

The Effect of Method of Delivery and Psychosocial Factors  
on Postpartum Sexual Satisfaction

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## ABSTRACT

**INTRODUCTION:** Female sexual dysfunction is a common postpartum morbidity. Perineal birth trauma is hypothesized to be a major factor adversely affecting women's postpartum sexual health. Recently, attention has turned to the protective role that Cesarean section may play in preventing perineal birth trauma. At the same time, there is growing opinion that the quality of women's postpartum sexual health is not solely related to physiological factors but psychosocial factors as well.

**OBJECTIVE:** The aim of this study was: 1) to determine factors associated with postpartum sexual satisfaction at 6 months and 12 months postpartum; 2) to examine the effect of method of delivery on postpartum sexual satisfaction at 6 months and 12 months postpartum.

**METHODS:** The current study undertook a secondary data analysis of The Ontario Mother and Infant Study (TOMIS) III which recruited 2560 postpartum women from across Ontario, Canada. Participants completed a self-report questionnaire in hospital and structured telephone interviews 6 weeks, 6 months and 12 months postpartum. Interview questions measured factors such as overall health, mental health, breastfeeding status, pelvic floor trauma and sexual satisfaction. A biopsychosocial predictive model of sexual satisfaction at 6 months and 12 months postpartum was developed. Associations were assessed using logistic regression analyses.

**RESULTS:** Most women were sexually satisfied at 6 months (92%) and 12 months (92%). Statistically significant factors associated with sexual satisfaction at 6 months postpartum were country of birth, breastfeeding status, physical health scores, perceived social support, mental health scores and the risk of postpartum depression. At 12 months postpartum, breastfeeding status, physical health scores, perceived social support and mental health scores were associated with postpartum sexual satisfaction. Method of delivery was not found to be statistically significant at both time points. A possible association was just shy of statistical significance at 12 months postpartum suggesting that vaginal deliveries were associated with increased odds of sexual satisfaction.

**CONCLUSION:** Our findings do not support the hypothesis that C-section delivery provides a protective benefit to women's sexual satisfaction. The impact of common postpartum factors on sexual satisfaction is multidimensional and complex. A shift towards a biopsychosocial model of postpartum sexual satisfaction is necessary to better counsel women on delivery method and postpartum sexual health.

## Dedication

“I sustain myself with the love of family.”

Maya Angelou

This work is dedicated to my family.

To my husband, James, who has always been my greatest support, thank you for being my biggest cheerleader and always believing in me. I love you more than you know.

To my children, Alexander-James and Lilly, you are my greatest accomplishments. Thank you for motivating me to pursue my dreams. I love you to the moon and back.

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## Associated Publications

### *Conferences*

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## CHAPTER 1

### Introduction

Childbirth is a monumental event that can have a significant impact on a women's quality of life (Barrett et al., 2000; Morof et al., 2003). Various physical, psychological and sociocultural changes may occur after childbirth, especially within the first year, that can affect a women's postpartum sexual health (Barrett et al., 2000; Woolhouse et al, 2014; Olsoon et al., 2015; WHO, 2013). The current study examined the effect of postpartum physical and psychosocial factors on sexual health. The goal of the present study was to provide women and healthcare providers with a greater understanding of the normal fluctuations in postpartum sexual function and their effect on overall postpartum sexual satisfaction.

Researchers have found that a large percentage of postpartum women, ranging from 64% (Barrett et al., 2000) to 91% (Acele & Karcam, 2011), experience negative changes in their sexual health. Despite the high prevalence of women experiencing changes to their sexual health postpartum women rarely seek professional help (Abdool et al., 2009). Sexual health issues are rarely discussed during follow-up visits largely due to shyness and modesty (Glazener, 1997). The literature has revealed that the topic of postpartum sexual function is also commonly disregarded by health care professionals (McBride et al., 2017, Olsson et al., 2005). The World Health Organization (WHO, 2013) has recently updated their postnatal care recommendations to include 4 postnatal visits between birth and 6 weeks postpartum; (a) within 24 hours postpartum, (b) 3 days postpartum, (c) between 7 to 14 days postpartum and (d) 6 weeks postpartum. The WHO's (2013) recommendations made regarding postpartum sexual health suggest that an assessment be made between 2 and 6 weeks postpartum in which all women should be asked about the time of resumption of sexual intercourse and any dyspareunia.

Although the new WHO (2013) postnatal care guidelines touch on the topic of postpartum sexual health they only assess physical measures of sexual function. These guidelines are in line with the traditional measures of postpartum sexual health which view sexual health through a physiological lens (Hipp et al., 2012; O'Malley et al., 2015) rarely exploring beyond the physical changes that lead to possible sexual dysfunction such as vaginal trauma, pelvic floor trauma and breastfeeding (Hipp et al., 2012). Traditional models of postpartum sexual health disregard the subjective nature of sexual health and the psychosocial factors that influence it (Basson, 2000).

Recently, findings from sexual health research suggests that many aspects of female sexual function do not align with the traditional models that have defined sexual health in terms of physical sexual response. Examples of traditional sexual health models include the model developed by Masters and Johnson (1966) where sexual function is measured by the ability to achieve excitement, plateau, orgasm and resolution (Basson, 2001; Basson, 2005). There is a growing consensus that psychological and relationship factors affect sexual function, in addition to biological factors (Basson, 2005). A shift towards a more biopsychosocial model of sexual health and an acknowledgement of the subjective nature of sexuality is necessary to better understand postpartum sexual health (Basson, 2005).

This view that traditional models no longer suffice to define female sexual function is evident in the changes made over the past two decades to the definitions of sexual dysfunction. The proposed change in the definition of sexual dysfunction was addressed by an international multidisciplinary panel, the Consensus Development Panel on Female Dysfunction, convened by the Sexual Function Health Council of the American Foundation for Urologic Disease (1998). The Consensus Development Panel realized the need to develop a new classification system for

female sexual dysfunction and to include a personal distress criterion which evaluates if sexual dysfunction leads to personal distress, either physical or psychological (Basson, 2000). This model offered a more holistic approach to sexual health and suggested that an impairment in sexual response may not be an actual dysfunction but rather an adaptive response to interpersonal difficulties (Hatzimouratidis & Hatzichristou, 2007). The final classification system followed the same general structure as the two most widely used classification systems, the International Statistical Classification of Diseases and Related Health Problems (ICD-10) (World Health Organization, 2004) and the Diagnostic and Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 2013). Four main categories of dysfunction like those used in the standard classification systems (desire, arousal, orgasmic and sexual pain disorders) were preserved to maintain continuity of research and clinical practice. Panel recommendations included expanding current definitions to include physical and psychological causes of female sexual dysfunction, a personal distress criterion, and a new category of noncoital sexual pain (Basson et al., 2000).

The incorporation of the personal distress criterion highlights that the inability to achieve desire, arousal or orgasm, may not cause personal distress, physical or psychological, in all women. This criterion acknowledges the subjective nature of the female sexual response which is essential to better understand female sexual health and to avoid the over diagnosis of female sexual dysfunction (Basson et al., 2000; Ferenidou et al., 2008; Shifren et al., 2008).

The importance of the personal distress criterion in understanding female sexual function drove the current study to find an adequate measure of postpartum sexual health that encompasses this criterion. Therefore, understanding that sexual health is subjective, and that sexual dysfunction does not always equate to sexual distress, the current study examined a more

subjective aspect of sexual health, sexual satisfaction, as an outcome measure. Within the sexual health literature conflict still exists on a universal definition of sexual satisfaction (Phillippson & Hartmann, 2009; Stephenson & Sullivan, 2009). Debate remains on what factors should be included in this term which defines a very subjective dimension of sexual health and to what degree it should be linked to the physical act of sexual intercourse. Sexual satisfaction has been conceptualized as an interpersonal model of rewards and costs (Lawerence & Byers, 1995, p.268), as a psychological model of appraisal of overall satisfaction with one's sex life (Meston & Trapnell, 2005) and as a biopsychosocial model that assess the physical, emotional and contextual aspects of sexual satisfaction (Phillippson & Hartmen, 2009). For this research, the definition of postpartum sexual satisfaction was guided by the biopsychosocial model where both physical and psychosocial postpartum factors were used to measure sexual satisfaction.

The investigation of common postpartum factors, both physical and psychosocial, will provide greater insight on which factors effect postpartum sexual satisfaction. The current study examined a possible modifiable physical factor, method of delivery, to determine any protective benefit to sexual satisfaction related to delivery method. The recent rise in caesarean section (CS) rates, from 17% to 27% (CIHI, 2016) over the past two decades, led to an extensive investigation of the effects of method of delivery on postpartum sexual health however, few studies within this literature have focused on sexual satisfaction as the sexual health outcome (Rowlands & Redshaw, 2012).

There is currently a growing trend of maternal request for CS worldwide (D'Souza & Arulkumaran, 2013). Fear of decreased vaginal tightness and its negative effect on sexual health after a vaginal delivery (VD) is a deciding factor for women choosing elective CS (Kahramanoglu et al., 2017). Recently, obstetricians, midwives and pregnant women have

changed their perspective on elective CS with the belief that the protective benefits of CS over vaginal birth outweigh the risks (McFarlin, 2004; Wu et al., 2005; McCourt et al., 2007).

Approximately 42% of Canadian obstetricians expressed support for a caesarean delivery on maternal request (Klein et al, 2011). The new generation of Canadian obstetricians stated that their support for CS was driven by the possible risk of urinary incontinence, damage to the pelvic floor and possible sexual dysfunction related to VD (D'Souza & Arulkumaran, 2013; Dunkley-Bent, 2005; Klein et al., 2011).

## **Summary**

Postpartum sexual health is an important aspect of a woman's quality of life. Research has typically taken a traditional approach to sexual health focusing solely on the physical aspects of sexuality that lead to dysfunction. Studies have shown that the presence of sexual dysfunction, as measured by the traditional models, may not reflect women's overall sexual satisfaction (Basson et al., 2000) suggesting that sexual satisfaction is a better measure of overall postpartum sexual health. A shift towards a biopsychosocial model of sexual health allows for the consideration of all factors, physical, psychological and social, affecting postpartum sexual satisfaction. To provide high quality maternity care, appropriate counsel and treatment to postpartum women, it is imperative that all factors associated with postpartum sexual satisfaction, especially those that are modifiable such as method of delivery, be understood.

## **Problem**

Traditional measures of postpartum sexual health have focused on the effect of physical factors on sexual health and have greatly disregarded psychosocial factors common within the postpartum period, including postpartum depression and social support. Furthermore, traditional

models of sexual health have rarely looked beyond measuring sexual dysfunction failing to understand its effect on a women's overall sexual satisfaction. The current study took a more holistic approach to understanding postpartum sexual health using a more subjective measure of sexual health, sexual satisfaction. The use of sexual satisfaction as the outcome variable is relatively non-existent with the literature. The use of sexual satisfaction as the outcome variable can provide insight on how postpartum factors such as physical health, social support and method of delivery affect a women's sexual health rather than solely indicating a possible sexual dysfunction.

### **Study Goals**

The goal of the current study was to investigate women's postpartum sexual satisfaction and the factors that affect it. This study investigated postpartum physical factors (i.e., pelvic floor trauma and breastfeeding) and psychosocial factors (i.e., mental health, postpartum depression and social support) that affect postpartum sexual satisfaction. A secondary goal of this study was to examine the effect of method of delivery, vaginal delivery and caesarean section delivery, on postpartum sexual satisfaction to determine any protective health benefits related to birth method.

### **Thesis Outline**

Chapter 1 provides an introduction to postpartum sexual health and satisfaction. The need to shift from traditional models of sexual health to a more holistic view of postpartum sexual health is discussed.

Chapter 2 offers a review of the literature regarding postpartum sexual health and satisfaction. A review of demographic, physical and psychosocial factors common to the

postpartum period is provided. Traditional models of female sexual health are evaluated and the need to shift to a biopsychosocial model of female sexual health is addressed. The theoretical approach adopted to guide the study (i.e., Basson's (2001) model of female sexual response) is explained. The research goals and questions are presented in detail.

Chapter 3 explains the study design and the methods used to measure the variables of interest. A detailed description of the data analysis implemented is presented.

Chapter 4 describes the results of the current study including the descriptive analysis of the data regarding sample characteristics. The presentation of the results for each of the research questions is included.

Chapter 5 offers a discussion of the key findings of the current study in relation to past research. Study limitations and nursing implications are presented.

## CHAPTER 2

### Review of the Literature

This chapter provides a review of the literature on postpartum sexual health including the search strategies used to identify the relevant literature. In addition, a review of traditional models of the human sexual response and the gaps that exist in such models will be included. A description of Basson's (2001) model of female sexual response, the model that guided this study, will also be discussed. The role of demographic, physical and psychosocial factors on postpartum sexual satisfaction will be presented to highlight the current gaps in the literature regarding the biopsychosocial model of postpartum sexual satisfaction.

### Search Strategy

A review of the literature on postpartum sexual health and satisfaction was conducted. Multiple bibliographic databases (CINAHL, Proquest, PubMed, PsycInfo) were searched using the following keywords: *women, human sexual response, mode of delivery, method of delivery, cesarean section, caesarean section, C-section, vaginal delivery, assisted vaginal delivery, postpartum, sexual health, sexual dysfunction sexual function, sexual satisfaction, breastfeeding, parity, postpartum depression, pelvic floor trauma, postpartum health, social support and ethnicity*. Databases were searched for literature dating from 2000 to 2017. A large timeframe was used due to the limited amount of research on the current topic. Only literature published in English were included.

Articles were first considered by their title and abstract in order to identify their relevance to the study topic. Articles were then selected based on their clinical relevance regarding originality (primary sources), design (prospective studies, retrospective studies and theoretical

papers), and measurement tools. An ancestry approach was applied in which cited literature was used to identify additional studies that aligned with the aim of this review.

### **Role of Demographic Factors on Postpartum Sexual Satisfaction**

The following section will review the literature on the effects of demographic factors, i.e., age, parity, marital status, ethnicity, income level and education level, on postpartum sexual satisfaction.

**Age.** Research suggests that female sexual health is impacted by age (Acele & Karacam, 2012; Ishak et al, 2010; Laumann et al., 1999; Yee et al., 2013). Sexual health amongst women in the general population, not specifically during the postpartum period, has been found to be affected by age (Fehniger et al., 2014; Ishak et al., 2010). Ishak and colleagues (2010) used a validated Malay version of the Female Sexual Function Index (MVFSFI) to determine female sexual dysfunction involving 163 married women, aged 18–65 years, in a tertiary hospital-based primary care clinic in Kuala Lumpur, Malaysia. Approximately 26% of women had sexual dysfunction described as problems with desire (39.3%), arousal (25.8%), lubrication (21.5%), orgasm (16.6%), satisfaction (21.5%) and pain (16.6%). The researcher found that women between the ages of 18-30 did not report any sexual problems. Prevalence of sexual dysfunction increased significantly with age for women between 31-65 years of age ( $p < 0.001$ ). Women over 45 years of age were at 4.1 times the odds of being at high risk for sexual dysfunction compared to women under 45 [95% CI (1.9-9.0)]. The results of this study were based on a population sample from Malaysia, making results difficult to generalize to the Canadian population. Another limitation to this study included its cross-sectional design in which only an association can be inferred, not causation.

In a sample of 2409 Iranian women, Safarinejad (2006) found that age was associated with female sexual dysfunction. The prevalence of female sexual dysfunction, indicated by self-reported desire, arousal, pain and orgasmic disorders, increased with age from 26% in women aged between 20-39 years old to 39% in women over 50 years of age ( $p < 0.001$ ). Amongst the women suffering from sexual dysfunction, 37% reported orgasmic disorders, 35% reported desire disorders, 33.7% reported lubrication disorders, 31.5% reported satisfaction disorders and 30% reported arousal disorders. Women between 50-60 years of age were at 4.4 times more to experience sexual dysfunction in comparison to women between 20-39 years of age [95% CI (2.5-6.1)]. Strengths of this study included the two-stage cluster random sampling design used as well as the ability of co-morbidities to be assessed and verified by the interviewers who were general practitioners.

In a large U.S. based study, *Prevalence of Female Sexual Problems Associated with Distress and Determinants of Treatment Seeking (PRESIDE)*, Shifren et al. (2008) examined the prevalence of self-reported sexual problems and sexually related personal distress. The female version of the Changes in Sexual Functioning Questionnaire Short Form (CSFQ-14), the Female Sexual Distress Scale and the Short Form 12 Health Survey (SF-12 version 1) were administered to a sample of 31,581 women aged between 18-102 years of age. The study examined whether the self-reported sexual dysfunctions caused women any distress, indicated by a score higher than 15 on the Female Sexual Distress Scale. The prevalence of any sexual problem (desire, arousal or orgasm difficulties) was 44.2% and the reported sexually related personal distress was 22.8%, indicating that sexual dysfunctions did not always equate to personal sexual distress. Sexually related personal distress was lowest amongst women over 65 years of age (8.9%) and highest amongst women aged 44-64 (14.8%). Women aged 18 – 44 years of age fell in between

(10.8%). A limitation to this study was the method sexual problems and distress were classified via self-reported information. Due to the large sample size, clinical evaluation of sexual dysfunction was deemed impractical.

Within the postpartum population Song et al (2014) found associations between age and various sexual function factors. A total of 435 women were included in their study which investigated the relationship between sexual function and method of delivery. Using the Female Sexual Function Questionnaire (SFQ28), a self-reported measure of female sexual function, they found that maternal age was a significant predictor of desire ( $r = -0.137$ ,  $p=0.005$ ), arousal (lubricant) ( $r = -0.206$ ,  $p=0.003$ ), arousal (cognitive) ( $r = -0.178$ ,  $p=0.007$ ) and the enjoyment domain ( $r = -0.167$ ,  $p=0.001$ ). The limitations to this study included one-time point assessment as well as the exclusion of a pre-delivery sexual function assessment.

Few studies have examined whether any of the common sexual dysfunctions associated with aging such as desire, arousal or orgasm disorders (Ishak et al., 2010; Safarinejad, 2006; Shefrin et al., 2008) truly affects a women's overall sexual satisfaction. Fehniger et al. (2014) used self-administered questionnaires to investigate sexual desire, activity, satisfaction and sexual problems in women over 40 years of age. Among their sample of 1,094 women, they found increasing age was significantly associated with low sexual desire [AOR 1.20, 95% CI (1.09-1.51) for each 5-year increase in age] less than monthly sexual activity [AOR 1.42, 95% CI (1.28-1.58)] and an increased odds of reporting difficulty with lubrication [AOR 1.27, 95% CI (1.11-1.46)]. With regards to sexual satisfaction, Fehniger et al. (2014) found that age was not associated with overall sexual satisfaction [AOR= 1.07, 95% CI (0.97-1.18) for every 5-year increase]. A strength of this study was its large sample size ( $n=1094$ ). However, the study also had several limitations as well including: 1) assessment done at one-time point, 2) instrument

used was not validated in its current form, and 3) the participants were members of a health-maintenance program, making the results less generalizable (Fehniger et al., 2014).

