

Use of population-based data to characterize racialized and non-racialized Ontarians  
who self-report a past hysterectomy

by

Meagan Budhwani

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science (MSc) in Nursing

The Faculty of Graduate Studies  
Laurentian University  
Sudbury, Ontario, Canada

© Meagan Budhwani, 2021

**THESIS DEFENCE COMMITTEE/COMITÉ DE SOUTENANCE DE THÈSE**  
**Laurentian Université/Université Laurentienne**  
Faculty of Graduate Studies/Faculté des études supérieures

Title of Thesis Titre de la thèse	Use of population-based data to characterize racialized and non-racialized Ontarians who self-report a past hysterectomy		
Name of Candidate Nom du candidat	Budhwani, Meagan		
Degree Diplôme	Master of Science		
Department/Program Département/Programme	Nursing	Date of Defence Date de la soutenance	May 18, 2021

**APPROVED/APPROUVÉ**

Thesis Examiners/Examineurs de thèse:

Dr. Phyllis Montgomery  
(Supervisor/Directeur(trice) de thèse)

Dr. Sharolyn Mossey  
(Committee member/Membre du comité)

Dr. Parveen Nangia  
(Committee member/Membre du comité)

Dr. Tracy Colella  
(External Examiner/Examineur externe)

Approved for Graduate Studies  
Approuvé pour Études supérieures  
Tammy Eger, PhD  
Vice-President Research (Office of Graduate Studies)  
Vice-rectrice à la recherche (Bureau des études supérieures)  
Laurentian University / Université Laurentienne

**ACCESSIBILITY CLAUSE AND PERMISSION TO USE**

I, **Meagan Budhwani**, hereby grant to Laurentian University and/or its agents the non-exclusive license to archive and make accessible my thesis, dissertation, or project report in whole or in part in all forms of media, now or for the duration of my copyright ownership. I retain all other ownership rights to the copyright of the thesis, dissertation or project report. I also reserve the right to use in future works (such as articles or books) all or part of this thesis, dissertation, or project report. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my thesis work or, in their absence, by the Head of the Department in which my thesis work was done. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that this copy is being made available in this form by the authority of the copyright owner solely for the purpose of private study and research and may not be copied or reproduced except as permitted by the copyright laws without written authority from the copyright owner.

## Abstract

North American researchers report that women who undergo a hysterectomy for benign conditions are threatened by health disparities. Few studies have examined race and health in Ontario women who underwent a past hysterectomy. The purpose of this descriptive correlational study was to describe and compare health features of racialized and non-racialized women. Using the 2011-2012 Canada's Community Health Survey (CCHS) dataset, this study's sample consisted of all Ontario residing female respondents (n = 1,730) who self-reported having had a hysterectomy with no cancer history. Extracted socio-demographic and health-related variables were extracted in accordance with the *Gender and Equity Health Indicator Framework* (Clark & Bierman, 2009). Chi-squares and z-scores were calculated to compare racialized and non-racialized women health indicators. Many of the significant differences were found within the non-medical determinants of health domain. Study implications reinforce the need for aggregated data by race in Ontario to address health equity.

### Keywords:

Hysterectomy, Ontario, women, long-term health indicators

## Acknowledgments

The data analysis and results disseminated in this thesis are based on publicly available data permitted for research projects. The data source is the 2011-2012 Canadian Community Health Survey owned by Statistics Canada. The views and results expressed in this thesis are those of the graduate student and not those of Statistics Canada.

My deepest gratitude goes first to my thesis supervisor, Dr. Phyllis Montgomery, who expertly guided me through my graduate student journey. Her unwavering enthusiasm for nursing research helped guide this project over eight years, despite a myriad of challenges particular to working through the coronavirus pandemic. Her dedication to nursing research and to the academic success of her students is admirable and a true testament to the grit of those in the nursing profession.

My appreciation also extends to Professor Sharolyn Mossey, another exceptional faculty member of Laurentian University's School of Nursing, who was a staple in my thesis committee. Her expertise relevant to nursing linguistics, research semantics, and academic rigor was always warmly and graciously received.

I cannot forget to thank Dr. Parveen Nangia from the Department of Sociology, who not only was a fundamental thesis committee member, but also extended his time and classroom to me as a graduate student to foster my understanding of statistics in healthcare.

Lastly, I need to thank my husband, Karim, who relentlessly provided support as I embarked on this academic journey. The juggling of motherhood, a nursing career, and graduate education would have been nearly impossible without you. I share this achievement with you.

# Table of Contents

Thesis Defence Committee .....	ii
Abstract .....	iii
Acknowledgements .....	iv
Table of Contents .....	v
List of Tables .....	vii
List of Appendices .....	viii
Chapter 1: Introduction .....	1
Chapter 2: Literature Review .....	6
Long-term outcomes .....	6
Pelvic Floor and Organ Prolapse .....	6
Urinary and Bowel Incontinence .....	8
Body Mass Index .....	9
Bone Density .....	10
Cardiovascular Disease .....	11
Quality of Life .....	13

Disparities	15
Socioeconomics	15
Disability	17
Race/Ethnicity	17
Healthcare System	19
Geography	20
Theoretical Framework	21
Chapter 3: Methods	22
Design	22
Setting and Sample	23
Data Extraction	25
Data Analysis	28
Chapter 4: Results	30
Non-medical Determinants of Health	30

Health Behaviours and Personal Resources	
.....	33
Community Characteristics	
.....	36
Health Status	
.....	37
Healthcare System Characteristics and Performance	
.....	40
Chapter 5: Discussion and Conclusions	42
References	50
Appendix A	63

## List of Tables

Table 1. Inclusion Criteria based on the 2011-2012 CCHS variables .....	25
Table 2. Data Extraction Template (Statistics Canada, 2012) .....	26
Table 3. Non-medical Determinants of Health .....	32
Table 4. Health Behaviours and Personal Resources .....	35
Table 5. Community Characteristics .....	37
Table 6: Health Status .....	38
Table 7: Healthcare System Characteristics and Performance .....	40



## List of Appendices

Appendix A: Laurentian University REB Approval Letter .....	63
---	----

# Chapter 1

## Introduction

Partial or total removal of the uterus, hysterectomy, is a common gynecological surgery. Hysterectomy is irreversible. The number of hysterectomies performed per 1000,000 Canadian women aged 35 or older was 303 in 2017 (Chen, Choudhry, & Tulandi, 2019). This is less than the hysterectomy rate of 628 per 100,000 Canadian women in 1996/1997 (Millar, 2001). A similar trend of declining incidence of hysterectomy over time has been reported in the United States. Morgan and associates (2018) found that the hysterectomy rates decreased from 40 to 35 hysterectomies per 10,000 women between 2010 and 2013.

In Canada, the hysterectomy prevalence rates vary by age. According to the 2008 Canadian Community Health Survey, 34% of women aged 60 to 69 self-reported having had a hysterectomy; a rate higher than that of women aged 50 to 59 years (21%) and 40 to 49 years (12%) (Stankiewicz, Pogany, & Popadiuk, 2014). Morgan et al. (2018) found that approximately 78% of hysterectomies were performed on American women less than 55 years of age. In women aged between 65 and 74 years, the rate significantly increased by 17% during the three-year study period.

Hysterectomies are most often a surgical intervention for benign gynecological disorders of the uterus, cervix, or endometrium as opposed to cancer (Ministry of Health and Long-Term Care, 2016). Common benign indicators for surgery are abnormal uterine bleeding, uterine fibroids, endometriosis, pelvic organ prolapse, adnexal mass, chronic pelvic pain, and dyspareunia (Lefebvre, Allaire, Jeffrey, & Vilos, 2018; National Women's Health Network, 2015). In most Canadian provinces, a diagnosis of fibroids was the most common indicator for hysterectomy in the early 1980s and mid-1990s (Millar, 2001). Several studies show that African

American women have larger, faster growing, and more symptomatic uterine fibroids compared to Caucasian women. It has been reported that younger African American women are diagnosed with fibroids nearly three times more frequently than white women (Jacoby, Fujimoto, Giudice, Kuppermann, & Washington, 2010; Uccella et al., 2013; Weiss et al., 2009). Researchers suggested that stress and perceived racial disparities across the life span in addition to underlying pathology may play a role in the increased prevalence of fibroids in African American women (McClurg, Wong, & Louise, 2020).

Individual surgeons have discretionary judgment regarding the most efficacious and safe approach to hysterectomy for removal of the uterus and other pelvic organs as necessary such as the ovaries, fallopian tubes, and cervix. Treatment approaches include vaginal hysterectomy, laparoscopic assisted vaginal hysterectomy, total laparoscopic hysterectomy, laparoscopic hysterectomy with robotic assistance, and abdominal hysterectomy. Further, these approaches are classified in accordance with the degree of surgical invasiveness. Vaginal and laparoscopic routes are deemed as minimally invasive in comparison to the abdominal approach. Minimally invasive hysterectomies are the 'gold standard' for benign uterine conditions given their association with fewer short-term patient complications and healthcare outcomes (Chen et al., 2019; Lefebvre et al., 2018; National Institute for Health and Care Excellence, 2018; Nensi, Coll-Black, Leyland, & Sobel, 2017).

Over time, there has been a change relative to the type of hysterectomy surgery. Laparoscopic hysterectomies increased nearly fourfold from 2007 (11%) to 2017 (39%) in Canada (Chen et al., 2021). Concurrently, these researchers also showed that the proportion of both abdominal and vaginal hysterectomies declined during the same study period, 60% to 37% and 30% to 25%, respectively. In an earlier systematic review of 27 studies, faster return to

normal activities was associated with vaginal hysterectomy, followed by laparoscopic approach, and slowest following the more invasive abdominal hysterectomy (Johnson et al., 2005).

Lefebvre and associates (2018) described that surgical approach is underpinned by a combination of factors including patient, surgeon, and healthcare service characteristics. In a person-centered approach, recognizing women's rights, patient choice is a key consideration for the surgeon in determining the route used for the hysterectomy. Current gynecologic practice guidelines emphasize that primary outcome is to optimize "the decision-making process of women and their caregivers in proceeding with a hysterectomy having considered the disease process, and available alternative treatments and options, and having reviewed the risks and anticipated benefits" (Lefebvre et al., p. e567). Kluivers et al. (2009) found that women preferred minimally invasive procedures in order to circumvent post-surgical outcomes. Although racialized women accepted their gynecological diagnosis, they were ambivalent about how to proceed as influenced by mistrust of physicians and institutions, secondary to histories of racism and discrimination (Dillaway, 2016). Even though the trend has shifted from inpatient to outpatient hysterectomies to optimize fiduciary responsibility, pain management, and women's satisfaction, medical datasets show racial differences in the availability of outpatient hysterectomy. In a three-year period, the number of outpatient hysterectomies performed on African American women increased from 38 to 42 per 10,000 women (Robinson et al., 2017). Yet, for Caucasian women, the rate remained the same, 28 per 10,000 women.

Kelly and associates (2019) conducted a population-based study to investigate the outcomes of minimally invasive and abdominal hysterectomies. Using six reliable provincial and national health databases, 163,894 Ontario women underwent hysterectomy between 2003 and 2014. Most women had an abdominal hysterectomy (57%), the preferred route associated with a

history of previous abdominal surgery, as opposed to minimally invasive hysterectomy approaches. Women in the minimally invasive hysterectomy group tended to be older and required another concurrent surgery for pelvic organ prolapse or incontinence compared to women in the abdominal hysterectomy group. Further, women in the minimally invasive hysterectomy group had significantly lower postoperative complications, 30-day mortality, and shorter lengths of hospital stay. Similar findings were reported in a recent meta-analysis of 47 randomized controlled trials (Aarts et al., 2015). Minimally invasive hysterectomies were associated with fewer post-surgical complications, faster return to normal activities, shorter duration of hospitalization, and healthcare cost savings.

As stated in the Canada Health Act (Government of Canada, 1984), all Canadians, regardless of race or ethnicity, have the right to equitable access to services. The Society of Obstetricians and Gynecologists of Canada (2020), however, acknowledges that ongoing systematic racism against minority groups erodes the constitutional principle of equality. They stipulate that individuals, healthcare professionals, and systems share responsibility in identifying disparities and effecting socially just change. This is particularly poignant given the multiethnic composition of Canadian women. Minority groups represented 21% of the Canadian female population in 2011; a figure projected to increase to over 30% by 2031 (Hudon, 2016). This researcher reported that compared to Caucasian women, visible minority women self-reported fewer chronic cardiovascular, respiratory, musculoskeletal, and mood conditions. No information was available about the self-reported gynecological health of Canadian women.

Despite hysterectomy being one of the most commonly performed surgical procedures for women, there is a paucity of evidence surrounding long-term effects on health. In Ontario, Canada's most populous province, the gynecological health of racialized women requires further

exploration. As such, the purpose of my thesis was to compare sociodemographic and health-related variables between racialized and non-racialized groups of Ontario women who self-reported a past hysterectomy for benign indications.

