenbeek & Langille,

2012). Students accessed a web-based survey from their university affiliated emails and

overall health was measured using the global health scale ranging from excellent to poor.

Results showed that only a small percentage of undergraduate students (2.2%) from the

Maritime Provinces rated their health as fair or poor. Gender stratified results further

showed that 4.6% of the weighted sample of females reported fair or poor self-rated

health in comparison to 5.3% of the weighted sample of males (Steenbeek & Langille,

2012). Therefore, although available literature has demonstrated a need for more research

on bisexual female undergraduate students' health (Dawson et al., 2004; Eriksson et al.,

2001; Statistics Canada, 2010), a major knowledge gap still remains in this area of

research.

Mental health. Unlike self-rated or general health, many studies had addressed

the mental health status and needs of the LGBQ community. From this literature, an

alarming consensus showed that, in comparison to heterosexual and lesbian women,

bisexual women had significantly higher rates of mental health disparities, such as mental

distress, poor perceived mental health, and stress (Fredriksen-Goldsen et al., 2010;

Hughes, Szalacha, & McNair, 2010; Koh & Ross, 2006; Lindley et al., 2012; McNair et

al., 2011; Tjepkema, 2008), as well as more diagnoses of depression and anxiety (Bostwick, Boyd, Hughes, & Esteban, 2010; Kerr, Santurri, & Peters, 2013; McNair, Kavanagh, Agius, & Tong, 2005; Rogers, Emanuel, & Bradford, 2002) and higher rates of self-harm, suicidal ideation and attempts (Hughes et al., 2010; Koh & Ross, 2006). Although few studies have specifically addressed the mental health status or needs of female bisexual university students, available literature also reports that young bisexual women have significantly higher rates of depression, anxiety, stress, and self-harm (Kerr, Santurri et al., 2013; Klein & Dudley, 2014; Needham & Austin, 2010; Ross et al., 2014; Schauer et al., 2013).

Depression. Although mood disorders typically develop during young adulthood (PHAC, 2011b), American researchers Kerr, Santurri, and colleague (2013) conducted one of the only studies to explore the mental health of female heterosexual, bisexual, and lesbian undergraduate university students (aged 18 to 25) (N = 6, 689). Using data from the fall 2008, spring 2009, and fall 2009 American College Health Association-National College Health Association II (ACHA-NCHA II) surveys, analyses showed that bisexual women were 3.1 times (95% CI [2.8, 3.6]) more likely than heterosexual women to report having had a diagnosis of depression (Kerr, Santurri et al., 2013), as well as over two times more likely to report feeling overwhelming anxiety ($p = .000$), anger ($p = .000$), hopelessness ($p = .000$), and sadness ($p = .000$) (Kerr, Santurri et al., 2013). Bisexual women were also significantly more likely than lesbian women to report feeling overwhelming anxiety ($p = .036$) and sadness ($p = .01$) (Kerr, Santurri et al., 2013).

Similar findings were reported by Schauer et al. (2013) following their secondary analysis of web-based data assessing psychosocial correlates with concurrent substance abuse of university students from six American colleges (N = 4, 840). Bisexual women

emerged as a distinct group, with significantly more depressive symptoms ($p < .0001$), lower life-satisfaction ($p < .0001$), and lower levels of emotional stability ($p < .0001$) than both heterosexual and lesbian women.

Sexual health. Although sexual health is defined by the WHO (2006b) 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 studies on young bisexual women's sexual health have focused solely on risky sexual behaviours (Oswalt & Wyatt, 2013; Riskind, Tornello, Young, & Patterson, 2014), STIs (Charlton et al., 2011; Estrich, Gratzer, & Hotton, 2014; Kaestle & Waller, 2011) and sexual victimization (Hequembourg, Livingston, & Parks, 2013; Hughes et al., 2010; Martin et al., 2011). Therefore, available research does not address how factors impacting sexual health may further impact young bisexual women's perceived health status.

Sexually transmitted infections. Canadian statistics show that in 2010, young women aged 20 to 24 had seven times the average national rate of chlamydia and those aged 15 to 19 had four times the average national rate of gonorrhea, both of which can cause pelvic inflammatory disease and infertility if left untreated (PHAC, 2013). Additionally, Canadian women aged 25 and under are believed to be at highest risk for HPV infections, a potentially cancer-causing viral infection (PHAC, 2013). Although these national reports of STI diagnoses did not account for sexual orientation, additional research has identified that bisexual women have some of the highest rates of STI diagnoses among women (Estrich et al., 2014; Kaestle & Waller, 2011; Oswalt & Wyatt, 2013).

Additionally, researchers from the US has proposed that young bisexual women may be at increased risk for STIs as they tend to have more sexual partners than there

heterosexual, lesbian, and 'unsure' female peers ($p < .001$) (Kerr, Ding et al., 2013; Oswalt & Wyatt, 2013), as well as more anonymous sexual partners (i.e., casual sexual encounters with an unfamiliar person) than heterosexual women ($p = .002$) (Estrich et al., 2014). Few studies had addressed undergraduate bisexual women's STI rates; however, Lindley and colleagues (2008) examined STI trends among female university students (aged 18 to 24) from data collected during the spring 2006 ACHA-NCHA survey (N = 25,952). As well, Oswalt and Wyatt (2013) examined STI history of undergraduate students (aged 30 and under) using data collected during the fall 2009 ACHA-NCHA II survey (N = 25, 553). Lindley and colleagues (2008) found that bisexual women were significantly more likely to report having been diagnosed with *any* STI in the past year than heterosexual women, lesbian women, and women who were unsure of their sexual orientation ($p < .001$). Additionally, bisexual women reported significantly higher rates of HPV (Lindley et al., 2008) and genital herpes ($p < .001$) (Oswalt & Wyatt, 2013); while, past year diagnoses of chlamydia, genital herpes, gonorrhea, hepatitis and HIV were only slightly higher among bisexual women (Lindley et al., 2008; Oswalt & Wyatt, 2013). Therefore, STIs may be fairly consistent among women of all sexual orientations during emerging adulthood; however, because these studies were American, findings may not be generalizable to young Canadian women.

In addition to university based research, Charlton and colleagues (2011) and Kaestle and Waller (2011) conducted secondary analyses examining the health of US youth, using data from young female participants (aged 19 to 26) of national longitudinal studies. As well, Steele and colleagues (2009) used Canadian data from the CCHS cycle 2.1 to understand the differences in health among adult women (aged 18 to 59). These authors found that bisexual women reported higher rates of lifetime STI diagnoses than

heterosexual and lesbian women ($p < .01$) (Charlton et al., 2011; Steele et al., 2009) and were almost one and a half (95% CI [1.04, 2.00]) times more likely than heterosexual women to have had a recent bacterial STI diagnosis (detected by urine specimen or self-report) (Kaestle & Waller, 2011).

Regardless, prevalence rates provide little to no insight on whether contracting and/or living with an STI impacts bisexual female undergraduate students' perceived health. Individuals who identify as a minority, such as bisexual women, can experience additional stigma following a STI diagnosis (PHAC, 2013). This can further inhibit health seeking behaviours, lead to exacerbated conditions, and negatively impact overall health and wellbeing (PHAC, 2013).

Sexual victimization. The WHO has recognized that "…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, 2006b, p. 5). Unfortunately, female university students are at increased risk for sexual assault, with over 28% experiencing attempted or completed sexual assault by their fourth year of undergraduate studies (Krebs, Lindquist, Warner, Fisher, & Martin, 2009). Sexual assault not only involves physical and sexual trauma, but also often serious mental health issues, such as depression and post-traumatic stress disorder (Long, Ullman, Long, Mason, & Starzynski, 2007). Although little research had focused on bisexual women's experiences with sexual assault, coercion, and/or rape, available literature has indicated that bisexual women are at increased risk of being sexually victimized compared to heterosexual and lesbian women (Hequembourg, Livingston, & Parks, 2013; Hughes et al., 2010; Kuyper & Vanwesenbeek, 2010; Martin et al., 2011;

McCauley et al., 2015; Pathela & Schillinger, 2010; Tornello, Riskind, & Patterson, 2014).

Martin and colleagues conducted a secondary analysis of data from female undergraduate students from a US university, ages 18 to 25 years, (N = 5, 439) and examined women's experiences of physically forced and incapacitated sexual assault before and during university (2011). Analyses showed that bisexual women had a greater prevalence of sexual assault than heterosexual and lesbian both before university (25.4%, 10.7%, 22.4% respectively) and during university (24%, 13.3%, 17.9% respectively). Although bisexual and lesbian women were similar in their reported rates, bisexual women were 2.4 times (95% CI [1.8, 3.1]) and 1.8 times (95% CI [1.4, 2.4]) more likely than heterosexual women to experience sexual assault before and during university (respectively) ($p < .05$) (Martin et al., 2011).

In addition, research conducted with young bisexual women in general have also shown higher rates of sexual victimization. Pathela and Schillinger (2010) found that among young women aged 13 to 18, women who have sex with women and men (WSWM) reported significantly higher rates of past experiences of forced sex than women who sex with men (WSM) and women who have sex with women (WSW) ($p < .05$). As well, Tornello and colleagues (2014) found that among young women aged 18 to 20, self-identified bisexual women reported significantly higher rates of forced vaginal intercourse than heterosexual and lesbian women ($p < .001$). In contrast, findings from the Women's Life Experiences Study (N = 1, 022) by Long and colleagues (2007) indicated that among adult women who had experienced completed rape, heterosexual women had the highest prevalence. The authors attributed their contradictory finding to the fact that majority of past research uses a measure of lifetime prevalence, while this study measured

participants' "most serious experience" of sexual assault (Long et al., 2007, p.689). It is possible that the heterosexual, lesbian, and bisexual women may have different interpretations of what constitutes their "most serious" experience of sexual assault (Long et al., 2007). Therefore, due to the dearth of literature, it is clear that there is a need to better understand the potential impact sexual victimization may have on the health and health seeking behaviours of bisexual female undergraduate students in the Maritime provinces.

Environment

Determinants of health are those internal and external environmental factors that influence a person's ability to achieve an optimal level of health (Munro et al., 2000). Although the determinants of health collectively influence health, there are specific determinants which may impact or predict bisexual female undergraduate students' health more greatly than others. These include personal health practices and coping, social support networks, and health services.

Personal health practices and coping. Personal health practices and coping behaviours go beyond eating healthy and exercising for physical health. Instead, these practices enable individuals, families, groups, and communities to maintain wellness and prevent illness through the management of day to day and stressful life challenges (Munro et al., 2000; PHAC, 2013). Healthy problem solving skills promote self-reliance and positive management of challenges, rather than reliance on harmful coping practices, such as substance abuse (PHAC, 2013). Unfortunately, researchers have found bisexual female undergraduate students may have poor personal health practices and/or negative coping behaviours, such as substance abuse (Kerr et al., 2014; Kerr et al., 2015; Schauer

et al., 2013). Substance abuse, a component of mental health, is often studied separately due to the problematic culture of excessive alcohol and illicit drug use on university campuses (Eisenberg & Wechsler, 2003; Kerr et al., 2014). Substance abuse involves a physiological and behavioural dependence on a substance that is hazardous to one's health (WHO, 2015a). Steenbeek and Langille (2012) identified that alcohol and marijuana are substances used to excess among many undergraduate university students in the Maritime Provinces, with 25.2% of female undergraduate students reporting marijuana use at least once in the previous 30 days and 44.3% reporting frequent binge drinking in the previous 30 days (measured as five or more drinks in one occasion) (Steenbeek & Langille, 2012).

Alcohol. Findings from past literature have consistently shown bisexual women to be at significantly higher risk for excessive alcohol use in the form of binge drinking (Hughes et al., 2010; Kerr et al., 2015; Kerr et al., 2014; Needham & Austin, 2010; Rostosky, Danner, & Riggle, 2010; Schauer et al., 2013). As well, bisexual women have been found to be at significantly higher risk for experiencing negative consequences as a result of binge drinking, such as having unprotected sex, driving under the influence, missing classes, or doing something they "regret" (Bostwick et al., 2007; Kerr et al., 2014; Klein & Dudley, 2014; McCabe Hughes & Boyd 2004; Tucker et al., 2008). Furthermore, female university students have also been shown more likely to report binge drinking alcohol than females not in university (Dawson, Grant, Stinson, & Chou, 2004).

Among the female undergraduate students who participated in Schauer and colleagues (2013) survey exploring American university students' substance use (N = 3, 892), bisexual women were significantly more likely than heterosexual and lesbian women to report binge drinking ($p < .05$) (five or more drinks on at least one occasion in

the past thirty days). Eisenberg and Wechsler (2003) obtained similar results from their secondary analysis of data from the 1999 College Alcohol Study (N = 10, 301); WSWM were more likely to report episodes of binge drinking (four or more drinks on at least one occasion in the past two weeks) than WSW or WSM ($p < .05$). Kerr and colleagues (2014) and Kerr and colleagues (2015) also studied alcohol use among undergraduate students and derived similar results using data from the fall 2009, 2010, and 2011 ACHA-NCHA II surveys. Bisexual women were significantly more likely to report alcohol use on more than one occasion in the past 30 days than heterosexual and lesbian women ($p <. 01$) (Kerr et al., 2015; Kerr et al., 2014). However, odds ratios of alcohol use were the lowest of all substances studied; bisexual women were only 1.52 times more likely than heterosexual women (CI 95% [1.37-1.6]) and 1.45 times more likely than lesbian women (CI 95% [1.22-1.73]) to report use on more than one occasion in the past 30 days (Kerr et al., 2015). This may be due to the fact that the authors did not measure the amount of alcohol used on each occasion by participants (i.e. binge drinking vs one drink).

However, two secondary analyses of web-based data from the Student Life Survey administered at an American university resulted in conflicting findings. McCabe Hughes, and Boyd (2004) found no statistical difference in past month and past two week episodic binge drinking behaviours among bisexual and heterosexual female university students ($p = .521$). While Bostwick and colleagues (2007) found bisexual women actually reported *less* episodic binge drinking in the two weeks prior to the survey than exclusively heterosexual women and heterosexual women with same-sex behaviours (Bostwick et al., 2007). Despite the fact bisexual women may have reported less binge drinking in the previous two studies, these authors and others found that bisexual women were still three to five times more likely to report suicidal ideation after using alcohol than heterosexual

women ($p < .001$) (Bostwick et al., 2007; Kerr et al., 2014; McCabe et al., 2004). They were also three times more likely to have sex without giving or receiving consent, two times more likely to cause injury to another person (Kerr et al., 2014), and significantly more likely to report driving under the influence than heterosexual women ($p < .001$) (McCabe et al., 2004). Although it has been established in the literature that bisexual women are at greater risk for mental distress, depression, and self-harm (Kerr, Santurri, & Peters, 2013; Klein & Dudley, 2014; Needham & Austin, 2010; Schauer et al., 2013), it seems that the addition of alcohol use further increases their risk (Kerr et al., 2014).

Marijuana. Similar to binge drinking, there was a consensus in the literature that female bisexual undergraduate students/emerging adult women report significantly higher rates of marijuana use than their heterosexual, gay, and lesbian peers (Bauer et al., 2010; Corliss et al., 2010; Eisenberg & Wechsler, 2003; Hughes et al., 2010; Kerr et al., 2015; Kerr et al., 2014; Needham & Austin, 2010; Schauer et al., 2013).

Two secondary analyses were conducted using data from the 1999 Harvard School of Public Health College Alcohol Study to explore marijuana use among university students based on their sexual orientation (Eisenberg & Wechsler, 2003; Ford & Jasinski, 2006). WSWM were three times more likely to report recent marijuana use (any use in the past 30 days) than both WSW and WSM ($p < .001$) (Eisenberg & Wechsler, 2003). As well, WSWM still had the highest rates of marijuana use when compared to MSMW, MSM, and MSW (35.1%, 27.7%, 18.8%, 23% respectively) (Eisenberg & Wechsler, 2003; Ford & Jasinski, 2006). More recently, bisexual female participants of the ACHA-NCHA II from fall 2009, 2010, and 2011 were found significantly more likely to have used marijuana (27.5%) (any use in the past 30 days) than lesbian (21.7%, $p < .05$) and heterosexual female (11.6%, $p < .01$) participants (Kerr

et al., 2014; Kerr et al., 2015). As well, Schauer and colleagues (2013) also found

bisexual female university students reported significantly higher rates of marijuana use

(any marijuana in past 30 days) than heterosexual and lesbian female students ($p < .0001$).

The sex of male participants' sexual partners made no significant difference in their rates

of marijuana use – this occurred only in females (Eisenberg & Wechsler, 2003; Schauer

et al., 2013).

Additionally, Robinson conducted a mixed methods study using data from the

Risk and Resilience survey ($N = 92$), aimed at exploring the role of anxiety in bisexual

women's (aged 16 and over) use of marijuana in Ontario, Canada (Robinson, 2015).

Quantitative analyses of survey data suggested bisexual women may use marijuana at

such high rates in order to help them become more relaxed (83.7%) and sleep better

(52.2%) (Robinson, 2015). However, focus groups further revealed that marijuana use

was an outlet for coping with anxiety related to isolation from the larger LGBQ

community among these participants (Robinson, 2015).