The association between age and sexual satisfaction in the postpartum period had been under-investigated. Yee et al. (2013) investigated sexual satisfaction in a group of 160 postpartum women at two-time points, 8-10 weeks postpartum and 6-8 months postpartum. The median age of the sample was 32.2 years old (SD=5.9) at 8-10 weeks postpartum and 32.1 years old (SD=6.0) at 6-8 months old. Using the Sexual Health Outcomes in Women Questionnaire (SHOW-Q) they found that older age was associated with a decrease in sexual activity resumption at 8-10 weeks postpartum [AOR 0.92, 95% CI (0.86-0.98) for each one-year increase in age]. At 6-8 months postpartum SHOW-Q satisfaction subscale scores were examined using effect estimates to demonstrate the change in score when compared to the reference group. Effect estimates as described by Yee and colleagues (2013) indicate the impact of each factor on the change in total SHOW-Q scores. Results showed that age had a negative effect estimate of -1.1 [95% CI (-1.8 to -0.3) for each one-year increase]. They concluded that, for every year increase in age women were on average, 1.1 points lower on sexual satisfaction than the reference population score of younger women. The study's small, homogenous sample size which consisted of only English-speaking women from the San Francisco Bay Area limits the generalizability of the results to other populations.

**Parity.** The literature suggests that there may be a relationship between parity and postpartum sexual function. Thompson et al. (2002) investigated postpartum sexual health in a sample of 1292 Australian women with 43% being primiparas (n = 556) and 57% being multiparas (n = 736). In-hospital questionnaires were given to the participants within the first four days postpartum. Postal questionnaires were mailed at 8, 16 and 24 weeks postpartum.

Participants were asked to report on 12 common health problems indicating “Yes or No” to having experienced the health problem within the past 8 weeks. Sexual problems was listed as one of the 12 health problems. Results showed that primiparas were more likely to report perineal pain at 8 [OR 2.90, 95% CI (2.19–3.82)], 16 [OR 3.70, 95% CI (2.23–6.14)], and 24 weeks [OR 4.28, 95% CI (2.21–8.30)]; and to report other sexual problems at 8 [OR 1.81, 95% CI (1.38–2.38)], 16 [OR 1.58, 95% CI (1.21–2.08)], and 24 weeks [OR 1.40, 95% CI (1.05–1.87)] compared to multiparas after adjusting for method of delivery. No association was found between parity and self-reported sexual problems at 6 months postpartum. A limitation to this study included the lack of data on any pre-existing sexual health conditions.

Although the relationship between parity and postpartum sexual health has been investigated, relatively few studies have looked at the effect of parity on postpartum sexual satisfaction. Yee et al. (2013) conducted a study aimed to identify predictors of postpartum sexual activity and functioning using the Sexual Health Outcomes in Women Questionnaire (SHOW-Q). Multiparity was found to be predictive of earlier sexual resumption, by 8-10 weeks postpartum [AOR 2.44, CI (1.09-5.45)], and was associated with greater postpartum SHOW-Q satisfaction ( $p = 0.03$ ). Multiparas had a positive effect estimate of 11.1 [95% CI (1.4 – 20.9)], indicating that their scores were 11.1 points higher than the average score of primiparas. It should be noted that the SHOW-Q has not been validated within the postpartum population although it has been widely used with women in different settings.

**Marital Status.** Little research has been done on the effect of marital status on postpartum sexual satisfaction. Research has examined the effect of sexual dysfunction or decreased sexual satisfaction on relationships, yet little is known as to whether being married effects one’s overall sexual satisfaction.

The effect of relationship status on sexual satisfaction was examined by Birnie-Porter and Hunt (2015) in a sample of 475 men and women. Sexual satisfaction was assessed using the 5-item Global Measure of Sexual Satisfaction which describes sexual relationships along 5-point Likert scales. When comparing across five different types of relationships (friends with benefits, casual dating, exclusive dating, engaged and married) engaged couples reported higher sexual satisfaction than all other relationship types except exclusively dating. Mean rating of sexual satisfaction were higher in engaged couples (4.69) than friends with benefits (4.39), those casually dating (4.41) or married (4.37) ( $p < 0.05$ ). Limitations to this study include the use of online recruitment, which excludes individuals that do not use the internet and self-report measures, which may increase the risk of recall error.

No research was found that examined the effect of marital status on postpartum sexual satisfaction. Further research is necessary to determine if an association between marital status and postpartum sexual satisfaction exists.

**Country of Birth.** No research was found that investigated the effect of country of birth on postpartum sexual satisfaction. Understanding the role of birthplace on sexual satisfaction and cultural influences on sexuality would facilitate the discussion of sexual health amongst postpartum women. It has been suggested that the consideration of women's ethnic/cultural backgrounds should be viewed as an integral part of sexual health assessments to help understand the factors that play a role in their sexual health decisions (Elam & Fenton, 2003). Further research is necessary to determine whether a woman's birthplace influences her postpartum sexual satisfaction.

**Income Level.** A relationship has been shown between income level and sexual health within the general population (Addis et al, 2006; DeLamater, 2005;). DeLamater (2005) studied

various biological, psychological and social factors that may influence sexual function in a sample of 1,384 individuals over the age of 45. Income level was deemed as a relevant sociodemographic factor to examine since access to resources are related to health (DeLamater, 2005). It is suggested that an individual with higher income has access to healthcare that may maintain their overall health and their sexual health. Results showed that household income was negatively correlated with sexual desire scores both in women ( $r = -.35, p < 0.000$ ) and in men ( $r = -.28, p < 0.000$ ). A limitation to this study includes the ethnic homogeneity of the sample which was primarily European-Americans.

Addis et al. (2006) investigated that relationship between sexual activity, frequency, satisfaction and sexual dysfunction in a sample of 2,109 women aged 40-69 years old. Participants completed self-report questionnaires on sexual activity, health and general quality of life. Results showed that women with higher income reported higher frequency of sexual activity ( $p < 0.001$ ). Higher income was not correlated with sexual satisfaction. Most of the sample consisted of women in committed relationships decreasing the generalizability of study results to women with different relationship statuses.

Safarinejad (2006) investigated the risk factors associated with female sexual dysfunction in 2409 Iranian women, aged 20-60. The Female Sexual Function Index (FSFI) was used to collect data on dimensions of sexual health. Results showed that 31.5% of women ( $n = 759$ ) in their sample reported a satisfaction disorder, indicated by a score of  $< 3.9$  in the satisfaction domain of the Female Sexual Function Index (FSFI). A positive association was found between sexual satisfaction disorder and unemployment status [OR 1.55, 95% CI (1.64-7.26)]. These findings suggest that a woman who is financially dependent on someone else, due to unemployment or being a housewife, may have decreased sexual satisfaction. A limitation to

this study includes the measure of income level, employed versus unemployed, which may not represent an accurate measurement of income level.

No studies were found examining the relationship between income and sexual satisfaction. Further research is needed to understand whether the relationship between income level and sexual satisfaction found in the general population exists within the postpartum population.

**Education Level.** Research findings on the relationship between level of educational and sexual health is inconsistent. In a sample of 2,109 women aged 40-69, Addis et al. (2006) found that women with higher levels of education were more sexually active and more likely to report increased sexual dysfunction compared to women with lower levels of education ( $p < 0.001$ ). It was suggested that this increase in sexual dysfunction amongst women with higher education levels may be due to increased life stressors and differing expectations for sexual health compared to women with lower education levels (Addis et al. 2006).

In contrast Sarafinejad (2006) in his study of 2409 Iranian women, found that women with lower education levels had significantly higher odds of sexual dysfunction [OR 1.25, 95% CI (1.07-1.86)] than more educated women. Study results showed a positive association was found between sexual satisfaction disorder and low level of education [OR 2.5, 95% CI (1.27-4.9)]. The results of this study may be influenced by cultural norms regarding education within the Iranian community, making them less generalizable to other populations.

Abdoly and Pourmousavi (2013) investigated the relationship between women's sexual satisfaction and education level in a sample of 270 married Iranian women aged 18-45. Sexual satisfaction was measured using the Sexual Satisfaction Score for Women (SSS-W), a 30-item

questionnaire in which higher satisfaction scores indicate greater satisfaction. The Female Sexual Function Index (FSFI) was used to measure sexual function. Sexual function was strongly correlated with sexual satisfaction ( $r=0.6$ ,  $p<0.001$ ). Sexual satisfaction scores and FSFI scores showed a non-linear relationship between education degree level and sexual satisfaction level ( $p<0.001$ ) where women with less than a diploma education and more than a master's degree education had lower sexual satisfaction scores (58 & 64, respectively) compared to women with under master and master's degree level education (98 & 92, respectively). Cultural norms around postpartum sexual health and sexual satisfaction need to be considered when interpreting the results.

No research was found on the impact of education level on sexual satisfaction in the postpartum period.

## **Summary**

The literature on the effect of demographic factors on postpartum sexual satisfaction is very limited. Most of the studies did not focus on women living in Canada and included women who were older than childbearing age which limits the generalizability of the findings to a Canadian population of childbearing aged women. Research amongst the general population suggests that sexual health is impacted by age however little is known about its effect on the postpartum population. The studies which investigated postpartum sexual satisfaction used measurement tools not specific to the postpartum population. With regards to parity and sexual health, most studies have focused on physiological measures of sexual health such as dyspareunia, resumption of sexual activity and ability to achieve orgasm. A large gap exists amongst the role of marital status on postpartum sexual satisfaction. It remains unclear whether satisfaction within a marriage or common-law relationship increases sexual satisfaction.

Research on the impact of income and education level on postpartum sexual satisfaction has not been investigated. Further investigation is needed to understand the effect of demographic factors on women's postpartum sexual health and satisfaction.

### **Role of Physical Factors on Postpartum Sexual Satisfaction**

The following section will review the literature on the effects of physical factors, i.e – postpartum physical health, method of delivery, pelvic floor trauma, and breastfeeding, - on postpartum sexual satisfaction.

**Postpartum Physical Health.** Approximately 94% of women report at least one poor health outcome in the first 8 weeks postpartum (Thompson et al., 2002). The most common physical morbidities include extreme fatigue, pain from CS wound, lower back pain, perineal pain and breast pain (McGovern et al., 2006; Thompson et al., 2002). Although there is evidence indicating the fluctuations in a women's general health in the postpartum period (Borders, 2006; McGovern et al., 2006; Thompson et al., 2002) the relationship between postpartum health and sexual health including sexual satisfaction is relatively unknown (Sehhatie & Malakouti, 2016).

Sehhatie and Malakouti (2016) evaluated sexual function and its relationship with postpartum health in a sample of 384 Iranian primiparas. Using validated tools, the Female Sexual Function Index (FSFI) and the General Health Questionnaire (GHQ-28), they found that 45.6% of their sample had a general health impairment and 67.9% reported sexual dysfunction. A significant negative correlation was observed between total sexual function scores and total general health scores ( $r = -0.78, p < 0.001$ ) and each of its domains, including satisfaction ( $r = -0.68, p < 0.001$ ). Results showed that sexual dysfunction played a role in decreased general health however a causal relationship could not be established (Sehhatie & Malakouti, 2016). The study

sample consisted of Iranian women who were 10-16 week postpartum and thus the findings may not be generalizable to women from other countries and to women at different times in the postpartum period.

**Method of Delivery.** There are four modes of delivery identified in Canada: spontaneous vaginal delivery (SVD), assisted vaginal delivery (AVD), planned caesarean section (CS), and unplanned caesarean section (CS) (CIHI, 2004). Risks related to postpartum sexual health differ depending on method of delivery.

Commonly reported postpartum sexual health symptoms related to method of delivery are perineal pain and dyspareunia (Andrews et al., 2008; Buhling et al., 2006; Thompson et al., 2002). Andrews et al (2008) examined the magnitude of perineal pain in a sample of 209 women. Two validated pain instruments were used, a 4-point Verbal Rating Score (VRS-4) and an 11-point visual analogue scale, to measure postpartum dyspareunia. Results showed that during the immediate postpartum period (day 1 postpartum) most women (92%) who had a vaginal delivery (VD) experienced perineal pain.

Thompson et al. (2002) conducted a large population-based cohort study with a total of 1193 Australian postpartum women. Participants answered questionnaires within 4 days postpartum and 8 weeks, 16 weeks, and 24 weeks postpartum. The questionnaires assessed health problems that occurred in the previous 8 weeks. Their findings showed that women who had AVDs reported feeling more perineal pain at 8 weeks [OR 3.67, 95% CI (2.57-5.16)], 16 weeks [OR 2.66, 95% CI (1.55-4.56)] and 24 weeks [OR 3.99, 95% CI (2.09-760)] postpartum compared to their counterparts who had SVDs. Spontaneous vaginal deliveries (SVDs) without episiotomies and CS deliveries were found to cause less perineal pain due to the absence of

episiotomies and instrumentation immediately after childbirth but no significant differences were found at 6 months postpartum (Thompson, 2002).

Buhling et al. (2006) investigated the effect of method of delivery on sexual function, focusing on dyspareunia in one of the largest German surveys of this nature to date. A sample of 655 primiparous women received a questionnaire containing 16 questions on sexual behavior and dyspareunia via mail. Results showed that persistent dyspareunia, longer than six months postpartum, differed based on mode of delivery ( $p=0.049$ ); 3.5% spontaneous vaginal delivery (SVD), 3.4% caesarean section (CS), 11% episiotomy or laceration and 14% assisted vaginal delivery (AVD). The elevated rate of persistent pain amongst their sample of women who had episiotomy or AVDs (11% - 14%) led the researchers to conclude that elective CS should be considered as a viable delivery option to protect the perineum from trauma and sexual dysfunction. Cultural considerations and societal norms must be considered when determining the generalizability of such results. A limitation to this study was the use of a non-validated questionnaire.

Dean et al. (2008) investigated the longitudinal relationship of sexual function with method of delivery in 2765 women 6 years postpartum. A postal questionnaire inquiring about prevalence of incontinence was sent to participants 3 months postpartum. A follow-up postal questionnaire was sent at 6 years postpartum which included 10 questions measuring sexual function based on the Golombok Rust Inventory of Sexual Satisfaction (GRISS). Findings showed that method of delivery was minimally related to sexual dysfunction at 6 years postpartum. Women who delivered exclusively by CS rated their vaginal tone as significantly better when compared with women who delivered via SVD only and AVD ( $p=0.002$  &  $p<0.0001$ , respectively). No significant differences were found between women who delivered

exclusively via CS and women who had both a previous SVD and CS delivery ( $p=0.364$ ). No other significant effect of method of delivery was found. The longitudinal research design of this study resulted in a low response rate at 6 years postpartum (35% of initial responders) and increased the risk of maternal recall bias. The use of a non-validated questionnaire to measure incontinence at 3 months postpartum is another limitation of this study.

Hosseini and colleagues (2012) investigated the effect of method of delivery on postpartum sexual health in 213 women using a validated Persian version of the Female Sexual Function Index (FSFI). Pre-pregnancy sexual function and sexual function between 6 and twenty-four months postpartum amongst women who had SVD and planned CS were examined. No significant differences were found between groups regarding six domains of sexual functioning, including desire ( $p=.55$ ), arousal ( $p=.39$ ), lubrication ( $p=.45$ ), orgasm ( $p=.36$ ), pain ( $p=.74$ ) and satisfaction ( $p=.39$ ). Vaginal deliveries did result in long term vaginal muscle relaxation however only a small percent (14.9%) of women believed it adversely affected their sexual function (Hosseini et al., 2012). Sexual satisfaction was found not to differ between both delivery groups ( $p=0.39$ ).

Kahramanoglu et al (2017) studied the impact of mode of delivery on sexual functioning in a total of 452 Turkish nulliparas. The Female Sexual Function Index (FSFI) was used to evaluate sexual function at 8 weeks, 3 months, 6 months, 12 months and 24 months postpartum. Participants were divided into two groups: 1) vaginal delivery with mediolateral episiotomy (VD with MLE) and 2) elective CS (ECS) with spinal anesthesia. Results indicated that the total FSFI score decreased at 3 and 6 months for both delivery method groups. A decrease in total FSFI scores suggest a possible sexual dysfunction. In the VD group FSFI scores for desires, arousal and pain decreased at 3 and 6 months postpartum compared to the pre-delivery baseline

indicating possible dysfunctions in those domains of sexual function. Lubrication and satisfaction were only reduced at 3 months postpartum ( $p < 0.05$ ). For women in the CS group FSFI scores for desire and lubrication decreased at 3 and 6 months compared to the baseline. Satisfaction and pain scores were only reduced at 3 months postpartum ( $p < 0.05$ ). A limitation to this study included the use of maternal recall for pre-pregnancy data that was collected during the participants' first prenatal visit when they were 8 weeks pregnant.

Safarinejad et al. (2009) investigated the relationship between sexual satisfaction and quality of life (QOL) in 836 women using the Female Sexual Function Index (FSFI) and Short Form-36 Health Survey (SF-36), a diagnostic tool used to evaluate various aspects of QOL and its connection to health. Results showed that sexual satisfaction varied depending on a women's method of delivery. At 3 months postpartum 64% of women who had SVDs, 44% of women who had operative vaginal deliveries (OVD), 82% who had Planned Caesarean Sections (PCSs) and 62% who underwent (Emergency Caesarean Sections (ECSs) were sexually satisfied. At 12 months postpartum, sexual satisfaction scores decreased 4.2% in the PCS group ( $p = 0.001$ ) and decreased 22.2% in the OVD group ( $p = 0.001$ ). OVD had the highest positive association in overall sexual satisfaction (OR 4.42, 95% CI 2.26-6.42). The authors concluded that forceps assisted deliveries lead to the least favorable sexual satisfaction outcomes. A strength of this study was its strategic attempt to reduce selection bias and confounding variables through standard prospective sampling and the assessment of comorbidity to exclude individuals with confounding factors.