## Chapter 2

### Literature review

In this chapter, I describe literature addressing long-term outcomes associated with a past hysterectomy for benign conditions. The location of relevant evidence was challenging given that there is a larger volume of studies investigating pre-, intra-, and post-operative complications rather than long-term effects of hysterectomy (Forsgren & Altman, 2013; McClurg, Wong, & Louie, 2020). As stated by Stewart and associates (2012), the dearth of evidence regarding long-term implications of hysterectomy may be attributed to the prolonged duration required for indicators to manifest—at least two decades. To address this gap, I include evidence published since the 2000s. Much of this evidence involves non-experimental designs with small, regional, and national samples of North American women. The heterogeneous samples from different healthcare contexts represented varied gynecologic conditions, surgical interventions, and patient outcomes (Aarts et al., 2015; Chen, Choudhry, & Tulandi, 2019; Cohen, Vitonis, & Einarsson, 2014). Another approach within the post-hysterectomy literature addressing long-term outcomes was observational studies measuring disparities in cohorts of women based on socioeconomic, race, ethnicity, and geographical factors. Thereby, the following literature review will consist of two sections. In the first section, I discuss the evidence measuring long-term outcomes of hysterectomy for benign gynecology. Subsequently, I present evidence addressing the association between indicators of disparity and hysterectomy.

#### **Long-term outcomes**

##### **Pelvic Floor and Organ Prolapse**

Pelvic organ prolapse is an indication for hysterectomy in approximately 20% of women (Chen et al., 2021). Further, for as many as one in three women, pelvic organ prolapse is a

recurrent and long-term outcome of hysterectomy (Forsgren & Altman, 2013; Lefebvre et al., 2018; Yount, 2013). This adverse outcome involves the descent of the vagina or cervix with potential implications for sexual functioning and health. The incidence of pelvic floor prolapse was reported as 3.3% by 20 years and 5.1% by 30 years after an initial hysterectomy (Blandon et al., 2007). These authors found that the incidence of a repeat surgery for pelvic organ repair was 2.5 times greater in women who had an initial concurrent hysterectomy and pelvic organ repair surgery compared to those who had a hysterectomy. In a later study, women's menopausal status at the time of hysterectomy was identified as variable, contributing to the incidence of additional follow-up gynecological surgery for pelvic organ prolapse (Lukanovič & Dražič, 2010). Women who were postmenopausal required subsequent pelvic surgery seven years after the initial hysterectomy. For premenopausal women, additional surgery was required 16 years following hysterectomy. These authors reported other factors contributing to increased risk of subsequent surgery, such as family history of pelvic organ prolapse, complicated deliveries, and postoperative complications after their initial hysterectomy, or demanding physical work.

In a recent systematic review of six studies involving 719 women aged 18 years and older, Carlin and associates (2020) reported that the prevalence of post-hysterectomy pelvic organ prolapse ranged from zero to 39%. The risk of repeat surgery was greatest in women whose index surgery was treatment for pelvic organ prolapse. In another contemporary study, 11% of women sought conservative or surgical treatment for pelvic organ prolapse 16 years post-hysterectomy (Vermeulen et al., 2021). This risk increased nearly doubled to 21% if women had an index hysterectomy due to pelvic organ prolapse; a risk that did not statistically differ regardless of a laparoscopic or vaginal surgical route for the hysterectomy.



## **Urinary and Bowel Incontinence**

The association between hysterectomy and long-term urinary outcomes is controversial. Ala-Nissilä and colleagues (2017) compared urinary and sexual outcomes of 95 women who had undergone either a supracervical or total abdominal hysterectomy for benign conditions over a three-decade period from 1978 to 2011. There were no significant differences in outcomes between the two surgical groups of women. In another study of 197 American women, no significant differences were found in relation to urinary incontinence, constipation, mental health, or hospital readmission 14 years following supracervical or total hysterectomy (Andersen et al., 2015). Similarly, there were no differences in prevalence rates of urinary, bowel, or sexual function in 1,553 women who underwent either a supracervical or total hysterectomy nine years earlier (Lethaby, Mukhopadhyay, & Naik, 2012). Collectively, these three groups of researchers identified a common study limitation in that their samples were predominantly homogenous relative to race.

During a commonly cited 30-year observational study, Altman and associates (2007) examined the risk of stress-urinary incontinence following hysterectomy in a nationwide sample of Swedish women. These researchers compared women who had or did not have a hysterectomy. Women who underwent a hysterectomy were 2.4 times more likely to experience stress-urinary incontinence surgery regardless of the hysterectomy route in comparison to their matched counterparts. Often, subsequent surgery to treat stress-urinary incontinence was required within five years of the original hysterectomy. The two age groups at greatest risk for repeat surgery were 44 years of age, or less, or aged 58 or older. In a more recent systematic review of 21 studies, hysterectomy was not found to adversely affect urinary functioning, urinary dysfunction, or bladder instability

(Duru, Jha, & Lashen, 2012). These researchers cautioned that much of the reviewed evidence was limited to small, non-experimental designs, thus the findings are to be viewed with caution.

There are fewer studies examining the association between hysterectomy and subsequent bowel disorders. Pitsillides and Lashen's (2017) systematic review examining this potential association included five prospective studies published between 1950 and 2010. The follow-up period post-hysterectomy ranged from six weeks to five years. Findings showed that the prevalence of constipation or bowel incontinence was not different when measured before and after hysterectomy. Darwish (2017) recommended future research using validated bowel function-specific quality of life instruments over an extended period of time.

### **Body Mass Index**

There is a general societal understanding that weight gain is an expected and negative outcome of hysterectomy. There is, however, limited evidence to address this perception. A prospective study examined this phenomenon in 628 women over a one-year period (Moorman et al., 2009). Women with hysterectomies had higher BMI at the time of survey, and at 12 months post-surgery, compared to a control group of women with intact uteri. These researchers found that women who underwent a hysterectomy were 1.62 times more likely to gain more than 4.5 kilograms in the first-year post-hysterectomy. Factors contributing to this weight gain were higher baseline weight, being of African American descent, living without a partner, lower educational level, being a smoker, non-alcohol consumption, and an adulthood pattern of weight fluctuations.

Gibson and associates (2013) completed a prospective study from the data in the Study of Women's Health Across the Nation. Their focus

was changes in body mass index trajectories for three groups of women, aged 42 to 52. The groups were women with natural menopause, a history of hysterectomy with oophorectomy, or history of hysterectomy with ovarian conservation. Although all women gained weight during the 10-year study period, there was a significantly higher mean rate of change in body mass index following hysterectomy with oophorectomy than women following hysterectomy with ovarian conservation or natural menopause. In addition, body mass index was higher among African American women and participants with lower education attainment. Overall, body mass index was lower among smokers and women who were physically active.

### **Bone Density**

Historically, it was common practice to remove the ovaries (oophorectomy) in women undergoing hysterectomy who were menopausal or post reproductive years. In more recent years, however, specialists have advocated for ovarian conservation (Cohen, 2014). Decreased bone mineral density has a positive association with decreased endogenous estrogen secretion secondary to premature menopause or hysterectomy with bilateral oophorectomy. An early study with a 38-year follow-up period examined the medical records of 9,258 American women (Melton et al., 2007). The median age at the time of hysterectomy, with and without concurrent oophorectomy, was 44 years of age. These researchers showed a significant increase in risk of fractures by 21% in the hysterectomy group compared to matched controls, however, there was a lack of information about estrogen treatment.

Jacoby and associates (2011) studied 25,448 American women, aged 50 to 79 years, over an eight-year period. Their sample were mostly Caucasian women, who received a high school diploma, and reported an annual income greater than \$20,000. Even in a multivariable model that controlled for current or prior hormone use, there was no statistically significant increased risk of

fractures among women in the hysterectomy only group in comparison to women with a history of hysterectomy and the bilateral oophorectomy group.

The authors of these two observational studies with large samples followed over time reported inconsistent results regarding risk of fractures for women undergoing hysterectomy. Thus, at this time, no conclusions can be drawn regarding the association between hysterectomy, bone density, and risk of fractures.

### **Cardiovascular Disease**

Although bilateral salping-oophorectomy, removal of ovaries and fallopian tubes, has proven benefits in ovarian cancer prevention, the long-term protective and negative effects of such surgical procedures, particularly related to cardiovascular health, have yielded inconsistent findings. The risk of cardiovascular heart disease following bilateral oophorectomy was examined in a systematic review by Jacoby and colleagues (2009). These authors reported that the evidence was inconclusive, thus falling short of a definitive association between oophorectomy and cardiovascular disease. Further, they reported significant study limitations, including lack of comparison groups of women with no prior hysterectomy, naturally occurring menopause, or pre-menopause. They recommended further observational study with randomized control trials and rigorous data analysis to further examine the long-term impact on cardiovascular health.

More recently, Jacoby (2014) acknowledged that cardiovascular disease is the leading cause of mortality among women. In this review of evidence, Jacoby reiterated the potential association between the loss of endogenous estrogen and the accelerated development of atherosclerosis and increased the incidence of coronary heart disease, including myocardial infarction and death. Parker et al.'s (2013) prospective cohort study, over a 28-year period,

investigated the comparative rate of mortality in a homogenous group of mostly Caucasian women aged 30 to 55 years who had a past hysterectomy with ovarian conservation (n = 13,203) and those with a history of hysterectomy and oophorectomy (n = 16,914). They found that at no age was hysterectomy with concomitant oophorectomy associated with reduced risk of mortality from all causes. For women who had a hysterectomy with concomitant bilateral oophorectomy prior to age 50, there was a 41% increased risk of all-cause mortality, inclusive of cardiovascular heart disease. It is important to note that these women did not receive estrogen replacement therapy, which may mitigate the risk associated with bilateral oophorectomy in younger women. Eighty percent of cardiovascular deaths occurred 15 years or more following a hysterectomy with bilateral oophorectomy, emphasizing the need for long-term follow-up and treatment.

Further, Gierach et al. (2014) also found a higher prevalence of mortality risk associated with cardiac health disease in women younger than 50 years. Yet, these researchers questioned if the relationship between concomitant surgery and cardiac health disease mortality is causal. They recommended that confounding variables, such as body mass index, be a repeat measure in future research to determine its predisposition for both gynecological surgery and cardiac mortality.

Appiah and associates (2015) compared changes in risk factors for cardiovascular disease for three groups of women, those with naturally occurring menopause, hysterectomy with ovarian conservation, and hysterectomy with bilateral oophorectomy. Women in the natural menopause group were generally older, had at least a college education, and were more physically active in comparison to those in the other two groups. The researchers reported that significantly more women in the hysterectomy with ovarian conversation group were African American, younger, and underwent surgery at a younger age compared to women in the

hysterectomy with oophorectomy group. There were no significant differences in body mass index, waist circumference, systolic blood pressure, total cholesterol, and low-density lipoprotein cholesterol among the three groups over time. Their findings suggest that hysterectomy route was not a predictor of cardiovascular disease. Rather, the predictor of post-menopausal cardiovascular risk was premenopausal cardiovascular risk in younger women.

Laughlin-Tommaso et al. (2015) reported that conserving ovaries during a hysterectomy does not prevent women against cardiovascular disease over an average of 22 years. The study sample of 2,094 predominantly white American women were compared to age-matched controls, women without hysterectomy or oophorectomy. The proportion of women who underwent a hysterectomy were more likely to have hyperlipidemia, larger BMI, and metabolic syndrome compared with age-matched controls. Using multivariable analysis, obesity was the primary mediating variable between hysterectomy and cardiovascular health. In addition, these researchers found that surgical operation before age 36 was associated with a 2.5 increased risk of coronary artery disease compared with controls. By contrast, the women who underwent hysterectomy after age 50 were at a 1.8 risk.

In the last decade, researchers have yielded inconsistent evidence regarding the association between hysterectomy, cardiovascular risk, and cardiovascular disease. Nevertheless, researchers continue to investigate this phenomenon, and have extended the work to include implication on quality of life.

### **Quality of Life**

Brucker and associates (2014) compared quality of life and sexual function outcomes after either a laparoscopic supracervical hysterectomy or a total laparoscopic hysterectomy. Nearly three years following laparoscopic hysterectomy, women reported significantly quicker return to

preferred lifestyle and heightened sexual desire compared to women in the other surgical group. Similarly, in a systematic review of 33 studies, total laparoscopic hysterectomy was associated with women's satisfaction in comparison to other routes of hysterectomy (Fortin, Hur, & Falcone, 2018). These researchers reported inconsistent findings with regards to longer term physical, psychosocial, and sexual functioning in women who undergo a laparoscopic hysterectomy, thus warranting further study.