Social support networks. Social support has been identified as a key factor in

maintaining and improving mental and physical health (Friedman & Morgan, 2009;

Needham & Austin, 2010; Ryan, Russell, Huebner, Diaz, & Sanchez, 2010). As well,

social support can cushion the effects of adverse life situations (PHAC, 2011a). Social

support can be derived from any positive interpersonal relationship with romantic

partners, family, friends, and larger communities (Ross, Dobinson, & Eady, 2010).

Unfortunately, research shows that young LGBQ women often lack adequate social

support (Hughes et al., 2010; McNair et al., 2005; Ryan et al., 2010), with young bisexual

women reporting some of the lowest rates of parental, peer, and LGBQ community

support (Hughes et al., 2010; McNair et al., 2005; Ross, Dobinson, & Eady, 2010; Saewyc et al., 2009).

   Parental support. Although emerging adulthood is a period of increasing independence from parents, research has revealed that support from a parent or parental figure has a positive impact on the health of young LGBQ individuals (Needham & Austin, 2010; Ryan et al., 2010). Available literature shows that young bisexual women rate their parental support and connectedness significantly lower than their heterosexual peers ($p < .05$) (Needham & Austin, 2010; Saewyc et al., 2009). However, the effects of parental support specific to bisexual female undergraduate students received little attention in past research and may in fact differ from LGBQ youth. As well, literature has shown that parents may not have the same influence during emerging adulthood as they once did in adolescence (Arnett, 2007). The importance of parental support has been found to decline and importance of peer and partner support inclines during this developmental period (Surjadi, Lorenz, Wickrama, & Conger, 2011).

   One secondary analysis of data from young female participants (aged 18 to 26) of the third wave of the National Longitudinal Study of Adolescent Health conducted in 2001-2002 (N = 11, 153) found that bisexual women also rated their parental support slightly lower than lesbian women, with mean scores of 12.4/15 and 12.6/15 (respectively); however, this difference did not reach statistical significance (Needham & Austin, 2010). Additionally, these authors discovered that among young women one unit of change in parent support scores led to a 16% difference in depressive symptoms scores (Needham & Austin, 2010). More specifically, parental support fully mediated the high depressive symptoms scores and partially mediated the high rates of marijuana and other

drug use among young bisexual female participants in this study (Needham & Austin, 2010).

Peer support. Peers are one of the most important aspects of young adults' lives and often play an important role in self-identity formation (McLaren et al., 2015); however, there was a dearth of literature on the impact peer support has on young bisexual women's overall health. Available literature mainly looked at the accessibility of social support for the LGBQ community as a whole, revealing that LGBQ young adults often feel they are unable to relate or fit in to larger peer groups (Johnson & Amella, 2014; Peter, Taylor, Ristock, & Edkins 2015). As well, LGBQ young adults have been found to anticipate rejection from peers and often do not have a trusted support person they can talk to (Johnson & Amella, 2014).

Friedman and Morgan (2009) conducted a qualitative narrative study using an open ended survey questionnaire aimed at examining the availability and use of social support among emerging adult women (aged 18 to 25, currently enrolled or recently graduated in university) (N = 229). Little difference was found between heterosexual and LGBQ women in seeking out support and both were more likely to approach friends regarding sexual issues (e.g., sexual health, romantic relationships, identity formation, etc.) than they were family; however, LGBQ women reported being less satisfied with support received (Friedman & Morgan, 2010). As well, 20% of LGBQ women (n = 88, including 42 bisexual women) stated they had never sought out support from friends regarding sexual issues as they felt their friends would be "uncomfortable or that they would not understand" or their friends actually did not "accept their sexual orientation" (Friedman & Morgan, 2010, p. 925).

Furthermore, a sense of school connectedness is a crucial component of young adults' development of friendships, academic achievements, mental health status, and substance use patterns (McLaren, Schurmann, & Jenkins, 2015; Peter et al., 2015). LGBQ youth who feel a sense of school connectedness report feeling less stigmatized, having improved self-esteem, and a positive view on sexual identity (McLaren et al., 2015). Available research shows bisexual youth feel less connectedness to their peers and their school environment ($p < .05$) (Peter et al., 2015; Saewyc et al., 2009). Between 2007 and 2009, 1, 256 young women from Canadian high schools took part in a cross-sectional study regarding their school attachment (Peter et al., 2015). Results of this study found 62.1% of female bisexual students reported feeling unsafe at school due to harassment and victimization related to their sexual orientation which negatively impacted their feeling of school connectedness (Peter et al., 2015). This was in comparison to just 5.2% of female heterosexual students (Peter et al., 2015). However, female lesbian students did report the highest rates of feeling unsafe at school at 71.8% (Peter et al., 2015). It is possible that increased rates among lesbian students is related to the fact that bisexuality may be more hidden if participants were in relationships with opposite sex partners.

LGBQ community support. LGBQ communities are often referred to as one's chosen family and research shows feeling connected to a LGBQ community can improve overall mental health and self-concept (Friedman & Morgan, 2010). Unfortunately, research continues to identify concerns around the lack of inclusion of bisexual women in LGBQ groups and communities (Borver et al., 2001; Bostwick & Hequembourg, 2014; Galupo, 2006; Hartman, 2006; Hayfield et al., 2014; Ross, Dobinson, & Eady, 2010). This lack of inclusion, distrust, and discrimination against bisexuals has created major barriers for bisexual women seeking supportive friendships from members of the LGBQ

communities (Galupo, 2006). This is particularly troublesome, as stigma-free

environments and group solidarity are key protective factors against minority stress

ailments (Meyer, 2003).

Qualitative literature has also provided rich data regarding adult bisexual women's

feelings of disconnection from LGBQ communities and overt exclusion from lesbian

groups (Borver et al., 2001; Hartman, 2006; Hayfield, et al., 2014). Hayfield and

colleagues (2014) interviewed 20 bisexual women (aged 15 to 53) about their experiences

with social marginalization. Hartman (2006) interviewed a mixture of male, female, and

transgender bisexual undergraduate students to understand how they see their sexual

orientation fitting in society. These authors found that bisexual women longed to feel

accepted and understood, yet felt "out of place", "rejected", and "unsupported" after

reaching out to LGBQ groups (Hartman, 2006; Hayfield et al., 2014).

Additionally, it also appears that bisexual women lack friendships with other

bisexuals (Galupo, 2006) – possibly due to the invisibility of this population. This lack of

social support among young bisexual women may lead to social isolation, withdrawal

from society, (Johnson & Amella, 2014) and clearly has vast and negative impacts on

overall health and wellbeing (Galupo, 2006; Hayfield et al., 2014; Ross et al., 2010).

Health services. "Essential health services" have traditionally been understood as

a key determinant of health (Munro et al., 2000, p.45). The PEI Conceptual Model clearly

highlights the importance of essential health services in the delivery of primary health

care: equal distribution and uptake of promotive, preventative, curative, rehabilitative,

and supportive care services (Munro et al., 2000). 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). None the less, the WHO has stated that access to non-discriminatory and culturally appropriate health services are not only a determinant of health, but a human right (WHO, 2015b). However, research addressing utilization of essential health care services among specific populations, such as young bisexual women, is sparse and poorly understood (Kerr, Ding et al., 2013; Kerr, Santurri, et al., 2013; McNair et al., 2011; Stover et al., 2012). Young bisexual women experience multiple layers of marginalization and may have an increased need to feel accepted and comfortable in a health care setting (Peate, 2008; Stover et al., 2014). This is further supported by Meyer (2003) who found that stigmatized individuals experience a chronic stress that is beyond what the general population typically copes with. This stress is often related to heteronormative institutional processes which impact psychological well-being and self-concept (Meyer, 2003). In one qualitative study Australian bisexual women explained that disclosing their sexual identity to health care providers was "risky," and in order to "protect their wellbeing" they sometimes avoided disclosure (Mulligan & Heath, 2007, p.470). However, researchers have only just begun developing an understanding of bisexual women's mental and sexual health service utilization through descriptive and comparative analyses.

Overall health care utilization. In past research, a commonly used measure of health care utilization was having access to a regular source of health care. As such, a trend has emerged showing that bisexual women often do not have a regular source of health care (Diamant et al., 2000; McNair et al., 2011; Tjepkema, 2008; Ward et al., 2014).

McNair and colleagues conducted a secondary analysis of data from the 2003 Australian Longitudinal Study on Women's Health (N = 8, 850) to examine the

differences between young women's (aged 18 to 30) health status, health service use, and satisfaction based on their sexual orientations (2011). Results showed that bisexual and lesbian women were more likely than heterosexual women to access health services from medical specialists, alternative care providers, and general practitioners ($p < .001$) (McNair et al., 2011). They were also significantly less likely to report continuity of care from a regular provider compared to heterosexual women ($p < .001$) (McNair et al., 2011).

In Canada, similar findings were reported by Tjepkema (2008) following a comparison of bisexual and lesbian women's utilization of health care services in contrast to heterosexual women. Adjusted odds ratios revealed that bisexual women were in fact 2.04 times as likely (95% CI [1.55, 2.70]) to report *not* having a current family physician as heterosexual women ($p < .05$) (Tjepkema, 2008). Likewise, Ward and colleagues' secondary analysis of data from the NHIS (N = 34, 557) showed that among women aged 18 to 64, 71.6% of bisexual women had access to a regular source of health care compared to 85.5% of heterosexual women and 75.6% of lesbian women; there were no significant difference in men's access to health based on their sexual orientations (Ward et al., 2014).

There still remains a lack of clarity in current research regarding bisexual women's utilization of health care services. Research shows that bisexual women have difficulty accessing and often lack a regular source of health care (Diamant et al., 2000; Tjepkema, 2008; Ward et al., 2014). They are still however, more likely to utilize specific health services such as STI testing, gynecological exams (Kerr, Ding, & Thompson, 2013; Koh, 2000; Lindley et al., 2008; McNair et al., 2011; Oswalt & Wyatt, 2013) and mental health services (Kerr, Santurri, & Peters, 2013; Tjepkema, 2008). Therefore,

bisexual women may utilize health services offered through community clinics rather than family physicians (McNair et al., 2011; Mulligan & Heath, 2007). See Table 2.2 for a summary of health service utilization research findings.

Table 2.2 *Health service utilization summary of results*

Health Service Utilization	N	Bisexual Women	Bisexual Men	Hetero Women	Hetero Men	Lesbian Women	Gay Men
McNair, Szalacha, & Hughes, 2011							
Regular health care provider	8,850	68.0%	N/A	78.3%	N/A	72.7%	N/A
Tjepkema, 2008							
No regular physician	159, 824	24.2%	26.2%	11.6%	21.9%	19%	22.2%
Ward et al., 2014							
Usual place to go for medical care	34, 557	71.6%	74.5%	85.5%	76.4%	75.6%	81.2%

Sexual health care utilization. Three recent secondary analyses of data from the ACHA-NCHA II have addressed sexual health service use among undergraduate women. Oswalt and Wyatt (2013) used data collected from gay, lesbian, bisexual, heterosexual and 'unsure' university students aged 30 and under (N = 25, 553) during the fall 2009 ACHA-NCHA. Chi-square analyses showed significant association among female sexual orientation and having had HIV testing ($p < .001$), the HPV vaccine ($p < .001$) and a gynecological exam in the past year ($p < .001$), with bisexual women reporting the highest rates (Oswalt & Wyatt, 2013).

Kerr, Ding, and colleague (2013) used data collected from heterosexual, bisexual, and lesbian female undergraduate students, aged 18 to 25 (N = 63, 448) during the fall 2008, spring 2009, and fall 2009 ACHA-NCHA. Again, chi-square analyses showed significant association among female sexual orientation and having had HIV testing ($p <$ .001) and a gynecological exam in the past year ($p < .001$), with bisexual women reporting the highest rates (Kerr, Ding et al., 2013).

By contrast, a secondary analysis of data from the 2006 ACHA-NCHA survey (N = 29, 952) by Lindley and colleagues (2008) found bisexual women (aged 18 to 24) were less likely to have received a gynecological exam in the past year than heterosexual women, but more likely to have done so than lesbian women ($p < .001$). Bisexual women were still found more likely to report having ever been tested for HIV ($p < .001$) (Lindley et al., 2008).

In addition, Canadian research by Steenbeek and Langille (2012) studied sexual health service use among undergraduate students in the Maritime provinces (N = 10, 232). Although results of the survey showed male and female undergraduate students were generally satisfied with the sexual health services provided on campus (e.g., gynecological examinations, STI testing, pregnancy testing, birth control counselling, and other sexual health counselling), the services remained underutilized. These results were not stratified by gender or sexual orientation.

Mental health care utilization. Kerr, Santurri, and colleague (2013) conducted a secondary analysis to compare female heterosexual, bisexual, and lesbian undergraduate students' utilization of mental health services (N = 6, 689). Findings revealed that bisexual undergraduate women were significantly more likely than heterosexual and lesbian women to have obtained mental health care from psychologists (*p* = .000*, p* =

.003), psychiatrists (*p* = .000*, p* = .004), and other medical providers (*p* = .000*, p* = .001) (Kerr, Santurri et al., 2013). As well, they were more likely to report that they would obtain mental health counselling in the future if required (*p* = .000*, p* =.003) (Kerr, Santurri et al., 2013). The only services bisexual women were *less* likely to have accessed were clergy and university based counselling services (Kerr, Santurri et al., 2013).

In addition, adult based research has also found that bisexual women may have a greater need for access to mental health services than heterosexual and lesbian women (Smalley et al., 2015; Tjepkema, 2008). Qualitative, community-based research has revealed that in Canada, bisexual women may not be receiving optimal provision of mental health care (Eady, Dobinson, & Ross, 2011). A common theme emerged from Eady and colleagues (2011) research with 55 bisexual individuals from Ontario, Canada: negative health care experiences. These experiences generally included encountering judgemental health care providers and having their sexual identity blamed as the cause of their mental health problems (Eady et al., 2011). Although the bisexual participants in Eady and colleagues (2011) study also recognized positive experiences, the current body of literature raises concerns regarding the quality of mental health care undergraduate bisexual female students are receiving on and off campus. As well, this literature raises further concerns around whether the quality of this care has impacted their health and wellbeing.

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-based and nonprobability-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 bisexual women) (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 LGBQ specific health related topics (McNair et al., 2011).

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 annual ACHA-NCHA II survey data derived from an unweighted, nonprobability, convenience sample of American university students (Kerr et al., 2014). The ACHA-NCHA II surveys are considered a "reference group" for the general American university student population (Kerr, Santurri et al., 2013, p. 187), however, they may lack generalizability to university students in the Canadian Maritime provinces. The only study to specifically address Canadian undergraduate students, was the Maritime Undergraduate Sexual Health Services Survey by Steenbeek and Langille (2012). However, study findings were not stratified by sexual orientation.

A small number of qualitative studies were also included in the review (Borver et al., 2001; Eady et al., 2011; Friedman & Morgan, 2009; Hartman, 2006; Hayfield et al., 2014; Mulligan & Heath, 2007; Stover et al., 2014). All were conducted using individual

semi-structured interviews via face to face or telephone, as well as several focus groups. One study (Stover et al., 2014) used online focus groups. Qualitative data adds the rich human experience to statistical information (Ryan, Coughlan, & Cronin, 2007); as well, qualitative researchers use purposive sampling methods, which may improve recruitment of hard to reach populations, such as LGBQ youth (McDermott & Roen, 2012). However, none of the researchers specifically recruited female bisexual undergraduate students and instead recruited broader groups, such as adult bisexual women (Borver et al., 2001; Eady, Dobinson, & Ross, 2011; Hayfield et al., 2014), LGBQ women (Mulligan & Heath 2007), LGBQ undergraduate students (Hartman, 2006; Stover et al., 2014), and female LGBQ undergraduate students (Friedman & Morgan, 2009). Therefore, current literature does not fully capture the experiences of female bisexual undergraduate students in regards to their health or health service utilization. As well, the majority of literature evidence regarding health service use is based on access to a family physician, while past research has recognised that young bisexual women are more likely to utilize community based health clinics (McNair et al., 2011; Mulligan & Heath, 2007). In addition, current research does not address university students' use of and access to health care services on campus.

There were several limitations in the research evidence throughout this review. The majority of research was collected from convenience samples of bisexual women and current literature may only be representative of self-identified bisexual women who are comfortable disclosing their sexual orientation and discussing sensitive topics, e.g. sexual behaviours, substance abuse, etc. (Diamant et al., 2000; Martin et al., 2010; Stover et al., 2014; Tjepkema, 2008). Response rates to telephone interviews also tend to be higher if there is contact prior to the telephone call (Glaser & Stearns, 2002; Polit & Beck, 2012);

although none of the previous studies reported any prior contact with participants, response rates ranged from 52% to 81% (Diamant et al., 2000; Fredriksen-Goldsen et al., 2010; Steel et al., 2009; Tjepkema, 2008). 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, self-identifying as heterosexual rather than bisexual. Although the proposed study will have similar limitations, web-based surveys are believed to be more effective in reaching LGBQ individuals who are concerned about confidentiality and anonymity (Martin et al., 2010; McDermott & Roen, 2012; Stover et al., 2014).