Qian et al. (2015) investigated the short-term and long-term complications of method of delivery with regards to sexual satisfaction. A sample of 2649 women, aged 20-65, living in Beijing participated in a questionnaire-based observational study which included face-to-face

interviews, physical and gynecological exams. The questionnaire developed combined components of the international standard pelvic floor dysfunction questionnaire, the international FSFI and urinary incontinence questionnaire. Results showed that in comparison to the VD group, a higher percentage of women in the CS group reported decreased sexual satisfaction (7.7% vs. 20.7%, respectively) ( $p < 0.001$ ). A limitation to this study includes the varied postpartum time points, where the time between delivery and the postpartum interviews for some women was longer than others. The possible lapse in time may have caused participants to provide estimates rather than exact information when answering interview questions.

**Pelvic Floor Trauma.** Pelvic floor trauma, including perineal damage, anal sphincter trauma and pelvic prolapse, is a possible consequence of both pregnancy and childbirth (Fonti et al., 2009). In the literature, pelvic floor dysfunction incorporates a host of different symptoms, including urinary and fecal incontinence (Horak et al., 2014). Incontinence is a multifactorial physiological outcome that may be caused by vaginal deliveries, lengthy pushing, instrumental deliveries and large babies (Fonti et al., 2009; Rogers et al., 2008). The effect of incontinence on sexual function has resulted in inconsistent results (Dean et al., 2008; Rogers et al., 2008).

Using a cross-sectional design Dean et al. (2008) examined the long-term effects of method of delivery, pelvic floor function and incontinence on sexual function in 2765 women 6 year postpartum. Results showed that women who had urinary incontinence scored significantly poorer across all sexual domains (desire, arousal, satisfaction, pain and quality of life;  $p < 0.0001$ ) when compared to women who did not suffer from this symptom. Fecal incontinence was also found to effect women's sexual function across all sexual domains: desire ( $p = 0.0005$ ), arousal ( $p < 0.0001$ ), orgasm ( $p < 0.0001$ ), satisfaction ( $p < 0.00$ ), pain ( $p < 0.0001$ ), and quality of life ( $p$

<0.0001). Limitations of this study included the use of maternal recall on obstetrical history and the use of a non-validated sexual health questionnaire.

Su et al. (2015) examined the effect of pelvic floor dysfunction on sexual function, including sexual satisfaction, in a sample of 883 Taiwanese women. A 35-item questionnaire which included a non-validated Chinese version of the FSFI and questions investigating urinary incontinence (UI) symptoms were used to investigate the effect of incontinence on sexual satisfaction. Women were separated into four groups based on their UI symptoms; 1) no UI, 2) pure stress UI, 3) pure urge UI and 4) mixed UI, both stress and urge UI. Results showed a significantly higher risk of decreased sexual satisfaction amongst the mixed UI group [OR 2.2, 95% CI (1.1-4.5)] compared the other incontinence groups. Limitations to this study included self-determined type of urinary incontinence rather than through urodynamic evaluation as well as the use of convenience sampling.

Literature on the effect of incontinence on sexual satisfaction is limited with the focus commonly being placed on the effect of incontinence on sexual dysfunction, including arousal, desire and orgasm. The effect of pelvic floor trauma, specifically incontinence, on postpartum sexual satisfaction has not been investigated.

**Breastfeeding.** Since the implementation of the World Health Organization and UNICEF's (1991) Baby Friendly Hospital Initiative there has been a heightened emphasis on breastfeeding initiation. This increased focus on breastfeeding requires that healthcare providers understand the effects of breastfeeding on all aspects of a woman's postpartum experience, including sexual satisfaction. Research on the effect of breastfeeding on postpartum sexual health is still inconsistent.

Physiologically, lactation affects a woman's hormone levels including an increase in prolactin and decrease in testosterone, which can lead to decreased sexual desire and vaginal lubrication (Avery et al., 2000; Glazner, 1997). Avery et al. (2000) investigated various aspects of sexuality in 576 breastfeeding primiparous women. Questionnaires were administered during postpartum hospitalization and follow-up phone interviews occurred at 1, 3, 6 and 12 months postpartum. The questionnaires addressed sexual interest, arousal and perceived spousal responses regarding breastfeeding and sexuality. While breastfeeding, sexual arousal never occurred for 59% of women, rarely occurred for 24% of women and increased for 17% of women. Vaginal lubrication remained about the same for 39% of women, decreased for 55% of women and increased for 6% of the women. Avery et al (2000) found that women who breastfed for longer periods of time experienced greater negative effects on vaginal lubrication ( $F 6.33, p = 0.002$ ). It was suggested that this effect was due to the prolonged decrease in hormone levels in women who breastfed for a long period of time compared to women who ceased breastfeeding earlier (Avery et al., 2000). A limitation to this study includes the measurement tool, a questionnaire developed by the researcher. Although the tool was reviewed by breastfeeding experts, it was not validated.

Barrett and colleagues (2000) investigated factors associated with dyspareunia, including breastfeeding, in a sample of 480 primiparas at 6 months postpartum. Postal questionnaires sent to women investigated sexual health through questions pertaining to sexual resumption, sexual problems, sexual practices, frequency and sexual satisfaction. Results showed that breastfeeding at 6 months postpartum was associated with dyspareunia ( $p = 0.0006$ ). Women who were breastfeeding were 2.25 times more at odds of experiencing dyspareunia [95% CI (1.42-3.57)]. A limitation of this study was the use of maternal recall 6 months after childbirth.

Few studies have looked beyond the physical dimensions of sexual health to examine how breastfeeding effects sexual satisfaction. Anbaran et al. (2015) examined the effect of infant feeding methods on postpartum sexual function. The Female Sexual Function Index (FSFI) and an infant feeding method questionnaire were used in a sample of 366 Iranian women. Results showed that at 4 months postpartum there was a significant difference amongst women's sexual function scores and infant-feeding method ( $p = 0.04$ ). A significant difference among the mean score for sexual satisfaction during the lactation period was found, with the highest sexual satisfaction mean scores belonging to the exclusive breastfeeding group ( $4.72 \pm 1.17$ ,  $p = 0.01$ ). Results from this study may not be generalizable due to possible cultural differences of Iranian women regarding postpartum sexual health.

Other research suggests that breastfeeding is associated with increased sexual dysfunction and lower sexual satisfaction (De Judicibus & McCabe, 2002; Yee et al. 2013). De Judicibus and McCabe (2002) examined the effects of common postpartum factors, including breastfeeding, on postpartum sexuality. The researchers assumed that breastfeeding would negatively affect postpartum sexuality. Questionnaire packages were completed by participants during their third trimester ( $n = 138$ ), at 12 weeks postpartum ( $n = 104$ ) and at 6 months postpartum ( $n = 70$ ). Results showed that at 12 weeks postpartum women reported decreased sexual desire ( $t(1,79) = -8.98$ ,  $p < .001$ ), decreased sexual frequency ( $t(1,79) = -6.47$ ,  $p < .001$ ) and decreased sexual satisfaction ( $t(1,79) = 2.81$ ,  $p < .01$ ) compared to pre-pregnancy. The decrease in pre-pregnancy sexual satisfaction was also present at 6 months postpartum ( $t(1,50) = -3.69$ ,  $p < .001$ ). A limitation to this study was the method in which the pre-pregnancy data was collected that required retrospective recall.

Yee et al (2013) examined predictors of postpartum sexual activity and function in 160 postpartum women using the Sexual Health Outcome in Women Questionnaire (SHOW-Q), a validated scale designed to assess the full range of female sexual activity. Higher total scores on the SHOW-Q indicated better sexual function. Breastfeeding was assessed during follow-up interviews, 8 to 10 weeks postpartum, in which women were asked about their current feeding method: exclusively breastfeeding, exclusively formula feeding or mixed feeding (both breastfeeding and formula feeding). Breastfeeding was associated with lower SHOW-Q scores ( $p=.02$ ) and exclusive breastfeeding was associated with less sexual satisfaction ( $p<.001$ ). A limitation to this study includes the use of the SHOW-Q, which has been validated in the general population, but has yet to be validated in the postpartum population.

### **Summary**

Literature on the effect of physical factors on postpartum sexual satisfaction remains inconsistent. The focus of the existing research is rooted in the traditional approach to sexual health in which the focus is on sexual dysfunction rather than on overall sexual satisfaction. It remains unclear as to whether pelvic floor trauma impedes sexual satisfaction in the presence of a sexual dysfunction. Similarly, with regards to breastfeeding, although research suggests that the hormonal changes associated with this feeding method may lead to sexual dysfunction, few studies have investigated its role on overall sexual satisfaction. Even though postpartum health has been linked to sexual function, its link to sexual satisfaction remain unknown. The role of method of delivery on sexual satisfaction is inconsistent within the sexual health research. Studies have focused on the physiological outcomes, such as dyspareunia, without further investigating whether this outcome truly effects sexual satisfaction. Varying views remain on the protective benefits of CS on sexual health. Further research is necessary to understand

whether the physical outcomes that may result in dysfunction ultimately effect sexual satisfaction.

### **Role of Psychosocial Factors on Postpartum Sexual Satisfaction**

The following section will review the literature on the effects of psychosocial factors – i.e, postpartum mental health, postpartum depression and social support - on postpartum sexual satisfaction.

**Postpartum Mental Health and Depression.** Sexual dysfunction is common amongst women with postpartum depression. DeJudicibus and McCabe (2002) examined the influence of role quality, relationship satisfaction, fatigue and depression on women's sexuality during pregnancy and the postpartum period. A total of 138 primiparas were administered questionnaire packages during their third trimester, 104 responded at the 12 week postpartum follow-up and 70 responded at the 6 month postpartum follow-up. Results showed that depression was associated with reduced frequency of intercourse at 12 weeks and 6 months postpartum ( $p < 0.05$ ,  $p < 0.05$ , respectively). An unexpected positive association was found between depression and sexual desire at 6 months postpartum ( $p < 0.001$ ) however it should be noted that the distribution of sexual desire by depression was found to be unusual, where a cluster of women with very low desire and very low depression may have influenced the results. A limitation to this study included the lack of pre-conception measures resulting in retrospective recall during the collection of both pre-pregnancy and pregnancy data at the same time, during the third trimester.

Morof et al. (2003) investigated the effects of postpartum depression on sexual function in a sample of 486 primiparas in London, England using the Edinburgh Postnatal Depression Scale (EPDS). A total of 57 women (12%) met the criteria for the EPDS criteria for risk of

postpartum depression. Depressed women were less likely to have resumed sexual activity at 6 months postpartum versus non-depressed women (77% vs. 90%,  $p = 0.003$ ). The median number of problems was higher for depressed women than non-depressed women (a median of two versus a median of one,  $p = 0.009$ ). A limitation of this study was the lack of pre-pregnancy and antenatal data on depression, creating a gap in understanding the proportion of women with postnatal depression that may have previously suffered from depression.

Research has suggested that even once a woman's depression has been resolved postpartum sexual dysfunction is still present (Moel et al, 2010). Moel et al (2010) examined long-term sexual functioning in women treated for postpartum depression with interpersonal psychotherapy compared to women who did not experience postpartum depression. Self-report questionnaires and clinician-rated measures were completed by 100 depressed women and 53 non-depressed women at initial entry to the study, immediately post-treatment, and 6, 12 and 18 months post-treatment. Results showed significant differences in sexual interest between the group of depressed and non-depressed women at the time of entry to the study ( $t(171) = 11.82$ ,  $p < 0.001$ ) and at 12 weeks postpartum ( $t(155) = 8.09$ ,  $p < 0.001$ ). Women who recovered from postpartum depression were found to be less satisfied with their sexual relationship than those who were never depressed ( $p < 0.005$ ). The effect of time, length of time since childbirth, ( $F(2,286) = 5.43$ ,  $p < 0.001$ ) and group, never depressed versus recovered, ( $F(1,143) = 27.47$ ,  $p < 0.005$ ) were statistically significant indicating that over time both groups improved in sexual satisfaction however the initial differences between the groups remained the same. This study was limited by the exclusion of pre-pregnancy data on sexual functioning.

**Social Support.** Social support during the postpartum period is essential for optimal maternal well-being and has been found to be a positive predictor of health-related quality of life

(Emmanuel et al., 2012). Social support consists of three separate dimensions: 1) emotional support (comfort and encouragement), 2) instrumental support (money and time) and 3) informational support (advice and knowledge sharing) (Boothe et al., 2011; Evans et al., 2012). Examples of social support include help from family and friends with child care, socialization with other adults and peer encouragement (Barkin et al., 2014).

Hipp et al. (2012) investigated social, psychological, relational and birth-related contextual factors that influence sexuality up to 3 months postpartum. An online survey was administered to 304 postpartum women. The Scale of Perceived Social Support (MSPSS) which measures emotional support from family, friends and significant others, and the Sexual Desire Inventory (SDI) which was used to measure sexual desire during the postpartum period were included in the online survey. Results indicated that women's perception of social support was not associated with levels of sexual desire ( $P > 0.061$ ). Limitations to this study include the use of retrospective recall to describe women's immediate postpartum experience as well as the use of an online format which excludes women who do not have access to a computer.

A study by Ojanlatva et al. (2005) investigated the associations of sex life and social support focusing on importance of, satisfaction with and ease in talking about sex. Data from a total of 21,101 Finnish men and women were analyzed to determine the role of social support within a person's sex life. Results showed that spouses were considered the primary source of social support in all three sex life factors ( $p < 0.001$ ). Social support received from one's spouse increased the likelihood of being sexually satisfied 1.45-fold for women and 1.50-fold for men. A limitation of this study was the use of a one question measurement of sexual satisfaction rather than the use of a validated measurement tool.

## **Summary**

Research on the role of psychosocial factors, postpartum depression/mental health and social support, on postpartum sexual satisfaction is limited. Few studies have examined sexual satisfaction as the sexual health outcome, rather in accordance with traditional models, they focused solely on sexual dysfunction. Postpartum depression has been linked to sexual dysfunction however its effect on sexual satisfaction is relatively unknown. Similarly, the effect of postpartum social support on postpartum sexual satisfaction has been under-investigated. Further research is needed to conclude if the link between postpartum depression and sexual dysfunction translates equally to sexual satisfaction and whether social support influences postpartum sexual satisfaction.

## **Models of Sexual Health**

This section highlights the various models of sexual health. Traditional models will be introduced and critiqued. The need to shift towards a biopsychosocial model of sexual health will be discussed.

## **Models of Human Sexual Health**

Research on sexual health dates to the 1960s when Masters and Johnson (1966) described the human sexual response. Masters and Johnson (1966) focused primarily on the biology of sex as they examined physiological responses to sexual activity. Although they were the first to examine female sexuality, their model was an interpretation of the physiological aspects of sexual response where each phase was sequential, and all phases needed to occur to describe a sexual response cycle as normal.

The four-stage model of the human sexual response consisted of excitement, plateau, orgasm and resolution (Fig.1). The excitement phase, considered the first stage of arousal, causes a number of physiological responses including vasocongestion, increased vaginal lubrication, increased heart rate and increased respiratory rate. The plateau is the phase in which excitement continues to grow and the physiological responses intensify. The orgasm phase is considered the climax during which a physiological response occurs where vaginal muscles and the uterus contract repeatedly. The body then returns to its normal pre-excitement state during the resolution phase (Masters & Johnson, 1966).

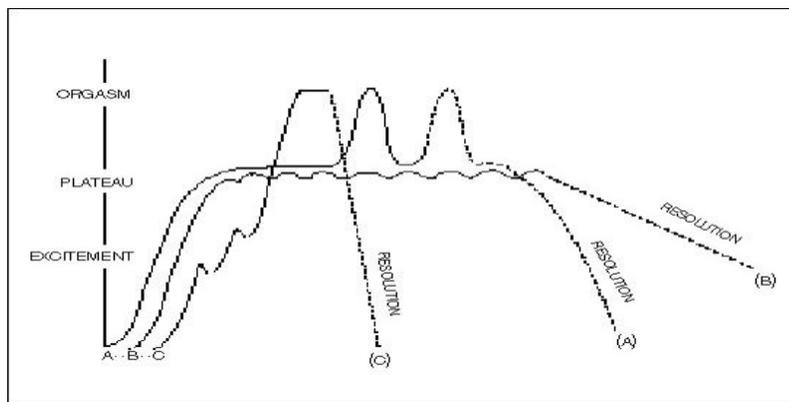


Figure 1. Masters and Johnson's (1966) Female Sexual Response Cycle.

Kaplan (1977) restructured the model by adding the missing psychological element of sexual desire and formed 3 phases: desire, arousal and orgasm. It was believed that without the psychological component of desire which included the motivation of sexual activity, sexual

urges and fantasies, the other two physiological phases could not occur. This model was also sequential and required orgasm to occur in a normal sexual response cycle (Fig. 2).

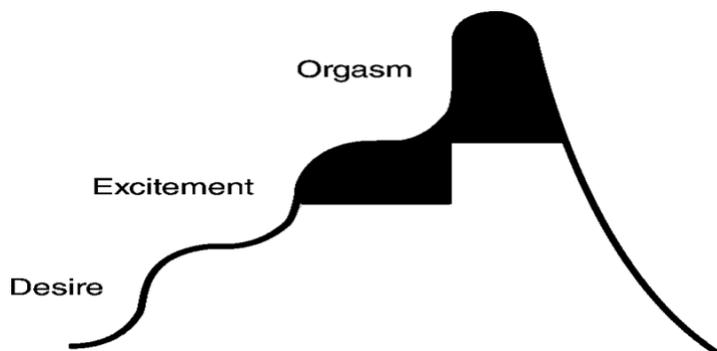


Figure 2. Kaplan's (1977) Three-stage Model.

These models define sexual response in terms of a biomedical model of sexual health in which solely physiological outcomes play a role in sexual dysfunction (Abdool, 2009; Fishman, 2002). They have been criticized due to their strict adherence to sequential stages, the need to achieve orgasm and their exclusion of non-physiological factors that may affect sexual response. It has been shown that women and men differ in their sexual response and that women do not necessarily experience all the phases described in these models (Basson, 2000; Basson, 2005). Various factors, psychological, social and biological in nature, are considered important when examining female sexual arousability. An important influence may stem from a women's need for emotional intimacy with her partner rather than physical desire or arousal (Basson, 2000).

The physiological response and traditional phases proposed by traditional models neglect major components of female sexual satisfaction (Tiefer, 1991). Tiefer (1991) outlined four fundamental aspects of female sexual response that indicated a need for change from the traditional sexual response models: 1) women have lower biological urges for sexual release compared to men, 2) sexual motivation is multifactorial not solely based on rewards or gains additional to any sexual urges, 3) arousal is a subjective excitement that is not necessarily based on vaso-genital congestion and 4) orgasmic release may or may not occur.