Hysterectomy has been assessed as a risk factor for frailty in later life. Verschoor and Tamim's (2019) cohort study involved a sample of 9,561 community dwelling Canadian women, from the Canadian Longitudinal Study on Aging. Within this group, natural menopause occurred prematurely (prior to 40 years), early (between 40 and 45 years), normally (between 46 and 54 years), or late (55 years and older). Alternately, menopause could have been surgically induced by hysterectomy, the type of surgical procedure and time at surgery was not available within the database. Frailty was measured by phenotype and deficit accumulation in areas such as activities of daily living, satisfaction with life, nutrition, physical activity, perceived health, and comorbidities. Associations, adjusting for socio demographics (age, marital status, ethnicity, income, education), lifestyle factors (smoking, alcohol consumption), social support (cohabitation), and hormone replacement therapy indicate that age at menopause was inversely related to frailty. Further, frailty was significantly higher (21%) in women who had a hysterectomy compared to women who had natural menopause between 46 and 54 years of age. Further, these authors report that:

... the effect of early menopause [surgically induced or naturally occurring] is similar to that of occasional smoking or excessive drinking once a week, while premature menopause or hysterectomy status is similar to

that of excessive drinking two to three times per week, living alone, or being married/widowed. (p. 679)

## **Disparities**

### **Socioeconomics**

There is evidence measuring socioeconomic variation and hysterectomy routes involving large samples of North American women. Cohen, Vitonis, and Einarsson's (2014) cross-sectional study involved 415,404 American women who underwent any type of hysterectomy, of which 201,152 had benign etiology, during a one-year period. Race, age, income, and health insurance were associated with the likelihood of undergoing minimally invasive hysterectomies. More specifically, non-racialized women, above 50 years of age, with median household income greater than \$48,000, holding private health insurance, and presenting with prolapse or menstrual disorders were more likely to undergo minimally invasive hysterectomies. Lee and associates (2014), using another national inpatient database, compared the types of hysterectomy performed based on American women's age, income, and insurance type. Over 500,000 women underwent laparoscopic or abdominal hysterectomies between 2003 and 2010. Caucasian race, less than 35 years of age, the highest median household income, and private insurance were significant independent predictors of undergoing laparoscopic hysterectomy.

There is a body of evidence indicative of high hysterectomy rates among women with the lowest socioeconomic status. Lower socioeconomic status has also been associated with the type of hysterectomy, with higher rates of abdominal hysterectomy and lower rates of minimally invasive approaches. Price et al. (2017) used a database of 1,746 women with hysterectomy over a three-year period to explore the implications of socioeconomic status on the type of hysterectomy performed. They reported that lower socioeconomic status was modestly



associated with higher incidence of invasive hysterectomy. Further, having private insurance coverage, compared to Medicaid, had significantly lower odds of more invasive surgical approaches with greater access to technologically mediated procedures, such as robotics.

Chen and associates (2017) examined variations in hysterectomy rates and routes relative to neighbourhood education and income in 13,511 Ontario women within the Canadian Institute for Health Information Discharge Abstract Database. Most women underwent hysterectomy for benign conditions between 45 and 54 years of age. Lower neighborhood education was significantly associated with higher rates of hysterectomy. With respect to economics, results showed a non-linear relationship between neighbourhood income and hysterectomy rate. Women in both the lowest and highest income quartiles had the lowest rates of hysterectomy. The researchers recommended further study to examine the confounding impact of women's autonomous decision making and system issues, such as inequities in access to surgical services.

Similar findings were reported by Sanei-Monghaddam et al. (2018) in their examination of socioeconomic disparities in hysterectomy routes based on records stored in an American affiliated hospital database over a compressed three-year period between 2012 and 2014. Their sample included 6,373 records indicating hysterectomies for benign conditions. Nearly 90% of the women were identified with European American origin, with the remainder identified as African American women. Women with household incomes greater than \$61,000 independently predicted minimally invasive hysterectomy over the more invasive total abdominal hysterectomy. Whereas women with household incomes between \$37,000 and \$45,000 were more likely to have an open abdominal hysterectomy. Again, these researchers identified the

need to elucidate the extent of socioeconomic disparities for quality gynecological care for all women.

### **Disabilities**

Drew (2013) examined the relationship between hysterectomy and disability using the 2010 National Health Interview Surveys database. The sample size was 42,842 women 18 years of age or older. Disability, either physical or mental, was defined as self-reported difficulties in individual performance of daily activities prior to the elective hysterectomy. The most common type of disability women reported was musculoskeletal (32%). Overall, women with disabilities were significantly different compared to their counterparts relative to several variables. They achieved a lower level of education, had their first birth at a younger age, were Caucasian, and had a hysterectomy prior to age 50. Multivariate analysis showed that disability is a risk factor for hysterectomy. Women less than 45 years of age with multiple disabilities, compared to their sampled aged, non-disabled counterparts, were more likely to have a hysterectomy. Drew cautioned that the reported findings may be an underestimation of this association given that there were no data about the timing of the hysterectomy.

### **Race/ethnicity**

The Study of Women's Health Across the Nation is recognized as one of the first longitudinal, community-based, multiethnic initiatives studying ethnic differences in the incidence of hysterectomy for benign conditions among women between 40 and 55 years. The researchers surveyed 15,160 women who self-reported a past hysterectomy for benign conditions. The sample included Caucasian (50%), African-America (28%), Hispanic (12%), and Asian American (10%) women. The findings showed that African American women had the

highest odds of hysterectomy compared to Caucasian and Asian American women. The odds ratios were adjusted for factors such as biology (body mass index, history of fibroids, abnormal bleeding), education, and lifestyle (smoking, number of close friends). Following this multivariate analysis, African American and Hispanic women had higher rates of hysterectomy. These authors concluded that such findings suggest that disparity in care occurs when ethnic differences, rather than other risk factors, predict occurrence of elective hysterectomies.

A team of researchers led by Bougie (2018) conducted a cross-sectional analysis using an American administrative data source entitled, Healthcare Cost and Utilization Project Nationwide Inpatient Sample. The large nationally representative sample included women aged 18 and over who underwent an elective hysterectomy over a five-year period. The 114,719 women inpatients were categorized by race/ethnicity using the specific terms white, black, Hispanic, and other. The rate of minimally invasive hysterectomy was 55% in white women, 50% in Hispanic women, 46% in women who self-identified with other racialized groups, and 29% in black women. Compared to white women, black women had significantly lower odds of having minimally invasive hysterectomy after adjusting for median household income of residence, type of insurance coverage, and a diagnosis of fibroids. The findings of this study support the need to identify and examine socioeconomic factors, underpinning the more prevalent use of invasive surgical hysterectomy intervention for racialized groups of women, particularly black women. Further, physician and patient preferences relative to the use of minimally invasive surgical intervention warrants examination to account for racial and ethnic disparities.

The most recent cross-sectional study addressing racial disparities and differences in hysterectomy route was conducted by Pollack and associates (2019). These researchers used

State Inpatient and Ambulatory Surgery Databases. The sample size was 133,082 women aged 18 or older who self-identified as white, African American, Asian/Pacific Islander, or Native American. During the four-year study period, the rates of laparoscopic hysterectomy increased across all groups of racialized groups. Yet, compared to white women, African American and Hispanic women were less likely to receive laparoscopic hysterectomy. These authors attributed this racial disparity to inaccessibility to facilities and surgeons where laparoscopy is available.

### **Healthcare System**

A number of American researchers have identified disparities related to select aspects of the healthcare system. Patel et al (2014), for example, studied hospital characteristics and hysterectomies by examining the 2010 Healthcare Cost and Utilization Project Nationwide Inpatient Sample database. The hospitals were grouped into four regions: northeast, midwest, south, and west United States. The study sample involved 32,436 women. Most of the women underwent an abdominal (67%) rather than a laparoscopic hysterectomy (32%). Hospitals located in the northeast had significantly higher rates of laparoscopic hysterectomies than those situated in midwest or south regions. Further, if the hospital was characterized as an academic and urban institution, the odds of a laparoscopic hysterectomy were higher compared to non-academic and rural hospitals.

Traylor and associates (2020) studied hospital characteristics associated with minimally invasive hysterectomy based on two years of data from 143 hospitals in Illinois. The most common indicator for minimally invasive hysterectomy was fibroids. Caucasian women were two times more likely to undergo minimally invasive hysterectomy compared to women of African American descent. This latter group of women often accessed hospitals characterized by

less than 30 hysterectomies annually and limited access to surgeons performing minimally invasive procedures.

## **Geography**

From a women's equity perspective, Dunn et al. (2011) examined variation in hysterectomy rates and routes for benign conditions based on geography. Using several national and provincial databases, they identified Ontario women aged 15 to 84 who had a hysterectomy in one year prior. They reported an overall provincial rate of hysterectomy was 258 per 100,000 women. Compared to all regions of Ontario, the highest prevalence occurred in the North East Local Health Network with a hysterectomy rate of 440 per 100,000 women. Hysterectomy rates also varied by rural versus urban residency. Rural-residing women had a higher age-standardized hysterectomy rate compared to their urban counterparts. Further, rural women had a higher prevalence of laparoscopic or vaginal hysterectomy in comparison to their counterparts residing in urban Ontario. Similarly, in another study, for women residing in coastal British Columbia, rurality was associated with higher incidence of laparoscopic in comparison to abdominal hysterectomy (Chen et al., 2014).

Several Canadian researchers have reported provincial variations in the prevalence of hysterectomy. Stankiewicz and fellow researchers (2014) reported a statistically significant difference between the 2008 hysterectomy prevalence rate of nearly 10% in Ontario and 21% in Nova Scotia. In 2017, the highest hysterectomy rate was 469 per 100,000 in Prince Edward Island compared to the lowest rate in Quebec, 259 per 100,000 (Chen et al., 2019). Further, these researchers showed that there was also interprovincial

variation relative to use of minimally invasive procedures. Saskatchewan women had the highest minimally invasive rates (84%), and Manitoba women had the lowest (44%). Patient, surgeon, and institutional factors, in addition to access to quality treatment options, may account for some regional variations in hysterectomy profile. Further studies, however, need to be conducted to more fully understand geographical variations in Canada relative to policies, procedures, and benchmarks for quality hysterectomy care.

### **Theoretical Framework**

This study was guided by the *Gender and Equity Health Indicator Framework* (Clark & Bierman, 2009). This equity-centric framework was developed to explore health differences among subgroups of Ontario women. The Canadian Council on Social Determinants of Health (2015) categorized 36 complex theoretical understandings of social determinants of health into five groups. The group labels were policy development/decision-making, practice approach, issue focus, broad focus, and finally, population focus. In the latter group was a framework addressing the interactions between gender and the achievement or maintenance of health. The *Gender and Equity Health Indicator Framework* presents gender as both influencing and influenced by all health domains.

Within this framework, a holistic definition of health acknowledges women's self-reported health and illness perceptions grounded in their day-to-day circumstances as well as biology. The determinants of health include four domains: non-medical, community characteristics, health status, and health system characteristics and performance.

Clark and Bierman asserted that without equity, subgroups of women are more likely to experience poor health compared to the general population as implications of social, economic,

and geography disadvantages. Bierman and Weissman (2016) recommended that measuring health indicators of one racial group, in comparison to one or more other groups, is a viable strategy to understanding women's health and healthcare needs.

## Chapter 3

### Methods

This chapter outlines quantitative, non-experimental methods implemented to describe statistical associations among a variety of sociodemographic, health-related variables between two groups of Ontario women who self-report undergoing a hysterectomy for benign conditions. These women are categorized as racialized and non-racialized based on their self-reported racial/ethnicity. The study design, setting and sample, data collection and analysis, and ethical considerations are addressed sequentially.

#### **Design**

The design of this study, descriptive correlational, was selected given its focus on exploration of associations among variables, rather than the identification of causal connections between them (Polit & Beck, 2017). This approach is suitable when little is known about the phenomenon of interest to uncover new knowledge. Descriptions based on this design, void of manipulation of research variables, presents a snapshot of what exists, the frequency of occurrence, relationship among variables, and categorization of data for understanding a phenomenon (Polit & Beck). This design allows for the examination of publicly accessible data about the health of Ontario residing women.

The data source accessed in this study was the Public Use Microdata File generated from the national cross-sectional survey entitled the Canadian Community Health Survey (CCHS), available on the Statistics Canada website. The file is available within the Laurentian University library, Ontario Data Documentation, Extraction Service and Infrastructure Initiative (ODESI) <https://biblio.laurentian.ca/research/guides/data-and-statistics>). As such, the public use microdata



file available through an institution, allows a researcher “access to anonymized and non-aggregated data” (Statistics Canada, 2021).