Additionally, in the literature, samples of bisexual women were quite small in comparison to samples of heterosexual women; which may have led to inequitable comparisons and may not have provided sufficient statistical power for analyses. Overall, there is a knowledge gap in current literature on the health and health service utilization of bisexual female undergraduate students. Although there is a small body of evidence on the health of emerging adults, the majority of evidence focuses on health-risk behaviours and does not fully capture the health status of more marginalized groups. Female undergraduate students may differ greatly from non-students (Dawson et al., 2004); therefore, there is a need to correct this knowledge gap and understand how bisexual female 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

The literature review showed that young bisexual women are at an increased risk for poor overall health outcomes and many have experienced barriers to accessing health services for these needs (Kerr, Santurri, & Peters, 2013; McNair, Szalacha, & Hughes, 2011; Oswalt & Wyatt, 2013; Steele et al., 2009; Stover et al., 2014; Tjepkema, 2008). Although there is a small amount of research available on bisexual women's self-rated health, the majority of the data was derived from adult samples (i.e. 18 to 60 years old) (Steel et al., 2009; Tjepkema, 2008). Therefore, there is an obvious gap in past literature on young emerging adult bisexual women and how they perceive and rate their health. As well, there is a gap in our understanding on what factors determine or impact young bisexual women's self-rated health and an even larger gap on young bisexual women's use of health services. The lack of current research and knowledge is even particularly more prevalent among undergraduate populations of bisexual women.

Therefore, to fill these knowledge gaps, the current study explored the "self-rated health" and "university health service use" of a sample of bisexual female undergraduate students attending university in the Maritime Provinces in 2012. In addition, this study aimed to identify predictors of self-rated health and university health service use and to determine the relationship between perceived health and utilization of health services by bisexual female undergraduate students from the Maritime Provinces. This was completed through a secondary analysis of descriptive, cross-sectional design study data. Cross-sectional design studies are used to describe phenomena or to describe relationships between phenomena at one point in time (Polit & Beck, 2012). As well, secondary analyses are an efficient mode of examining relationships between variables among subpopulations from larger data sets (Polit & Beck, 2012).

Data collected during the *Maritime Undergraduate Student Sexual Health Services Survey 2012* (N = 10, 232) by co-lead investigators, Drs. Steenbeek and Langille (2012) (funded by the Canadian Institute of Health Research and Nova Scotia Health Research Foundation operating grants) was used for the study's analyses.

Target population

The *Maritime Undergraduate Student Sexual Health Services Survey 2012* sample population consisted of 10, 232 undergraduate students: 3,022 males, 7,178 females, and 32 transgender individuals aged 17 to 35 years old. The sample was predominately female (58.2%), between the ages of 17 and 24 (80.8%), and Caucasian (86.4%). These undergraduate students were recruited from eight universities located in Canada's Maritime Provinces: Dalhousie (Halifax, Nova Scotia), St. Mary's (Halifax, Nova Scotia), Mount St. Vincent (Halifax, Nova Scotia), Acadia (Wolfville, Nova Scotia), St. Francis Xavier (Antigonish, Nova Scotia), Cape Breton University (Sydney, 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 selected based on the broad range of undergraduate programs offered at each university in order to ensure a heterogeneous sample of the Maritime Provinces' undergraduate student population, excluding those students from francophone universities due to language and translation issues (Steenbeek & Langille, 2012).

The target population for this study was bisexual female undergraduate students from the eight universities located in Canada's Maritime Provinces. The sample population was made up of those participants who self-identified as female and bisexual (n = 357) during the survey. Steenbeek and Langille (2012) measured sexual orientation

by asking students "*Which of the following best describes your feelings?*" and response options included: 100% heterosexual, mostly heterosexual, bisexual, mostly homosexual, 100% homosexual, and not sure. This item was previously validated by Langille (2006) among high school students in Nova Scotia, achieving a Cohen's kappa coefficient of 0.8. Although there were no other measures of sexual orientation used in the survey, research shows that emerging adults' self-identified sexual orientation is consistently and significantly correlated with other self-reported measures of sexual orientation, such as sexual attraction, fantasies, and sexual behaviours ($p < .001$) (Ellis, Rob, & Burke, 2005; Priebe & Svedin, 2013). Biological sex was measured by asking students "*What is your sex*?" and response options included: male, female, transgender, and other (Steenbeek & Langille, 2012). This item did not receive reliability or validity testing prior to distribution of the survey, and to my knowledge there is no literature addressing the reliability or validity of similar items among undergraduate student population. See Appendix A for a copy of both demographic items.

The study population was not restricted by an age range due to the small number of bisexual female participants. Although the traditional undergraduate student population falls within the developmental period of emerging adulthood, defined as ages 18 to 25 (Arnett, 2000), it was felt that it would be unlikely that any outliers would alter or impact study findings. This was because the age range of female participants of the Maritime Undergraduate Sexual Health Services Survey 2012 was 17 to 35 years old. Participants from all eight participating universities of the Maritime Undergraduate Sexual Health Services Survey 2012 were also included. Therefore, the proposed study sample of bisexual female undergraduate students was derived from a heterogeneous sample of undergraduate students from a variety of large and small (in regards to size and

enrolment), as well as urban and rural university populations (Steenbeek & Langille, 2012).

Additionally, for the purpose of comparative analyses, data was also derived from the heterosexual female participant sample (n = 4, 739) of the *Maritime Undergraduate Sexual Health Services Survey 2012*. Again, participants from all eight participating universities were included, transgender identified participants were excluded, and no age range was applied due to small sample size of the lesbian sub-sample.

Instrumentation

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

Survey development. The survey was developed and piloted tested in 2009- 2010 with 220 undergraduate students from Dalhousie and Acadia University. Undergraduate students were continuously involved in the development of the survey instrument. First, data collected during undergraduate student focus groups at Dalhousie and Acadia universities guided the development of survey content. This was further supplemented by data from other tested/validated sexual health surveys and past literature. Second, undergraduate students provided feedback on how to improve 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 instrument which measured youth health and health service use (Langille, 2006). This survey instrument was tested among high school youth in Nova Scotia (Langille, 2006). A few other questions that were developed specifically for the survey were also included, although these were not piloted nor did they assess test-re-test reliability. The complete survey was piloted with a small sample of Dalhousie and Acadia undergraduate students yielding 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 were able to access the online questionnaire through a web-based surveying program, OPINIO (Object Planet, 2014). This program is a commonly used tool for large-scale surveys at Dalhousie University. The program also holds rigorous security standards, maintaining confidentiality and anonymity, and also prevents participants from taking the survey more than once. OPINIO was hosted by Dalhousie, however, each university had its own interface for their survey website. Additionally, letters of collaboration were obtained from each university stressing their commitment to help the research team distribute the survey via student list servers to all the undergraduate students at the participating universities.

Data Collection and Sampling

Data collected during the original survey, were stored as an encrypted file with Dr. Langille in the Community Health and Epidemiology Department at Dalhousie University. No additional data collection was required for the study.

Steenbeek and Langille (2012) collected data in the fall of 2012 using the Dillman approach (Hoddinott & Bass, 1986). This included a series of emails being sent out to undergraduate student server lists obtained from each university's registrar's office prior to, and during survey administration. This first email included a description of the study and the purpose of the study. Another email was then sent a week later containing a web-link to the online survey. Two weeks following the initial survey distribution, another email was sent via the server lists to remind students to participate and to thank those who already had. Steenbeek and Langille (2012) also posted advertisements for the survey on online notice boards and at each university's student services and health services departments. Having the registrar's office distribute the surveys maintained the anonymity and confidentiality of participants. Additionally, each university used different incentive strategies to encourage students to participate in the online survey, e.g., Dalhousie held a draw for an IPad. In order to be included in the incentive draws, participants were required to provide their contact information; however, this information was collected completely separately and presented no risk of being linked to survey responses (Steenbeek & Langille, 2012).

Online surveys are an increasingly popular method of data collection among university student populations (Pealer, Weiler, Pigg, Miller, & Dorman, 2001). Not only are they less time consuming and less expensive than traditional methods (i.e., face to face interviews, telephone surveys, and mail in surveys), but research shows that undergraduate students may be more likely to respond truthfully to sensitive items when participating in an online survey (Pealer et al., 2001). This finding came from a study on health risk behaviours among undergraduate students at an American university, where students were randomly distributed to either web-based or pen and paper surveys. The

web-based group were less likely to skip sensitive items and completed the surveys faster than the pen and paper group, with 51% of the web-based surveys completed in three days or less (Pealer et al., 2001). Similar findings were reported by Booth-Kewley, Larson, and Miyoshi (2007) where undergraduate students randomly assigned to a computer-assisted survey group were significantly more likely to report and reported higher rates of alcohol use and number of sexual partners than students assigned to a pen and paper group.

Additionally, undergraduate students typically have adequate access to computers, mobile devices, and the internet; making web-based surveys a convenient form of data collection. Researchers have also noted that undergraduate students prefer online, computer-assisted surveys to the more traditional methods of survey administration (Booth-Kewley et al., 2007; Pealer et al., 2001). However, online surveys have tended to result in lower response rates than face-to-face, pen and paper, or telephone surveys in the past (Lindley et al., 2008; Pealer et al., 2001). Past research using web-based surveys with university student populations had achieved a range of response rates, including one Canadian survey which achieved a response rate of 44% (Adlaf, Demers, & Gliksman, 2005). Additionally, past American based surveys have achieved response rates varying from 20.1% to 40.8% (Lindley et al., 2008; Martin et al., 2011; Schauer et al., 2013).

Study Variables

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

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

Age. Age was measured using results from item number two of the original survey, which asked participants "What is your age in years?" This variable had a reported Pearson's coefficient of 0.98 (Langille, 2006) and was measured as a continuous variable in the current study.

Ethnicity/race. Ethnicity/race was measured using item number three of the survey, which asked participants, "*What ethnic/racial background do you consider yourself to be*?" Response options included: Caucasian, African descent, Aboriginal, Asian, Middle Eastern, and other. Participants were asked to check all that apply, therefore a multiracial ethic group was also created for the current study. No test-re-test results were available for this demographic variable among undergraduate student populations. This item was measured as a nominal variable in order to describe any ethnic or racial diversity among bisexual female undergraduate, as having intersecting minority statuses are known to impact over health and access to health services (Parent, DeBlaere, & Moradi, 2013; PHAC, 2011a; Veenstra, 2011). However, because the observed frequencies of the Middle Eastern, African descent, and other ethnic groups were too statistically too small for the purpose of the analyses, these categories were collapsed into one group labeled "Other".

Year of study. Survey item number five asked participants to identify what year of their undergraduate program they were in. Response options included first year, second year, third year, fourth year, and other. This item had a reported Cohen's Kappa of 1.0

(Langille, 2006) and was measured as a continuous variable. Responses of "other" will be included, but not specified.

Living arrangement. Participants' living arrangement were measured using survey item number seven, which asked "*Who do you live with?*" Response options included: alone, with one or more parent, with a sexual or romantic partner, and with roommates. This item received a Cohen's kappa of 0.93 (Langille, 2006) and was measured as a nominal variable.

Socioeconomic status. Researchers have found that family socioeconomic status significantly predicts healthy development during emerging adulthood (O'Connor et al., 2011) and is believed to be an influential determinant of health and wellbeing (Munro et al., 2000; PHAC, 2011a). Therefore, participants' perceived socioeconomic status was measured using item number ten from the original survey. This item asked "*How wealthy do you see your family as being?*" and response options included very wealthy, quite wealthy, average, not so wealthy, and not wealthy at all. This item had a reported Cohen's kappa of 0.71 (Langille, 2006). Socioeconomic status was measured as an ordinal variable; however, due to the limited frequencies of some of the categories, 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 the self-report measures of self-rated health and university health service use for bisexual female undergraduate students. However, these variables were also included in analyses as potential independent/predictor variables of the other.

Self-rated health. Self-rated health was measured using the results of survey item

number 13 (see Appendix C). Steenbeek and Langille (2012) measured self-rated health by asking participants "*In general, would you say that your health is*?" and provided a five-point multiple choice scale ranging from excellent health, very good health, good health, fair health, to poor health. Langille (2006) reported a Cohen's kappa coefficient of 0.56 for this item following test-re-testing with youth across Nova Scotia. Although 0.6 is arguably the minimum value acceptable for research (Polit & Beck, 2012), self-rated health scales are a frequently used measure in epidemiology research and have been deemed a strong predictor of actual health, health seeking behaviours, and mortality in adult populations (Eriksson, Unden, & Elofsson, 2001; Statistics Canada, 2010; Steel et al., 2009).

Self-rated health was dichotomized by collapsing responses of excellent, very good, and good into one category and responses of fair and poor into another (see Table 3.1). This decision was based off of past research demonstrating that the response options included in the self-rated health scale are not evenly spaced and the largest discrimination between responses are typically found between good and fair (Perneger, Gayet-Ageron, Courvoisier, Agoritsas, & Cullati, 2013). Dichotomizing self-rated health was also common in past research and therefore, it was felt that this would enhance comparisons between the study's findings and past literature (Fredriksen-Goldsen et al., 2010; Steel et al., 2009).

Health service use. Health service use of young bisexual women has been poorly understood, as discussed in Chapter Two. To increase the current knowledge on health service utilization among this population, bisexual female undergraduate students' use of health services was measured using the results of survey item number 30 (see Appendix C). Steenbeek and Langille (2012) measured health service use as a dichotomous variable

by asking participants "*Have you ever seen a doctor or a nurse at your university health centre for any reason*?" Response options included yes or no. Those who answered yes were also prompted to specify the reason for the visit. This item did not receive reliability or validity testing prior to distribution of the survey, and there is currently no available literature addressing the reliability or validity of similar items among undergraduate student population at the time of this study.

However, a similar item was used during an analysis of population based data from the 1997 Belgian National Health Interview Survey (N = 5, 128) (Peersman, Pasteels, Combier, Maeseneer, & Williams, 2014). These researchers compared the self-reported physician service utilization with registered medical utilization history (i.e. registered administrative data) (Peersman et al., 2014). Results of this study demonstrated an adequate agreement between the self-reported data and the administrative data for the entire study population, reporting a Cohen's kappa of 0.65. As well, the researchers found adequate agreement among the sub-population of female participants (n = 2, 683), reporting a Cohen's Kappa of 0.62 (Peersman et al., 2014).

Additionally, self-reported health service utilization data were found to be more accurate when participants respond confidentially or online (Bhandari & Wagner, 2006). This was particularly important when participants felt that their past health service needs were stigmatizing (Bhandari & Wagner, 2006). Fortunately, the Maritime Undergraduate Student Sexual Health Services Survey 2012 was conducted anonymously and online, which may have improved the accuracy of item responses (Bhandari & Wagner, 2006).

For the purpose of this study, university health service use remained as a dichotomous variable: no, the participant had never accessed health services on campus to see a nurse or physician or yes, the participant had accessed health services on campus to

see a nurse or physician (see Table 3.1). Reason for last visit was not included due to irrelevance to the study objectives.

Independent variables. The following independent variables were selected based on the determinants of health as outlined in the PEI Conceptual Model of Nursing (Munro et al., 2000), as well as past literature on the health of bisexual female undergraduate students. These variables were used to identify the most significant predictors of self-rated health and health service use among bisexual female undergraduate students at the eight Maritime universities. See Appendix D for a copy of these survey items.

Depression risk. Depression risk was measured using scores from 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 participants' experienced depressive symptoms the week prior to the survey (Poulin, Hand, & Boudreau, 2005). Scores could range between 0 and 36; with scores of 0 to 11 indicating minimal depressive symptoms, scores of 12 to 20 indicating elevated depressive symptoms, and scores of 21 to 36 indicating very elevated depressive symptoms (Poulin et al., 2005).

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 may not fully capture depression among youth as it was believed to lack inquiry into irritability (Poulin et al., 2005) and was believed to result in an overestimation of depression among women (Carleton et al., 2013). Regardless, depression risk is considered an important factor for the health of young bisexual women (Kerr, Santurri et al., 2013; Klein & Dudley, 2014; Schauer et al., 2013)

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and a potentially important predictor of self-rated health and health service use (Steele et al., 2009; Tjepkema, 2008). There were no other measures of mental health were included in the Maritime Undergraduate Sexual Health Services Survey 2012.

For the proposed study, depression risk was measured as an ordinal variable based on the validated CES-D12 categories: minimal depressive symptoms, elevated depressive symptoms, and very elevated depressive symptoms (Poulin et al., 2005). See Table 3.1 for logistic regression coding.

Social support. It is believed that an individual's perceived support has a greater impact on their overall wellness than the actual amount of support they receive (Dolbier & Steinhardt, 2000). This fact is concerning, as was stated in Chapter Two, young bisexual women often report poor social support and feel isolated from LGBQ and heterosexual communities (Hughes, Szalacha, McNair, 2010; Ross, Dobinson, & Eady, 2010; Saewyc et al., 2009). Therefore, social support was included and measured using total scores from survey item number 18, 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 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 could fall anywhere from 0-84, while a higher score indicated 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 Chronbach's Alpha score of 0.71. Cut off points for the SSS scores had not been validated in past literature at the time of this study, therefore participants' total scores were measured as continuous

variables.

Binge drinking. Binge drinking was measured using item number 21 from the original survey. Steenbeek and Langille (2012) measured binge drinking by asking participants "*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*?" 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 was a commonly used measure of binge drinking behaviours among undergraduate student and emerging adult populations (Kerr et al., 2014; Talley, Hughes, Aranda, Birkett, & Marshal, 2014; Shauer et al., 2013) and was included in the study due to the negative health consequences young bisexual women experience related to binge drinking (as discussed in chapter two) (Bostwick et al., 2007; Kerr et al., 2014; Klein & Dudley, 2014; McCabe et al., 2004; Tucker et al., 2008).