## A Biopsychosocial Model of Female Sexual Health

To understand female sexual health a model which asserts the uniqueness of the female sexual response is needed. Basson (2001) developed a model of female sexual response that incorporates biological, psychological and psychosocial factors to acknowledge the complexity of female sexual functioning (Fig. 3). Women's sexual responses occur in overlapping variable sequences that incorporates both biological and psychosocial responses. Contrary to the male sexual response, women are not solely motivated by sexual desire rather there are numerous influencing factors, psychological, biological and social in nature, that lead women to initiate or engage in sexual relation with their partners (Basson, 2005). Contextual factors in the women's current environment may influence her sexual response. Contextual factors may include current interpersonal relationships, any medical conditions, current psychological health and substance abuse (Basson, 2001).

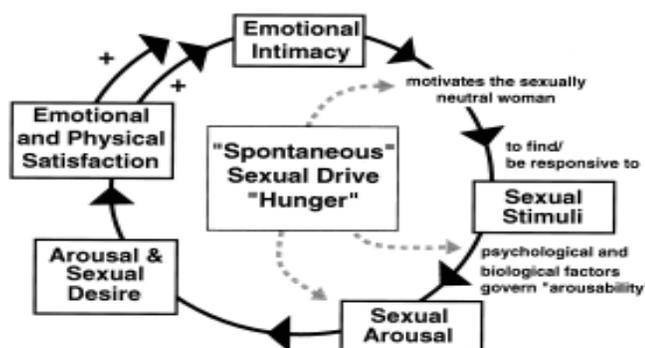


Figure 3. Basson's (2001) Alternative Model of Women's Sexual Response.

The importance of emotional intimacy and satisfaction in one's relationship are viewed as central components of a woman's sexual experience (Basson, 2000; Basson, 2005). Basson's (2001) model emphasizes that women desire intimacy and emotional closeness to achieve the ultimate result of personal satisfaction. This satisfaction may come in the form of an orgasm

(physical satisfaction) or a feeling of intimacy and closeness with partner (emotional satisfaction) (Basson, 2001). A positive outcome, either emotionally and physically, allows for female sexual satisfaction (Basson, 2001).

Basson (2000) noted that the significance of sexual health, its definition and effect on overall quality of life is extremely subjective. Women who achieve orgasm may not be sexually satisfied while others are satisfied despite never experiencing desire or orgasm (Basson, 2005). Physiological aspects of sexual function are not always the best indicators of sexual health due to its subjective nature (Basson, 2005). Therefore, investigating a more subjective aspect of sexual health, such as sexual satisfaction, may better offer insight into women's sexual health during the postpartum period.

### **Research Objectives and Questions**

Postpartum sexual health has been deemed an integral part of a women's overall quality of life. A vast amount of research has examined postpartum sexual health through traditional models of sexual health where the focus remains on the physical aspects of the sexual response. A recent shift to a biopsychosocial model of sexual health has resulted due to the need for a more holistic understanding of female sexual health. There is minimal quantitative research specific to postpartum sexual health that explores the subjective outcome measure of postpartum sexual satisfaction.

The objective of this study was to explore the multidimensional nature of female sexuality, sexual satisfaction, in postpartum women. It was guided by a biopsychosocial perspective to identify the factors associated with postpartum sexual satisfaction at 6 and 12 months postpartum. A specific focus was placed on the effect of method of delivery [vaginal

delivery (VD) versus Caesarean section (CS)] on sexual satisfaction at 6 months and 12 months postpartum. The following research questions were addressed:

### **Research Questions**

Primary research questions:

- a) What factors are associated with postpartum sexual satisfaction at 6 months postpartum?
- b) What factors are associated with postpartum sexual satisfaction at 12 months postpartum?

Secondary research questions:

- a) Is method of delivery associated with postpartum sexual satisfaction at 6 months postpartum?
- b) Is method of delivery associated with postpartum sexual satisfaction at 12 months postpartum?

### **Significance**

With a growing number of women voicing concern over their postpartum sexual health (D'Souza & Arulkumaran, 2013; Kahramanoglu et al., 2017) it is imperative to have a better understanding of the factors that affect it. Examining the role of physical and psychosocial factors common to the postpartum period through a biopsychosocial model of sexual health will allow for a better understanding of their effect on postpartum sexual satisfaction.

The literature suggests that a growing number of women and healthcare providers are considering choosing caesarean sections to decrease their risk of postpartum sexual dysfunction (D'Souza & Arulkumaran, 2013; Klein et al., 2011). Investigating whether method of delivery provides any protective benefit to postpartum sexual satisfaction will allow both women and healthcare providers to adequately assess their delivery options. It will also address whether

method of delivery, VD versus CS, provides any protective benefits to postpartum sexual satisfaction. This research is crucial given the current increase in caesarean delivery on maternal request (CDMR) and overall caesarean section rates (D'Souza & Arulkumaran, 2013; Kelly et al., 2013).

Research has shown that sexual dysfunction does not always equate to sexual dissatisfaction (Basson et al., 2000; Ferenidou et al., 2008) therefore a better understanding of what affects a women's postpartum sexual satisfaction is needed. The incorporation of these findings into perinatal education and counseling can better prepare women to make informed decisions. The findings will inform providers of the complexity of sexuality in postpartum women and the spectrum of factors that need to be assessed to optimize women's sexual satisfaction in the postpartum period. This new knowledge will help them effectively diagnose, counsel and treat women on the multidimensionality of postpartum sexual health (McDonald et al., 2015; Woolhouse et al., 2014).

## CHAPTER 3

### Methods

The study was carried out through a secondary analysis of data from The Ontario Mother and Infant Study III ((TOMIS III) (Sword et al., 2009). The following chapter describes the methods used for this secondary analysis including study design, participants, measurement instruments and data analysis. A detailed description of the procedures used in the primary study, The Ontario Mother and Infant Study III (TOMIS III) (Sword et al., 2009) is provided. Ethical considerations are also discussed.

#### **The Ontario Mother and Infant Study III**

This study consisted of a secondary analysis of data from The Ontario Mother and Infant Study III (TOMIS III), a multi-site study that applied a quantitatively-driven sequential mixed methods design (Sword et al., 2009). The primary study examined the relationships between method of delivery and maternal-infant health, service utilization and cost of care at three different time points (6 weeks, 6 months and 12 months postpartum).

Postpartum depression was the main maternal outcome chosen in the TOMIS III not only because of its significance within public health care but also due to its suggested effect on service use and cost of care. The study investigated numerous maternal health outcomes including self-reported health status, functional health status, physical health problems, pelvic floor trauma, sexual satisfaction and breastfeeding. Method of delivery was also included to investigate the potential protective health benefits of each method (Sword et al., 2009).

During the TOMIS III study women were recruited from ten hospitals across Ontario; two hospitals from each of the five geographic regions of Ontario (Sword et al., 2009). Hospitals were selected based on their classification as defined by the Women's Health – An Excerpt of

the Hospital Report 2002 (Porcellato et al., 2003) and the Family-Centred Maternity and Newborn Care National Guidelines (Health Canada, 2000); Level I and II community hospitals and Level III teaching hospitals were included.

A site project manager, who was a member of the postpartum care unit, was chosen to manage the recruitment and data collection at each hospital. The research coordinator provided an in-person orientation and training to all site managers. Study posters were displayed to advise potential participants that they may be approached to join the study. All women were first assessed for eligibility by both the site manager and postpartum unit nurses, if the inclusion criteria were met the women were invited to participate in the study (Sword et al., 2009).

The original study assumed equal participation between women with a vaginal delivery (VD) and women with a caesarean section (CS) delivery. Sample size was calculated using Power and Precision software (Cohen et al., 2001). The criterion for significance was set at  $\alpha = 0.05$ . The test was two-tailed and the power was set at 80% to detect any minimal significant differences between the two groups. The resulting sample size was 690 participants per delivery group, CS and VD (i.e. 1380 total). The final sample size was inflated to account for any intra-class correlation (ICC) structure within a hospital and for a potential 30% attrition rate. Both the ICC value (0.018) and the attrition rate were based on the previous TOMIS studies (Sword et al., 2001). Various strategies were implemented to optimize participant retention including, asking for multiple phone numbers where the women could be reached as well as keeping in touch with participants through the delivery of thank you magnets and new letters via mail (Sword et al., 2009).

The original data were collected per the procedure outlined in Sword and colleagues (2009). Data collection took place between April 2006 and October 2008. The data collection

tool for the TOMIS III was a modified version of the tool used in the previous TOMIS studies. The tool included a Mother's Questionnaire (Sword et al, 2009) that the participants completed while in hospital and structured telephone interviews at 6 weeks, 6 months and 12 months postpartum. All materials were available in four languages; English, French, Spanish and Chinese.

### **Current Study**

The current study implemented a secondary analysis of the TOMIS III (Sword et al., 2009) data to investigate the effect of postpartum psychosocial factors and method of delivery on sexual satisfaction at 6 and 12 months postpartum. Permission to use the TOMIS III data was obtained from the primary investigator Dr. Wendy Sword.

A secondary data analysis is an analysis of a data set that was collected by another researcher (Johnston, 2013). A data-driven approach, where the existing data influenced the formulation of the research question, was applied to this research through which postpartum sexual satisfaction became the research focus (Cheng & Phillips, 2014). A secondary data analysis applies the same basic principles as is applied in a primary study (Johnston, 2013). Smith (2011) described the research principles of a secondary analysis of data as follows: (a) define the research topic and question(s), (b) select a dataset, (c) evaluate and get to know your dataset and (d) structure your analysis and (e) report findings in a clinically meaningful manner. Prior to the study a review of the dataset was done and all the principles listed by Smith (2011) were implemented.

The researcher's intent to better understand the factors that facilitate and negatively impact women's quality of life, and in particular sexual health, in the postpartum period led the researcher to choose a dataset that included various important health outcome variables common

to the postpartum period. The TOMIS III study (Sword et al., 2009) investigated numerous important health factors identified in the postpartum health literature, including postpartum depression, breastfeeding and sexual health, that affect postpartum women and their quality of life.

Secondary use of data comes with numerous advantages and limitations. Major advantages of a secondary analysis are its cost-effectiveness and convenience. Using a pre-existing dataset removes the financial obligations that comes with research and removes some of the most time-consuming steps of a research project including measurement tool development and data collection (Smith, 2008). The current secondary analysis allowed for a cost-efficient analysis of the TOMIS III data (Sword et al., 2009) which gave the opportunity to address new research questions surrounding postpartum sexual health (Cheng & Phillips, 2014). Another advantage to the secondary analysis was the breadth of data available from the primary study. The use of a larger dataset provides a better representation of the population in question and allows for greater generalizability (Smith, 2008). For the current study, the large sample size of the TOMIS III study (Sword et al., 2009) allowed for a more representative sample of postpartum women in Ontario, Canada (Smith, 2011).

A common limitation to the secondary use of data is that the original data are collected for a different purpose (Boslaugh, 2007). For the TOMIS III research project by Sword and colleagues (2009) the sexual health data was intended to be used for further investigation. However, financial constraints did not allow for this additional data analysis to occur. Another limitation to this type of data analysis is that the researcher doing the secondary analysis was not involved in the primary research. Thus, the researcher does not have input into the study design, the research questions asked and the data collection tools and process (Boslaugh, 2007). For the

current study consultation with a member of the primary research team provided further input and clarification of the primary study which helped to mitigate some of these limitations.

### **Participants**

All the participants in the primary study were included in the current study. The present study used similar inclusion and exclusion criteria to those used in TOMIS III by Sword et al. (2009). The inclusion criteria for participants in this study were: woman over the age of 16, who delivered a live singleton who was full-term (over 37 weeks gestation). Mothers were the primary caretakers of the infant at time of discharge, were able to give consent and could be reached by telephone. The exclusion criteria included women who were sexual inactive within the four weeks prior to the follow-up interviews, women who had infants that were admitted to the neonatal intensive care unit for more than 24 hours or were unable to communicate in one of the four study languages (English, French, Chinese, Spanish) (Sword et al., 2009).

### **Sample Size**

The current study used data collected prior to postpartum discharge and at 6 and 12 months postpartum. Due to financial constraints in the TOMIS III (Sword et al., 2009) study data was not collected from all participants at the 6 and 12 month follow-up times. The final sample sizes in TOMIS III were 1823 women (71% of original sample) and 1310 women (51% of original sample) at 6 month and 12 months respectively. Although only half of the women provided follow-up data at 12 months this study still has one of the largest sample sizes within the postpartum sexual health literature.

A flow chart of the final sample of participants is shown in Figure 4. Of the initial 1823 women at 6 months and 1310 women at 12 months postpartum, 1480 and 1095 had completed sexual satisfaction scores respectively.

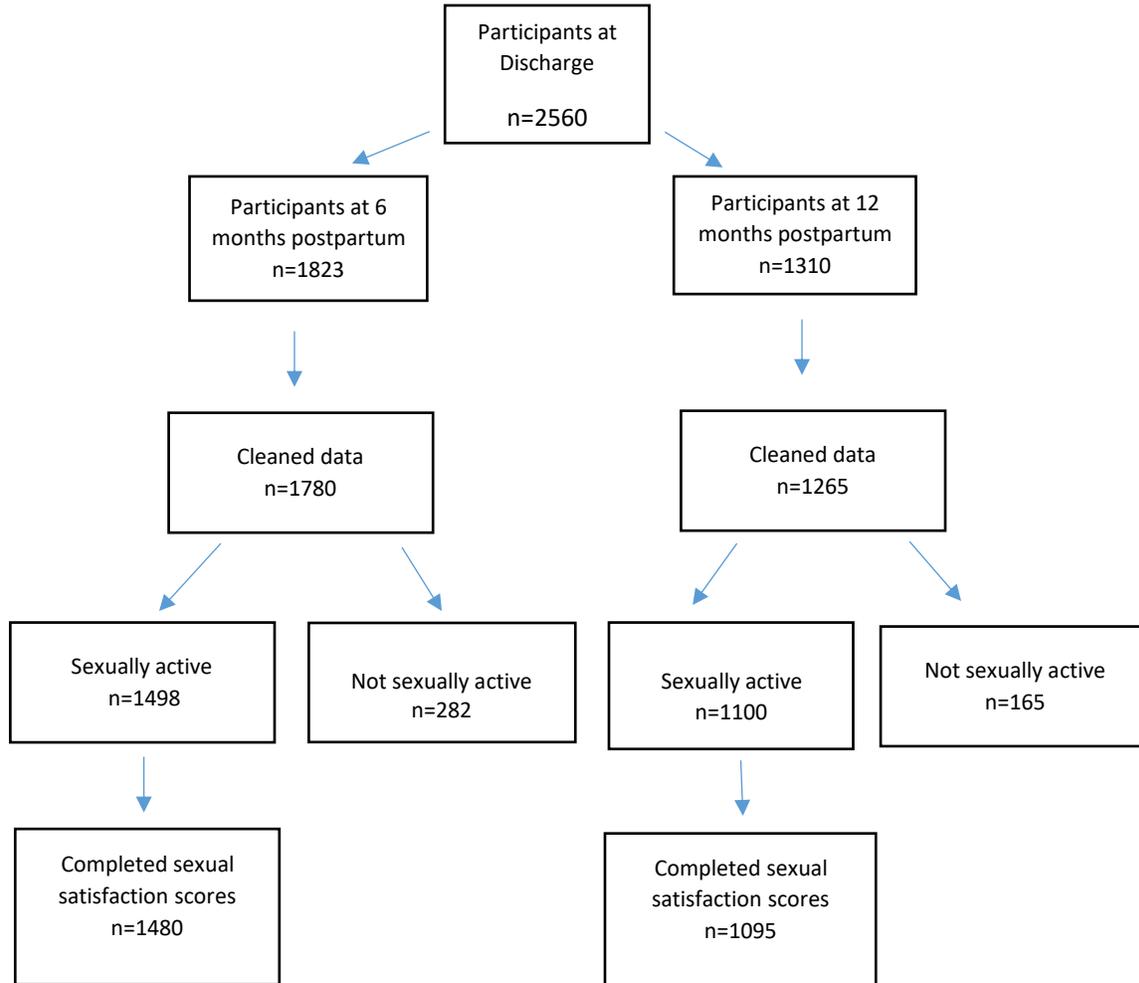


Figure 4. Flow Chart of the Number of Participants.

### Data Collection Instruments

Data used in this study was drawn from the TOMIS III (2009) in-hospital Mother's Questionnaire and the follow-up structured telephone interview at 6 months and 12 months postpartum. Data from the 6-week follow-up interviews were not included as the current study was investigating long-term outcomes of sexual satisfaction. In a study, as large as TOMIS III, the use of self-report instruments, questionnaires and telephone interviews, came with many advantages. Questionnaires allowed for an inexpensive and expedient data collection from a

large sample of woman across a large geographical area. With the sensitive nature of some of the factors being studied, sexual health and postpartum depression, telephone interviews allow for a degree of anonymity helping to decrease the amount of missing information since participants are more likely to respond to an interviewer (Polit & Beck, 2012).

The Mother's Questionnaire included questions regarding both maternal perinatal information and infant health (Appendix A). Questions focused on obstetrical history, pregnancy complications, chronic health problems, type of delivery, postpartum health issues and rating of prenatal services in the community. Information about the baby was also collected including baby's birth date, sex, birth weight, health problems and feeding type.

**Demographic Data.** Demographic information including the mother's birth date, country of birth, parity, marital status, family income, and education level were collected from the in-hospital Mother's Questionnaire.

**Age.** Participants' age was calculated from the date of birth indicated on the questionnaire.

**Country of Birth: Canadian Born.** Whether the participants were born in Canada was derived from the answers given to the question "Were you born in Canada?". Response options included Yes or No.

**Parity.** Parity was measured by the answer given by participants to the question "Is this your first live birth?". Participants had the option to answer Yes or No. Primiparous women were defined as women who have given birth only once to a baby after 20 weeks gestation. Multiparous women were women who had given birth more than once after 20 weeks gestation (Cunningham et al., 2005).

**Marital Status.** Participants' marital status was determined by their answer to the question "What is your marital status?". Responses available included 1) Married, 2) Common-Law, 3) Live with a partner, 4) Single (never married), 5) Widowed, and 6) Separated/Divorced.

**Family Income.** To determine family income participants were asked "What is your best estimate of the total income, before taxes and deductions of all household members from all sources in the past 12 months?". Response options ranged from no income to \$80,000 or more.

**Education Level.** Education level was measured by the response to the question "What is your highest level of education?". Response options ranged from elementary school to graduate degree.