The first rendition of the CCHS (in 2000) was developed in response to health information system issues identified by the National Task Force on Health Information in 1991 (Statistics Canada, 2012). The team of CCHS developers consisted of representatives from three organizations: Health Canada, Public Health Agency of Canada, and the Canadian Institute for Health Information. The publicly accessible and reliable data allow health researchers to examine population characteristics relative to standardized demographic and socioeconomic characteristics, health status and well-being, factors that affect health, and healthcare utilization. Statistics Canada administers it annually, collecting household self-reported health-related data to identify emerging issues at a community level. This study used the 2011-2012 CCHS. It involved the collection of health, including gynecological health, lifestyle/social, mental health/well-being, prevention/detection of disease, and healthcare services variables. Additionally, analysis of CCHS data seemed suitable as CCHS data were used to estimate prevalence of hysterectomy among Canadian women aged 20 to 69 years in 2000/2001, 2003, and 2008 (Stankiewicz et al., 2014).

### **Setting and Sample**

The CCHS targeted sample are Canadian residents aged 12 years or older. Multi-staged probability sampling in each survey cycle identifies the geographical areas, households, and respondents. One willing person per household was selected randomly for a telephone or in-person interview. Statistics Canada (2012) reported the exclusions from the survey as follows: persons living on reserves and other Aboriginal settlements in the provinces; full-time members of the Canadian Forces; the institutionalized population and persons living in the Quebec health

regions of Région du Nunavik and Région des Terres-Cries-de-la-Baie-James. In Nunavut, the coverage is limited to the ten largest communities which represent about 70% of the Nunavut population. Altogether, these exclusions represent less than 3% of the target population (Statistics Canada, 2012).

The total Canadian sample of the 2011-2012 CCHS was 61,707, where 34,104 women made up a 50.6 weighted percentage of the population. This study's inclusion criteria were records representing females over the age of 12 years residing in Ontario who self-reported hysterectomy and no history of cancer (Table 1). The age and type of hysterectomy (including concomitant oophorectomy) was not discernable in the data set. In the primary survey, female respondents also identified themselves as belonging to an ethnic group. The possible responses to the ethnicity question were, White, South Asian, Chinese, Black, Filipino, Latin American, Arab, Southeast Asian, West Asian, Korean, Japanese, and Other. The visible minority opinions include 'persons, other than Aboriginal persons, who are non-Caucasian in race or non-white in 'colour' (Statistics Canada, 2012, p. 306). In this CCHS cycle, the majority of women self-identified as white (76.7%). Because of the small sample sizes of visually minority groups, data were grouped into two cohorts, racialized and non-racialized. These labels will be used throughout this study to distinguish the two comparison groups of women.

Table 1

*Inclusion Criteria based on the 2011-2012 CCHS variables*

Inclusion Criteria	CCHS Variables	CCHS Questions
Female	DHH_SEX: Sex	Enter the respondent's sex
>12 years of age	DHHGAGE: Age - (G)	What is the respondent's age in years?
Ontario resident	GEOGPRV=35	What is the respondent's province of residence?
Self-reported hysterectomy	MAM_038=1	Have you had a hysterectomy? In other words, has your uterus been removed?
No history of cancer	CCC_31A=2	Have you ever been diagnosed with cancer?
Non-racialized	SDC_43A	To which cultural or ethnic group do you belong? Are you White?
Racialized	SDC_43B to SDC_43M	To which cultural or ethnic group do you belong? Are you South Asian? Chinese? Black? Filipino? ... Other?

### **Data extraction**

The willing respondent in a household had the opinion of a telephone or in-person structured interview of approximately 45 minutes. This study's variables of interest included demographic, socioeconomic, and health-related variables addressed in the reviewed literature. In the database, each variable was identified by both a descriptive and numeric label and its level of measurement. The creation of the data extraction template (Table 2) allowed for the systematic collection of 43 relevant 2011-2012 CCHS discrete items from 17 of the reported 84 CCHS variable groupings (Statistics Canada, 2012). For transparency, Table 2 shows the CCHS interview questions. The extracted data for each variable were organized according to four constructs in the *Gender and Health Equity Framework*: non-medical determinants of health, community characteristics, health status, and health systems characteristics and performance.

Table 2

*Data Extraction Template (Statistics Canada, 2012)*

CCHS Variable Group	CCHS Discrete Variables	CCHS Questions
<b>Non-Medical Determinants of Health</b>		
<b>Living and Working Conditions</b>		
Dwelling and Household	Age Marital status Number of persons $\leq 5$ years old in household Number of persons 6–11 years old in household Number of persons $\geq 12$ in household Living arrangements Household size	What is your age? What is your marital status?
Education	Highest level of education	What is the respondent's highest level of education?
Income	Main source of personal income  Household income*	What was the main source of your personal income? What is your best estimate of the total income received by all household members, from all sources, before taxes and deductions, in the past 12 months?
Labour Force	Employment status  Full-time/part-time current jobs	Are you an employee or self-employed? Do you work full-time or part-time?
<b>Health Behaviours</b>		
Alcohol Use	Type of alcohol consumption  Frequency of alcohol use (past 12 months)	During the past 12 months, do you use alcohol regularly, occasionally, or not at all? During the past 12 months, how often did you drink alcoholic beverages?
Smoking	Frequency of smoking  Someone smokes inside the house	At the present time, do you smoke cigarettes daily, occasionally, or not at all? Including both household members and regular visitors, does anyone smoke inside your home, every day or almost every day?
Food security	Food situation in household  Unable to afford balanced meals	Which of the following statements best describes the food eaten in your household in the past 12 months? Can you afford to eat balanced meals?
Physical activities	Participates in physical leisure activities  Number of minutes per week of sedentary leisure activities	In the past 3 months, did you do any physical activity for leisure? In a typical week, how many minutes did you spend playing video games, using the internet on

		a device, or reading, not counting at work or school?
<b>Personal Resources including Social Support</b>		
Positive Mental Health (social supports)	Felt had trusting relationships	In the past month, how often did you feel that you had warm and trusting relationships with others?
<b>Community Characteristics</b>		
General Health	Felt belonged to a community  Sense of belonging to local community	How often did you feel you belonged to the community? How would you describe your sense of belonging to your local community? Would you say it is...?
<b>Health Status</b>		
Chronic conditions	Has arthritis  Has high blood pressure  Has Chronic Obstructive Pulmonary Disease (COPD)  Has diabetes Has heart disease Has urinary incontinence  Has a mood disorder  Has an anxiety disorder	Do you have arthritis, excluding fibromyalgia? Do you have high blood pressure?  Do you have chronic bronchitis, emphysema or chronic obstructive pulmonary disease or COPD? Do you have diabetes? Do you have heart disease? Do you have urinary incontinence?  Do you have a mood disorder such as depression, bipolar disorder, mania, or dysthymia? Do you have an anxiety disorder such as phobia, obsessive-compulsive disorder, or a panic disorder?
Self-reported Height/Weight	Body Mass Index	How tall are you without shoes on? How much do you weigh?
General health	Self-perceived physical health  Self-perceived mental health  Perceived life stress  Employed in past 12 months  Self-perceived work stress	In general, would you say your health is...? In general, would you say your mental health is...? Thinking about the amount of stress in your life, would you say that most days are...? Have you worked at a job or business at any time in the past 12 months? Would you say that most days at work were...?
<b>Health System Characteristics and Performance</b>		
Healthcare utilization	Has a regular medical doctor  Frequency of general physical check ups	Do you have a regular medical doctor? How frequently do you have general physical checkups?
Contacts with health professionals	Consulted family doctor/General practitioner	Have you seen or talked to any of the following health professionals about your physical, emotional, or

	<p>Consulted a mental health professional</p> <p>Consulted with other medical (specialist) doctor</p>	<p>mental health: family doctor, or general practitioner? In the past 12 months, have you seen or talked to a health professional about your emotional or mental health? Have you seen or talked to any other medical doctor or specialist about your physical, emotional, or mental health?</p>
Unmet healthcare needs	Self-perceived unmet health care needs	Thinking of the most recent time, why didn't you get care?

### **Data analysis**

Extracted 2011-2012 CCHS data were tabulated in preparation for analysis using IBM's Statistical Package for the Social Sciences 26 (SPSS). The level of measurements for most of the extracted data were nominal or ordinal. Descriptive statistics were therefore a suitable analytic approach. This included the calculation of frequencies and weighted percentages. Respondent data were weighted using sample weights recommended by Statistics Canada to account for their CCHS sampling procedure. These weights were applied to all percentages to assert estimated representability of the sample to the population as a whole. Associations were tested using z-scores, calculated using Social Science Statistics online calculator (2020). Z-scores are useful when making comparisons between two population proportions to know whether the two groups differ significantly on a characteristic. Z-scores were two-tailed as both negative and positive associations were of interest for this study. Dichotomous categorical variables were compared using Chi-square to ascertain group differences (Knapp, 2017; Polit & Beck, 2017).

### **Ethics**

This descriptive correlational study used publicly available, ethically obtained data released electronically by Statistics Canada. It is noteworthy that all CCHS respondents were informed that their participation was voluntary and that collected personal data would be

grouped, compiled, and anonymized to protect privacy. All personal data held by Statistics Canada are kept confidential and secure, and not publicly available (Statistics Canada, 2016). Key considerations when involved in population health status reporting is upholding stewardship and trust (National Collaborating Centre for Determinants of Health, 2012). Stewardship and trust were safeguarded through conscientious use of non-discriminatory appropriate language to best represent the welfare of Ontario residing women. In compliance with Article 5.5B of the Tri-Council Policy Statement on the ethical conduct of research involving humans (Canadian Institutes of Health Information, 2018), ethical approval was obtained from the academic research ethics board (Appendix A).

## Chapter 4

### Results

This chapter shows the quantitative findings based on selected variables of the 2011-2012 CCHS file. The total number of Ontario respondents was 21,257. This sample consisted of 11,786 women (55.4%). Of these Ontario women, 15% self-identified as belonging to a racialized group. Based on the weighted values, it was estimated that in Ontario, 712,022 women had undergone hysterectomy while the number of hysterectomized women who never had cancer was 554,374. In comparison to 8.5% of the racialized women, 13.1 % of the non-racialized women has a hysterectomy ( $p < 0.05$ ) for non-cancerous indicators. In this study sample, the number of such respondents grouped as racialized was 153, whereas the non-racialized group was 1,577. The tables in this chapter show the precise weighted percentage of characteristics of women who had hysterectomy, whereas the narrative text, descriptive of the accompanying tables, the percentages were rounded to the nearest whole number. The results are organized relative to each domain of the *Gender and Equity Health Indicator Framework*.

#### **Non-medical Determinants of Health**

Racialized women were younger than non-racialized women, with 25% of them being 65 years or older in comparison to 47% of the non-racialized women ( $p = < .01$ ). The largest proportion of women were concentrated in the 40 to 64 age group: over 70% of racialized women and almost 50% of non-racialized women (Table 3). What was unknown from the available CCHS data was the respondents' age at the time they underwent a hysterectomy.

Over 87% of racialized and 95% of non-racialized women were predominantly partnered or had a partner in the past. In both groups of women, fewer respondents were



currently single or never partnered. There was a statistically significant difference in marital status between the two comparison groups.

Most of the women in both groups reported that they did not have children aged five or less in their household. Nearly six percent of racialized women reported cohabitation with young children. This was a statistically significant difference in comparison to the two percent of non-racialized women living with young children in their homes. There was a significant difference in the proportion of women living with children aged 6 to 11 years. In comparison to nearly eight percent of racialized women, four percent of non-racialized women lived with school aged children. There was also a significant difference in the proportion of racialized women cohabitating with children 12 years of age or older. In comparison to nearly 12% of racialized women, just over five percent of non-racialized women resided with one or more children 12 years of age or older. Overall, there was a significant difference in the household size of the racialized and non-racialized women, with 38% of the former living in households with up to two members compared to 79% of the latter. The living arrangements of the two groups were also significantly different, with the highest proportion of racialized women living with their children/parents/siblings/others (35%) and the non-racialized women with their spouse/partner (47%).

Most women, regardless of group, reported achieving post-secondary education or higher. There was, however, no significant difference between comparison groups relative to the highest level of education. Nearly 69% of racialized women reported employment as their primary source of income in comparison to 42% of non-racialized women. There was a significant difference between the racialized and non-racialized groups of women relative to their employment as the main source of income ( $p = .018$ ). There was no significant difference in the

total household income of the racialized and non-racialized women. Employment status (employee/self-employed) and status in current job (full-time/part-time) was also similar for the racialized and non-racialized women.