This measure had been validated among youth in Nova Scotia, achieving a Cohen's kappa coefficient of 0.51 (Langille, 2006). Although this score could be deemed moderate by some (Pilot & Beck, 2012), it may be partially due to the fact that use of alcohol among high school age students is illegal and therefore subject to disapproval (Brener, Billy, & Grady, 2003). Langille (2006) performed test-re-testing of survey items among high school students via pen and paper which students completed and handed in to their teachers. Although the surveys were confidential and concealed in sealed envelopes, research shows that self-reports of alcohol use are more accurate among youth when surveys are conducted privately, confidentially, anonymously (Brener et al., 2003). Despite the low kappa score, it was felt that this item would be more reliable among undergraduate student populations as alcohol use is not illegal for the majority of

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undergraduate students in Canada.

The Canadian Centre on Substance Abuse (2014) and World Health Organization (WHO) (2014) had defined binge drinking as the consumption of at least four to six standard drinks on one occasion at least once a month. As well, binge drinking at least once a month was believed to reflect regular binge drinking (Kerr et al., 2014). Therefore, participants' responses were dichotomized into two variables for the purpose of this study: no binge drinking in the past 30 days and one or more occasions of binge drinking in the past 30 days (see Table 3.1).

Marijuana use. Marijuana use was measured using participants' responses to item number 20 of the *Maritime Undergraduate Sexual Health Services Survey 2012* (see Appendix C). 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: zero times, one to two times, three to nine times, ten to nineteen times, twenty to thirty-nine times, and forty or more times. This is a commonly used measurement of 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). Additionally, researchers have found that denial of marijuana use among youth is not common (Brener et al., 2003) and that the accuracy of self-reported marijuana use is often dependent on the privacy, confidentiality, and anonymity of the survey (Brener et al., 2003).

For the purpose of this study, marijuana use was analyzed as a dichotomous variable: no use in the past 30 days or use in the past 30 days (see Table 3.1). This decision was made because, although at the time of this study there was considerable

debate around the legalization and safety of marijuana use in Canada, it was still an illicit substance (Government of Canada, 2015). As well, researchers out of Ontario, Canada have found that bisexual women often use marijuana to cope with anxiety and stress related to biphobia (Robinson, 2015). Marijuana use also appears to be a growing concern among Canada's undergraduate population (Adlaf et al., 2005) and long term use among youth was believed to have negative health implications, such as addiction, chronic lung problems, and decreased brain function (e.g. ability to concentration and make decisions) (Government of Canada, 2015). Dichotomizing substance use was also commonly done in past research with undergraduate students (Kerr et al., 2014; Kerr et al., 2015; Schauer et al., 2013; Steenbeek & Langille, 2012); therefore, also doing so in the current study would have enhanced any comparisons with past research findings.

   Sexually transmitted infection history. Sexually transmitted infection (STI) history is believed to be an important predictor of self-rated health and health service use, as noted in chapter two. Young bisexual women have reported some of the highest rates of past year STIs (Lindley et al., 2008; Oswalt & Wyatt, 2013) and are at risk for experiencing additional stigma and exacerbated health conditions related to STI diagnoses (PHAC, 2013). STI history was measured using survey item number 27. Steenbeek and Langille (2012) measured STI history by asking participants to identity if they had ever been diagnosed with a STI by a health care professional. Those who answered yes were also prompted to specify which STI they had been diagnosed with. This item did not receive validity or test-re-testing prior to survey administration. Additionally, little reliability testing had ever been conducted on self-reported STI history among young women. One study did measure the agreement between young women's (aged 16 to 21)

self-reported STI diagnoses and their medical records. This resulted in minimal agreement with a Cohen's kappa coefficient of just .185 (Clarke, Brasseux, Richmond, Getson, & D'Angelo, 1997). However, this may be due to the fact that interviews were conducted face to face by a researcher who was unknown to participants (Clarke et al., 1997). Research has shown that youth value confidentiality, anonymity, and trusted health care providers (Brener et al., 2003; Clarke et al., 1997).

For the current study STI history was to be analyzed as a dichotomous variable: no history of STI diagnosis and a history of STI diagnosis (see Table 3.1). However, over 60% of the bisexual female participants of the original survey did not respond to this question. Therefor, due to cell sizes being too small for the purpose of analyses, this variable was not able to be included in the inferential analyses.

Sexual victimization. Sexual assault victims often develop serious mental health issues, such as depression and post-traumatic stress disorder, particularly when support is not accessed (Long, Ullman, Long, Mason, & Starzynski, 2007). This is concerning, as bisexual undergraduate students reported high rates of sexual victimization (Martin et al., 2011). Therefore, sexual victimization was measured using survey item number 28, which asked participants to identify yes or 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 at Dalhousie and Acadia, they did not perform test-re-testing; therefore, there was no known Cohen's kappa coefficient for this item.

A similar item was included in the Juvenile Victimization Questionnaire, a national random digit dial survey among children and youth ages two to seventeen, and was shown to have high validity and adequate test-retest reliability (Finkelhor, Hamby,

Ormrod, & Turner, 2005). This item addressed both attempted and completed rape, asking participants "*In the last year, did anyone TRY to force you to have sex; that is, sexual intercourse of any kind, even if it didn't happen?*" (Finkelhor et al., 2005). Construct validity of this item was demonstrated through a significant correlation with symptomology of victimization trauma ($p < .01$) and test-rest reliability showed 100% agreement among youth aged 10 to 17 (Finkelhor et al., 2005).

This variable was analyzed as a dichotomous variable: never experienced forced sex during university and experienced forced sex during university (see Table 3.1).

Confounding variables. Due to the potential for particular variables to have a confounding effect on the outcome variables, it was necessary to identify and control for these particular variables (Field, 2013). More specifically, socioeconomic status and race/ethnicity were two variables that were found to be significantly related to self-rated health and health service utilization (PHAC, 2011a). The PHAC (2011a) identified that socioeconomic status has the largest impact on the health of Canadians and that individuals belonging to minority groups are often faced with marginalization and difficulty accessing culturally appropriate health care. Additionally, Steenbeek and Langille (2012) 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 second and first 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 it was decided that they were be controlled for during multivariable statistical analyses if found to be significant predictors during univariable analyses.

Data Analysis

Analyses were conducted using IBM Statistical Package for Social Sciences (SPSS). Beginning with descriptive statistics, all variables of interest were measured in order to provide a description of the bisexual female undergraduate student participants of the *Maritime Undergraduate Sexual Health Services Survey 2012*. Results of these analyses were also used to describe the distribution of each variable of interest referred to above, among bisexual female undergraduate students (See Table 3.1). 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 bisexual female undergraduate students rating their health as excellent/very good/good versus fair/poor based on the values and relationships with the independent/predictor variables. As well, the logistic regression models were used to examine and predict the probability of the study population utilizing university health services or not based on the values and relationships with the independent/predictor variables (Field, 2013). A final logistic regression model (multivariable) was then used to determine the difference in health service use among bisexual and heterosexual female undergraduate students with similar need. These tests were performed at a standard alpha level of .05 (Hosmer & Lemeshow, 2000).

Logistic regression was selected for this study because it expresses categorical variable relationships in a linear fashion and both of the outcome variables were dichotomous (Field, 201; Hosmer & Lemeshow 2000). This is done 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). This 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). When data is dichotomous, the mean value of the outcome variables

"…must be greater than or equal to zero and less than or equal to one" (Hosmer &

Lemeshow, 2000, p. 5). Therefore, for the purpose of this study dummy codes were used

to represent the categorical dependent and independent variables of interest. See Table 3.1

for a complete list of the variable codes used during for the analyses.

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?	Fair and poor = 0 Excellent, very good, and good = 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
Socioeconomic Status	How wealthy do you see your family as being?	Average = 0 Very wealthy and wealthy = 1 Not so wealthy and not wealthy = 2
Race/Ethnicity	What ethnic/racial background do you consider yourself to be?"	Caucasian = 0 African descent = 1 Aboriginal = 2 Asian = 3 Middle Eastern = 4 Other = 5
Year of study	What year of your undergraduate program are you in?	Continuous variable

Variables	Survey Item	Logistic Regression Dummy Codes
Living Arrangement	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.	Minimal depressive symptoms = 0 Elevated depressive symptoms = 1 Very elevated depressive symptoms = 2
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
STI diagnosis	Have you ever had a sexually transmitted infection (STI) which was diagnosed by a health professional?	No history of STI diagnosis = 0 History of STI diagnosis = 1
Forced sex	Since you have been at university, have you ever been forced to have sex of any type against your will?	Never experience forced sex = 0 Experienced forced sex =1

To answer the first two research questions, 1) What are the predictors of self-rated health for bisexual female students on Maritime University campuses? 2) What are the predictors of university health service use for bisexual female students on Maritime University campuses?, two phases of logistic regression were employed for each outcome variable.

Univariable logistic regression phase. Univariable logistic regression was first employed to examine and predict the individual relationships between self-rated health and health service use with each of the independent variables (Field, 2013). The results of these models were presented as odds ratios, 95% confidence intervals, and p values and determined which independent variables would be included as potential predictor variables in the multivariable logistic regression models. These results were also used determine whether the theoretically selected confounding variables (i.e. socioeconomic status, race/ethnicity, and years of study) had a significant association with either of the outcome variables. For the purpose of parsimony, only those confounding variables that had a significant association with the outcome variables at the $p < .05$ level were controlled for during multivariable logistic regression models.

Multivariable logistic regression phase. Using the forced entry method where as independent variables are entered into the model simultaneously, multivariable logistic regression was then employed to break up the individual interactions between variables into multiple comparisons in order to identify the *most* significant associations (Field, 2013). The forced entry method was identified as the most appropriate method for this study, as the independent variables were all selected based on the conceptual model and past research (Field, 2012). Only those variables identified as potential predictors ($p < .05$) during the univariable logistic regression phase were included in the final models.

This was done for the purpose of parsimony (Bursac, Gauss, Williams, & Hosmer, 2008; Field, 2012), as well because the variables selected were all theoretically important and no past research evidence had suggested the need to include specific variables when non-significant. Therefore, this phase of logistic regression allowed for the examination and determination of only the *most* significant predictors of self-rated health and health service use.

The results of these multivariable logistic regression models were also presented as odds ratios, 95% confidence intervals, and p values. In addition, the Homer-Lemeshow goodness of fit test was also used to ensure the accuracy of the prediction results (Field, 2013) and the Omnibus Tests of Model Coefficients was used to ensure that fit of the model had improved relative to a baseline model with no predictor variables (Field, 2012).

To develop a better understanding of bisexual female undergraduate students' use of health services, it was necessary to compare this population's use of health services with the health service use of other undergraduate females based on similar need. Additionally, the majority of researchers who have conducted research with undergraduate populations have also included comparative analyses between sexual orientation groups (Ford & Jasinski, 2006; Kerr, Ding, & Thompson, 2013; Kerr, Santurri, & Peters, 2013; Kerr et al., 2015; Martin et al., 2011; Schuaer et al., 2013). Therefore, a final multivariable logistic regression model was employed to answer the last research question, 3) Based on need, is there a difference between bisexual female students' university health service use and the university health service use of heterosexual female students? Again, these results were presented as odds ratios, 95% confidence intervals, and p values, and the Homer-Lemeshow goodness of fit test the

Omnibus Tests of Model Coefficients were used to measure the fit of the model (Field, 2012).

As discussed in Chapter Two, bisexual women have been found significantly more likely than heterosexual and lesbian women to perceive their health as poor (Steele et al., 2009; Tjepkema, 2008) and therefore, may be more likely to access health services as a consequence of this. Therefore, to ensure that comparative analyses were run as equivalent as possible, need was defined as poor self-rated health due the important role that perceived health has on an individual's health seeking behaviours (Statistics Canada, 2010) and the sexual orientation groups were limited to only those participants who reported poor or fair health.

Sample and effect size. There has been little to no consensus on how sample sizes for logistic regression analyses should be determined (Hosmer & Lemeshow, 2000); however general guidelines, such as Peduzzi, Concato, Kemper, Holford, and Feinstein (1996)'s general rule of thumb do exist. Based on these authors' work, it is suggested that ten participants (or events) per predictor variable is an acceptable number to prevent issues of over estimation and under estimation of variances (Peduzzi et al., 1996). However, other researchers have reported that up to twenty participants (or events) per variable is needed (Courvoisier, Combescure, Agoritsas, Gayet-Ageron, & Perneger, 2010; Vittinghoff & Mcculloc, 2007). Due to the fact that this study entailed a secondary analysis of data, the sample size for the population of interest was fixed. Therefore, a power analysis was necessary to determine that the available sample size of bisexual female undergraduate students from the Maritime Undergraduate Sexual Health Services survey (n = 357) was adequate enough to detect differences in variables with a reasonable degree of statistical power.

Of the proposed study variables, it was hypothesized that binge drinking alcohol would have only a small effect on bisexual women's self-rated health - even though it was considered to be a major health concern among emerging adult populations (Canadian Centre on Substance Abuse, 2014). At the time of the study, there was no available literature which compared binge drinking rates between bisexual women who reported poor health and bisexual women who reported good health, or literature which reported the magnitude of the possible effect of binge drinking on self-rated health. However, there was one study which showed that among a sample of female university students in the US (N = 2, 000), binge drinking in the previous year was not a significant predictor of poor/fair self-rated health (p = .25) (Zinzow et al., 2011). As well, another US based study showed that among adults who report fair/poor health, 31.2% reported binge drinking in the past 30 days and among those who report or excellent/very good/good health, 29.2% reported binge drinking in the past 30 days (Tsai et al., 2010). Although this was a difference of only 2%, past research indicates that bisexual women's self-rated may be more negatively impacted by binge drinking than the general population (Bostwick et al., 2007; Kerr et al., 2014; Klein & Dudley, 2014; McCabe et al., 2004; Tucker et al., 2008). Again, the magnitude of that difference is unknown.

A review of literature showed that approximately 17% of bisexual women reported their self-rated health as fair/poor (Gorman et al., 2014; Steele et al., 2009; Tjepkema, 2008; Zinzow et al., 2011). This suggests that approximately 61 cases from the available data set will report their health as fair/poor. A preliminary examination of data revealed that 44% of female undergraduate students from the Maritime Universities reported binge drinking in the past 30 days (the exposure variable). Therefore, a power

analysis was conducted assuming that bisexual female undergraduate students would have approximately 10% higher rates of binge drinking than the general undergraduate population (54%) (Kerr et al., 2015), assuming those who reported fair/poor self-rated health would have higher rates (at least 2%) of binge drinking behaviours (56%) (Tsai et al., 2010), and assuming those who reported excellent/very good/good health would report lower rates of binge drinking. This analysis suggested that there was adequate sample size to detect a 19% prevalence difference at 78.5% power. See Figure 3.1 for power analysis results.

Figure 3.1 *Power analysis results*

Power for Unmatched Case-Control Studies

	Input Data
Two-sided confidence interval (%)	95
Number of cases	61
Percent of exposure among cases (%)	56
Number of controls	296
Percent of exposure among controls (%)	37
Odds Ratio	2.2

Power based on:	
Normal approximation	78.51%
Normal approximation with continuity correction	74%

Given the scarcity of literature comparing the health and risk factors of bisexual women with other women at the time of this study, anticipated effect sizes were impossible to determine with any certainty. However, the available sample was deemed adequate to power the study (at 80%) when differences were of the magnitude of 19-20%. When differences between groups were less than this, it was understood that the study results would be less definitive. Again, with the lack of literature, it was felt that this

study would still contribute to determining needed effect sizes, so that samples in the future could be constructed to fully power analyses.

Ethical Considerations

Steenbeek and Langille (2012) were granted ethics approval by each participating university's Research Ethics Board in accordance with the most recent Tri-Council Policy Statement and the Declaration of Helsinki (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). 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 (CIHR, NSERCC, SSHRCC, 2010). These guidelines were grounded in three core principles: respect for persons, concern for welfare, and justice (CIHR, NSERCC, SSHRCC, 2010). However, due to the study design ethics approval from the other participating universities was not required.

Informed consent. The initial email which was distributed to the undergraduate server lists at each university included a description of study purpose, and also explained the survey's confidential and anonymous nature. This 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 that they agreed by clicking 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 participation was fully voluntary and that they had the right to exit the survey at any time, without consequence.

However, participants were also made aware that once surveys were completed, there were no means of deleting or withdrawing responses due the anonymous nature of the responses. Consent was then further implied by the completion and submission of the survey.

These consent disclaimers stated that the study was about sexual health services and sexual health care needs and explained that survey results would be used to better inform and to 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 proposed study results were used to inform and improve health services offered on Maritime university campuses for a subpopulation of undergraduate students, i.e. bisexual women a population who were often marginalized due to their sexual orientation. Therefore, while the study was clearly distinct from the original study, it was felt that the purpose and intended use of survey data were closely aligned with the purpose in which participants consented to.

There were no direct benefits and were no foreseen risks to participants' health or life circumstances in the design of the original and the current study. However, it was noted that certain questions pertaining to sexual health, sexual risk taking, sexual abuse, and substance abuse had the potential to cause discomfort among participants. Participants were reassured that any questions on the survey instrument that made them uncomfortable could be skipped with no repercussions. Extra caution was also taken to ensure the current study did not place any unintended stigma or discrimination on the bisexual female population of the Maritime Provinces. No form of deception or abuse of power was used to obtain data during the *Maritime Undergraduate Sexual Health*

Services Survey 2012. However, modest incentives in the form of a draw were used to encourage participation.