**Physical Factors.** Participants were asked questions regarding physical factors associated with labour and delivery as well as the postpartum period. The measurement tools were incorporated in the follow-up interviews at 6 months (Appendix B) and 12 months postpartum (Appendix C).

**Method of delivery.** For this study, method of delivery was separated into two groups, vaginal delivery (VD) and caesarean section (CS) delivery. Delivery method was collected through the Mother's Questionnaire that was completed in the hospital during the TOMIS III.

**Pelvic Floor Trauma.** To determine the presence of pelvic floor trauma participants were asked whether they experienced any urinary or fecal incontinence during the 6 month and 12 month follow-up interviews. Sandvik's (2000) Severity Index for Urinary Incontinence, a validated two question index with good test-retest reliability ( $r = 0.69$  to  $0.83$ ), was used to determine the severity of the urinary incontinence. The severity index is created by multiplying the results of the two questions. Severity was categorized as slight/moderate and severe based on the cut-offs described by Sandvik (2000). The impact of urinary incontinence was measured

using the short-form Incontinence Impact Questionnaire (IIQ-7), a seven-item questionnaire that demonstrates high correlation to the long form (0.97) and that is sensitive to change (Uebersax et al., 1995).

To measure the severity of fecal incontinence questions were adapted from Sandvik's index. The same cut-offs from Sandvik's (2000) Severity Index for Urinary Incontinence were used to determine the severity of fecal incontinence amongst participants. The impact of fecal incontinence was measured using the Lifestyle Scale of the Fecal Incontinence Quality of Life Scale (Rockwood et al., 2000). This 10-item scale has been shown to have good test/retest reliability ( $\alpha = 0.96$ ) and acceptable internal reliability (Cronbach's  $\alpha > 0.70$ ).

***Breastfeeding.*** The telephone interview postpartum questionnaires included questions regarding infant feeding. To measure breastfeeding status participants were asked the following question, "Are you still breastfeeding?" at both 6 and 12 months postpartum. Participants had the option to answer Yes or No.

***Postpartum Physical Health.*** The incorporation of the 12-Item Short-Form Health Survey (SF-12), developed from the SF-36, was included in the interview schedule to assess multiple health dimensions in the 6 months and 12 month follow-up interviews. This tool measures eight dimensions of health related-functional status (physical functioning, role physical, role emotional, mental health, bodily pain, general health, vitality, social functioning) which are then interpreted into two summary scores: a physical component summary and a mental component summary. Individual summary scores are compared to a U.S. national average to determine whether the score is below or above average. The mean summary score used is 50 with a standard deviation of 10. The SF-12 has a multiple  $R^2$  of 0.911 and 0.918 in the prediction

of the physical and mental component summary, respectively. The test-retest correlations at 2 weeks were 0.89 and 0.76 for the scale components (Ware et al., 1996).

**Psychosocial Factors.** All participants were asked about psychosocial factors including postpartum depression and social support during the 6 months and 12 months postpartum interviews.

**Postpartum Depression.** The interview incorporated the Edinburgh Postnatal Depression Scale (EPDS) to assess the risk of postpartum depression. The EPDS developed by Cox et al. (1987) is a screening tool that has been widely used to measure risk for postpartum depression. The 10-item self-report questionnaire asked women to rate how they felt in the seven previous days. Each question was rated 0-3 and the questionnaire takes approximately five minutes to complete. Cox et al (1987) determine that a score of 13 or greater indicates the risk of postpartum depression. This tool has been validated in many languages and used internationally (Gibson et al., 2009). Validation of the tool resulted in 86% sensitivity, 78% specificity, and a positive predictive value of 73%. The split-half reliability of the scale was 0.88 and the alpha coefficient was 0.87 (Cox et al., 1987).

**Postpartum Mental Health.** The mental component summary score obtained from the 12-Item Short-Form Health Survey (SF-12) was used to measure postpartum mental health. Individual summary scores are compared to a U.S. national average to determine whether the score is below or above average. The SF-12 has a multiple  $R^2$  of 0.911 and 0.918 in the prediction of the physical and mental component summary, respectively. The test-retest correlations at 2 weeks were 0.89 and 0.76 for the scale components (Ware et al., 1996).

**Social Support.** Social support was measured by the modified Duke-UNC Functional Social Support Questionnaire (LONGSCAN). The 10-item questionnaire measures an

individual's perception of the amount and type of social support received. Seven of the original items from the questionnaire were included and three were developed by LONGSCAN. Test-retest correlation at 2 weeks was 0.66 (Broadhead, 1988). A 5-point Likert scale, with 1 indicating "much less than I would like to" and 5 "as much as I would like", was used to measure affective support, confidant support and instrumental support. Higher scores indicated higher social support (Broadhead, 1988). This study categorized the levels of perceived social support into sufficient ( $\geq 40$  points) or lacking ( $< 40$  points) based on participants' responses.

**Outcome variable.** Sexual satisfaction at 6 months and 12 months postpartum was the outcome variable for this study.

**Sexual satisfaction.** The Female Sexual Function Index (FSFI) developed by Rosen et al. (2000) was incorporated into the 6 month (Appendix B) and 12 month interviews (Appendix C) and assessed sexual function. This 19-item questionnaire is divided into six domains of sexual functioning which includes desire, arousal, lubrication, orgasm, satisfaction and pain. The satisfaction domain scores were used to quantify sexual health in the current study. The sexual satisfaction domain assesses women's satisfaction regarding the amount of closeness with partner, sexual relationship and overall sex life.

The cut-off of the FSFI aligns with the current standard for female sexual dysfunction diagnosis in the United States amongst women from 18-74 years of age. A value of  $< 3.6$  for the satisfaction domain was chosen based on previous research to indicated sexual dissatisfaction (Aydin et al., 2015; Jiann et al., 2007; Su et al, 2015; Royo et al, 2014). This measurement tool was tested for validity and reliability and demonstrated high test-retest reliability (0.79-0.86), high internal consistency (Cronbach's alpha value of 0.82-0.94) and good construct validity ( $p \leq 0.001$ ) (Rosen et al., 2000).

## **Ethical Considerations**

Approval from the Review Ethics Board at York University was obtained for the current study. The TOMIS III study was approved by the Hamilton Health Sciences/McMaster University Faculty of Health Sciences Research Ethics Board and by the review board of each of the participating hospitals (Appendix D). Informed consent was obtained from all the participants. Confidentiality, anonymity, risks, benefits and right to withdraw were all discussed. Confidentiality procedures were used based on the ethic board's requirements and the Canadian privacy legislation. Procedures developed to uphold confidentiality included: training all members of the team on confidentiality, removing all names and contact information from the data, storing data in locked cabinets which were only accessible by the research team; and using password protected computers to store electronic data (Sword et al, 2009). The secondary data used for this study was stored on a password protected computer and stripped of any identifiable factors.

## **Data Analysis**

The purpose of this study was to determine which postpartum factors were associated with sexual satisfaction at 6 and 12 months postpartum with a specific focus on the effect of method of delivery on the outcome. The dependent variable was the satisfaction score of the Female Sexual Function Index (FSFI) by Rosen et al. (2000) which was calculated based on three questions that focus on female sexual satisfaction. A cut-off value of 3.6 was used based on previous research (Aydin et al., 2015; Jiann et al., 2007; Su et al, 2015; Royo et al, 2014). Participants were grouped into categories of sexually satisfied ( $\geq 3.6$ ) and sexually dissatisfied ( $< 3.6$ ) based on their score in the satisfaction domain of the FSFI. All statistical tests were

performed using two-sided tests at the 0.05 level of significance. All analyses were implemented using R software.

Descriptive statistics were implemented to summarize sample demographic characteristics (age, parity, marital status, household income, place of birth and level of education) at 6 months and 12 and were expressed as frequency (%). Bivariate analysis including chi-square analyses were used to examine the association between the sociodemographic factors and sexual satisfaction at both follow-up time points. Crude Odds Ratios (ORs) with a 95% Confidence Intervals (95% CIs) were calculated for each of the relationships.

A large percentage of women were found to be sexually inactive at both 6 months (16%) and 12 months (13%) postpartum and thus did not complete the sexual satisfaction questions. Further analysis was done to determine if there were differences between the participants who were sexually active and sexually inactive at 6 and 12 months postpartum. A focus was placed on method of delivery to determine whether the difference in sexual activity was related to method of delivery. Descriptive statistics were used to examine the distribution of all the demographic factors and method of delivery (caesarean section delivery versus vaginal delivery) with regards to sexual activity at both time points. Chi-square analyses were implemented to examine the relationship between sexual activity and method of delivery at 6 months and 12 months postpartum. Crude Odds Ratios (ORs) with a 95% Confidence Intervals (95% CIs) were reported for each of the relationships.

A multivariate logistic regression analysis was performed to determine the relationship between the factors and sexual satisfaction at both 6 months and 12 months postpartum. A simultaneous building approach, in which all factors were entered in the multivariate logistic regression model simultaneously, was performed. This strategy was appropriate because the

factors were of comparable importance to the research question (Polit & Beck, 2012). The logistic regression coefficient (B), the standard error of coefficients (SE(B)), Beta ( $\beta$ ), t-values, significance level and odds ratio (OR) with corresponding two-sided 95% confidence intervals were reported for each model. For the multivariate analysis the indicator variable equal to 1, corresponded with sexually satisfied (satisfaction score of  $\geq 3.6$ ).

## Chapter Four

### Results

This chapter reports the study results. The chapter presents the descriptive analysis of sample characteristics followed by the presentation of the results for the bivariate and multivariate analyses.

Prior to conducting the analyses, the data were examined for missing values. A small percentage of participants did not provide any sexual health data at 6 months and 12 months postpartum (2.4% and 3.4%, respectively). Since data on the study focus, sexual health, was not available from these participants their data were removed from the datasets. Schafer (1999) stated that if less than 5% of data is missing it is inconsequential and should not have an impact on statistical inference.

For the data included in the study, the assumption of Missing at Random (Schafer, 1999), in which missing values can be predicted by other variables, was used. Mean imputation was the approach used to handle missing data. If less than 10% of the data for a specific variable was missing, the missing values were replaced by the group mean of that variable as calculated by R software (R Core Team, 2017). Bennet (2001) stated that when the amount of missing data is greater than 10%, the results of the statistical analyses may be biased. Therefore, any given variable with missing data over 10% (i.e., fecal incontinence) was removed from the multivariate analyses. All statistical tests were performed using two-tailed tests with alpha values set at  $p \leq 0.05$ . All analyses were implemented using R software (R Core Team, 2017).

Between April 2006 and October 2008, a total of 2560 women were recruited for the primary study (Sword et al., 2009). At 6 months postpartum 1823 women participated in the follow-up interviews, 71% of the original sample. A total of 1310 women, approximately half of

the original sample (51%) participated in the 12 month follow-up interviews. After cleaning the data and removing the participants that had not provided any sexual health data, the total number of participants at 6 months postpartum were 1780 women and at 12 months postpartum were 1265 women.

### **Participants' Characteristics**

Demographic information is presented for the entire sample at 6 months (n=1780) and 12 months postpartum (n=1265) in Appendix E. At both 6 months and 12 months postpartum the follow-up samples consisted mostly of women who were between 25 to 35 years old (n=1101, 63% and n=769, 61%, respectively), married or in a common-law relationship (n=1684, 95% and n=1204, 96%, respectively) and Canadian born (n=1296, 73% and n=910, 72%, respectively). At both follow-up time points the majority of women in the study went to college (n=631, 36% and n=435, 35%, respectively) or obtained a bachelor's degree (n=603, 34% and n=437, 35%, respectively) and reported a household income of over \$80,000 (n=889, 51% and n=657, 53%, respectively).

### **Participants' Characteristics Based on Sexual Activity**

Only participants who were sexually active within 4 weeks prior to the 6 and 12 month interviews completed the interview questions pertaining to sexual health. During the initial examination of the data, it was noted that a large percentage of women were not sexually active at both follow-up points; 16 % at 6 months and 13 % at 12 months postpartum. The high percentage of sexually inactive women at both time points led to the question whether the sexually active participants were different from the sexually inactive participants. Thus, an unplanned analysis of the data comparing the sexually active to inactive participants was

undertaken to determine whether the two groups differed in demographic statistics and method of delivery.

At 6 months postpartum, 1498 participants (84%) were sexually active. Bivariate analysis revealed that 5 of the 6 demographic factors examined had statistically significant associations with sexual activity: age, marital status, household income, birthplace and level of education ( $p < 0.05$ ) (Appendix E). Results showed that being older, non-married, having a low household income and being born outside of Canada were associated with sexual inactivity.

Approximately one-third of the total sample delivered by Caesarean section ( $n=589$ , 33%) and two-third delivered vaginally ( $n=1191$ , 67%). There was no statistically significant association between method of delivery and sexual activity at 6 months postpartum ( $p = 0.3934$ ).

A total of 1100 participants (87%) were sexually active at 12 months postpartum (Appendix E). Amongst the demographic factors examined, 4 of the 6 factors were found to be statistically significant; parity, age, marital status and household income ( $p < 0.05$ ) (Appendix E). At 12 months postpartum being a primipara, under 25 years of age, non-married and having a low-income were associated with sexual inactivity.

Approximately two-thirds of women had a vaginal delivery ( $n=822$ , 67%) and one-third delivered via Caesarean section ( $n=443$ , 34%). The difference between the two groups regarding method of delivery was not found to be statistically significant ( $p = 0.5656$ )

### **Factors Associated with Postpartum Sexual Satisfaction**

Further analysis investigating postpartum sexual satisfaction excluded the women who were not sexually active at 6 months and 12 months postpartum.

## **Bivariate Analysis for Sexual Satisfaction at 6 Months Postpartum**

A total of 1480 participants had completed sexual satisfaction scores at 6 months postpartum. Based on their Female Sexual Function Index (FSFI) satisfaction domain score, 1357 women (92%) were found to be sexually satisfied (Table 1). Half of the women in the 6 month sample were primiparas (n=737, 50%) and the majority were married or in common-law relationships (n=1418, 96%) and many women were college educated (n=540, 37%) or had obtained a bachelor's degree (n=506, 34%). In the overall sample at 6 months postpartum, two-thirds of women had a vaginal delivery (n=997, 67%) and were breastfeeding (n=836, 63%). The majority of the sample had average or above average physical health scores (n=1272, 87%) and only a small number of women suffered from severe urinary (n= 92, 7%) or fecal (n= 5, 0.4%) incontinence. At 6 months postpartum the majority of women in the sample were at no risk of postpartum depression (n=1396, 95%) and indicated having sufficient social support (n=1166, 79%) (Table 1).

**Demographic Factors.** Only one significant association was found between the demographic factors examined and sexual satisfaction, that being country of birth. Results showed that women who were not born in Canada were at 2.07 more odds of being sexually satisfied compared to Canadian born women [95% CI (1.209-3.736)].

**Physical Factors.** Of the physical factors examined a statistically significant association was found between breastfeeding and sexual dissatisfaction and physical health scores and sexual satisfaction. Women who were not breastfeeding had 1.6 times the odds of being sexually satisfied compared to women who were breastfeeding [95% CI (1.009-2.506)]. Women with average and above average physical health scores had 2.0 times the odds of being sexually satisfied compared to women with below average physical health scores [95% CI (1.249-3.247)].

**Psychosocial Factors.** All three of the psychosocial factors examined were found to have a statistically significant association with sexual satisfaction. Women with sufficient social support had 4.0 times the odds of being sexually satisfied compared to women lacking sufficient social support [95% CI (2.683-5.942)]. The association between sexual satisfaction and mental health indicated that women with average and above average mental health scores had 3.5 times the odds of being sexually satisfied compared to women with below average mental health scores [95% CI (2.361-5.214)]. The association between the risk of postpartum depression and sexual satisfaction was found to be statistically significant. Women who were at risk of postpartum depression (i.e., with a score  $\geq 13$  of the Edinburgh Postpartum Depression Scale) were at lower odds [OR 0.214, 95% CI (0.122-0.388)] of being sexually satisfied compared to women who were not at risk of postpartum depression.