Table 3

*Non-Medical Determinants of Health of Women with a past Hysterectomy*

CCHS Variable	Racialized		Non-racialized		Z	X <sup>2</sup>
	n	Weighted %	n	weighted %	p	
<b>Living and Working Conditions – Dwelling and Household</b>						
Age						
≤ 39	5	3.7	16	3.0		< .01
40-64	90	71.0	641	49.7		
≥ 65	58	25.3	920	47.4		
Total	153	100	1577	100.1		
Marital Status						
Married/Common-Law/Widowed/Separated/Divorced	135	87.3	1513	95.5		< .01
Single/Never Married	18	12.8	62	4.5		
Total	153	100	1575	100		
Number of persons ≤ 5 years						
None	148	94.4	1561	97.9		.015
≥ 1	5	5.6	16	2.1		
Total	153	100	1577	100		
Number of persons 6–11 years						
None	143	92.4	1547	95.9		< .01
≥ 1	10	7.6	30	4.1		
Total	153	100	1577	100		
Number of persons ≥ 12 years						
None	141	88.5	1538	94.7		< .01
≥ 1	12	11.5	39	5.3		
Total	153	100	1577	100		
Living Arrangements						
Unattached/Alone/Other	66	18.5	707	28.4		.001
Spouse/Partner	51	18.5	697	46.6		
Parent/Spouse/Child	18	21.3	77	11.5		
Parent/Child	5	6.4	41	6.8		
Child/Parent/Sibling/Other	13	35.4	45	6.6		
Total	153	100	1567	100		
Household size						
1 person	61	12.4	690	26.6		< .01
2 persons	59	25.9	759	52.4		
3 persons	16	37.5	78	11.8		
4 persons	9	13.3	33	7.2		
5 ≥ persons	8	10.8	16	2		
Total	153	100	1576	100		

CCHS Variable	Racialized		Non-racialized		Z	X <sup>2</sup>
	n	Weighted %	n	weighted %	p	
<b>Living and Working Conditions – Education</b>						
Highest Level of Education						
≤ Secondary School Graduate	31	7.8	417	24.1	.082	
Secondary School Graduate	31	19.0	355	22.6	.478	
Some Post-Secondary Education	6	3.9	45	4.1	.472	
≥ Post-Secondary Graduate	85	69.3	742	49.2	.060	
Total	153	100	1559	100		
<b>Living and Working Conditions – Income</b>						
Main Source of Personal Income						
Employment Income	40	68.9	269	41.7	.018	.053
EI/Employer compensation/Senior Benefits	33	23.2	373	43.9	.101	
Other	5	7.8	74	14.4	.271	
Total	78	100	716	100		
Total household income						
<20,000	31	12.8	258	12.4		.615
20,000–39,999	51	32.4	497	25.2		
40,000–59,999	29	21.0	344	24.0		
60,000–79,999	18	9.0	182	12.9		
80,000 or more	24	24.8	296	25.5		
Total	153	100	1577	100		
<b>Living and Working Conditions – Labour Force</b>						
Employment Status						
Employee	52	84.9	372	86.2		.288
Self Employed	6	15.1	69	13.8		
Total	58	100	441	100		
Full-time/part-time current job						
Full-time	40	75.7	303	76.9		.915
Part-time	18	24.3	132	23.1		
Total	58	100	435	100		

### Health Behaviours

Table 4 represents health behaviors and personal resources, two features of non-medical determinants of health. With respect to alcohol consumption, nearly 29% of the racialized and 49% of non-racialized women reported regular drinking. Whereas approximately 50% of racialized women reported that they had not consumed alcohol in the previous year compared to 29% of the non-racialized women. Overall, these differences were statistically significant. The vast majority of women were non-smokers and resided in a smoke-free home, with no significant difference between groups.

Nearly 92% of non-racialized women and 84% of racialized women self-reported that they always had enough food in their household. There was, however, a significant difference in overall food situation in households ranging from not enough food to always enough. The majority of women in both comparator groups identified that they were able to afford 'balanced' meals. There was a significant difference between groups of women who were often unable to afford 'balanced' meals: 4% of racialized compared to less than 2% of non-racialized women. Comparable incidence of participation in leisure physical activity was self-reported among both comparator groups; over 88% of racialized women and over 86% of non-racialized women. A greater proportion of non-racialized women, approximately 42%, in comparison to 31% of women in the racialized group, participated in 15 to 29 minutes of sedentary leisure activities per week, such as using the internet and reading. With respect to personal resources, over 90% of women in both comparator groups perceived that they had warm and trusting relationships on a daily basis in the past month.

Table 4

*Health Behaviours and Personal Resources of Women with a past Hysterectomy*

CCHS Variable	Racialized		Non-racialized		<i>z</i>	<i>X</i> <sup>2</sup>
	n	weighted %	n	weighted %	<i>p</i>	
<b>Health Behaviours – Alcohol Use</b>						
Type of alcohol consumption						
Regular drinker	55	29.4	685	48.8		.046
Occasional drinker	35	20.4	391	22.5		
No drinks last 12 months	63	50.2	495	28.7		
Total	153	100	1571	100		
Frequency of alcohol use (past 12 months)						
Monthly	58	67.3	614	55.3		.246
Weekly	25	29.5	320	30.8		
Daily	7	3.2	142	13.8		
Total	90	100	1076	100		
<b>Health Behaviours – Smoking</b>						
Frequency of Smoking						
Daily	22	8.9	246	18.2		.690
Occasional	3	1.1	35	3.4		
None	128	90	1296	78.4		
Total	153	100	1577	100		
Someone smokes inside the house						
Yes	10	10.7	109	12.1		.853
No	32	89.3	1350	87.9		
Total	142	100	1459	100		
<b>Health Behaviours – Food Security</b>						
Food situation in household						
Always enough	123	83.6	1439	91.6		.001
Enough	22	14.7	116	7.1		
Not enough	6	1.7	20	1.4		
Total	151	100	1575	100		
Unable to afford balanced meals						
Often	10	3.7	23	1.4		.001
Sometimes	12	6.7	65	4.4		
Never	129	89.6	1481	94.2		
Total	151	100	1569	100		

CCHS Variable	Racialized		Non-racialized		Z	X <sup>2</sup>
	n	weighted %	n	weighted %	p	
<b>Health Behaviours – Physical Activities</b>						
Participates in physical leisure activities						
Yes	131	87.9	1367	85.6		.713
No	22	12.1	210	14.4		
Total	153	100	1577	100		
Number of minutes/weeks of sedentary leisure activities						
14 mins or less	54	35.7	448	28.8		.071
15–29 mins	47	31.1	647	41.6		
30–44 mins	32	21.1	320	20.6		
45 mins or more	20	11.9	162	9.0		
Total	153	100	1577	100		
<b>Personal Resources – Positive Mental Health (social supports)</b>						
Perceived trusting relationships						
Daily	141	94.8	1386	91.9		.493
Weekly/Rarely/Never	9	5.2	113	8.1		
Total	150	100	1499	100		

### Community Characteristics

Most women, regardless of comparator group, perceived that they belonged to a community every day, over 65% for racialized women and over 64% for non-racialized women (Table 5). Ten percent of racialized women and nearly 22% of non-racialized women self-reported that they never felt they belonged to a community. This difference, however, was not statistically significant. Further, a vast majority of women, regardless of comparator group, self-reported a very or somewhat strong sense of belonging, with no significant difference between groups or strength of relationship with their community.

Table 5

*Community Characteristics of Women with a past Hysterectomy*

CCHS Variable	Racialized		Non-racialized		Z	X <sup>2</sup>
	N	weighted %	n	weighted %	p	
<b>Community Characteristics – Belonging</b>						
Felt belonged to a community						
Daily	91	65.5	972	64.4		.231
Weekly	27	24.2	197	13.6		
Never	29	10.3	315	21.9		
Total	147	100	1484	100		
Sense of Belonging to local community						
Very strong	40	22.2	376	25.4		.353
Somewhat strong	68	48.1	759	49.7		
Somewhat weak	22	12.8	268	15.8		
Very weak	19	16.9	139	9.1		
Total	149	100	1542	100		

**Health Status**

As depicted in Table 6, self-reported incidence of chronic conditions, such as high blood pressure and diabetes, was statistically different between groups. Hypertension was reported by nearly 43% of racialized women in comparison to 38% of non-racialized women. More racialized women, 25%, self-reported that they have diabetes, in comparison to 13% of non-racialized women. A greater proportion of the non-racialized group of women self-reported the following chronic conditions: arthritis, chronic obstructive lung disease, heart disease, urinary incontinence, mood disorders, and anxiety disorders. However, with respect to these chronic conditions, there was no statistically significant difference between the comparator groups. More than three-fifths of the women in both non-racialized and racialized groups perceived themselves to be obese or overweight. The differences between the groups were not significant.

With respect to general health, 33% of racialized women reported very good to excellent self-perceived health. Although not a statistically significant difference, a higher proportion of

non-racialized women, 52%, reported similar high ratings of self-perceived health.

Self-perceived mental health was reported as very good to excellent by 76% of racialized women. Again, although not a statistically significant difference, a lower proportion of non-racialized women, 68%, reported similar high ratings of self-perceived mental health.

Almost one quarter of both groups of women perceived their life to be extremely stressful, however, this finding was not statistically significant. Racialized women, 43%, self-reported that their life is not very to not at all stressful, whereas, non-racialized women, 38%, self-reported a comparable rating. This later finding was statistically not significant.

Although there was no significant difference between groups, most racialized women, 68%, reported employment in the past years, whereas less than 48% of non-racialized women made a similar declaration relative to employment. Of employed women, 25% of racialized women in comparison to 35% reported being quite or extremely stressed due to work. This later finding was not statistically significant.

Table 6

*Health Status of Women with a past Hysterectomy*

CCHS Variable	Racialized		Non-racialized		Z	$X^2$
	N	weighted %	n	weighted %	p	
<b>Health Status – Chronic Conditions</b>						
Has arthritis						
Yes	71	26.1	817	44.5	.190	
Total	153	100	1573	100		
Has high blood pressure						
Yes	55	42.7	698	38.2	.044	
Total	153	100	1573	100		
Has Chronic Obstructive Pulmonary Disease						
Yes	11	4.9	146	8.5	.395	
Total	152	100	1565	100		
Has diabetes						
Yes	35	25.2	233	12.7	.007	
Total	152	100	1576	100		
Has heart disease						



Yes	13	5.3	216	10.5	.072	
Total	152	100	1570	100		

CCHS Variable	Racialized		Non-racialized		Z	X <sup>2</sup>
	N	weighted %	n	weighted %	p	
Has urinary incontinence						
Yes	24	6.5	219	12.1	.503	
Total	151	100	1574	100		
Has a mood disorder						
Yes	26	10.8	211	16.7	.219	
Total	153	100	1575	100		
Has an anxiety disorder						
Yes	17	4.2	148	11.9	.497	
Total	153	100	1573	100		
Health Status – Self-reported Height/Weight						
Body mass index						
Normal/Underweight	56	37.3	582	38.6		.762
Overweight/Obese	94	62.7	926	61.4		
Total	150	100	1508	100		
Health Status – General Health						
Self-perceived physical health						
Excellent	21	11.2	207	15.5		.239
Very Good	45	22.1	554	36.5		
Good	51	52.4	454	25.4		
Fair	22	11.2	263	15.3		
Poor	14	3.1	90	7.3		
Total	153	100	1568	100		
Self-perceived mental health						
Excellent	43	39.0	498	31.8		.476
Very good	52	36.6	562	36.1		
Good	39	15.5	365	20.4		
Fair	13	3.5	115	7.8		
Poor	6	5.4	32	4		
Total	153	100	1572	100		
Perceived life stress						
Not at all/Not very	53	42.6	679	37.7		.102
A bit	63	34.5	577	39.6		
Quite a bit/Extremely	37	22.9	309	22.7		
Total	153	100	1565	100		
Employed in past 12 months						
Yes	61	67.7	498	47.6		.491
No	67	32.3	622	52.4		
Total	128	100	1120	100		
Self-perceived work stress						
Not at all/Not very	12	42.6	126	25.9		.664

A bit	27	32.3	204	39.4		
Quite a bit/Extremely	19	25.1	157	34.7		
Total	58	100	487	100		

### Healthcare System Characteristics and Performance

Almost all women, regardless of group, reported having a regular family doctor (Table 7). The rates were almost identical, 98%. Ninety percent of racialized and 61% of non-racialized women self-reported at least one annual medical check-up, a difference that was statistically significant. The other significant difference between the groups was the proportion of women with a three-year or greater duration between physical check-ups. Non-racialized women reported a statistically significant greater frequency (22%) compared to their counterparts (3%) of having a medical check-up once every three years or longer. The most frequent type of consultation was with a family doctor or general healthcare practitioner, 92% for racialized and 86% for non-racialized women. This difference, however, was not statistically significant. Regardless of the comparative group, the majority of women reported no consultations with either a mental health professional or specialized doctor. Non-racialized groups perceived a higher portion of unmet health needs (13%) compared to (8%) for racialized women. These later two differences were not statistically significant.