Additionally, neither I, nor any member of my research committee had any conflicts of interest in the outcomes of this study, as presented and discussed in the following chapters.

Chapter Four: Results

The overall goal of this thesis research was to examine, determine, and describe the predictors of both self-rated health and health service use for the bisexual female undergraduate students from eight Maritime universities, using data collected during the *Maritime Undergraduate Sexual Health Services Survey 2012*. Additionally, this research aimed to determine whether bisexual women's use of health services differed from their female peers and to understand the relationship between self-rated health and health service use for this population. The following analyses were conducted using the statistical software program, IBM Statistical Package for Social Sciences (SPSS) version 22.

Bisexual Female Undergraduate Student Demographics

The study sample consisted of 357 participants, with the majority of participants reporting a Caucasian ethnicity (82.4%) and falling within the age range of 18 to 25 years old (87.4%) with a mean age of 21($SD = 3.8$). The sample was evenly dispersed among different years of undergraduate studies, with a small majority of participants being in their first year (28.6%). Half of the bisexual female students had reported perceiving their family's wealth as average (50.1%), while just over a quarter reported perceiving their family's wealth as below average (31.7%). Living with a roommate was the most common living arrangement among this sample of bisexual undergraduate students (39.2%), this was followed by living with a romantic partner (21.3%), living with parent(s) (20.2%) and the least common living arrangement, living alone (18.9%).

Health and Health Behaviours

In regards to the health and health behaviours, binge drinking alcohol at least once a month was a common occurrence among the bisexual female sample with 62.7% 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 the survey. This was higher than predicted during the power analysis in Chapter Three. Marijuana use was less common, with 35.7% of the sample reporting any use in the past 30 days. The Center for Epidemiological Studies Depression Scale - 12 (CES-D12) scores indicated that 32.2% of bisexual undergraduate students had elevated risk for depression, while 18.8% had very elevated risk for depression. However, scores from the Sense of Support Scale (SSS) indicated that bisexual undergraduate students had just above median social support, with scores ranging from 17 to 82 out of a possible 84 ($M = 55.9$, $SD = 12.6$). Among the sample population, 48 bisexual female undergraduate students (13.6%) reported having experienced sexual victimization in the form of forced sex since being in university; four participants did not respond to this question. Survey participants were also asked whether they had been diagnosed by a health care professional with a sexually transmitted infection (STI) ever in their lifetime. This survey item attained a low response rate, with only 39.2% of participants providing a response. Among those who did respond, 15.7% reported that they had been diagnosed with an STI in the past. However, among the entire sample population, 6.2% reported an STI diagnosis.

Lastly, when asked to rate their health on the five-point global health scale, 89.6% (n = 320) of the bisexual female undergraduate student population reported good self-rated health (excellent, very good, or good), while only 10.4% (n = 37) rated their health as poor (fair or poor), lower than predicted in Chapter Three. In regards to the bisexual

female population's use of health services, 43.6% (n = 154) of the bisexual female undergraduate student population reported having accessed the health services on their university campus. Please see Appendix E for a detailed table of the descriptive statistical findings.

Logistic Regression

Contingency tables were reviewed to ensure that the observed frequencies for each variable of interest were adequate prior to beginning the logistic regression phase of the statistical analyses. Field (2012) recommends that each cell should have an expected frequency of no less than five cases. A contingency table for self-rated health revealed that three independent variables did not meet the frequency requirement: ethnicity, STI history, and year of program. (See Appendix F). To address these issues, STI risk was removed as a predictor variable (Field, 2012) and year of program was analyzed as a linear (continuous) variable rather than as a categorical variable. However, ethnicity remained as a categorical variable, as discussed in Chapter Three. Additionally, a contingency table for health service use showed adequate frequencies for each cell except one; only 4.4 cases were expected for Aboriginal ethnicity and having accessed health services (See Appendix G). Again, ethnicity remained as a nominal categorical variable during the analyses. It was also noted that two variables, sense of support scores and age in years, had cell frequencies of less than five for both self-rated health and health service use; however, 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. These unadjusted models were used to determine which variables were potential predictors of each of the outcome variables and therefore, determined which variables it was appropriate to include in the multivariable logistic regression models (Bursac, Gauss, Williams, & Hosmer, 2008).

The unadjusted univariable logistic regression models showed that depression risk and sense of support were the only two potential predictors of self-rated health. As well, the unadjusted univariable logistic regression model showed that ethnicity, year of study, living arrangement, and sexual victimization in the form of forced sex were the only potential predictors of health service use (Tables 4.1 and 4.2). Both models were run with a significance level of $p < .05$.

Table 4.1 *Unadjusted univariable logistic regression results for self-rated health*

Independent variable	N	Odds ratio Exp(B)	95% Confidence interval	P Value
Age (per year)	357	1.01	.918, 1.10	.906
Ethnicity		-	-	.996
Caucasian	294	1.00	-	-
Aboriginal	10	1.14	.140, 9.27	.904
Asian[a]	21	∞	-	.998
Other[b]	13	1.52	.191, 12.05	.693
Multiracial	19	1.08	.238, 4.86	.925
Year of program (per year)	357	1.11	.849, 1.46	.439
Living arrangement		-	-	.375
With roommate	140	1.00	-	-
Lives alone	67	.567	.213, 1.51	.257
With parent(s)	72	.714	.260, 1.96	.514
With partner	76	.455	.184, 1.125	.088
Family wealth		-	-	.230
Average	179	1.00	-	-
Wealthy	65	.703	.270, 1.83	.470
Not wealthy	113	.514	.241, 1.10	.086

Independent variable	N	Odds ratio Exp(B)	95% Confidence interval	P Value
Health service use				
No	199	1.00	-	-
Yes	154	1.49	.731, 3.03	.273
Binge drinking				
No	133	1.00	-	-
Yes	224	1.50	.753, 2.97	.250
Marijuana use				
No	229	1.00	-	-
Yes	127	1.35	.644, 2.83	.427
Forced sex				
No	305	1.00	-	-
Yes	48	.639	.264, 1.55	.322
Depression risk		-	-	.001*
Minimal risk	175	1.00	-	-
Elevated risk	115	.346	.140, .853	.021*
Very elevated risk	67	.166	.067, .414	.000*
Sense of support (per unit change)	357	1.06	1.03, 1.09	.000*

Note: *Italics* indicate reference category. *Indicates significant *p* value <.05. [a]No Asian participants reported poor self-rated health. [b]Other includes participants who reported their ethnicity as African, Middle Eastern, and other.

Table 4.2 *Unadjusted univariable logistic regression results for health service use*

Independent variable	N	Odds ratio Exp(B)	95% Confidence interval	P Value
Age (per year)	353	.993	.938, 1.05	.804
Ethnicity		-	-	.033*
Caucasian	291	1.00	-	-
Aboriginal	10	.482	.122, 1.90	.297
Asian	21	.187	.054, .650	.008*
Other[a]	12	1.12	.354, 3.57	.843
Multiracial	19	.401	.141, 1.14	.087
Year of study (per year)	353	1.72	1.44, 2.06	.000*
Living arrangement		-	-	.000*
With roommate	139	1.00	-	-
Alone	67	.779	.434, 1.40	.401
With parent(s)	70	.206	.104, .410	.000*
With partner	75	.791	.451, 1.389	.414

Independent variable	N	Odds ratio Exp(B)	95% Confidence interval	P Value
Family wealth		-	-	.505
Average	176	1.00	-	-
Wealthy	65	1.25	.705, 2.21	.448
Not wealthy	112	.864	.534, 1.40	.550
Self-rated health				
Poor health	37	1.00	-	-
Good health	316	1.49	.731, 3.03	.273
Binge drinking				
No	132	1.00	-	-
Yes	221	1.53	.987, 2.38	.057
Marijuana use				
No	226	1.00	-	-
Yes	126	.994	.640, 1.54	.978
Forced sex				
No	305	1.00	-	-
Yes	48	3.00	1.58, 5.70	.001*
Depression risk		-	-	.582
Minimal risk	174	1.00	-	-
Elevated risk	112	1.04	.642, 1.68	.880
Very elevated risk	67	1.34	.763, 2.36	.307
Sense of support (per unit change)	353	1.01	.989, 1.02	.475

Note: *Italics* indicate variable reference group. *Indicates significant *p* value <.05. ªOther includes participants who reported their ethnicity as African, Middle Eastern, and other.

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, 2012).

Self-rated health. The multivariable logistic regression model for self-rated health revealed that sense of social support was the most significant predictor of self-rated health among the bisexual female undergraduate student population from the Maritime

Provinces (Table 4.3). Results showed that bisexual women were more likely to rate their health as good (OR 1.04, 95% CI [1.01, 1.06], $p = .013$) with each unit increase in their SSS score. Additionally, the model revealed that the odds of bisexual women rating their health as good was lower (OR .303, 95% CI [.109, .845], $p = .023$) for those who, according to their CES-D12 scores, had very elevated depression risk (Poulin, Hand, & Brock, 2005). See Figures 4.1 and 4.2 for frequencies of self-rated health among the bisexual female population based on their depression risk and social support.

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 (depression risk and social support) improved the fit of the model relative to a baseline model with no predictor variables (Field, 2012). The Hosmer-Lemeshow goodness-of-fit test revealed a nonsignificant chi-square statistic ($p > .05$); indicating failure to detect inadequacy of the model.

Table 4.3 *Final multivariable logistic regression results for self-rated health*

Independent variable	Odds ratio Exp(B)	95% Confidence interval	P Value
Depression risk	-	-	.073
Minimal risk	1.00	-	-
Elevated risk	.465	.182, 1.18	.108
Very elevated risk	.303	.109, .845	.023*
Sense of support	1.04	1.01, 1.06	.013*
Omnibus Test of Model Coefficients	$X^2 = 22.62$	df = 3	$p = .000$
Hosmer-Lemeshow Test of Model Adequacy	$X^2 = 5.35$	df = 8	$p = .720$

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

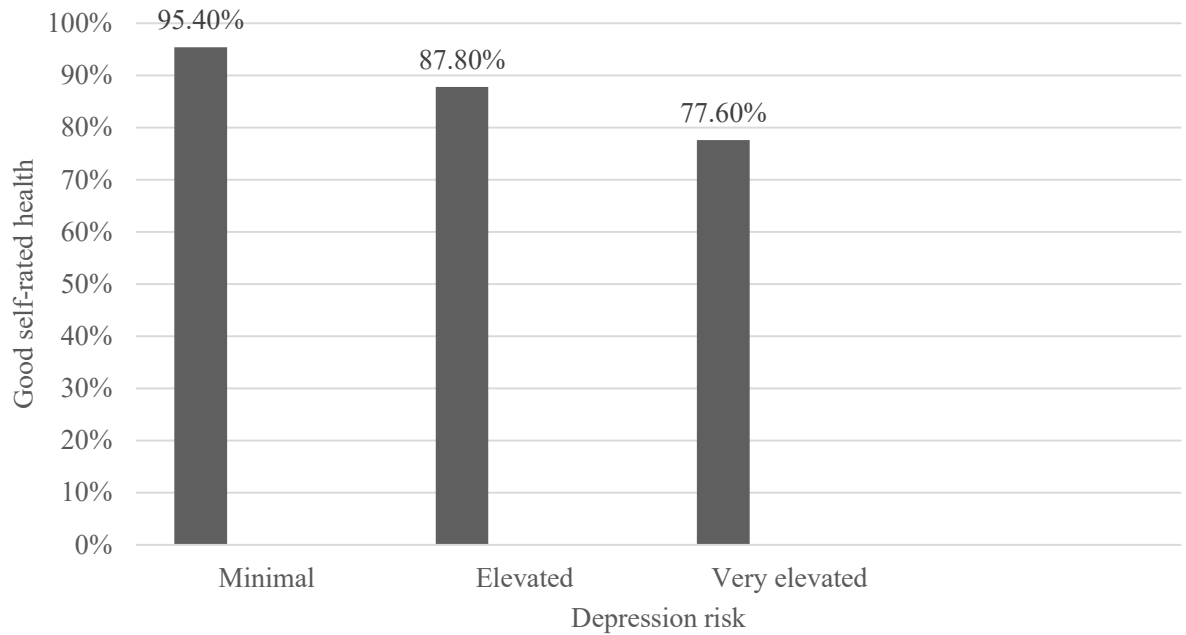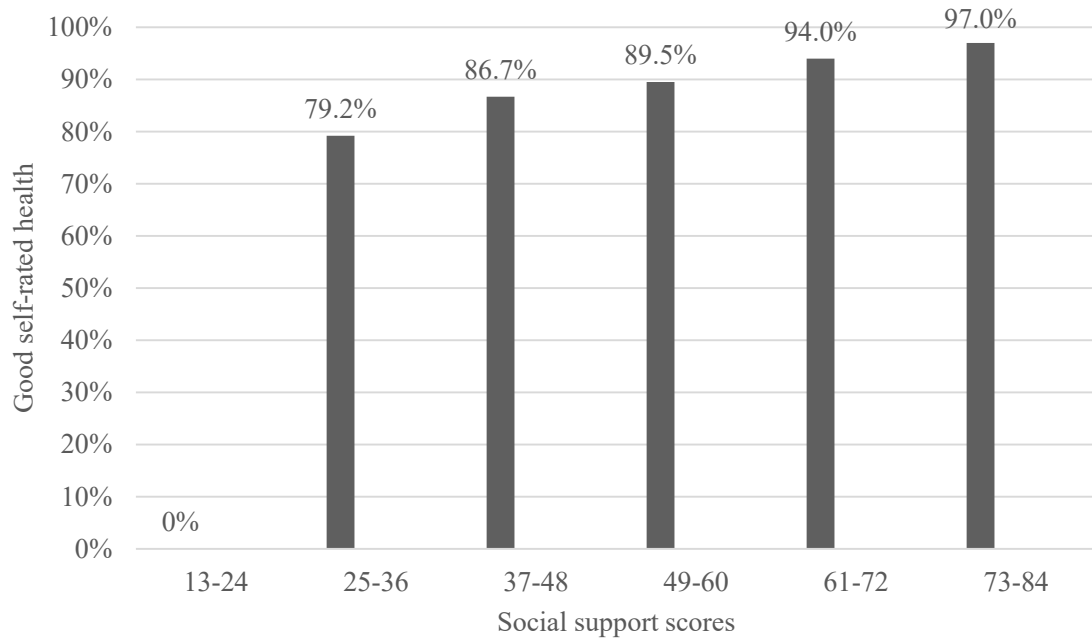Figure 4.1 *Percentage of undergraduate bisexual women with good self-rated health by depression risk*

Figure 4.2 *Percentage of undergraduate bisexual women with good self-rated health by social support score*

Health service use. As discussed in Chapter Three, ethnicity and year of undergraduate program were identified as having potential confounding effects on health service use. Therefore, because these variables were found to have a significant association with health service use during the univariable logistic regression models, the final multivariable logistic regression model was adjusted for ethnicity and year of undergraduate program. Results showed that among the different ethnic groups, having an Asian ethnicity was significantly associated with not accessing university health services ($p < .05$) with a prevalence difference of 71.4% (see Table 4.4). Moreover, bisexual women who reported an aboriginal ethnicity and bisexual women who reported a multiracial ethnicity both had prevalence differences of over 40% in their use and non-use of health services. However, it was likely due to small cell sizes that these difference were undetectable during the logistic regression analyses.

In regards to year of study and bisexual undergraduate students' use of university health services, a linear relationship between the two variables clearly exists (see Table 4.4). With each increase in year of study, the prevalence of having accessed the university health services increased and the prevalence of not having accessed the university health services decreased. This is with the exception of fourth year, where there appears to be a plateau and slight decrease in university health service use by just 2%. This finding offers support for the decision to measure year of study as a continuous variable.

Table 4.4 *Health service use by confounding variables ethnicity and year of study*

Confounding variable	Accessed university health services n (%)	Did not access university health services n (%)
Ethnicity		
Caucasian	137(47.1)	154(52.9)
Aboriginal	3(30.0)	7(70.0)
Asian	3(14.3)	18(85.7)
Other[a]	6(50)	6(50.0)
Multiracial	5(26.3)	14(73.7)
Year of study		
First	18(17.8)	83(82.2)
Second	40(43.5)	52(56.5)
Third	43(59.7)	29(40.3)
Fourth	34(57.6)	25 (42.4)
Other	19(65.5)	10 (34.5)

Note: [a]Other includes participants who reported their ethnicity as African, Middle Eastern, and other.

Furthermore, findings from the multivariable logistic regression model revealed that the odds of bisexual women having accessed the health services on their campus were lower (OR .217, 95% CI [.105, .451], p = .000) for those who lived with their parent(s) at the time of the survey (See Table 4.5). However, the model also revealed that having experienced sexual victimization in the form of forced sex more than doubled the odds of bisexual women accessing their university health services (OR 2.23, 95% CI [1.10, 4.53], p = .026). See Figures 4.3 and 4.4 for bar charts depicting the difference in health service among those bisexual undergraduate students based on living arrangement and sexual victimization.

Again, the Omnibus Tests of Model Coefficients revealed significant model and block chi-square statistics (p < .05), which indicated that the predictor variables (living with parent(s) and sexual victimization) improved the fit of the model relative to a baseline model with no predictor variables (Field, 2012). However, the Hosmer and

Lemeshow goodness-of-fit test did reveal a significant chi-square statistic ($p < .05$) (Field, 2012). Indicating that inadequacy of the model was detected.