Table 1

*Summary of Bivariate Analysis for Sexual Satisfaction at 6 Months Postpartum*

<i>Characteristics</i>	<i>Overall (n=1480)</i>	<i>Sexually Satisfied (n=1357) (91.69) N (%)</i>	<i>Sexually Dissatisfied (n=123)(8.31) N (%)</i>	<i>OR (95% CI)</i>	<i>P</i>
<b>Demographic Factors</b>					
<b>Parity</b> (n = 1479)					0.534
Primiparas	737 (49.83)	680 (92.27)	57 (7.73)	1.00 [Reference]	
Multiparas	742 (50.17)	677 (91.24)	65 (8.76)	0.87(0.591-1.287)	
<b>Age</b> (yr.) (n=1462)					0.347
<25	172 (11.76)	160 (93.02)	12 (6.98)	1.00 [Reference]	
25-35	932 (63.75)	859 (92.17)	73(7.83)	0.86 (0.446-1.552)	
>35	358 (24.49)	322(89.94)	36(10.06)	0.75 (0.49-1.17)	
<b>Marital Status</b> (n=1472)					0.990
Married, Common-Law,	1418 (96.33)	1301 (91.75)	117 (8.25)	1.00 [Reference]	
Single, Divorced, Widowed	54 (3.67)	49 (90.74)	5 (9.26)	0.88 (0.34-2.89)	
<b>Household Income</b> (n=1438)					0.117
<40,000	223 (15.51)	204 (91.48)	19 (8.52)	1.00 [Reference]	
40,000 – 79,999	457 (31.78)	429 (93.87)	28 (6.13)	1.06 (0.63-1.72)	
$\geq 80,000$	758 (52.71)	686 (90.50)	72 (9.50)	0.72 (0.49-1.07)	
<b>Born in Canada</b> (n=1474)					0.008

yes	1118 (75.85)	1013 (90.61)	105 (9.39)	1.00 [Reference]	
No	356 (24.15)	339 (95.22)	17 (4.78)	2.07 (1.21-3.74)	
<b>Highest Level Educ (n=1473)</b>					0.498
High school and below	172 (11.68)	161 (93.60)	11 (6.40)	1.00 [Reference]	
Some college, college	540 (36.66)	492 (91.11)	48 (8.89)	0.77 (0.38-1.44)	
Bachelor's degree	506 (34.35)	460 (90.91)	46 (9.09)		
Graduate degree	255 (17.31)	238 (93.33)	17 (6.67)	1.33 (0.77-2.41)	
<b>Physical Factors</b>					
<b>Method of Delivery (n=1480)</b>					0.282
C-section	483 (32.64)	437 (90.48)	46 (9.52)	1.00 [Reference]	
Vaginal	997 (67.36)	920 (92.28)	77 (7.72)	1.26 (0.84-1.87)	
<b>Breastfeeding Status (n=1328)</b>					0.048
Yes	836 (62.95)	756 (90.43)	80 (9.57)	1.00 [Reference]	
No	492 (37.05)	461 (93.70)	31 (6.30)	1.57 (1.01-2.51)	
<b>Urinary Incont. (n=1389)</b>					0.234
Slight	1297 (93.38)	1195 (92.14)	102 (7.86)	1.00 [Reference]	
Severe	92 (6.62)	81 (88.04)	11 (11.96)	0.63 (0.32-1.35)	
<b>Fecal Incontinence (n=1265)</b>					1.000
Slight	1260 (99.60)	1168 (92.70)	92 (7.30)	1.00 [Reference]	
Severe	5 (0.40)	5 (100.00)	0 (0.00)	1.00 (0.07-1.00)	
<b>Physical Health (n=1470)</b>					0.003
Below Average	198 (13.47)	170 (85.86)	28 (14.14)	1.00 [Reference]	
Average and Above	1272 (86.53)	1177 (92.53)	95 (7.47)	2.04 (1.25-3.5)	
<b>Psychosocial Factors</b>					
<b>Depression Score (n=1474)</b>					<0.001
No Risk	1396 (94.71)	1294 (92.69)	102 (7.31)	1.00 [Reference]	
Risk	78 (5.29)	57 (73.08)	21 (26.92)	0.21 (0.12-0.39)	
<b>Social Support (n=1479)</b>					<0.001
Lacking	313 (21.16)	254 (81.15)	59 (18.85)	1.00 [Reference]	
Sufficient	1166 (78.84)	1102 (94.51)	64 (5.49)	4.00 (2.68-5.94)	
<b>Mental Health Score (n=1470)</b>					<0.001
Below Average	459 (31.22)	387 (84.31)	72 (15.69)	1.00 [Reference]	
Average and Above	1011 (68.78)	960 (94.96)	51 (5.04)	3.50 (2.36-5.21)	

*Notes: Educ = Education; Incont = Incontinence  
OR = odds ratio; CI = confidence interval*

## **Bivariate Analysis for Sexual Satisfaction at 12 Months Postpartum**

A total of 1095 participants completed sexual satisfaction scores at 12 months postpartum. Based on their Female Sexual Function Index (FSFI) satisfaction domain score, 92% of women (n = 1008) were sexually satisfied (Table 2). Approximately two-thirds (n=687, 63%) of the total 12 months sample was between 25 to 35 years old, the majority were married or in a common-law relationship (n=1050, 97%) and born in Canada (n=799, 73%). A large number of women indicated having an income level above \$80,000 (n=584, 55%) and a college (n=376, 35%) or bachelor (n=386, 35%) level education. The majority of the women (n=712, 73%) in the sample were no longer breastfeeding. Most of the women reported average or above average physical health (n=953, 88%). A small number of women suffered from severe urinary (n=68, 7%) or fecal (n=1, 0.01%) incontinence. The majority of women in the sample were not at risk for postpartum depression (n=1044, 95%) and indicated having sufficient social support (n=847, 77%) (Table 2).

**Demographic Factors.** There were no statistically significant associations between sexual satisfaction at 12 months postpartum and any of the demographic factors examined.

**Physical Factors.** Breastfeeding status and physical health scores had a statistically significant association with sexual satisfaction. Women who were not breastfeeding had 2.4 times the odds of being sexually satisfied compared to women who were breastfeeding [95% CI (1.455-3.871)]. Women with average and above average physical health scores had 2.5 times the odds of being sexually satisfied compared to women with below average physical health scores [95% CI (1.371-4.421)]. Urinary incontinence was just shy of reaching statistical significance in relation to sexual satisfaction [OR 0.459, 95% CI (0.220-1.052)].

**Psychosocial Factors.** A statistically significant association was found between each psychosocial factor and sexual satisfaction at 12 months postpartum. Women who were at risk of postpartum depression had lower odds of being sexually satisfied compared to women who were not at risk of postpartum depression [OR 0.252, 95% CI (0.123-0.552)]. Women with sufficient social support had 3.4 times the odds of women being sexually satisfied compared to would who perceive lacking social support [95% CI (2.142-5.525)]. Average and above average mental health scores were associated with increased odds of being sexually satisfied compared to below average mental health scores [OR 3.724, 95% CI (2.309-6.101)].

Table 2

*Summary of Bivariate Analysis for Sexual Satisfaction at 12 Months Postpartum*

<i>Characteristics</i>	<i>Overall (n=1095)</i>	<i>Sexually Satisfied (n=1008) N (%)</i>	<i>Sexually Dissatisfied (n=87) N (%)</i>	<i>OR (95% CI)</i>	<i>P</i>
<b>Demographic Factors</b>					
<b>Parity</b> (n = 1093)					1.000
Primiparas	539 (49.31)	497 (92.21)	42 (7.79)	1.00 [Reference]	
Multiparas	554 (50.69)	510 (92.06)	44 (7.94)	0.98(0.61-1.56)	
<b>Age</b> (yr.) (n=1082)					0.451
<25	101 (9.33)	92 (91.09)	9 (8.91)	1.00 [Reference]	
25-35	687 (63.49)	639 (93.01)	48 (6.99)	1.42(0.68-2.75)	
35	294 (27.17)	267 (90.82)	27 (9.18)	0.80(0.49-1.34)	
<b>Marital Status</b> (n=1088)					0.127
Married, Common-Law,	1050 (96.51)	970 (92.38)	80 (7.62)	1.00 [Reference]	
Single, Divorced, Widowed	38 (3.49)	32 (84.21)	6 (15.79)	0.44(0.18-1.33)	
<b>Household Income</b> (n=1066)					0.792
<40,000	174 (16.32)	160 (91.95)	14 (8.05)	1.00 [Reference]	
40,000 – 79,999	308 (28.89)	287 (93.18)	21 (6.82)	1.25(0.69-0.79)	
≥80,000	584 (54.88)	537 (91.95)	47 (8.05)	0.97(0.61-1.54)	
<b>Born in Canada</b> (n=1090)					0.710
yes	799 (73.30)	734 (91.86)	65 (8.14)	1.00 [Reference]	
no	291 (26.70)	270 (92.78)	21 (7.22)	1.14(0.67-2.00)	
<b>Highest Level Educ</b> (n=1091)					0.545
High school and below	110 (10.08)	103 (93.64)	7 (6.36)	1.00 [Reference]	

Some college, college	376 (34.46)	341 (90.69)	35 (9.31)	0.86(0.35-1.85)	
Bachelor's degree	386 (35.38)	360 (93.62)	26 (6.74)		
Graduate degree	219 (20.07)	201 (91.78)	18 (8.22)	0.96(0.55-1.75)	
<b>Physical Factors</b>					
<b>Method of delivery (n=1095)</b>					0.173
C-section	386 (35.25)	349 (90.41)	37 (9.59)	1.00 [Reference]	
Vaginal	709 (64.75)	659 (92.95)	50 (7.05)	1.40(0.87-2.23)	
<b>Breastfeeding Status (n=985)</b>					<0.001
Yes	273 (27.72)	236 (86.45)	37 (13.55)	1.00 [Reference]	
No	712 (72.28)	668 (93.82)	44 (6.18)	2.38(1.46-3.87)	
<b>Urinary Incont (n=1023)</b>					0.051
Slight	955 (93.35)	885 (92.67)	70 (7.33)	1.00 [Reference]	
Severe	68 (6.65)	58 (85.29)	10 (14.71)	0.46(0.22-1.05)	
<b>Fecal Incontinence (n=943)</b>					1.000
Slight	942 (99.89)	871 (92.46)	71 (7.54)	1.00 [Reference]	
Severe	1 (0.01)	1 (100.00)	0 (0.00)	1.00(0.00-1.00)	
<b>Physical Health (n=1089)</b>					0.001
Below Average	136 (12.49)	115 (84.56)	21 (15.44)	1.00 [Reference]	
Average and Above	953 (87.51)	887 (93.07)	66 (6.93)	2.45(1.37-4.24)	
<b>Psychosocial Factors</b>					
<b>Depression Score (n=1095)</b>					<0.001
No Risk	1044 (95.34)	969 (92.82)	75 (7.18)	1.00 [Reference]	
Risk	51 (4.66)	39 (76.47)	12 (23.53)	0.25(0.12-0.55)	
<b>Social Support (n=1095)</b>					<0.001
Lacking	248 (22.65)	207 (83.47)	41 (16.53)	1.00 [Reference]	
Sufficient	847 (77.35)	801 (94.57)	46 (5.43)	3.44(2.14-5.53)	
<b>Mental Health Score (n=1089)</b>					<0.001
Below Average	383 (35.17)	327 (85.38)	56 (14.62)	1.00 [Reference]	
Average and Above	706 (64.83)	675 (95.61)	31 (4.39)	3.72(2.31-6.10)	

*Notes: Educ = Education; Incont = Incontinence  
OR = odds ratio; CI = confidence interval*

## Multivariate Analysis

For all the multivariate logistic regression models, the results included the significance level and odds ratio (OR) with corresponding two-tailed 95% confidence intervals. Factors were included in the multivariate logistic regression models at 6 months and 12 months based on common postpartum variables found in the literature as well as theoretical reasoning. The variable fecal incontinence was removed due to the high percentage of missing values at 6 months (15%) and at 12 months (14%).

The multivariate logistic regression analysis showed six factors to be significantly associated with postpartum sexual satisfaction at 6 months postpartum (Table 3): country of birth, breastfeeding status, physical health scores, perceived social support, mental health scores and risk of postpartum depression. Results show that women who were not born in Canada had 2.8 times the odds of being sexually satisfied than those born in Canada [95% CI (1.622-5.157)]. Women who were not breastfeeding at 6 months postpartum had higher odds of being sexually satisfied compared to women who were currently breastfeeding [OR 1.77, 95% CI (1.119 – 2.865)].

Women with average or above average physical health scores had 1.9 times higher odds of being sexually satisfied compared to women with below average physical health scores [95% CI (1.139-3.123)]. Women who perceived having sufficient social support had higher odds of being sexually satisfied compared to women who reported lack of social support [OR 3.16, 95% CI (2.025-4.929)]. Average and above average mental health scores increased the odds of women being sexually satisfied [OR 2.54, 95% CI (1.662 – 3.897)]. Women who were at risk of postpartum depression had decreased odds of being sexually satisfied compared to women with no risk of postpartum depression [OR 0.49, 95% CI (0.265-0.919)].

The overall accuracy of the 6 month predictor model was 91.62%. The method used to evaluate the logistic regression model was the Area under the ROC curve (AUC), a value that varies from 0.5 (discriminating power not better than chance) to 1.0 (perfect discriminating power). For the 6 month model the AUC =0.769, indicates that the result of the model is better than chance.

Table 3

*Summary of Multivariate Logistic Regression for Sexual Satisfaction at 6 Months Postpartum*

<i>Characteristics</i>	<i>OR (95% CI)</i>	<i>P</i>
<b>Demographic Factors</b>		
<b>Parity</b> (n = 1479)		0.3515
Primiparas	1.00 [Reference]	
Multiparas	1.22(0.80-1.85)	
<b>Age</b> (yr.) (n=1462)		0.8218
<25	1.00 [Reference]	
25-35	0.92(0.42-1.90)	
>35	0.83(0.35-1.89)	
<b>Marital Status</b> (n=1472)		0.5928
Married, Common-Law,	1.00 [Reference]	
Single, Divorced, Widowed	1.35 (0.49-4.45)	
<b>Household Income</b> (n=1438)		0.2892
<40,000	1.00 [Reference]	
40,000 – 79,999	1.45(0.72-2.87)	
≥80,000	0.78(0.39-1.51)	
<b>Born in Canada</b> (n=1474)		0.0004**
yes	1.00 [Reference]	
No	2.81(1.62-5.16)	
<b>Highest Level Educ</b> (n=1473)		0.3099
High school and below	1.00 [Reference]	
Some college, college	0.68(0.31-1.40)	
Bachelor's degree	0.70(0.30-1.57)	
Graduate degree	1.18(0.46-2.95)	
<b>Physical Factors</b>		
<b>Method of Delivery</b> (n=1480)		0.3775
C-section	1.00 [Reference]	
Vaginal	1.20(0.79-1.81)	
<b>Breastfeeding Status</b> (n=1328)		0.0169*
Yes	1.00 [Reference]	
No	1.77(1.12-2.87)	
<b>Urinary Incont.</b> (n=1389)		0.8934

Slight	1.00 [Reference]	
Severe	0.95(0.48-2.05)	
<b>Physical Health</b> (n=1470)		0.0112*
Below Average	1.00 [Reference]	
Average and Above	1.91(1.14-3.12)	
<hr/>		
<b>Psychosocial Factors</b>		
<hr/>		
<b>Depression Score</b> (n=1474)		0.0231*
No Risk	1.00 [Reference]	
Risk	0.49(0.27-0.92)	
<b>Social Support</b> (n=1479)		<0.0001***
Lacking	1.00 [Reference]	
Sufficient	3.16(2.03-4.93)	
<b>Mental Health Score</b> (n=1470)		<0.0001***
Below Average	1.00 [Reference]	
Average and Above	2.54(1.66-3.90)	

**Notes: \*p ≤0.05, \*\*p ≤0.001, \*\*\*p ≤0.0001**  
*Educ = Education; Incont = Incontinence*  
*OR = odds ratio; CI = confidence interval*

The multivariate logistic regression analysis showed that four factors were significantly associated with postpartum sexual satisfaction at 12 months postpartum (Table 4): breastfeeding status, physical health scores, perceived social support and mental health scores. Women who were not breastfeeding at 12 months postpartum had 2.5 times higher odds of being sexually satisfied compared to women who were currently breastfeeding [95% CI (1.467-4.085)]. Women who had average or above average physical health scores had higher odds of being sexually satisfied compared to women with below average physical health scores [OR 1.88, 95% CI (1.018-3.343)].

Women who reported having sufficient social support had higher odds of being sexually satisfied compared to women who reported insufficient social support [OR 2.48, 95% CI (1.485-4.120)]. Women who had average or above average mental health scores had 2.7 times higher odds of reporting sexual satisfaction compared to women with below average mental health

scores [95% CI (1.636 – 4.500)]. Method of delivery, i.e. vaginal delivery, was just shy of reaching significance as a predictor of sexual satisfaction, compared to Caesarean delivery [OR 1.6, 95% CI (0.985-2.586); p=0.056)].

The overall accuracy of the 12 month predictor model was 92.05%. For the 12 month model the AUC =0.761, indicating that the result of the model is better than chance.

Table 4

*Summary of Multivariate Analysis for Sexual Satisfaction at 12 Months Postpartum*

<i>Characteristics</i>	<i>OR (95% CI)</i>	<i>P</i>
<b>Demographic Factors</b>		
<b>Parity</b> (n = 1093)		0.189
Primiparas	1.00 [Reference]	
Multiparas	1.40(0.85-2.31)	
<b>Age</b> (yr.) (n=1082)		0.2456
<25	1.00 [Reference]	
25-35	1.63(0.69-3.64)	
>35	1.49(0.58-3.74)	
<b>Marital Status</b> (n=1088)		0.2690
Married, Common-Law,	1.00 [Reference]	
Single, Divorced, Widowed	0.54(0.19-1.74)	
<b>Household Income</b> (n=1066)		0.3888
<40,000	1.00 [Reference]	
40,000 – 79,999	1.40(0.65-2.97)	
≥80,000	0.80(0.37-1.65)	
<b>Born in Canada</b> (n=1090)		0.3637
yes	1.00 [Reference]	
No	1.30(0.75-2.31)	
<b>Highest Level Educ</b> (n=1091)		0.2393
High school and below	1.00 [Reference]	
Some college, college	0.57(0.21-1.39)	
Bachelor's degree	0.89(0.30-2.39)	
Graduate degree	0.72(0.23-2.10)	
<b>Physical Factors</b>		
<b>Method of Delivery</b> (n=1095)		0.0558
C-section	1.00 [Reference]	
Vaginal	1.60(0.99-2.59)	
<b>Breastfeeding Status</b> (n=985)		0.0005**
Yes	1.00 [Reference]	
No	2.45(1.47-4.09)	

<b>Urinary Incont.</b> (n=1023)		0.1978
Slight	1.00 [Reference]	
Severe	0.60(0.28-1.37)	
<b>Physical Health</b> (n=1089)		0.0373*
Below Average	1.00 [Reference]	
Average and Above	1.88(1.02-3.34)	
<hr/>		
<b>Psychosocial Factors</b>		
<hr/>		
<b>Depression Score</b> (n=1095)		0.1563
No Risk	1.00 [Reference]	
Risk	0.57(0.27-1.28)	
<b>Social Support</b> (n=1095)		<0.0005**
Lacking	1.00 [Reference]	
Sufficient	2.48(1.49-4.12)	
<b>Mental Health Score</b> (n=1089)		<0.0001***
Below Average	1.00 [Reference]	
Average and Above	2.70(1.64-4.50)	

Notes: \* $p \leq 0.05$ , \*\* $p \leq 0.001$ , \*\*\* $p \leq 0.0001$

*Educ = Education; Incont = Incontinence*

*OR = odds ratio; CI = confidence interval*

## **Chapter Five**

### **Discussion and Conclusion**

The primary purpose of this study was to examine women's sexual health at 6 and 12 months postpartum. To develop a more holistic understanding of women's postpartum sexual health, postpartum factors associated with sexual satisfaction were measured, including the effects of psychosocial factors. The secondary purpose of this study was to determine the effects of method of delivery on postpartum sexual satisfaction at both time points. This chapter will discuss the results of the present study in relation to past research findings. Study limitations and suggestions for future research will be given.

#### **Summary of the Findings**

To the researcher's knowledge this is the first study to examine Canadian women's sexual health via sexual satisfaction at 6 and 12 months postpartum. Few published studies have investigated postpartum sexual satisfaction as a sexual health outcome, limiting the ability for comparison with prior research. The results of this study suggest that postpartum sexual satisfaction is a multidimensional aspect of sexual health that may be best understood using a biopsychosocial approach in which demographic, physical and psychosocial factors common to the postpartum period are assessed. Results of the current study showed that at 6 months postpartum, various demographic factors (place of birth), physical factors (physical health scores, breastfeeding status) and psychosocial factors (mental health status, risk of postpartum depression and social support) were associated with postpartum sexual satisfaction. At 12 months postpartum, physical factors (physical health scores, breastfeeding status) as well as

psychosocial factors (mental health scores and social support) were associated with postpartum sexual satisfaction.