Table 7

### *Healthcare System Characteristics and Performance*

CCHS Variable	Racialized		Non-racialized		<i>z</i> <i>p</i>	
	n	weighted %	n	weighted %		
<b>Healthcare System Characteristics and Performance – Healthcare Utilization</b>						
Has a regular medical doctor	Yes	146	98.2	1526	97.9	.379
	No	7	1.8	51	2.1	.379
	Total	153	100	1577	100	
Frequency of general physical check-ups	≤ once per year/once per year	103	90.2	803	60.5	.001
	once every 2 to 3 years	16	6.6	267	17.3	.051

≥ once every 3 years	15	3.3	355	22.3	.001
Total	134	100	1425	100	

CCHS Variable	Racialized		Non-racialized		<i>z</i>
	n	weighted %	n	weighted %	<i>p</i>
<b>Healthcare System Characteristics and Performance – Contracts with Health Professionals</b>					
Consulted a family doctor/general practitioner					
Yes	125	92.2	1366	86.3	.087
No	28	7.8	210	13.7	.087
Total	153	100	1576	100	
Consulted a mental health professional					
Yes	28	11.2	265	20.1	.646
No	125	88.8	1309	79.9	.646
Total	153	100	1574	100	
Consulted with other medical (specialist) doctor					
Yes	56	33.5	685	45.4	.101
No	97	66.5	891	54.6	.101
Total	153	100	1576	100	
<b>Healthcare System Characteristics and Performance – Unmet Healthcare Needs</b>					
Self-perceived unmet healthcare needs					
Yes	24	7.7	178	13.2	.110
No	129	92.3	1394	86.8	.110
Total	153	100	1572	100	

## Chapter 5

### Discussion and Conclusions

This study's purpose was to compare sociodemographic and health-related variables between racialized and non-racialized groups of Ontario women who self-reported a past hysterectomy for benign conditions. This study was framed by a population-based model entitled, the *Gender and Equity Health Indicator Framework*. Its four components guided the extraction of proxy health indicators from the publicly available 2012 CCHS national dataset as it was possible to focus on a subset of women residing in Ontario. Based on Statistics Canada survey data for 2011, the response rate to the national survey elicited self-reports from 0.1% of the Ontario population over 15 years of age, and more specifically 0.03% of Ontarian women. As such, the results presented in Chapter 4 are discussed with caution regarding the generalizability to the overall provincial population of both non-racialized and racialized women. That being said, the patterns identified within the results presented in the preceding chapter illustrate insights for future examination and deliberation in an effort to improve gynecological services for Ontarian women. Despite this caution, this study has refined my capacity to engage in a systematic process of quantitative inquiry to explore a clinically grounded locally relevant health topic through a lens of equity. The application of research methods was meritorious in solidifying an understanding of the dearth of published data and evidence about women who have had a hysterectomy, one of the most prevalent gynecological procedures. Again, the following discussion is organized by the four components of the equity model.

#### **Non-medical Determinants of Health**

Within the guiding framework, non-medical determinants of health were depicted by living and working conditions, health behaviours, and personal resources including social support. These are pre-existing conditions that contextualize women's gynecological health post-hysterectomy.

The majority of women were 40 years or older. The results do demonstrate a statistically significant difference between the two groups of women, with racialized women representing a smaller sub-group aged 65 years or older. Most women, in either cohort, did not cohabit with children aged 11 years or younger. For those women who did live with dependent children, a higher proportion self-identified as a member of a racialized group. Further, racialized women were more likely to live in an intergenerational household including children, parents, siblings, and others. Over 60% of racialized women lived in a household with three or more individuals, whereas a similar living condition was reported by approximately 20% of non-racialized women. This larger household composition has unknown implications for women who return home to recover following surgery. Previous authors (Dunn et al., 2011; Lefebvre et al., 2018) have indicated that the immediate recovery period for a hysterectomy ranges from four to eight weeks. There are no data to indicate the roles and responsibilities of respondents within their home situation prior to or following surgery. As such, a household with many family members may provide a supportive environment for convalescence, recovery, and well-being. Alternatively, larger households may impose limits on privacy and premature resumption of roles for women following surgery. Recent evidence (Dillaway 2015; Lonnée-Hoffmann & Pinas, 2014) recommends the importance of meaningful pre-surgical discussion of the benefits and risks and implications of hysterectomy approach for timely resumption of functional activities; roles including spouse and mother; and social responsibilities. For example, earlier resumption of

general activities including sexual functioning and satisfaction has been reported following less invasive hysterectomy. This warrants preparing women to make informed decisions prior to granting surgical consent informed by knowledge of risks, benefits, and implication for their personal, cultural, and social realities.

Most women in this study were employed in a full-time capacity. Although not statistically significant, a greater proportion of racialized women had earned a post-secondary education in comparison to their non-racialized counterparts. Chen et al.'s (2017) population-based retrospective study reported that lower education was associated with higher rates of short-term complications following a hysterectomy. These authors cited the following as possible rationale for this inverse relationship between education and post-surgical complication including delay in seeking medical care, lack of awareness of treatment options, variation in treatment preferences, and access to health care providers. In the current study, despite the observations between employment and education, more racialized women lived in households within the lowest reportable total income category in comparison to their non-racialized counterparts, a statistically significant difference. When total household income is considered in the context of household size, the degree of financial disparity experienced by racialized women may be magnified and/or hidden.

With respect to smoking behaviours, a non-medical determinant of health, there were no significant findings between racialized and non-racialized women. Most women were non-smokers and resided in a smoke free home. It is notable that a small proportion of racialized women, one in ten, and non-racialized women, one in five, reported smoking on a daily basis. This finding has potential implications for immediate surgical recovery and longer-term cardiorespiratory health (Thurston et al., 2019). In response to a pre-operative screening question

regarding smoking status and an expressed interest in smoking cessation, it is a challenge to engage in meaningful health teaching during the short hospital stay for hysterectomy.

Alternatively, there is an opportunity for individual clinicians to refer women to accessible supports including their primary healthcare provider and community-based initiatives such as the Canadian Cancer Society's Smokers Helpline to provide for their individual health and that of the population at large. Gynecological follow-up care offers opportunities to engage women in cardiovascular health promotion which ultimately will contribute to individual health and decreased future healthcare costs. Ontario Agency for Health Protection and Promotion et al. (2019) estimated that an overall reduction in smoking saves 4.2 billion in healthcare expenditures over a 10-year period. This is an important finding given the unknown association between past hysterectomy and long-term cardiovascular health compounded by smoking behaviours. A non-medical determinant of health, activity may have a moderating effect on cardiovascular health. It is noteworthy that over 85% of the women in this study participated in physical leisure activities, a positive observation to be acknowledged by healthcare providers.

Fewer racialized women in comparison to their non-racialized counterparts described themselves as consuming alcohol on a regular basis. For both groups, monthly consumption of alcohol, as opposed to weekly or daily intake, was most often reported. Alcohol consumption is associated with short-term intra-operative risks such as bleeding, wound infection, and cardiopulmonary complications (Egholm et al., 2018). There is some literature indicating that long-term implications of light to moderate alcohol use, as reported in the current study, include increased risk of breast cancer, hepatic disorders, mental illness, bone loss, and hypertension (Wilsnack & Wislnak, 2014). Awareness of such risk factors allow healthcare workers to assess women appropriately in the preoperative phase prior to consideration of surgical intervention.

These informed assessments could provide an opportunity to engage clients in a discussion regarding interest in moderating alcohol use prior to and following hysterectomy in order to promote optimal health outcomes over time.

Over 98% of women in both groups identified having enough or always enough food in their household, demonstrating overall food security. Racialized women (3.7%), however, were more likely unable to provide balanced meals than their non-racialized counterparts (1.4%), a statistically significant finding. Although literature addresses the short-term post-surgical implications of balanced nutrition for healing and infection, the long-term implications are elusive with the exception of special populations such as individuals with diabetes and cardiovascular disease, specifically hypertension. In the current study, racialized women had a high self-report of these two chronic health challenges, the implications of which are potentially compounded by a lack of a balanced diet by some. Further, over 60% of women in both groups, perceived their body mass index as greater than normal. As identified by Sherman, Rose, and Makarchuk (2017), nationally funded health research examining obesity and health body weight must extend its focus in order to address solutions to this population health issue. The Institute of Nutrition, Metabolism and Diabetes (INMD), one of Canadian Institute of Health Research's 13 institutes, responded to this call and developed a strategic plan that identifies three key research priorities, all of which are relevant to the findings of this study: food and health; chronic disease; and seeking solutions for obesity and healthy body weight (Canadian Institute of Health Research, 2018).

### **Community Characteristics**

With respect to community characteristics, over 70% of each group perceived a strong sense of belonging to their community. Of concern, however, is the non-statistically significant



finding that twice as many non-racialized women felt a very weak sense of belonging to their community. The relevance of this finding relates to the contemporary work of American Surgeon General, Murthy (2020), who posited the critical importance of connecting in a meaningful way to one's social context as a conduit to contributing to a sense of belonging and health. Such social interactions allow for sharing of common pleasures or struggles around health challenges. Murthy further posited that the antithesis of belonging is isolation or loneliness. This subjective state is not only stigmatizing but also longevity reducing, impacting both physical and mental well-being, and affecting a growing number of individuals including potentially the women in the current study.

### **Health Status**

The overall profile of each group of women indicates that the majority of the population self-reported a positive health status. With respect to self-perceived health, 52% of non-racialized women ranked their physical health as very good to excellent in comparison to 33% of their racialized counterparts. Alternatively, for self-perceived mental health, 76% of racialized women ranked themselves as very good to excellent, whereas 68% of non-racialized women submitted a comparable ranking. There was a significant difference in perceived life stress. More frequently, racialized women (43%) reported that their life was not very to not at all stressful in comparison to their non-racialized counterparts (38%). These findings are viewed with caution as they are not substantiated by quantitative metrics nor do they indicate rural/urban geographic variation which may have implications for access to services and service providers.

### **Healthcare System Characteristics and Performance**

Almost all women, regardless of group, reported having a family doctor. The incidence of seeking services from a family doctor at least once per year was higher among racialized women

(90%), compared to non-racialized women (60%), a statistically significant difference. As such, racialized women may have access to a primary care physician relative to gynecological concerns. A relationship with a primary care provider is one indicator of equity within the framework used in this study. It is important to note that within the province of Ontario, there is an uneven distribution of primary care providers impacting Ontarian's access to health care that does not coincide with a dichotomous rural urban pattern of disparity (Green, Gozdyra, Frymire, & Glazier, 2017). These authors identify that select geographic areas, such as North East and North West Local Health Integration networks, are devoid of permanent and comprehensive primary care services, thus compromising equity with respect to access.

### **Limitations**

Although access to and use of large publicly available datasets presents multiple well-established merits in examining health and health services, there can be a number of associated limitations. For example, in the current study, a key limitation was the researcher's inability to ascertain the respondent's age at time of hysterectomy from the dataset as this information was not collected. Further, there was no indication of the surgical approach, ovarian conservation, and use of hormone-replacement therapy. This information would strengthen comparisons between the two cohorts of women and to currently published literature. In addition, the small sample size, as discussed at the onset of this chapter, is devoid of clear ethnic identification beyond racialized/non-racialized grouping, and the absence of information regarding rural or urban residency limits the generalizability and specificity of findings and conclusions that could be rendered from this study. El-Mowafi and associates (2021) argued for aggregation of Canadian sexual health data by race so that Indigenous, Black, and racialized communities have access to equitable, just, evidence-based practices.



## **Conclusions**

It is alarming that hysterectomy is one of the most common procedures performed on women, yet no major accessible provincial or national database exists that presents gender-based data particular to gynecological health. Using the best population-based data available, this study demonstrates the need for dedicated resources to generate knowledge from women's gynecological experiences, specific to hysterectomy, and the associated long-term outcomes at both an individual and population level. Such knowledge will inform future peri-operative assessments and interventions. The findings indicate that clinicians have a role to fulfill in health education both during the pre-operative phase as women make decisions regarding health behaviours and consent to surgical procedures, and post-operatively in relation to health practices and healthcare. Further, additional research could examine the confounding impact of women's autonomous decision making and system issues, such as inequities in access to quality surgical services and post-hysterectomy care supportive of their individualized needs for well-being and regard for their ethnic uniqueness.