Table 4.5 *Final multivariable logistic regression for health service use*

Independent variable	Odds ratio Exp(B)	95% Confidence interval	P Value
Living arrangement	-	-	.001*
With roommate	1.00	-	-
Alone	.751	.394, 1.43	.384
With parent(s)	.217	.105, .451	.000*
With partner	.547	.294, 1.02	.057
Forced sex	2.23	1.10, 4.53	.026*
Omnibus Test of Model Coefficients	$X^2 = 74.80$	df = 9	$p = .000*$
Hosmer-Lemeshow Test of Model Adequacy	$X^2 = 17.32$	df = 7	$p = .015$

Note: Adjusted for ethnicity and year of study. *Italics* indicate reference category. *Indicates significant p value <.05

Figure 4.3 *Percentage of undergraduate bisexual women accessing university health service use by living arrangement*
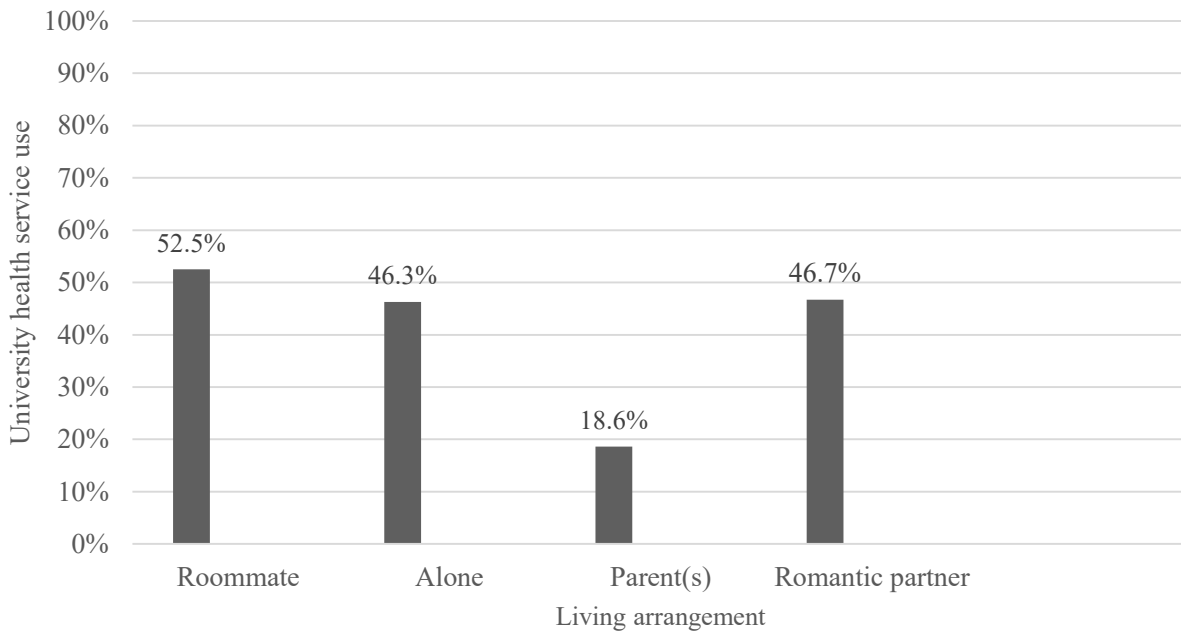
Figure 4.4 *Percentage of undergraduate bisexual women accessing university health services by sexual victimization since beginning university*
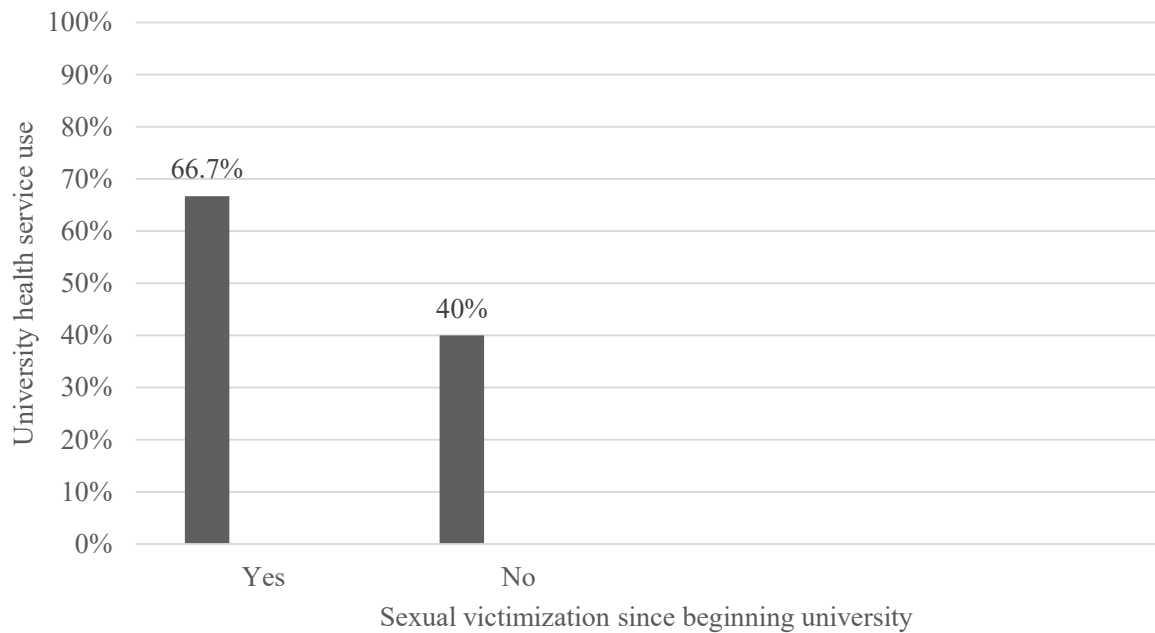
Health service use based on need. The original research question aimed to compare bisexual female undergraduate students' health service use with heterosexual and lesbian undergraduate students' health service use based on similar need, i.e. poor health. However, a contingency table revealed that the expected frequency cell counts for the lesbian sample were not adequate (Table 4.6) and therefore, the lesbian female population was not included in the analysis (Field, 2012). Consequently, comparisons of health service use based on need could only be made between heterosexual and bisexual females. It is important to note that this research did not intend to create a dichotomy perpetuating heterosexual women as the "norm". This decision was made in response to the statistical limitations of including such a small sample.

Table 4.6 *Contingency table for health service use by sexual orientation and poor health*

Sexual Orientation	*Observed cell counts for health service use*		*Total*
	No access of health services	*Accessed health services*	
Bisexual	24	13	37
% within sexual orientation	64.9%	35.1%	100%
Heterosexual	103	90	193
% within sexual orientation	53.4%	46.6%	100%
Lesbian	**1**	**3**	**4.0**
% within sexual orientation	25%	75%	100%
Total	128	106	230

Furthermore, the heterosexual undergraduate students were the reference group and the model was adjusted for ethnicity, year of study, living arrangement, and sexual victimization. These variables were selected due the fact that they were identified as significant predictors of health service use for bisexual women and were identified as potential predictors of health service use for heterosexual women. As well, these variables were selected based on the theoretical impact each one has on accessing health services for women.

Using a forced entry method, the logistic regression model showed that being a bisexual woman was a significant predictor of health service use. However, in comparison to heterosexual women with poor self-rated health, bisexual women with poor self-rated health were significantly *less* likely to access the health services on their university campus (OR .373, 95% CI [.149, .933], $p = .035$).

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 (sexual orientation) improved the model from the

baseline model with no predictor variables (Field, 2012). Again, the Hosmer-Lemeshow

goodness-of-fit test also revealed a nonsignificant chi-square statistic ($p > .05$), indicating

failure to detect inadequacy of the model. See Table 4.6 for detailed logistic regression

results and Figure 4.5 for a bar chart depicting the heath service use of heterosexual and

bisexual women with poor self-rated health.

Table 4.7 *Multivariable logistic regression for university health service use by sexual orientation and poor self-rated health*

Independent variable	Odds ratio Exp(B)	95% Confidence interval	P Value
Sexual Orientation			
Heterosexual women	1.00	-	-
Bisexual women	.373	.149, .933	.035*
Omnibus Test of Model Coefficients	$X^2 = 63.84$	df = 10	$p = .000$*
Hosmer-Lemeshow Test of Model Adequacy	$X^2 = 4.01$	df = 8	$p = .856$

Note: Adjusted for ethnicity, year of study, living arrangement, and sexual victimization. *Italics* indicate reference category. *Indicates significant p value <.05.

Figure 4.5 *Percentage of undergraduate women accessing health services by sexual orientation and poor self-rated health*
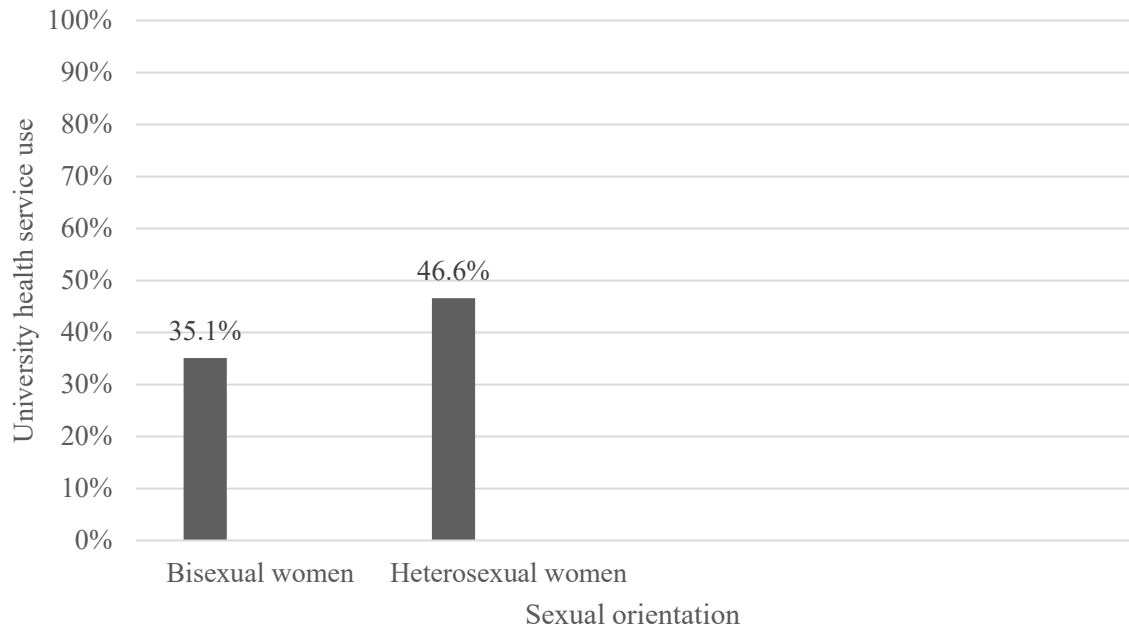
In summary, these results have revealed important information about bisexual female undergraduate students from the Maritime provinces' health. The findings have shown that this population reports higher rates of poor health than the general female undergraduate population in the Maritimes. As well, these results have further indicated that this population may in fact, have lower reported rates and decreased odds of accessing health services when compared with heterosexual female peers with similarly perceived health status. Additionally, the results of this study have revealed that the most significant predictors for self-rated health among bisexual undergraduate students are depression risk and social support, and the most significant predictors for university health service use are living arrangement and sexual victimization.

The following chapter will delve deeper into a discussion of these results, highlighting not only the statistically significant findings of this research, but the

clinically significant findings as they align with past research and the Prince Edward

Island Conceptual Model for Nursing.

Chapter Five: Discussion

The purpose of this study was to explore and predict the self-rated health and health service use of the bisexual female undergraduate student population in eight universities throughout the Maritime Provinces. Guided by the Prince Edward Island (PEI) Conceptual Model for Nursing, this research study aimed to explore key demographic, behavioral, and psychosocial predictors of self-rated health and health service use among the bisexual female undergraduate population from the Maritime provinces' universities. As well, this study aimed to determine the similarities and differences in health service use among this population in comparison to their heterosexual counterparts with similarly perceived health.

The following chapter provides a critical interpretation of the research findings in relation to known literature about bisexual women's health. The bisexual female undergraduate student sample is first described and compared to past study samples of a similar demographic population. This will be followed by a discussion of the significant predictors for, and the relationship between self-rated health and health service use. This chapter will then conclude with study strengths and limitation, suggestions and recommendations for nursing practice as supported by the PEI Conceptual Model for Nursing, and future research implications.

Bisexual Female Undergraduate Student Sample

The study sample was comprised of 357 participants, with the majority being of Caucasian ethnicity, between the ages of 18 to 25 years old, and in their first year of undergraduate studies. This developmental period is known as emerging adulthood (Arnett, 2000) and is the typical age group of most post-secondary education students in

Canada (Public Health Agency of Canada [PHAC], 2011b). These demographics are comparable with the majority of past research conducted in the United States (US) with undergraduate bisexual female students (Kerr, Ding, Burke, & Ott-Walter, 2015; Kerr, Ding, & Thompson, 2013; Kerr, Santurri, & Peters, 2013; Lindley, Barnett, Brandt, Hardin, & Burcin, 2008; Stover, Hare, & Johnson, 2014).

With respect to sample size, the bisexual female undergraduate population in this study made up 4.9% of the total undergraduate female sample from the *Maritime Undergraduate Sexual Health Services Survey 2012* (n = 7, 178)*,* including those who identified as heterosexual, lesbian, bisexual, mostly heterosexual, mostly homosexual, and unsure. This is a slightly larger representation of bisexual women than in past American based research, as bisexual female undergraduate participants in theses studies generally made up 3% to 4% of the total female sample populations which typically only included those who identified as heterosexual, lesbian, and bisexual (Kerr, Ding et al., 2013; Kerr et al., 2015; Kerr, Santurri et al., 2013; Klein & Dudley, 2014; Lindley et al., 2008; Martin et al., 2011).

Despite the difference in sample sizes, these studies were quite similar to the current study. For example, they were all convenience samples, used the self-identification measure of sexual orientation, and were mainly conducted anonymously online (Kerr, Ding et al., 2013; Kerr et al., 2015; Kerr, Santurri et al., 2013; Klein & Dudley, 2014; Lindley et al., 2008; Martin et al., 2011). Therefore, the larger representation of bisexual female undergraduate students in the current study may be a reflection of the sociopolitical and demographic differences between the US and Canada. Unlike Canada, many of US states still do not have laws in place to protect LGBQ people against discrimination (Human Rights Campaign, 2014). The majority of the mentioned

studies were secondary analyses of larger surveys conducted between 2006 and 2009, so the bisexual female American undergraduate students may not have disclosed their sexual orientation for fear of being "outed" and discriminated against by current or future employers, landlords, professors, etc. (Human Rights Campaign, 2014; Witeck, 2014).

Self-Rated Health

This is one of the first studies using Canadian data to address bisexual female undergraduate students' self-reported health status and one of only a few to explore the self-rated health of Canadian bisexual women in general (Steele, Ross, Dobinson, Veldhuizen & Tinmouth, 2009; Tjepkema, 2008). Health is a complex process that encompasses physical, mental, and social well-being, as well as the socio-political environment (Canadian Nurses Association, 2007; Munro et al., 2000). Study analysis showed higher percentages of "good" 89.6% (n = 320) rather than "poor" 10.4% (n = 37) self-rated health among the study population, although the latter was still double that of the total female undergraduate sample (5.3%) (Steenbeek & Langille, 2012). In addition, the percentage of "poor" self-rated health among the study population was double that of an American sample of female undergraduate students (N = 2, 000), where just 4.3% reported their health was "poor" during a random digit dial telephone interview (Zinzow et al., 2011).

There are currently no other studies that have measured the self-rated health of young bisexual women, as such it is difficult to determine how representative the current study findings are. Tjepkema's (2008) secondary analysis of Canadian Community Health Surveys (CCHS) data from 2003 and 2005 (N = 268, 5200) showed that an adult sample of bisexual women (aged 18 to 59) reported even higher rates of "poor" health

(16.2%) and lower rates of "good" health (83.8%) than the current study population. Although the reported rates of self-rated health are quite different among Tjepkema's (2008) adult bisexual population and the undergraduate population from the current study, it is possible that the adult population had greater health issues related to the general decline in health that occurs with advancing age (Statistics Canada, 2010).

The current study findings indicate that the undergraduate bisexual female population in the Maritime provinces may perceive their health poorer than the average female undergraduate student population, which further supports the need to identify predictors of self-rated health among this population.

Predictors of self-rated health. Multiple demographic, behavioural, and psychosocial variables were analyzed as potential predictors of self-rated health for the bisexual female population in the Maritime Provinces. Of these variables, only perceived social support and depression risk reached statistical significance ($p < .05$).

Social support. Perceived social support was measured using Dolbier and Steinhardt (2000) Sense of Support Scale (SSS) and was the most significant predictor of self-rated health (OR 1.04, 95% CI [1.01, 1.06], $p = .013$). Although no available literature has looked at social support as a predictor of bisexual women's health, this finding was supported by past research indicating that social support improves mental and physical health (Friedman & Morgan, 2009; Needham & Austin, 2010; Ryan, Russell, Huebner, Diaz, & Sanchez, 2010), and can decrease negative health effects related to adverse life situations (Public Health Agency of Canada [PHAC], 2011a).