The effect of method of delivery on postpartum sexual satisfaction was examined at 6 months and 12 months postpartum. Method of delivery was not a statistically significant predictor of postpartum sexual satisfaction at either time point. A possible trend, just shy of statistical significance, was visible at 12 months postpartum suggesting that vaginal delivery may be associated with greater sexual satisfaction than Caesarean delivery.

### **Postpartum Sexual Satisfaction**

At 6 and 12 months postpartum, the average Female Sexual Function Index (FSFI) satisfaction domain score for the study sample was above the cut-off for sexual dissatisfaction assigned based on previous research (Aydin et al., 2015; Jiann et al., 2007; Su et al., 2015; Royo et al., 2014). Within the current study 92% of women were sexually satisfied at both 6 months and 12 months postpartum. The high prevalence of postpartum sexual satisfaction was surprising given prior research indicating that the majority of women suffer from sexual dysfunction in the first year postpartum (Barrett et al., 2000; Acele & Karcam, 2011). This finding supports the view that sexual dysfunction does not necessarily equate to sexual dissatisfaction (Basson, 2005).

### **Factors Associated with Postpartum Sexual Satisfaction**

**Demographic Factors Related to Postpartum Sexual Satisfaction.** Country of birth was the sole demographic factor associated with sexual satisfaction at 6 months postpartum. Interestingly this study found that women born outside of Canada were at higher odds of being sexually satisfied at 6 months postpartum (OR 2.81, 95% 1.622-5.157). Literature on the association between birthplace and postpartum sexual satisfaction is non-existent. Research on

sexual satisfaction amongst immigrants may be limited due to the sensitive nature of the topic. Maticka-Tyndale et al. (2002) found that Iranian immigrants described their difficulty discussing sexual health due to modesty and embarrassment surrounding the topic. Language and cultural differences were found to be barriers to communication regarding sexual health (Maticka-Tyndale et al., 2002).

According to the 2011 Census, 21% of the total Canadian population are foreign-born, with approximately 250,000 new immigrants arriving each year and the majority residing in Ontario, British Columbia, Quebec and Alberta (Statistics Canada, 2011). Even though immigration is a large part of Canadian culture, data on migrant health remains limited. Migration has a deep impact on the lives of individuals and their families (Hyman et al., 2008). For women, post-migrant stressors may include the need to learn a new language and culture, adjusting to changes in social status and income level, loss of social support and possible isolation (Meadows et al., 2001; Hyman et al., 2008). Overcoming these obstacles may be facilitated by a strong social support system (Simich et al., 2005). Social support has been found to play an important role in major transition periods, such as immigration, by facilitating coping, decreasing the effect of stressors and promoting health (Simich et al., 2005). For many newly immigrated women this source of social support may be found in their family, especially their spouse. The reliance on one another for social support may bring couples closer, increasing their emotional intimacy, which Basson (2000) has been deemed an integral part of having a more satisfied sexual experience.

Previous research findings suggest the existence of a healthy immigrant effect in which immigrants are in relatively better health on arrival in Canada compared to native-born Canadians (McDonald & Kennedy, 2004). New immigrants have been found to report lower

rates of unhealthy status compared to both long-term immigrants and non-immigrants (Wang & Hu, 2013). The healthy immigrant effect could possibly explain why the women in the current study who were born outside of Canada reported higher levels of sexual satisfaction at 6 months than native-born Canadian women.

Another possible explanation for the difference in sexual satisfaction, based on country of birth, may be due to how immigrant women view health. Meadows and colleagues (2001) examined immigrant women's health in a sample of 42 immigrant women living in Alberta, with most of their sample having emigrated from the Middle East (Lebanon, Egypt, Iran and Kuwait) and the Far East (Hong Kong and China). They found that immigrant women defined health in a more holistic manner, integrating physical, psychological and spiritual aspects into their overall health assessment. Women placed importance on their ability to perform their role as wife or mother as more important than their own self-care. It may be possible that immigrant women rate their sexual satisfaction based on their ability to please their husbands; how well they were able to perform their role as wife. Thus, the way health is operationalized may be different amongst immigrant and native born Canadian women. A deeper understanding on how immigrant women evaluate sexual health is needed.

Being born outside of Canada was no longer a predictor of sexual satisfaction at 12 months. The change in the association between country of birth and sexual satisfaction may be explained by the effect of years since immigration (YSM) described by MacDonald and Kennedy (2004) which states that there is a noticeable decline in the healthy immigrant effect as time since migration increases. However, since the current study did not assess time since immigration it is difficult to determine the influence of years since immigration on postpartum sexual satisfaction. Future research should examine the difference in postpartum sexual

satisfaction amongst Canadian born women and immigrant women, focusing on sources of social support, the possible healthy immigrant effect and length of time since migration.

**Physical Factors Related to Postpartum Sexual Satisfaction.** Breastfeeding status and physical health scores were found to be predictive of sexual satisfaction at both 6 months and 12 months postpartum. The current study findings, which suggest that breastfeeding is associated with decreased odds of sexual satisfaction, are consistent with previous research (DeJudicibus & McCabe, 2002; Yee et al., 2013). Breastfeeding literature suggests that the physiological changes due to breastfeeding (i.e., increase in prolactin and decrease in testosterone) may affect postpartum sexual health, specifically decreasing sexual desire and vaginal lubrication (Avery et al., 2000; Glazner, 1997). However, it has also been suggested that exclusive breastfeeding may improve a women's sexual satisfaction (Anbaran et al., 2015). Increased sexual satisfaction may be explained by the release of oxytocin that occurs during breastfeeding. The differing effects of breastfeeding on sexual satisfaction may be due to women's unique response to the changes in hormone levels that occur (increase in prolactin and decrease in testosterone versus increase in oxytocin).

The current study did not distinguish between exclusive breastfeeding and breastfeeding. Women who were exclusively breastfeeding and mixed breastfeeding (breastfeeding plus another feeding method) were included in the breastfeeding group which may explain the difference in the results between the current study and those found within the literature. Future breastfeeding research needs to examine sexual satisfaction as the outcome measure focusing on the difference between all feeding methods (breastfeeding, formula feeding or mixed feeding). This would allow for a greater understanding of whether the physiological changes due to breastfeeding that lead to dysfunction affect overall sexual satisfaction.

Participants' physical health was a significant predictor of sexual satisfaction at 6 months and 12 months postpartum. Postpartum women who had average or above average physical health scores were more likely to be sexually satisfied compared to women with below average physical health scores. It remains unclear however, whether physical health influences postpartum sexual satisfaction or vice versa. Once again, it is important to note that the current study measured sexual satisfaction and not sexual dysfunction, led by the assumption that sexual dysfunction does not necessarily equate to sexual dissatisfaction. Although, sexual dysfunction may decrease general health (Sehhatie & Malakouti, 2016) it does not mean that sexual dissatisfaction would have the same effect. Understanding the relationship between postpartum physical health and sexual satisfaction, specifically, whether better overall postpartum physical health leads to better sexual satisfaction, would provide insight on how to counsel postpartum women and formulate appropriate treatment plans.

**Psychosocial Factors Related to Postpartum Sexual Satisfaction.** At 6 months postpartum all the psychosocial factors examined, mental health scores, perceived social support and risk of postpartum depression, were found to be associated with sexual satisfaction. At 12 months postpartum both social support and mental health scores were found to be associated with postpartum sexual satisfaction.

Social support has been found to be a positive predictor of quality of life and maternal well-being (Emmanuel et al., 2012) while lack of social support has been found to be a predictor of postpartum stress and to influence maternal coping (Hung & Chung, 2001). Results from the current study indicate that women who perceived having sufficient social support were more likely to be sexually satisfied compared to women who felt they were lacking social support.

This result aligns with previous findings in which men and women with abundant social support were more likely to be satisfied with their sex life (Ojanlatva et al., 2005).

Participants' mental health was a predictor of their sexual satisfaction. Mental health was examined using the SF12 (individual's role limitation caused by emotional problems, vitality, social functioning and mental health) and the Edinburgh Postnatal Depression Scale (EPDS). Participants with average and above average mental health scores on the SF12 were more likely to be sexually satisfied compared to those with below average mental health scores at both time points. At 6 months, participants who were at risk for postpartum depression (as measure by the EPDS) were less likely to be sexually satisfied compared to women who were not at risk of postpartum depression. Within the literature, postpartum mental health and the risk of postpartum depression have been associated with delay in time to resumption of sexual activity, reduced frequency of sexual intercourse and increased reported sexual health problems (DeJudicibus & McCabe, 2010; Morof et al., 2003). Findings from this study are among the first to link mental health and risk for postpartum depression with sexual satisfaction at 6 months postpartum.

The risk of postpartum depression was not found to be a predictor of sexual satisfaction at 12 months postpartum which differs from the results found in the study by Moel and colleagues (2010). They found that postpartum depression had a long-term effect on sexual function (Moel et al., 2010). It should be noted that in the current study, the effect of the risk of postpartum depression on postpartum sexual satisfaction was measured while Moel and colleagues (2010) measured the effect of clinically diagnosed depression on postpartum sexual satisfaction which may explain the difference in results.

## **The Effect of Method of Delivery on Postpartum Sexual Satisfaction**

The current rise in Caesarean section (CS) rates and the growing belief that CS may provide protective benefits to the pelvic organs and thus sexual health, led the researcher to examine the effect of method of delivery on postpartum sexual satisfaction at 6 months and 12 months postpartum. Method of delivery was not found to be a predictor of sexual satisfaction at 6 months postpartum and was just shy of reaching statistical significance at 12 months postpartum. The results suggest vaginal deliveries may increase a woman's likelihood of being sexually satisfied at 12 months postpartum. Qian and colleagues (2016) had similar findings in their study and reported that CS was associated with decreased sexual satisfaction. However other studies have reported that vaginal delivery decreased postpartum sexual satisfaction (Kahramanoglu et al., 2017; Safarinejad et al., 2009). Further investigation on the effects of method of delivery on sexual satisfaction is needed to determine if CSs have protective benefits regarding postpartum sexual health as suggested in the literature (McFarlin, 2004; Wu et al., 2005).

## **Differences Between Participants Based on Sexual Activity**

The current study assessed sexual activity, not through time of resumption which is commonly used in the literature (Barrett et al., 2000; Fodstad et al., 2014; Yee et al., 2013), but rather it measured whether participants had engaged in sexual activity within the four weeks prior to their follow-up interviews at 6 months and 12 months postpartum. Results of this study showed that 84% (n = 1498) of women at 6 months and 87% (n = 1095) of women at 12 months were sexually active within the past four weeks at the time of the interview. Thus, 16% of the women at 6 months and 13% of the participants at 12 months postpartum did not complete the sexual satisfaction scale during their interviews and therefore could not be included in this study.

To determine whether there were statistically significant differences between the sexually active and sexually inactive participants at 6 and 12 months postpartum further analysis was performed.

Analysis of the participants' demographic characteristics at 6 months postpartum found statistically significant differences in age, marital status, country of birth, household income and highest level of education between sexually active and inactive women. At 12 months postpartum, parity, age, marital status and household income were found to be statistically significant between the participants in both sexual activity groups.

The reasons behind the lack of sexual activity was not assessed in the current study. The measurement of sexual activity, within the last four weeks, may have altered the study results. An evaluation of overall postpartum sexual activity, not limited to a four week time frame, may have resulted in a different number of sexually active participants. It is possible that the participants who were not sexually active in the 4 week period prior to their 6 month and 12 month follow-up may have included women who had previously experienced sexual dissatisfaction, ultimately leading to sexually inactivity. If the current study had examined postpartum sexual satisfaction since resumption of sexual activity, the prevalence of sexual satisfaction at both time points may have differed. Also, since these participants were not able to provide any information on sexual satisfaction, it limits our understanding on non-coital sexual satisfaction. Future research should assess sexual activity in a multifaceted way, including aspects of sexual activity such as foreplay and non-coital sexual activities.

Although examining the factors effecting sexual activity was not a focus of the current study, further investigation was done to determine whether method of delivery played a role on postpartum sexual activity. Results indicated that method of delivery was not found to effect postpartum sexual activity at 6 months and 12 months postpartum. These findings are consistent

with the results of various studies that found that sexual activity did not differ significantly by method of delivery (Alesheikh et al., 2016; Buhlig et al., 2009; Yee et al., 2013).

### **Implications**

The main finding of this study was that postpartum sexual health, more specifically sexual satisfaction, is not solely explained by physical factors and that using a multidimensional approach which includes psychosocial factors related to sexual health is important. The study generated new knowledge regarding the nature of sexual satisfaction. Results of this study have important implications for all healthcare professionals – physicians, nurses, midwives and nurse educators – that work with pregnant and postpartum women, allowing them to be more cognizant of the multidimensional nature of postpartum sexual satisfaction.

Current study findings suggested that demographic factors, including country of birth, should not be overlooked during the postpartum assessment. Country of birth appears to be a predictor of sexual satisfaction at 6 months postpartum. Clinical implications for nurses working with immigrant populations include the need to initiate a culturally sensitive discussion and assessment of their patients' postpartum sexual health experiences and needs. Clinical strategies for working with immigrant populations may consist of using interpreters when there is limited English proficiency and providing written instruction in the individual's native language. The development of a culturally sensitive instrument to measure sexual health and satisfaction validated within a postpartum immigrant population would be beneficial to understanding the effect of immigration on sexual health.

Further research is needed to understand why Canadian-born women were less likely to be sexually satisfied at 6 months postpartum compared to foreign-born women. Investigating

what it means to be sexually satisfied for Canadian-born women would provide insight on how to improve their sexual health. Examining the influence of Canadian health behaviours and lifestyle factors on postpartum sexual satisfaction would also increase our understanding of what factors effect sexual health amongst this population.

Once the effect of birthplace on sexual satisfaction is better understood, tailored care plans can be designed for the different postpartum groups (i.e. immigrant women and Canadian-born women). It should be noted however, that due to the heterogenous nature of both groups complexity will remain when attempting to provide care specifically based on place of birth.

In the current study breastfeeding was found to negatively impact sexual satisfaction at both 6 and 12 months postpartum. This finding is concerning considering the numerous maternal-infant health benefits associated with breastfeeding. The potential negative impact of breastfeeding on postpartum sexual satisfaction may deter women from breastfeeding. Healthcare providers need to assess possible predictors of breastfeeding, including whether initiation and cessation are influenced by sexual health. Postpartum sexual health interventions need to be developed, and their effectiveness tested, to support breastfeeding women to counter the effects of breastfeeding on sexual satisfaction.

A deeper understanding of the effect of breastfeeding on sexual satisfaction can lead to better strategies to prevent or treat sexual health issues in breastfeeding women. Healthcare providers, including lactation consultants, should also be aware of the influence of breastfeeding on postpartum sexual health in order to provide breastfeeding women with possible strategies (i.e., use of vaginal lubrication) to overcome any challenges that may arise. Implementing such strategies in nursing practice and educating women on the effect of breastfeeding on sexual satisfaction may positively impact initiation and cessation rates.

In this study, below average mental health scores and the risk of postpartum depression effected postpartum sexual satisfaction. These results have important implications for all healthcare providers providing care or counsel to postpartum women. Understanding that postpartum mental health affects multiple aspects of postpartum health, including sexual satisfaction, reinforces the need for early screening and treatment. Through staff education postpartum nurses should be provided the skills to screen for postpartum mood disorders and the ability to provide adequate referrals. It is also important to provide pediatricians and pediatric nurses with the skills to screen mothers for postpartum depression due to their increased contact with mothers while providing their children's care.

The use of a mental health screening tool that incorporates an assessment of sexual health would be a beneficial addition to a woman's postnatal assessment plan. This would help identify women at risk for possible mental health issues as well as its effect on sexual health. An appropriate care plan could then be developed to address both postpartum mental health and sexual health needs.

Social support was found to be a predictor of postpartum sexual satisfaction both in the current study and within the literature (Ojanlatva et al., 2005). This finding suggests that social support is an important psychosocial factor that needs to be assessed during the postpartum period. Nurses should be encouraged to assess postpartum women's social support systems and evaluate the resources available to them. Formal forms of social support, such as postpartum support groups, may be provided when needed. Referrals to social workers may be used to strengthen any post-discharge social support needs. Using an interdisciplinary approach to strengthen postpartum women's social support may ultimately improve other aspects of postpartum health, including sexual satisfaction.

The effect of method of delivery on postpartum sexual satisfaction was examined in the current study to determine if a protective benefit exists between delivery methods. Results indicated that method of delivery did not affect overall postpartum sexual satisfaction. It is important that healthcare providers are informed about the lack of evidence to support the notion that Caesarean sections provide any protective benefit to women's postpartum sexual satisfaction. The incorporation of this finding in prenatal counseling would better inform women of their postpartum sexual health outcomes and ultimately could decrease the number of Caesarean sections by maternal request.

Study results indicate that the current routine 6-week postpartum follow-up is not adequate in addressing women's postpartum sexual health needs. Common postpartum factors (breastfeeding, physical health and mental health) that may affect postpartum sexual satisfaction are rarely assessed beyond the routine postpartum check-up. Postpartum health assessments need to be expanded beyond the scope of the 6 week follow-up and include long-term assessments of postpartum women's physical and psychosocial health. To address the need for more comprehensive follow-ups, community-based programs can be implemented to provide in-home assessments for postpartum women.

Healthcare providers need to be cognizant that sexual health is a sensitive topic for many women. To facilitate the discussion nurses should initiate the conversation of postpartum sexual health during prenatal and postnatal visits. Study findings suggest that child-bearing women should be given information beyond the physical outcomes of sexual health and include other factors that may affect postpartum sexual satisfaction. Through education and counselling, healthcare providers can incorporate a biopsychosocial model of sexual health to address issues related to postpartum sexual satisfaction. The use of a biopsychosocial model of female sexual

satisfaction, which encompasses various demographic, physical and psychosocial factors, will also decrease the likelihood of misdiagnosis of female sexual dysfunction and increase women's understanding of the norms associated with postpartum sexual satisfaction.

### **Limitations of the Current Study**

The large sample size of the current study makes it, to the researcher's best knowledge, the largest study investigating postpartum sexual satisfaction in Canadian women. The study sample consisted of mostly well-educated women, with middle-level incomes who were either married or in common-law relationships, with the majority being sexually satisfied. The homogeneity in social economic status (SES) of the sample decreases the generalizability of the results. To increase the heterogeneity of the sample, collecting data from women across Canada, with varying social economic statuses, should be considered in future research. It should be noted that the sexual orientation of the participants was unknown limiting our understanding of the study findings based on sexual orientation.