## References

- Aarts, J. W. M., Nieboer, T. E., Johnson, N., Tavender, E., Garry, R., Mol, B. W. J., & Kluivers, K. B. (2015). Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database of Systematic Reviews*, Issue 8. Art. No.: CD003677. doi: 10.1002/14651858.CD003677.pub5
- Ala-Nissilä, S., Haarala, M. Järvenpää, T., & Mäkinen, J. (2017). Long-term follow-up of the outcome of supracervical versus total abdominal hysterectomy. *International Urogynecology Journal*, 28, 299-306. doi:10.1007/s00192-016-3143-0
- Altman, S., Granath, F., Cnattingius, S., & Falconer, C. (2007). Hysterectomy and risk of stress-urinary-incontinence surgery: Nationwide cohort study. *The Lancet*, 370(9597), 1494–1499. doi:10.1016/s0140-6736(07)61635-3
- Andersen, L. L., Ottesen, B., Alling Moller, L. M., Gluud, C., Tabor, A., Zobbe, V ... Gimbel, H. M. (2015). Subtotal versus total abdominal hysterectomy: Randomized clinical trial with 14-year questionnaire follow-up. *American Journal of Obstetrics & Gynecology*, 212(6), 1.e1-1. e7. doi:10.1016/j.ajog.2014.12.039
- Appiah, D., Schreiner, P. J., Bower, J. K., Sternfeld, B., Lewis, C. E., Wellons, M. F. (2015). Is surgical menopause associated with future levels of cardiovascular risk factor independent of antecedent levels? The CARDIA study. *American Journal of Epidemiology*, 182(12), 991-999. doi:10.1093/aje/kwv162
- Bierman, A. S., & Weissman, J. S. (2016). Disparities in medical practices. In T. Stukel & A. Johnson (Eds.). *Medical practice variations* (Chapter 18). New York, NY: Springer

- Blandon, R. E., Bharucha, A. E., Melton III, L. J., Schleck, C. D., Babalola, E. O., Zinsmeister, A. R., & Gebhart, J. B. (2007). Incidence of pelvic floor repair after hysterectomy: A population –based cohort study. *American Journal of Obstetrics Gynecology*, 197(6), 664.e1-664.e7. doi: 10.1016/j.ajog.2007.08.064
- Bougie, O., Singh, S., Chen, I., & McCarthy, E. (2018). Relationship between race/ethnicity and hysterectomy outcomes for benign gynecological conditions. *The Journal of Minimally Invasive Gynecology*, 26(3), 456-462. doi:10.1016/j.jmig.2018.05.017
- Brucker, S. Y., Taran, F-A., Bogdanyova, S., Ebersoll, S., Wallwiener, C. W., Schönfisch. B. ... Wallwiener, M. (2014). Patient-reported quality-of-life and sexual-function outcomes after laparoscopic supracervical hysterectomy (LSH) versus total laparoscopic hysterectomy (TLH): A prospective, questionnaire-based follow-up study in 915 patients. *Archives of Gynecology and Obstetrics*, 290, 1141-1149. doi:10.1007/s00404-014-3318-1
- Carlin, G. L., Bodner-Adler, B., Husslein, H., Ritter, M., & Umek, W., (2020). The effectiveness of surgical procedures to prevent post-hysterectomy pelvic organ prolapse: A systematic review of the literature. *International Urogynecology Journal*, 32(4), 775-783. doi.org/10.1007/s00192-020-04572-2
- Canadian Council on Social Determinants of Health. (2015). A review of frameworks on the determinants of health. Retrieved from [http://ccsdh.ca/images/uploads/Frameworks\\_Report\\_English.pdf](http://ccsdh.ca/images/uploads/Frameworks_Report_English.pdf)
- Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada. (2018). Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. Retrieved from [https://ethics.gc.ca/eng/nr-cp\\_2019-06-05.html](https://ethics.gc.ca/eng/nr-cp_2019-06-05.html)

- Canadian Institutes of Health Research (2018). INMD strategic research priorities. Retrieved from: <https://cihr-irsc.gc.ca/e/27308.html>
- Chen, I., Choudhry, A. J., & Tulandi, T. (2019). Hysterectomy trends: A Canadian perspective on the past, present, and future. *Journal of Obstetrics and Gynecology Canada*, 41(2), 340-342. doi:10.1016/j.jogc.2019.09.002
- Chen, I., Lisonkova, S., Allaire, C., Williams, C., Yong, P., & Joseph, K. (2014). Routes of hysterectomy in women with benign uterine disease in the Vancouver Coastal Health and Providence Health Care regions: A retrospective cohort analysis. *Canadian Medical Association Journal Open*, 2(4), 273-280. doi:10.9778/cmajo.20130080
- Chen, I., Wise, M., Dunn, S., Anderson, G., Degani, N., Lefebvre, G., & Bierman, A. (2017). Social and geographic determinants of hysterectomy in Ontario: A population-based retrospective cross-sectional analysis. *Journal of Obstetrics and Gynaecology Canada*, 39(10), 861–869. doi.org/10.1016/j.jogc.2017.03.109
- Chen, I., Mallick, R., Allaire, C., Bajzak., K., Belland, L. M., Bougie, O ... Leberge, P. Y. (2021). Technicity in Canada: A nationwide who-population analysis of temporal trends and variation in minimally invasive hysterectomies. *Journal of Minimally Invasive Gynecology*, 18, 1553 doi: 10.1016/j.jmig.2021.01.010
- Clark, J. P., & Bierman, A. S. (2009). The POWER Study Framework, Chapter 2. In: Bierman A. S. (Editor). *Project for an Ontario Women's Health Evidence-Based Report: Volume 1*: Toronto. Ontario: St. Michael's Hospital and the Institute for Clinical Evaluative Sciences.
- <http://powerstudy.ca/wp-content/uploads/downloads/2012/10/Chapter2-ThePOWERStudyFramework.pdf>

- Cohen, S. L., Vitonis, A. F., & Einarsson, J. I. (2014). Updated hysterectomy surveillance and factors associated with minimally invasive hysterectomy. *Journal of the Society of Laparoendoscopic Surgeons*, 18(3), 1-12. doi:10.4293/JLS.2014.00096
- Darwish, A. (Ed.). (2017). *Fertility-oriented female reproductive surgery*. Janeza Trdine
- Dillaway, H. (2016). Are hysterectomies necessary? Racial-ethnic differences in women's attitudes. *Journal of Women & Aging*, 28(4), 309-321.  
doi:10.1080/08952841.2015.1017429
- Drew, J. A. R. (2013). Hysterectomy and disability among U.S. Women. *Perspectives on Sexual and Reproductive Health*, 45(3), 157–163. doi:10.1363/4515713
- Dunn, S., Wise, M. R., Johnson, L. M., Anderson, G., Ferris, L. E., Yeritsyan N, ...
- Bierman, A.S (2011). Reproductive and gynaecological health. Bierman, A. S. (Editor). *Project for an Ontario Women's Health Evidence-Based Report: Volume 2: Toronto, ON: St. Michael's Hospital and the Institute for Clinical Evaluative Sciences.*
- Duru, C., Jha, S., & Lashen, H. (2012). Urodynamic outcomes after hysterectomy for benign conditions. *Obstetrical & Gynecological Survey*, 67(1), 45-54.  
doi:10.1097/ogx.0b013e318240aa28
- Egholm, J., Pedersen, B., Møller, A., Adami, J., Juhl, C., & Tønnesen, H. (2018). Perioperative alcohol cessation intervention for postoperative complications. *Cochrane Database of Systematic Reviews*, 11. doi: 10.1002/14651858.CD008343.pub3.
- El-Mowafi, I. M., Yalahow, A., Idriss-Wheeler, D., & Yaya, S. (2021). The politest form of racism: Sexual and reproductive health and rights paradigm in Canada. *Reproductive Health*, 18:59 doi:10.1186/s12978-021-01117-8



- Forsgren, C., & Altman, D. (2013). Long-term effects of hysterectomy: a focus on the aging patient. *Aging Health, 9*(2), 179–187. doi:10.2217/ahe.13.7
- Fortin, C., Hur, C., Falcone, T. (2018). Impact of laparoscopic hysterectomy on quality of life. *Journal of Minimally Invasive Gynecology, 25*(2), 219-232. doi: 10.1016/j.jmig.2018.08.019
- Gibson, C. J., Thurston, R. C., El Khoudary, S. R., Sutton-Tyrrell, K., & Matthews, K. A. (2013). Body mass index following natural menopause and hysterectomy with and without bilateral oophorectomy. *Internal Journal of Obesity, 37*(6), 809-813. doi:10.1038/ijjo.2012.164
- Gierach, G. L., Rfeiffer, R. M., Patel, D. A., Black, A., Schairer, C., Gill, A. ... Sherman, M. E. (2013). Long-term overall and disease-specific associated with benign gynecologic surgery performed at different ages. *Menopause: The Journal of the North American Menopause Society, 21*(6), 592-601. doi:10.1097/gme.000000000000118
- Government of Canada. (1984). Canada Health Act. Retrieved from <https://www.canada.ca/en/health-canada/services/health-care-system/canada-health-care-system-medicare/canada-health-act.html>
- Government of Canada (2018). Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans - TCPS 2. Retrieved from [https://ethics.gc.ca/eng/policy-politique\\_tcps2-eptc2\\_2018.html](https://ethics.gc.ca/eng/policy-politique_tcps2-eptc2_2018.html)
- Green, M. E., Gozdyra, P., Frymire, E., & Glazier, R. H. (2017). *Geographic Variation in the Supply and Distribution of Comprehensive Primary Care Physicians in Ontario, 2014/15*. Retrieved from

<https://www.ices.on.ca/Newsroom/News-Releases/2017/Access-to-family-doctors-varies-widely-across-the-province-ICES-report>

Hudon, T. (2016). *Visible minority women*. Retrieved from

<https://www150.statcan.gc.ca/n1/pub/89-503-x/2015001/article/14315-eng.htm>

Jacoby, V. L., Grady, D., & Sawaya, G. F. (2009). Oophorectomy as a risk factor for coronary heart disease. *American Journal of Obstetrics & Gynecology*, 200(2), 140.e1–140.e9. doi: 10.1016/j.ajog.2008.08.045

Jacoby, V. L. (2014). Hysterectomy controversies: Ovarian and cervical preservation. *Clinical Obstetrics and Gynecology*, 57(1), 95–105. doi:10.1097/GRF.0000000000000011

Jacoby, V., Fujimoto, V., Giudice, L., Kuppermann, M., & Washington, E. (2010). Racial and ethnic disparities in benign gynecologic conditions and associated surgeries. *American Journal of Obstetrics and Gynecology*, 202(6), 514-521. doi:10.1016/j.ajog.2010.02.039

Jacoby, V. L., Grady, D., Wactawski-Wende, J., Manson, J. E., Allison, M. A., Kuppermann, M ... Stefanick, M. L. (2011). Oophorectomy vs ovarian conservation with hysterectomy: Cardiovascular disease, hip fracture, and cancer in the Women's Health Initiative observational study. *Archives of Internal Medicine*, 171(8), 760-768. doi:10.1001/archinternmed.2011.121

Johnson, N., Barlow, D., Lethaby, A., Tavender, E., Curr, L., & Garry, R., (2005). Methods of hysterectomy: Systematic review and meta-analysis of randomized controlled trials. *British Medical Journal*, 330(7506), 1478-1456. doi:10.1136/bmj.330.7506.1478

Kelly, E., Winick-Ng, J., McClure, A., Peart, T., Chou, Q., MacMillan, B., ...McGee, J. (2019). Hysterectomy in Ontario: A population-based study of outcomes and complications in

- minimally invasive compared with abdominal approaches. *Journal of Obstetrics and Gynecology Canada*, 41(8), 1168-1176. doi:10.1016/j.jogc.2018.10.026
- Kluiwers, K. B., Opmeer, B. C., Geomini, P. M., Bongers, M. Y., Vierhout, M. E., Bremer, G. L., & Mol, B. W. J. (2009). Women's preference for laparoscopic or abdominal hysterectomy, *Gynecological Surgery*, 6(223), 223-228. doi:10.1007/s10397-008-0455-1
- Knapp, H. (2017). *Practical statistics for nursing using SPSS®*. Los Angeles, CA: Sage.
- Laughlin-Tommaso, S. K., Khan, Z., Weaver, A. L., Schleck, C. D., Rocca, W. A., & Stewart, E. A., (2015). Menopause. *Journal of the North American Menopause Society*, 23(2), 121-128. doi:10.1097/GME.0000000000000506
- Lee, J., Jennings, K., Borahay, M., Rodriguez, A., Kilic, G., Snyder, R., & Patel, P. (2014). Trends in the national distribution of laparoscopic hysterectomies from 2003-2010. *Journal of Minimally Invasive Gynecology*, 21(4), 656-661. doi:10.1016/j.jmig.2014.01.012
- Lefebvre, G., Allaire, C., Jeffrey, J., & Vilos, G. (2018). No. 109-Hysterectomy. *Journal of Obstetrics and Gynaecology Canada*, 40(7), e567–e579. doi:10.1016/j.jogc.2018.04.031
- Lethaby, A., Mukhopadhyay, A., & Naik, R. (2012). Total versus subtotal hysterectomy for benign gynaecological conditions. *Cochrane Database Systematic Reviews*, 18(4), 1-74. doi:10.1002/14651858.CD004993.pub3.
- Lonnée-Hoffmann, R., & Pinas, I. (2014). Effects of hysterectomy on sexual function. *Current Sexual Health Reports*, 6, 244-251. doi:10.1007/s11933-014-9929-3.
- Louie, M., Strassel, P. Moulter, J. K., Dizon, M., Schiff, L. D., & Carey, E. T. (2018). Uterine weight and complications after abdominal, laparoscopic, and vaginal hysterectomy. *American Journal of Obstetrics & Gynecology*, 219, 480.e1-480.e8.