This finding was also supported by past research which found peer support could improve adjustment during transitory life events, such as beginning university (Friedlander, Reid, Shupak, & Cribbie, 2007). Researchers have found that social support

can promote positive coping mechanisms and enhance health information sharing among

LGBQ individuals, e.g. sharing information about local queer friendly health services

(Mulligan & Heath, 2007; Ueno, 2005). Additionally, research has led us to understand

that social interactions can influence the way a person perceives their self and their

wellbeing (Meyer, 2003). As such, social support 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 bisexual women, research has shown that social support is harder to come by.

The descriptive findings of the current study have shown that the mean SSS score

reported by bisexual female undergraduate students was 55.9, while past research using

the same dataset found that the mean SSS score for all undergraduate women (N = 6, 939)

was 59.4 (McDougall, 2014). Although this difference is not great, research does show

that bisexual women report feeling marginalized and unwelcomed in LGBQ spaces and at

times, falsely identify as lesbian to avoid such isolation and belong to a supportive

community (Borver, Gurevich, & Mathieson, 2001; Bostwick & Hequembourg, 2014;

Ross, Dobinson, & Eady, 2010). Interestingly, an American study (N = 470) with self-

identified bisexual women revealed that women who had a female partner at the time of

the study were less likely to report depressive symptoms and had decreased odds of binge

drinking than women who had a male partner (Molina et al., 2015). Bisexual women have

also reported having difficulty meeting other bisexual people due to the invisible nature

of their sexual orientation (Barker, Richards et al., 2012; Bostwick & Hequembourg,

2014). As such, bisexual women are at high risk for lacking adequate social support

(Hughes et al., 2010; McNair et al., 2005; Ross, Dobinson, & Eady, 2010; Saewyc et al.,

2009). This is an important consideration when assessing health needs of bisexual female

undergraduate students in the Maritime provinces 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 bisexual female undergraduate students' self-rated health. More specifically, having *very* elevated depression risk (i.e. a CES-D12 score over 21) decreased the bisexual female undergraduate students' odds of reporting good self-rated health (OR .303, 95% CI [.109, .845], *p* = .023).

Descriptive findings showed that 18.8% of the bisexual female undergraduate population met the CES-D12 criteria for "*very* elevated depression risk" (a score of 21 or over); 32.2% had met the criteria for "elevated depression risk" (a score of 12 to 20), and 49% had "minimal depression risk" (a score under 12). Compared to the total female undergraduate student sample from the original survey, bisexual women had much higher rates of *any* elevated depression risk (51%), as 34.8% of the female participates in the total sample met the CES-D12 criteria for *any* elevated depression risk (score of 12 or over). Similarly, among Nova Scotia female high school students aged 15 to 19 (n = 216), just 36.2% met the CES-D12 criteria for elevated/very elevated depression risk (Langille et al., 2013).

To my knowledge, the CES-D12 has not been employed in any studies with bisexual female undergraduate students, nor has depression risk been assessed as a predictor of self-rated health. However, as discussed throughout Chapters One and Two, bisexual women are known to be at higher risk for mental health issues such as depression (Bostwick, Boyd, Hughes, & McCabe, 2010; Kerr, Santurri et al., 2013; Schauer, Berg, & Bryant, 2013; Steele, Ross, Dobinson, Veldhuizen, & Tinmouth, 2009).

Therefore, it was not surprising that depression risk was a significant predictor of the undergraduate bisexual women's self-rated health in the Maritimes, as this finding is well supported by past research.

A large-scale secondary analysis of data derived from the World Health Organization (WHO) Survey (N = 245, 404) revealed that depression in adults was significantly associated with a decrement in health status (Moussavi et al., 2007). When compared with other chronic illnesses, such as angina, asthma, arthritis, and diabetes, depression had the greatest and most negative impact on health status (Moussavi et al., 2007). Participants with depression had the lowest health statuses among all participants with chronic conditions and those with chronic conditions comorbid with depression had even lower health statuses (Moussavi et al., 2007). However, it is important to note that depression and health status were measured quite differently from the current study. These authors used an algorithm of past year symptoms from the International Classification of Diseases and health status was measured using responses to sixteen health related questions (e.g. vision, mobility, pain, affect, self-care, etc.) and two questions on overall general health perception (Moussavi et al., 2007).

The CES-D12 measures mainly affective symptoms, as well as some somatic symptoms and anhedonia (Poulin, Hand, & Boudreau, 2005). Therefore, because bisexual women also lack adequate social support, i.e. the buffer to psychological harm, they may have more difficulty dealing with their symptoms of depression (Barker, Richards et al., 2012; Bostwick & Hequembourg, 2014; Hughes et al., 2010; McNair et al., 2005; Ross et al., 2010; Saewyc et al., 2009). This combination may have resulted in bisexual female undergraduate students' perceived health being more influenced by these depressive symptoms and the impact the symptoms have on their day-to-day functioning.

University Health Service Use

There is no available research on university health service use among bisexual female undergraduate populations in Canada, let alone the Maritime provinces. As well, there is only a small body of Canadian research which has looked at bisexual women's health service use at all (Mathieson, Bailey, & Gurevich, 2000; Steele et al., 2009; Tjepkema, 2008). Results of the current study showed that among the undergraduate bisexual female population, 43.6% had accessed their university's health service department. Interestingly, this rate was higher than the total female population of the *Maritime Undergraduate Sexual Health Services Survey 2012,* where 39% reported having used their university health services. This finding aligns with Tjepkema's (2008) secondary analysis of data from the CCHS 2003/05 which showed that adult bisexual women reported past year consultations with a general practitioner and/or a nurse at similar or higher rates than heterosexual and lesbian women.

Additionally, the rates of university health service use from the current study were comparable to findings from larger American based studies with undergraduate students. A secondary analysis of data from the American College Health Association National College Health Assessment II (ACHA-NCHA II) survey data showed that 31.5% of bisexual female undergraduate students (n = 2, 456) accessed their university health service departments for mental health counselling (Kerr, Santurri et al., 2013). As well, the bisexual female undergraduate students reported higher rates than their heterosexual and lesbian female peers (14.3%, 29.9% respectively) (Kerr, Santurri et al., 2013). Another secondary analysis of ACHA-NCHA II survey data by Kerr, Ding, and colleague (2013) (N = 63, 044) revealed higher rates of health service use than were reported in the current study. The authors found that 58% of bisexual female undergraduate students

accessed health services; however, these reports were specific to routine gynecological exams and not specific to health services on campus. Nonetheless, the bisexual women's rate of health service use was also higher than those reported by their heterosexual and lesbian female peers (52.6%, 39.9% respectively) (Kerr, Ding et al., 2013). Further analysis comparing bisexual and heterosexual female undergraduate students' health contradicted this finding and will be discussed at a later point in this chapter.

Predictors of university health service use. As mentioned, no research has looked at predictors of health service use among bisexual female undergraduate student prior to this one. Hypotheses have been drawn by past researchers, that undergraduate bisexual women's higher rates of health service use were related to their increased health needs, i.e. the bisexual female students reported poorer mental health status and higher rates of sexual risk taking behaviours (Kerr, Ding et al., 2013; Kerr, Santurri et al., 2013). 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 currently smoking were all significantly ($p < .001$) correlated with the use of physician provided health services (Vingilis, Wade, & Seeley, 2007). Additionally, reporting good self-rated health, being physically active, and binge drinking were negatively and significantly correlated with the use of physician health services ($p < .001$) (Vingilis et al., 2007).

Among the bisexual female undergraduate student sample in the current study, sexual victimization and living with parent(s) were found to be the most significant predictors of university health service use. However, due to the lack of available literature

on the topic, it is difficult to say for certain how reflective these findings are of the

Maritimes' bisexual female undergraduate students.

Living arrangement. Living with parents significantly decreased the odds of

bisexual undergraduate students accessing the university health services after adjusting

the model for ethnicity and year of study (OR .217, 95% CI [.105, .451], p =.000). Living

with parents was the second least common living arrangement reported by bisexual

women, as just 20.3% reported living with one or more parent(s) compared to 39.4%

reporting living with a roommate, 21.4% reporting living with a romantic partner, and

18.9% reporting living alone. The number of bisexual female undergraduate students who

reported living with their parent(s) in the current study was higher than reported in past

American research where 12.3% to 14.1% of bisexual female undergraduate students

reported living with a parent/guardian (Kerr et al., 2015; Kerr, Santurri et al., 2013).

This may have also been the first study to include living arrangement as a

predictor variable of health service use for any undergraduate population. Due to the

design of the study, it was not possible to determine a cause and effect. However, it is

quite plausible that undergraduate students who lived with their parent(s) during the

survey had access to their family's health care provider and thus, had no reason to access

the health services 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). As well,

university students who live in a traditional campus residence setting are more likely to

binge drink than those in substance free housing (Adlaf, Demers, & Gilksman, 2005;

Boyd, McCabe, & d'Arcy, 2004). Therefore, bisexual women who were living with their

parent(s) at the time of the survey may have had less need for university health services. However, these past research findings were not stratified by sexual orientation or gender and therefore, may not be generalizable to young bisexual women.

Sexual victimization. Having experienced sexual victimization in the form of "forced sex" since beginning university was also a significant predictor of university health service use (OR 2.23, 95% CI [1.10, 4.53], p = .026). Descriptive statistics showed that 13.6% of the bisexual female undergraduate students reported having experienced forced sex since starting university, which was more than double the 6.2% reported by the total female undergraduate sample from the same survey. This finding aligns well with past research. Martin, Fisher, Warner, Krebs, and Lindquist's (2011) American based study on sexual victimization among female undergraduate students (N = 5, 439) revealed that 24% of bisexual female participants had experienced sexual victimization during university, while lesbian and heterosexual female students had much lower rates in comparison (17.9%, 13.3% respectively). Notably, these reports of sexual victimization were considerably higher than those reported during the *Maritime Undergraduate Sexual Health Service Survey 2012.* This is understandable, as Martin and colleagues (2011) defined sexual assault as "non-consensual or unwanted sexual contact" and provided specific examples, while Steenbeek and Langille (2012) used the phrase "forced sex". As such, the current research findings are also dependent on how the bisexual female participants perceived their experience of forced sex, i.e. their level of understanding of what constitutes forced sex. Additionally, many people are reluctant to disclose such information; therefore, the reported rates of sexual victimization among the bisexual female undergraduate population may be an underestimation.

No prior research has been found that included sexual victimization as a predictor of health service use; however, there is available literature to support the predictive relationship between sexual victimization and university health service use. It is common knowledge that medical assistance, such as forensic examinations and psychological counselling are generally needed after experiencing sexual victimization (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002; Long, Ullman, Long, Mason, & Starzynski, 2007). As well, sexual victimization can also result in long term health issues, such as decreased sexual pleasure, sexually transmitted infections, urinary tract infections, other gynecological issues (e.g. fibroids, pain), unwanted pregnancy, social marginalization (Krug et al., 2002), post traumatic stress disorder along with other mental illnesses (Long et al., 2007). Therefore, it is quite likely that women who have experienced forced sex, or any other form of sexual victimization, would have needed to access health services at some point following their experience.

This postulation is further supported by research. A study with female students at an American university found that of the women who reported a sexual assault in that academic year (n = 90), 22% sought out help from services offered on campus (12% reporting health service use and 8% reporting psychological service use) (Nasta et al., 2005). In addition to this, bisexual women have been found more likely to seek out formal mental health support following a sexual assault than lesbian and heterosexual women (Long et al., 2007). However, research also shows that bisexual women experience more negative reactions following assault disclosure (Long et al., 2007; Sigurvinsdottir & Ullman, 2016), which may lead to poorer recovery (e.g. alcohol and drug use, post-traumatic stress disorder, etc.) and thus more need for health services.

Relationship Between Self-Rated Health and University Health Service Use

To determine the relationship between self-rated health and university health service use, an objective of the current study, self-rated health was included as a potential predictor of university health service use and 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 discern 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 had impacted the participants' perceived health status at the time of the survey participation (Sutton, Carr-Hill, Gravelle, & Rice, 1999), as the bisexual female undergraduate students may have been influenced by external, internal, and socio-political factors between the two time periods (Munro et al., 2000).

A final logistic regression model was employed to answer the last research question: to determine whether university health service use differed and/or could be predicted by sexual orientation when self-rated health was the same among participants. The logistic regression model was adjusted for sexual victimization, ethnicity, year of study, and living arrangement as these were identified as predictors of university health service use, as discussed in Chapter Four. Findings showed that bisexual female undergraduate students with poor self-rated health were significantly less likely than heterosexual female undergraduate students with poor self-rated health to have accessed health services on their university campus (OR .373, 95% CI [.149, .933], $p = .035$). This finding may have highlighted a misconception that bisexual women are more likely to access health services than their heterosexual and lesbian female peers as commonly

reported in past research (Kerr, Ding et al., 2013; Kerr, Santurri, & Peters, 2013), as well as previously indicated in the current study.

One explanation for this finding may be that bisexual female undergraduate students are more likely to access health services outside of their university campus. Research has suggested that bisexual women prefer community health clinics as these services are perceived as more queer friendly (McNair et al., 2011; Mulligan & Heath, 2007). As such, heteronormativity in the university health service departments may have also disinhibited bisexual women from accessing their university health services. Research shows that heteronormativity is still quite evident in health care environments, although generally unintentional, through the availability of only educational materials directed towards heterosexual individuals (Beagan et al., 2012; Stover et al., 2014), the assumption that all individuals are heterosexual unless otherwise disclosed (Stover et al., 2014), and the lack of health care provider knowledge on LGBQ health needs (Carabez, Pellegrini, Mankovitz, Eliason, & Dariotis, 2015; Stover et al., 2014).

Bisexual women may also avoid accessing health services on campus for fear of discrimination, and judgment by health care providers (Mulligan & Heath, 2007; Polonijo & Hollister, 2011). This avoidance may be particularly pertinent for undergraduate students if there is little to no presence of LGBQ symbols in the health care environment (e.g. rainbow flags, Human Rights Campaign equals sign, SafeSpace pink triangles), as qualitative research has found that students use these symbols as indicators to whether or a not a health care environment is safe and inclusive (Stover et al., 2014). Nevertheless, it is outside the scope of this study to speculate whether or not the Maritime universities' health service departments were inclusive or had heteronormative environments at the time of the survey. This is would require retrospective assessments and additional

research and analyses. However, if the majority of bisexual female undergraduate students were accessing health services off campus this may help to explain why there were no associations found between self-rated health and university health service use among the bisexual female undergraduate student sample.

Study Limitations

There are several limitations that should be taken into consideration when interpreting the findings of this study. First, the *Maritime Undergraduate Sexual Health Services Survey 2012* achieved a low response rate of just 21.4%. However, past research using web-based surveys with university student populations have achieved a similarly low response rates, ranging from 20.1% to 44% (Adlaf, Demers, & Gliksman, 2005; Lindley et al., 2008; Martin et al., 2011; Schauer, Berg, Lawrence, & Bryant, 2013). As well, the percentage of female undergraduate students who identified as bisexual in the *Maritime Undergraduate Sexual Health Services Survey 2012,* is actually higher than past research samples.

Additionally, the total bisexual female undergraduate student population was quite small with just n = 357, which ultimately impacted the power of the statistical analyses. As discussed in Chapter Three, the available sample of bisexual female undergraduate students was deemed adequate to power the study (at 78.5%) when differences were of the magnitude of 19% to 20%. However, the proportion of the sample who reported poor health (10%) was smaller than originally predicted (17%). Unfortunately, this likely caused the actual study power to be lower than expected. In light of this limitation, statistically significant results were still obtained indicating that the effect sizes of social

support, depression risk, and forced sex were quite large. Thus, with a larger sample, the current research findings would likely have been even more significant and definitive.

Using secondary data involves additional limitations, as data sets are often lacking in some way (Polit & Beck, 2012). This limitation is quite evident in the current study as the original survey was designed with a general undergraduate student population in mind and recruitment efforts may not have sufficiently reached marginalized undergraduate student subpopulations, such as bisexual women. As well, the survey items were designed and selected with a general undergraduate student population in mind. Therefore, the survey items and responses may not have been able to capture the unique experiences of the Maritimes' bisexual female undergraduate students.

In addition to the limitation related to secondary data use, the study findings may also lack generalizability to the Maritime's population of bisexual female undergraduate students due to the use of convenience sampling and increased risk for sample bias (Pilot & Beck, 2012). The bisexual female undergraduate students who participated in the survey are likely more representative of young bisexual women who are "out" and consequently more comfortable with their sexual identity. This is believed to impact health and health behaviours (Tjepkema, 2008).

For the current study, all data used was derived from participants' self-reported information, which inevitably increased the risk of response bias (Polit & Beck, 2012). In particular, many survey items involved sensitive topics (e.g. substance use, sexual victimization, depression, etc.), which may have elicited some participants to answer questions untruthfully to align better with perceived social values (Polit & Beck, 2012). However, this risk may have been reduced, as 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 poses limitations on the study findings. Self-rated health is a subjective measure of health based on a participants' personal perspective. Therefore, it is difficult to determine which constructs or components of health the bisexual female undergraduate students had reflected on to make their personal health assessments, and whether these constructs were consistent among all participants (Jylha, 2009). Additionally, research has shown that self-assessments of health are made in reference to peers, previous health experiences, and expectations for health: none of which could be determined nor controlled for in the current study (Jylha, 2009). Nevertheless, it is generally understood that self assessments of health are not made haphazardly and provide important information that cannot be elicited from a clinical assessment (Jylha, 2009).

Lastly, the cross-sectional design of the *Maritime Undergraduate Sexual Health Services Survey 2012* poses some limitation to the current research study, as cause and effect relationships were not able to be determined. Therefore, only associations between self-rated health, health service use and the predictor variables could be determined and could only reflect one point in time (Pilot & Beck, 2012).

Future Implications

Regardless of the limitations of this research, this is the first study to address the health status and needs of the bisexual female undergraduate population in the Maritime Provinces. This study brought forward clinically important and statistically significant findings regarding bisexual women's need for social support, their risk of depression, and their history of sexual victimization. As well, this research identified many knowledge gaps and emphasized the need for additional research on bisexual women in Canada.

PEI conceptual model for nursing and clinical implications. The PEI

Conceptual Model has great potential for guiding the practical application of study

findings in nursing practice, as Munro and colleagues (2000) emphasized the importance

of the nurse-client relationship and the principles of primary health care for nursing (i.e.

accessibility, appropriate technology, public participation, health promotion/illness

prevention, and intersectoral collaboration). Based on the findings of this research,

appropriate technology, health promotion/illness prevention, and public participation may

be key principles to guide nursing practice with bisexual female undergraduate students.

Accessibility and appropriate technology. The research findings highlight the

need for Maritime university health care services to be culturally accessible to young

bisexual women, such as through the provision of resources and services designed to

address bisexual women's unique health needs and strengths (Munro et al., 2000). I

recommend that nurses should be provided with more education on bisexual women's

health, as well as the internal, external, and socio-political environmental influences that

can impact their health (e.g. depression risk, sexual victimization, biphobia, and minority

stress). For example, this research has identified that bisexual women may be more likely

to access university health services if they have experienced sexual victimization since

beginning university. Therefore, nurses should be aware of this risk and be assessing for

sexual victimization when bisexual women present in university health service

departments.

I believe this recommendation is timely and has great potential for successful

knowledge translation given the current initiatives to enhance diversity and inclusiveness

on university campuses in the Maritimes (Dalhousie, 2015). In Halifax, Nova Scotia the

committee for Dalhousie University's Strategic Initiative on Diversity and Inclusiveness

has already recommended that that nursing and other health profession programs include curriculum on LGBQ health (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, Eccles, Lavis, Hill, & Squire, 2012). This will help to ensure LGBQ curriculum reflects the unique health needs of bisexual women, thus improving initial training and education for nurses and other health care providers to be better prepared to advocate for and develop partnerships with bisexual women (Munro et al., 2000).

Health promotion/illness prevention with pubic participation. 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 bisexual female undergraduate women attending university in the Maritime Provinces. As social support and depression risk were identified as key predictors of perceived health and forced sex was identified as a key predictor of university health service use, it is recommended that health promotion/illness prevention strategies are developed to target these health issues among bisexual women across all Maritime university campuses.

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 to these personnel in combination with educational outreach (Grimshaw et al., 2012). To be most effective, educational outreach should be done in collaboration with bisexual female students and/or

alumni, whereas the women would present the study findings and recommendations in light of their own experiences. This is crucial to ensure administrators, directors, policy makers, and providers translate this knowledge into practice, as supplementing quantitative research evidence with narrative is known to humanize research evidence, enhance awareness, and improve the uptake and commitment to health promotion/illness prevention recommendations (Stamatakis, McBride, & Brownson, 2010).

The PEI Conceptual Model recognizes that both the 'nurse' and 'client' hold responsibility in the improvement and maintenance of health; therefore, it is imperative that bisexual female undergraduate students are also aware of and educated regarding the research findings (Munro et al., 2000). To ensure that bisexual female undergraduate students in the Maritimes are aware of the research findings, it is recommended that bi-women's health information sessions are developed and delivered in collaboration with bisexual female students and/or alumni and LGBQ support groups across campuses. Collaboration is critical, as messengers of research evidence must be seen as creditable by the target audience (Grimshaw et al., 2012), as well should be sensitive and familiar with the unique needs of the target audience (Barker, Yockney, et al., 2012). These sessions would help to ensure that bisexual female undergraduate students are knowledgeable about their potential health risks and thus, are able to actively participate in promoting their own health and preventing possible illness (Munro et al., 2000).

Based on the findings of this research study, I would recommend that the bi-women's health information sessions focus on the importance of social support and mental wellness. As well, as focus on personal health practices and coping mechanisms, as bisexual female undergraduate student sample were more likely to report binge drinking and marijuana use than the general female undergraduate student sample.

Marijuana use in particular has been identified as a coping mechanism against biphobia and isolation from the LGBQ community among bisexual women in Ontario, Canada (Robinson, 2015). In addition, although sexual victimization is in no fault of the victim, these sessions could educate bisexual women on how the abuse of drugs and alcohol make women more vulnerable to sexual victimization. This is important as research has found a strong association between alcohol, marijuana use, and incapacitated sexual assault among college women (Krebs, Lindquist, Warner, Fisher, & Martin, 2009).

Lastly, it is also recommended that health care providers and policy makers working in university based health service departments encourage the active participation of bisexual women in all aspects of planning, organizing, and implementing health promotion/illness prevention strategies aimed at increasing social support for bisexual women on campus (Munro et al., 2000). This is also the most effective way to ensure the uptake of evidence by those who need it most.

Implications for Future Research. This is one of the first quantitative studies to address the health of bisexual female undergraduate students in Canada. The current research findings aligned closely with a small body of American based literature which has reported bisexual female undergraduate student health have specific health risks, such as high rates of binge drinking, marijuana use, sexual victimization, and depression risk (Kerr, Ding, & Thompson, 2013; Kerr, Santurri, & Peters, 2013; Kerr et al., 2015; Martin et al., 2011). This close alignment with previous and much larger studies, highlight a need for more targeted research on bisexual female populations in Canada and the Maritimes. As well, the alignment with past research highlights the need to continue filling the knowledge gap on young Canadian bisexual women's health and address important topics

that were not included in the current study, such as sexual risk taking and suicidal ideation (Kerr, Ding et al., 2013; Kerr, Santurri et al., 2013).

This study revealed that bisexual women were less likely than heterosexual women with similarly perceived health to access health services on their university campuses. 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 and learn where, how, and why bisexual women access health care services. Additionally, it may be beneficial for future research to assess and determine the "queer-friendliness" of Maritime university health service departments. Lastly, conducting a qualitative research study using the research methodology of feminist poststructuralism would be the ideal way to delve deeper and actually uncover the social and political ideologies and hierarchies that may be impacting bisexual women's health (Weedon, 1997).

Conclusion

In summary, this research has succeeded in its goal to fill the gap in research knowledge on young bisexual women's health and health service use in the Maritime provinces. A review of the literature clearly demonstrated that bisexual women's health is an area of interest that has been dramatically under researched in the past, particularly in Canada. As such, the findings of this research have brought to light demographic and psychosocial factors that impact young bisexual women, their health, and their access to culturally appropriate health care in the Maritime provinces.

This was one of the first studies to measure self-rated health among bisexual female undergraduate students from Maritime universities. Using data from the *Maritime*

Undergraduate Sexual Health Services Survey 2012, this secondary analysis revealed that bisexual female students reported higher than average rates of poor self-rated health, particularly when compared to the results of the original survey among all undergraduate women. Additionally, this is one of the first studies to measure bisexual female undergraduate students use of health services and to compare this use the use of heterosexual women with similarly perceived health. The findings differed from past research, revealing that bisexual women access health services considerably less than heterosexual women 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 social support and very elevated depression risk were most significant factors impacting bisexual female undergraduate students' self-rated health. As well, sexual victimization and living with parents were identified as the most significant factors impacting bisexual female undergraduate students' use of university health services. Bisexual women also reported higher rates of depression risk and sexual victimization than were reported by women during the original survey. These findings have validated that bisexual female undergraduate students in the Maritime provinces are not exempt from the negative effects of biphobia and minority stress, as found in past research with bisexual women and bisexual female undergraduate students 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 bisexual women. The application of the PEI Conceptual Model should provide nurses, administration, 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 the improvement of bisexual women's health by recognizing that these women are a distinct from the rest of the LGBQ community, and by advocating for the specific health concerns of this population.

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Inclusion Criterion Survey Items from the Maritime Undergraduate Sexual Health

Services Survey 2012

11. What is your sex?
   - ☐ Male
   - ☐ Female
   - ☐ Transgender
   - ☐ Other (*describe*) _____

12. People have different feelings about themselves when it comes to questions of being attracted to other people. Which of the following best describes your feelings?
   - ☐ 100% heterosexual
   - ☐ Mostly heterosexual
   - ☐ Bisexual (attracted to both males and females)
   - ☐ Mostly homosexual
   - ☐ 100% homosexual (gay/lesbian, attracted to persons of the same sex)
   - ☐ Not sure

Appendix B

Demographic Survey Items from the Maritime Undergraduate Sexual Health

Services Survey 2012

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 Maritime Undergraduate Sexual Health

Services Survey 2012

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 Maritime Undergraduate Sexual

Health Services 2012

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

27. Have you ever had a sexually transmitted infection (STI) which was diagnosed by a health professional?
- ☐ No
- ☐ Yes (*Specify which STI(s)*)_____

28. Since you have been at university, have you ever been forced to have sex of any type against your will?
- ☐ No
- ☐ Yes

Descriptive Statistics of Variables Included in the Study for Bisexual Female

Population

Bisexual Female Undergraduate Students (n=357)	Frequency (n)	Percent (%)	Mean(SD)
Demographics			
Age	-	-	21(3.8)
17	6	1.7%	-
18	69	19.3%	-
19	60	16.8%	-
20	43	12%	-
21	57	16%	-
22	35	9.8%	-
23	21	5.9%	-
24	16	4.5%	-
25	11	3.1%	-
26	6	1.7%	-
27	6	1.7%	-
28	6	1.7%	-
29	3	0.8%	-
30	3	0.8%	-
31	1	0.3%	-
32	2	0.6%	-
33	1	0.3%	-
34	1	0.3%	-
35	10	2.8%	-
Ethnicity			
Caucasian	294	82.4%	-
Aboriginal	10	2.8%	-
Asian	21	5.9%	-
Other[a]	13	3.6%	-
Multiracial	19	5.3%	-
Year of program			
First	102	28.6%	-
Second	92	25.8%	-
Third	73	20.4%	-
Fourth	60	16.8%	-
Other	30	8.4%	-

Bisexual Female Undergraduate Students (n=357)	Frequency (n)	Percent (%)	Mean(SD)
Living arrangement[b]			
Lives alone	67	18.9%	-
Lives with parent(s)	72	20.3%	-
Lives with romantic partner	76	21.4%	-
Lives with roommate	140	39.4%	-
Family wealth			
Average	179	50.1%	-
Wealthy	65	18.2%	-
Not so wealthy	113	31.7%	-
Survey Items			
Self-rated health			
Poor health	37	10.4%	-
Good health	320	89.6%	-
Health service use[c]			
No	199	56.4%	-
Yes	154	43.6%	-
Binge drinking (past 30 days)			
No binge drinking	133	37.3%	-
Binge drinking	224	62.7%	-
Marijuana use (past 30 days)[d]			
No marijuana use	229	64.3%	-
Marijuana use	127	35.7%	-
Forced sex[e]			
No	305	86.4%	-
Yes	48	13.6%	-
STI history[f]			
No	118	84.3%	-
Yes	22	15.7%	
Depression risk			
Minimal	175	49%	-
Elevated	115	32.2%	-
Very elevated	67	18.8%	-
Sense of support scores	-	-	55.9(12.6)
13-24	3	0.8%	-
25-36	24	6.7%	-
37-48	75	21%	-
49-60	105	29.4%	-
61-72	117	32.8%	-
73-84	33	9.2%	-

Note: [a]Other ethnicities include African, Middle Eastern, and Other. [b]Missing cases (n=2, 0.6%). Valid percentages displayed. [c]Missing cases (n=4, 1.1%). Valid percentages displayed. [d]Missing cases (n=1, 0.3%). Valid percentages displayed. [e]Missing cases (n=4, 1.1%). Valid percentages displayed. [f]Missing cases (n=217, 60.8%). Valid percentages displayed.

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	6	**0%**	100%
18	69	11.6%	88.4%
19	60	10%	90%
20	43	**9.3%**	90.7%
21	57	10.5%	89.5%
22	35	14.3%	85.7%
23	21	**9.5%**	90.5%
24	16	**12.2%**	87.5%
25	11	**0%**	100%
26	6	**0%**	100%
27	6	**16.7%**	83.3%
28	6	**0%**	100%
29	3	66.7%	33.3%
30	3	**0%**	**100%**
31	1	**0%**	**100%**
32	2	**0%**	**100%**
33	1	**0%**	**100%**
34	1	**0%**	**100%**
35	10	**10%**	90%
Ethnicity			
Caucasian	294	11.2%	88.8%
Aboriginal	10	**10%**	90%
Asian	21	**0%**	100%
Other[a]	13	**7.7%**	92.3%
Multiracial	19	**10.5%**	89.5%
Year of program			
First	102	10.8%	89.2%
Second	92	13%	87%
Third	73	9.6%	90.4%
Fourth	60	**6.7%**	93.3%
Other	30	**10%**	90%

Independent variables	Observed cell counts for self-rated health	Percentage with poor self-rated health	Percentage with good self-rated health
Living arrangement			
With roommate	140	7.1%	92.9%
Lives alone	67	11.9%	88.1%
With parent(s)	72	9.7%	90.3%
With partner	76	14.5%	85.5%
Family wealth			
Average	179	7.8%	92.2%
Wealthy	65	10.8%	89.2%
Not wealthy	113	14.2%	85.8%
Health service use			
No	199	12.1%	87.9%
Yes	154	8.4%	91.6%
Binge drinking			
No binge drinking	133	12.8%	87.2%
Binge drinking	224	8.9%	91.1%
Marijuana use			
No marijuana use	229	11.4%	88.6%
Marijuana use	127	8.7%	91.3%
Forced sex			
No	305	9.8%	90.2%
Yes	48	14.6%	85.4%
STI History			
No	118	11%	89%
Yes	22	**9.1%**	90.9%
Depression risk			
Minimal risk	175	4.6%	95.4%
Elevated risk	115	12.2%	87.8%
Very elevated risk	67	22.4%	77.6%
Sense of support scores			
13-24	3	**100%**	**0%**
25-36	24	20.8%	79.2%
37-48	75	13.3%	86.7%
49-60	10	10.5%	89.5%
61-72	117	6%	94%
73-84	33	**3%**	97%

Note: **Bold** indicates observed cell count below 5. [a]Other includes participants who reported their ethnicity as African, Middle Eastern, and other.

Appendix G

Contingency Tables for University Health Service Use

Independent variables	Observed cell counts for university health service use	Percentage did not access health services	Percentage accessed health services
Age			
17	6	**66.7%**	**33.3%**
18	68	75%	25%
19	60	51.7%	48.3%
20	43	53.5%	46.5%
21	57	45.6%	54.4%
22	34	47.1%	52.9%
23	21	47.6%	52.4%
24	15	40%	60%
25	11	63.6%	**36.4%**
26	6	**50%**	**50%**
27	6	**50%**	**50%**
28	6	83.3%	**16.7%**
29	3	**33.3%**	**66.7%**
30	3	**33.3%**	**6.7%**
31	1	**100%**	**0%**
32	2	**0%**	**100%**
33	1	**100%**	**0%**
34	1	**100%**	**0%**
35	9	100%	**0%**
Ethnicity			
Caucasian	291	52.9%	47.1%
Aboriginal	10	70%	**30%**
Asian	21	85.7%	14.3%
Other	12	50%	50%
Multiracial[a]	19	73.7%	26.3%
Year of program			
First	101	82.2%	17.8%
Second	92	56.5%	43.5%
Third	72	40.3%	59.7%
Fourth	59	42.4%	57.6%
Other	29	34.5%	65.5%

Independent variables	Observed cell counts for university health service use	Percentage did not access health services	Percentage accessed health services
Living arrangement			
With roommate	139	47.5%	52.5%
Lives alone	67	53.7%	46.3%
With parent(s)	70	81.4%	18.6%
With partner	75	53.3%	46.7%
Family wealth			
Average	176	56.3%	43.8%
Wealthy	65	50.8%	49.2%
Not wealthy	112	59.8%	40.2%
Self-rated health			
Poor	37	64.9%	35.1%
Good	316	55.4%	44.6%
Binge drinking			
No	132	62.9%	37.1%
Yes	221	52.5%	47.5%
Marijuana use			
No	226	56.2%	43.8%
Yes	126	56.3%	43.7%
Forced sex			
No	305	60%	40%
Yes	16	33.3%	66.7%
STI History			
No	118	55.1%	44.9%
Yes	22	50%	50%
Depression risk			
Minimal risk	174	58%	42%
Elevated risk	112	57.1%	42.9%
Very elevated risk	67	50.7%	49.3%
Sense of support scores			
13-24	3	**33.3%**	**66.7%**
25-36	24	41.7%	58.3%
37-48	74	66.2%	33.8%
49-60	103	61.2%	38.8%
61-72	116	50%	50%
73-84	33	45.5%	54.5%

Note: **Bold** indicates observed cell count below 5. [a]Other includes participants who reported their ethnicity as African, Middle Eastern, and other.