- Lukanovič, A., & Dražič, K. (2010). Risk factors for vaginal prolapse after hysterectomy. *International Journal of Gynecology & Obstetrics*, *110*(1), 27-30.  
doi:10.1016/j.ijgo.2010.01.025
- McClurg, A., Wong, J., & Louie, M. (2020). The impact of race on hysterectomy for benign indications. *Current Opinion in Obstetrics & Gynecology*, *32*(4), 263–268.  
doi:10.1097/gco.0000000000000633
- Melton III, L. J., Achenbach, S. J., Gebhart, J. B., Babalola, E. O., Atkinson, E. J., & Bharucha, A. E. (2007). Influence of hysterectomy on long-term fracture risk. *Reproductive Endocrinology*, *88*(1):156-62. doi: 10.1016/j.fertnstert.2006.11.080.
- Millar, W. J. (2001). Hysterectomy, 1981/82 to 1996/97. *Health Reports*, *12*(2), 9-22. PMID: 15112423.
- Ministry of Health and Long-Term Care. (2016). *Quality-based procedures clinical handbook for hysterectomy*. Retrieved from [https://www.health.gov.on.ca/en/pro/programs/ecfa/docs/hb\\_hysterectomy.pdf](https://www.health.gov.on.ca/en/pro/programs/ecfa/docs/hb_hysterectomy.pdf)
- Moorman, P. G., Schidkraut, J. M., Iversen, E. S., Myers, E. R., Gradison, M., Warren-White, N., & Wang, F. (2009). A prospective study of weight gain after premenopausal hysterectomy. *Journal of Women's Health*, *18*(5), 699-708. doi:10.1089=jwh.2008.1019
- Morgan, D. M., Kamdar, M. S., Swenson, C. W., Kobernik, E. K, Sammarco, A. G., & Nallamotheu, B. (2018). Nationwide trends in the utilization of and payments for hysterectomy in the United States among commercially insured women. *American Journal of Obstetrics and Gynecology*, *4*, 425.e1-425.e18.  
doi:10.1016/j.ajog.2017.12.218

- Murthy, W. H. (2020). *Together: The Healing Power of Human Connection in a Sometimes Lonely World*. New York, NY: Harper Collins.
- National Collaborating Centre for Determinants of Health. (2012). *Learning together – Population health status reporting ethics and best practices for access and use of external data*. Retrieved from [https://nccdh.ca/images/uploads/Ethics\\_EN.pdf](https://nccdh.ca/images/uploads/Ethics_EN.pdf)
- National Institute for Health and Care Excellence [NICE]. (2018). *Heavy menstrual bleeding: Assessment and management*. Retrieved from <https://www.nice.org.uk/guidance/ng88/resources/heavy-menstrual-bleeding-assessment-and-management-pdf-1837701412549>
- National Women's Health Network. (2015). *Hysterectomy*. <https://nwhn.org/hysterectomy>
- Nensi, A., Coll-Black, M., Leyland, N., & Sobel, M. L. (2018). Implementation of a same-day discharge protocol following total laparoscopic hysterectomy. *Journal of Obstetrics and Gynaecology Canada*, 40(1), 29-35. doi:10.1016/j.jogc.2017.05.035
- Ontario Agency for Health Protection and Promotion (Public Health Ontario), Berenbaum E, KellerOlaman S, Watson K, Longo C. (2019). Economic benefits of smoking cessation. Toronto, ON: Queen's Printer for Ontario. Retrieved from <https://www.publichealthontario.ca/-/media/documents/r/2020/rapid-review-economic-benefits-smoking-cessation.pdf?la=en>
- Patel, S., Modi, K., Shah, S., & Pamnani, D. (2014). Hysterectomy ..... Why? *Journal of Evolution of Medical and Dental Sciences* (3)32, 8750-8755. DOI: 10.14260/jemds/2014/3117
- Parker, W. H., Feskanich, D., Broder, M. S., Chang, E., Shoupe, D., Farquhar, C. M., Berek, J. S., & Manson, J. E. (2013). Long-term mortality associated with oophorectomy compared

- with ovarian conservation in nurses' health study. *Obstetrics & Gynecology*, 121(4), 709-716.
- Pitsillides, C., & Lashen, H. (2017). *Bowel dysfunction after hysterectomy for benign conditions: Meta-analysis and systematic review*. Retrieved from <https://www.intechopen.com/books/fertility-oriented-female-reproductive-surgery/bowel-dysfunction-after-hysterectomy-for-benign-conditions-meta-analysis-and-systematic-review>
- Polit, D. F., & Beck, C. T. (2017). *Nursing research: Generating and assessing evidence for nursing practice* (10th ed.). Philadelphia, PA: Wolters Kluwer.
- Pollack, Lisa M.; Olsen, Margaret A.; Gehlert, Sarah J.; Chang, Su-Hsin; Lowder, Jerry L. (2019). Racial/Ethnic Disparities/Differences in Hysterectomy Route in Women Likely Eligible for Minimally Invasive Surgery. *Journal of Minimally Invasive Gynecology*, 27(5), 1167-1177.e2. doi:10.1016/j.jmig.2019.09.003
- Price, J., Zimmerman, L, Koelper, N., Sammel, M., Lee, S., & Butts, S. (2017). Social determinants of access to minimally invasive hysterectomy: Reevaluating the relationship between race and route of hysterectomy for benign disease. *American Journal of Obstetrics and Gynecology*, 217(572), e1-e10. doi:10.1016/j.ajog.2017.07.036
- Robinson, W., Cheng, M., Green Howard, A., Carpenter, W., Brewster, W., & Doll, K. (2017). For US black women, shift of hysterectomy to outpatient settings may have lagged behind white women: A claims-based analysis, 2011-2013. *BMC Health Services Research*, 17(1), 1-9. doi:10.1186/s12913-017-2471-1
- Sanai-Moghaddam, A., Kang, C., Edwards, R., Louder, P., Ismail, N., Goughnour, S., Mansuria, S., Comerci, J., & Linkov, F. (2018). Racial and socioeconomic disparities in

- hysterectomy route for benign conditions. *Journal of Racial and Ethnic Health Disparities*, 5, 758-765. doi:10.1007/s40615-017-0420-7
- Sherman, P. M., Rose, K., Makarchuk, M-J. (2017). Refreshed Strategic Plan for the Canadian Institutes of Health Research Institute of Nutrition, Metabolism and Diabetes. *Canadian Journal of Diabetes*, 41(3), 249-252. doi:10.1016/j.jcjd.2016.10.010
- Social Science Statistics online calculator (2020) Retrieved from <https://www.socscistatistics.com/>
- Society of Obstetricians and Gynecologists of Canada. (2020). *SOGC Statement on racism*. Retrieved from <https://sogc.org/en/content/featured-news/SOGC-Statement%20-on-Racism.aspx?WebsiteKey=4d1aa07b-5fc4-4673-9721-b91ff3c0be30>
- Stankiewicz, A., Pogany, L., & Popadiuk, C. (2014). Prevalence of self-reported hysterectomy among Canadian women, 2000/2001-2008. *Chronic Diseases and Injuries in Canada*, 34(1), 30-35.
- Stangroom, J. (2021). Z score calculator for 2 population proportions. Social science statistics. <https://www.socscistatistics.com/tests/ztest/default.aspx>
- Statistics Canada. (2011). Population growth in Canada: From 1851-2061. Population and dwelling counts, 2011 Census. Catalogue no. 98-310-X2011003
- Statistics Canada. (2011). Focus on geography: 2011 census. Retrieved from <https://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-pr-eng.cfm?Lang=Eng&GK=PR&GC=35>
- Statistics Canada. (2012). Canadian community health survey CCHS annual component –

- 2012 questionnaire. Retrieved from  
[https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=getInstrumentList&Item\\_Id=137057&UL=1V](https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=getInstrumentList&Item_Id=137057&UL=1V)
- Statistics Canada. (2016). Canadian community health survey, 2012: Annual component. Study Document. Retrieved from <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&Id=114112>
- Statistics Canada (2021). Access to microdata. Retrieved from <https://www.statcan.gc.ca/eng/help/microdata>.
- Stewart, E. A., Shuster, L. T., & Rocca, W. A. (2012). Reassessing hysterectomy. *Minnesota Medical, 95*(3), 36-39.
- Stewart, E. A., Shuster, L. T., & Rocca, W. A. (2012). Reassessing hysterectomy. *Minnesota Medical, 95*(3), 36-39.
- Thurston, J., Murji, A., Scattolon, S., Wolfman, W., Kives, S., Sanders, A., & Leyland, N. (2019). No.377-Hysterectomy for benign gynecological indications. *Journal of Obstetrics and Gynecology Canada, 41*(4), 543-557.
- Traylor, J., Simon, M., Tsai, S., & Feinglass, J. (2020). Patient and Hospital Characteristics Associated with Minimally Invasive Hysterectomy: Evidence from 143 Illinois Hospitals, 2016 to 2018. *Journal of Minimally Invasive Gynecology, 27*(6), 1337-1343.  
doi:10.1016/j.jmig.2020.02.013
- Uccella, S., Cromi, A., Bogani, G., Casarin, J., Formenti, G., Ghezzi, F. (2013). Systematic implantation of laparoscopic hysterectomy independent of uterus size: Clinical effect. *The Journal of Minimally Invasive Gynecology, 20*, 505-516. doi:10.1016/j.jmig.2013.02.009



- Vermeulen, C. K. M., Veem, J., Adang, C., van Leijsen, S. A. L., Coolen, A-L.W. M., & Bongers, M. Y., (2020). Pelvic organ prolapse after laparoscopic hysterectomy compared with vaginal hysterectomy: The POP-UP study. *International Urogynecology Journal*, 32, 841-850. doi: 10.1007/s00192-020-04591-z
- Verschoor, C. P., & Tamim, H. (2019). Frailty is inversely related to age at menopause and elevated in women who have had a hysterectomy: An analysis of the Canadian Longitudinal Study on Aging. *Journal of Gerontology Series A Biological Sciences and Medical Sciences* 74(5), 675-682. doi:10.1093/gerona/gly092
- Weiss, G., Noorhasan, D., Schott, L., Powell, L., Randolph Jr, J. F., & Johnston, J. (2009). Racial differences in women who have a hysterectomy for benign conditions. *Women's Health Issues*, 19(3), 202-210. doi:10.1016/j.whi.2009.03.001
- Wilsnack, S. C., & Wilsnack, R. W. (2019). Focus on: Women and the costs of alcohol use. *Alcohol Research Current Reviews*. 35(2), 219-228.
- Yount, S. M. (2013). The impact of pelvic floor disorders and pelvic surgery on women's sexual satisfaction and function. *Journal of Midwifery & Women's Health*, 58(5), 538-545. doi.10.1111/jmwh.1203

## Appendix A



**APPROVAL FOR CONDUCTING RESEARCH INVOLVING HUMAN SUBJECTS**  
Research Ethics Board – Laurentian University

This letter confirms that the research project identified below has successfully passed the ethics review by the Laurentian University Research Ethics Board (REB). Your ethics approval date, other milestone dates, and any special conditions for your project are indicated below.

TYPE OF APPROVAL / New X / Modifications to project / Time extension	
<b>Name of Principal Investigator and school/department</b>	
<b>Title of Project</b>	Use of Population-Based Data to Characterize Racialized and Non-Racialized Ontarians Who Self-Report a Past Hysterectomy
<b>REB file number</b>	6020984
<b>Date of original approval of project</b>	March 22, 2021
<b>Date of approval of project modifications or extension (if applicable)</b>	
<b>Final/Interim report due on: (You may request an extension)</b>	March 22, 2022
<b>Conditions placed on project</b>	

During the course of your research, no deviations from, or changes to, the protocol, recruitment or consent forms may be initiated without prior written approval from the REB. If you wish to modify your research project, please refer to the Research Ethics website to complete the appropriate REB form.

All projects must submit a report to REB at least once per year. If involvement with human participants continues for longer than one year (e.g., you have not completed the objectives of the study and have not yet terminated contact with the participants, except for feedback of final results to participants), you must request an extension using the appropriate LU REB form. In all cases, please ensure that your research complies with Tri-Council Policy Statement (TCPS). Also please quote your REB file number on all future correspondence with the REB office.

Congratulations and best wishes in conducting your research.

Rosanna Langer, PHD, Chair, *Laurentian University Research Ethics Board*