A possible limitation to consider is the loss of participants that occurred during the both 6 months (29%) and 12 months postpartum (49%) follow-ups in TOMIS III (Sword et al., 2009). Analysis was not done to determine if differences existed between the participants that remained in the study and those that were lost. The loss of participants may have introduced bias which could affect the study's validity.

A limitation to the current study was the implementation of a secondary analysis of the TOMIS III data (Sword et al., 2009). Although the original data was collected to study postpartum sexual health it was not collected to specifically study postpartum sexual satisfaction.

Therefore, important factors, such as pre-pregnancy sexual health, were not available for the analysis.

A baseline measure of sexual satisfaction was not available due to the lack of pre-pregnancy sexual health data. It is possible that some of the women in the study had different sexual satisfaction outcomes pre-pregnancy. To obtain a more accurate understanding of the effects of pregnancy and childbirth on sexual satisfaction it would have been beneficial to have a baseline measure. To increase our understanding of the fluctuations in sexual satisfaction, future research should collect sexual health data at various time points from pre-pregnancy to the postpartum period.

A possible limitation of this study is the tool used to measure sexual satisfaction within the postpartum population. The Female Sexual Function Index (FSFI) by Rosen et al. (2000), although a widely used and validated measurement tool, is not specifically designed for the postpartum population and it is based on the traditional model of sexual health. The cut-off used for the sexual satisfaction domain of the FSFI resulted in a population of 9:1 sexually satisfied in the current study. The disproportionate number of women classified as sexually satisfied may not be a precise representation of the postpartum population.

Over the last two decades, the increased interest in sexual health has led to a push for more valid and reliable measure of sexual satisfaction. Although newer tools have been developed, the Sexual Satisfaction Scale for Women (SSS-W) (Meston & Troppell, 2005), the Sexual Satisfaction Questionnaire (Nomeyko & Dolinska-Zygmunt, 2014) and the Global Measure of Sexual Satisfaction (Byers & MacNeil, 2006), they are not specific to the postpartum population. To obtain a more accurate measure of postpartum sexual satisfaction a tool needs to

be developed that considers the normal fluctuations of postpartum sexual health while determining if these changes truly cause sexual dissatisfaction.

### **Future Directions**

Current study findings suggest that sexual satisfaction is a unique and individual measure of sexual health. Future research should attempt to gain further understanding between the distinction of sexual dysfunction and satisfaction with the inclusion of qualitative data. This would allow for a better understanding of the sensitive topic of sexual satisfaction and would increase our depth of understanding of postpartum sexual health. However, this research might be challenging as previous work has shown that some women feel shame, embarrassment and are too shy to speak about sexual health (Matick-Tyndale et al., 2002). With this knowledge in mind, future research needs to design an environment in which women will feel safe to discuss their sexuality. With a greater understanding of all the factors that effect postpartum sexual satisfaction valid and reliable assessment tools can be developed to facilitate diagnosis of sexual health problems, decrease misdiagnosis and develop appropriate treatment plans to better postpartum women's sexual health and thus, overall quality of life.

Although an effect was found with method of delivery on postpartum sexual satisfaction it was just shy of being statistically significant within the criteria of this study. The results suggest that vaginal deliveries are associated with increased postpartum sexual satisfaction when compared to Caesarean section deliveries are 12 months postpartum. Further investigation is needed to determine the true effect of method of delivery on postpartum satisfaction. If method of delivery does not affect sexual health outcomes, the rate of Caesarean sections by maternal requests (CDMR) and overall Caesarean section rates might decrease. Understanding the effect

of method of delivery on a women's overall sexual satisfaction would allow women and healthcare providers to make informed decisions regarding method of delivery.

Building on the findings of the current study and shifting away from traditional models of sexual health, future research should further investigate the effect of both physical and psychosocial factors on postpartum sexual satisfaction. The development of a psychometrically validated measurement tool specific to the postpartum period, that evaluates common postpartum biopsychosocial predictors of sexual satisfaction would optimize our understanding of postpartum sexual health.

### **Conclusion**

The postpartum period is filled with physical, psychological and social changes that can affect women's quality of life and sexual health. To facilitate this period of transition it is important to distinguish between normal postpartum changes and those that may be considered a dysfunction. The current study highlighted the need to look beyond the traditional biomedical models of sexual health and towards a biopsychosocial model, that incorporates physical and psychosocial factors, to better understand the factors associated with postpartum sexual satisfaction. The results of this study provide nurses and healthcare providers with an increased knowledge of the multidimensionality of postpartum sexual satisfaction. This understanding is an essential step to providing appropriate counsel and treatment to postpartum women with regards to their sexual health.

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Appendix A  
Mother's Questionnaire



STUDY ID   -

**Section 1: Your Baby**

1. Your baby's date of birth:

/   /      
Month Day Year

2. Is your baby a:  
(fill in **ONE** circle only)

- Boy  
 Girl

3. How much did your baby weigh at birth?

grams OR   lbs   oz

4. How are you currently feeding your baby?  
(fill in circles for **ALL** that apply)

- Formula feeding  
 Breast feeding/expressing milk  
→ How long do you intend to breast feed?  
(fill in **ONE** circle only)
- Less than 1 month
  - 1-3 months
  - 4-6 months
  - 7-12 months
  - More than 1 year
  - Not sure







STUDY ID   -

12. Who took care of you during your pregnancy?  
(fill in circles for **ALL** that apply)

- No formal care during my pregnancy
- Family physician
- Obstetrician
- Midwife
- Other (describe)

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<input type="text"/>																			

13. Who delivered your baby?  
(fill in **ONE** circle only)

- Family physician
- Obstetrician
- Midwife
- Other (describe)

<input type="text"/>																			
<input type="text"/>																			

14. Overall, how would you rate the health services *in the community* (i.e. physician office visits, clinic visits, prenatal services) when you were pregnant?  
(fill in **ONE** circle only)

- Excellent
- Good
- Fair
- Poor
- Didn't use ANY prenatal services



3645

STUDY ID   -

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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**Section 3: Your Labour and Delivery**

15. Did you have a c-section or a vaginal delivery?  
(fill in **ONE** circle only)

- C-section → **GO TO QUESTION 16**
- Vaginal delivery

→ Was this your first vaginal delivery?  
(fill in **ONE** circle only)

Yes

No → How many have you had before this one?

→ How many hours did you labour?

→ Have you ever had a c-section?  
(fill in **ONE** circle only)

Yes → How many have you had?

No

**GO TO QUESTION 22 ON PAGE 10**

16. Was a c-section planned *before* you went into labour?  
(fill in **ONE** circle only)

- Yes → **GO TO QUESTION 17**
- No → Why did you have an unplanned c-section?  
(fill in circles for **ALL** that apply)

- Failure to progress/failure to dilate 10 cm
- Could not push my baby out
- Baby was in distress/having problems
- Baby's position
- Bleeding
- Other (describe)

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**GO TO QUESTION 19 ON PAGE 9**







STUDY ID

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21. Prior to this delivery, did you ever have a vaginal delivery?

(fill in **ONE** circle only)

Yes → how many have you had?

No

#### Section 4: Going Home

22. Please fill in your home postal code:

23. Please fill in today's date:

  /   /    

Month                  Day                  Year

24. Do you think that the help and support available to you when you get home will meet the needs of you and your baby?

(fill in **ONE** circle only)

- Definitely yes
- Probably yes
- Don't know
- Probably not
- Definitely not

25. Do you think that you and your baby are ready to be discharged from the hospital?

(fill in **ONE** circle only)

- Definitely yes
- Probably yes
- Don't know
- Probably not
- Definitely not



STUDY ID   -

26. At this time, do you have concerns about any of the following?  
(fill in circles for **ALL** that apply)

- No, I have no concerns
- Breast feeding
- Bottle feeding
- Infant care and behaviour
- Signs of illness in infant
- Physical changes and care of yourself
- Sexual changes and intercourse
- Family change
- Emotional changes in yourself
- Other concerns (describe)


**Section 5: Background Information**

The next set of questions asks about you and your family and will allow us to describe as a group the women who participated in our study. Please remember that your answers will be kept confidential.

27. Your date of birth:   /   /      
Month      Day      Year

28. What language do you speak **MOST OFTEN** at home?  
(fill in **ONE** circle only)

- English
- French
- Chinese
- Polish
- Portuguese
- Spanish
- Other (which one?)

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STUDY ID   -

29. Which ethnic or cultural group do you MOST identify with as reflecting your heritage?  
(fill in **ONE** circle only)

- English Canadian
- French Canadian
- Aboriginal Canadian
- Chinese
- Jewish
- South Asian
- Italian
- Portuguese
- Other (which one?)

30. Were you born in Canada?  
(fill in **ONE** circle only)

- Yes → **GO TO QUESTION 31**
- No

→ What is your country of origin?

→ How long have you lived in Canada?   years

31. What is your marital status?  
(fill in **ONE** circle only)

- Married
- Common-Law
- Living with a partner
- Single (never married)
- Widowed
- Separated/Divorced



STUDY ID

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32. Do you have other children that live with you?

- Yes → how many? 

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 No

33. What is your *best estimate* of the total income, before taxes and deductions, of *all* household members from all sources in the past 12 months?  
(fill in **ONE** circle only)

- No income  
 Under \$10,000  
 \$10,000 - \$19,999  
 \$20,000 - \$39,999  
 \$40,000 - \$59,999  
 \$60,000 - \$79,999  
 \$80,000 or more

34. What is your *highest* level of education?  
(fill in **ONE** circle only)

- Elementary school or less  
 Some high school  
 Completed high school  
 Some community college or technical school  
 Completed community college or technical school  
 Some university  
 Completed bachelor's degree  
 Graduate degree



37240

STUDY ID

□ □ - □ □ □ □

□ □ □ □ □ □

**35. Think of the ladder below as representing where people stand in Ontario.**

At the **top** of the ladder are the people who are the best off - those who have the most money, the most education and the most respected jobs. At the **bottom** are the people who are the worst off - who have the least money, least education, and the least respected jobs or no jobs. The higher you are on this ladder, the closer you are to the very top; the lower you are, the closer you are to the very bottom.

**Where would you place yourself on this ladder?**

(Place a large "X" on the ladder where you feel you are right now compared to other people in Ontario)



□ □  
For Office use only



STUDY ID   -

**36. Think of the ladder below as representing where people stand in their communities.**

People define community in different ways; please define it in whatever way is most meaningful to you. At the **top** of the ladder are the people who have the highest standing in their community. At the **bottom** are the people who have the lowest standing in their community.

**Where would you place yourself on this ladder?**

(Place a large "X" on the ladder where you feel you are right now compared to other people in your community)



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For Office use only	

## Appendix B

## 6 Month Interview



STUDY ID

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**TOMIS III 6 MONTH INTERVIEW**

INTERVIEWER:

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INTERVIEW DATE:

		/			/				
Month			Day			Year			

**THIS INTERVIEW STARTS WITH SOME QUESTIONS ABOUT THE HEALTH AND FEEDING OF YOUR BABY.**

6. Would you say that, in general, YOUR BABY'S health is:
- Excellent
  - Very good
  - Good
  - Fair
  - Poor











39016

STUDY ID

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15. During the PAST 4 WEEKS, how much of your time have you ACCOMPLISHED LESS than you would like when thinking about your work or other daily activities AS A RESULT OF YOUR PHYSICAL HEALTH?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
16. During the PAST 4 WEEKS, how much were you limited in the KIND of work or other activities you could do AS A RESULT OF YOUR PHYSICAL HEALTH?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
17. During the PAST 4 WEEKS, how much of the time have you ACCOMPLISHED LESS than you would like when thinking about your work or other regular daily activities AS A RESULT OF ANY EMOTIONAL PROBLEMS (such as feeling depressed or anxious)?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
18. During the PAST 4 WEEKS, how much of the time did you carry out your work or other activities LESS CAREFULLY THAN USUAL AS A RESULT OF ANY EMOTIONAL PROBLEMS (such as feeling depressed or anxious)?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
19. During the PAST 4 WEEKS, how much did PAIN interfere with your normal work (including both work outside the home and housework)?
- Not at all
  - A little bit
  - Moderately
  - Quite a bit
  - Extremely



STUDY ID

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**THE NEXT QUESTIONS ASK ABOUT HOW YOU FELT AND HOW THINGS HAVE BEEN WITH YOU DURING THE PAST 4 WEEKS. FOR EACH QUESTION, PLEASE GIVE THE ONE ANSWER THAT COMES CLOSEST TO THE WAY YOU HAVE BEEN FEELING.**

20. How much of the time during the PAST 4 WEEKS have you felt calm and peaceful?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
21. How much time during the PAST 4 WEEKS did you have a lot of energy?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
22. How much time during the PAST 4 WEEKS have you felt downhearted and depressed?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
23. During the PAST 4 WEEKS, how much of the time has your PHYSICAL HEALTH OR EMOTIONAL PROBLEMS interfered with your social activities (like visiting friends, relatives, etc)?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time

<p>INTERVIEWER NOTE: IF RESPONDENT HAS NO LIMITATIONS WITH THEIR DAILY ACTIVITIES GO TO QUESTION 25.</p>
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24. Did you have any of these limitations before you were pregnant with this baby?
- Yes, frequently
  - Yes, occasionally
  - No





39288

STUDY ID   -   
   

28. You get invitations to go out and do things with other people:
- Much less than you would like
  - Less than you would like
  - A moderate amount
  - Nearly as much as you would like
  - As much as you would like
29. There are people who care about what happens to you:
- Much less than you would like
  - Less than you would like
  - A moderate amount
  - Nearly as much as you would like
  - As much as you would like
30. You get chances to talk about money matters:
- Much less than you would like
  - Less than you would like
  - A moderate amount
  - Nearly as much as you would like
  - As much as you would like
31. You get useful advice about important things in life:
- Much less than you would like
  - Less than you would like
  - A moderate amount
  - Nearly as much as you would like
  - As much as you would like
32. You get help when you need transportation:
- Much less than you would like
  - Less than you would like
  - A moderate amount
  - Nearly as much as you would like
  - As much as you would like
33. You get help when you are sick in bed:
- Much less than you would like
  - Less than you would like
  - A moderate amount
  - Nearly as much as you would like
  - As much as you would like



STUDY ID

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34. You get help with cooking and housework:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

35. You get help taking care of your children:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

**A LOT OF WOMEN, AFTER HAVING A BABY, EXPERIENCE CHANGES IN THEIR EMOTIONS AND MAY EXPERIENCE FEELINGS OF DEPRESSION. THE NEXT FEW QUESTIONS ASK ABOUT YOUR EMOTIONAL WELL-BEING.**

Please choose the answer that comes closest to how you have felt IN THE PAST SEVEN DAYS, not just how you feel today.

**READ ALL RESPONSE OPTIONS FOR EACH QUESTION.**

36. In the past seven days, have you been able to laugh and see the funny side of things?

- As much as you always could
- Not quite so much now
- Definitely not so much now
- Not at all

37. In the past seven days, have you looked forward with enjoyment to things?

- As much as you ever did
- Rather less than you used to
- Definitely less than you used to
- Hardly at all

38. In the past seven days, have you blamed yourself unnecessarily when things went wrong?

- Yes, most of the time
- Yes, some of the time
- Not very often
- No, never



39410

STUDY ID

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39. In the past seven days, have you been anxious or worried for no good reason?
- No, not at all
  - Hardly ever
  - Yes, sometimes
  - Yes, very often
40. In the past seven days, have you felt scared or panicky for no very good reason?
- Yes, quite a lot
  - Yes, sometimes
  - No, not much
  - No, not at all
41. In the past seven days, have things been getting on top of you?
- Yes, most of the time you haven't been able to cope at all
  - Yes, sometimes you haven't been coping as well as usual
  - No, most of the time you have coped quite well
  - No, you have been coping as well as ever
42. In the past seven days, have you been so unhappy that you have difficulty sleeping?
- Yes, most of the time
  - Yes, sometimes
  - Not very often
  - No, not at all
43. In the past seven days, have you felt sad or miserable?
- Yes, most of the time
  - Yes, quite often
  - Not very often
  - No, not at all
44. In the past seven days, have you been so unhappy that you have been crying?
- Yes, most of the time
  - Yes, quite often
  - Only occasionally
  - No, never



STUDY ID

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45. In the past seven days, has the thought of harming yourself occurred to you?

- Yes, quite often
- Sometimes
- Hardly ever
- Never

INTERVIEWER NOTE:  
IF RESPONDENT INDICATES THAT THEY HAVE HAD THOUGHTS OF HARMING THEMSELVES, PLEASE ACKNOWLEDGE THIS BY SAYING "THAT MUST BE VERY DIFFICULT. AT THE END OF THE INTERVIEW WE CAN TALK ABOUT THIS A LITTLE MORE."

**MANY WOMEN EXPERIENCE BLADDER PROBLEMS, BOWEL PROBLEMS AND SEXUAL PROBLEMS FOLLOWING CHILDBIRTH. SOME WOMEN FIND THESE PROBLEMS AFFECT THEIR ACTIVITIES, RELATIONSHIPS AND FEELINGS.**

**I WOULD LIKE TO ASK YOU ABOUT SPECIFIC PROBLEMS YOU MIGHT HAVE, AND ABOUT AREAS IN YOUR LIFE THAT MIGHT BE INFLUENCED OR CHANGED BY THESE PROBLEMS. PLEASE REMEMBER TO LET ME KNOW IF YOU DON'T WANT TO ANSWER A QUESTION AND I WILL SKIP TO THE NEXT ONE. SOME OF THESE QUESTIONS MAY SEEM REPETITIVE, BUT WE NEED TO ASK THEM TO GET ALL THE INFORMATION WE NEED FOR THE STUDY.**

First, I would like to ask you some questions about bladder problems.

47. Do you experience urgency (the sensation to empty your bladder that is so strong that you are worried you will leak urine)?

- Never or rarely
- Less than once a week
- More than once a week but less than once a day
- Once a day or more



2348

STUDY ID

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48. Do you experience such a strong and sudden urge to void or empty your bladder that you leak before reaching the toilet?

- Yes  
 No

49. Do you have other problems with uncontrollable urine loss or leakage?

- Yes  
 No

INTERVIEWER NOTE:  
 IF RESPONDENT ANSWERS NEVER OR RARELY TO QUESTION 47 AND NO TO BOTH  
 QUESTIONS 48 AND 49, GO TO QUESTION 62.

50. You have indicated that you experience some bladder problems; did you experience these before your pregnancy with this baby?

- Yes, frequently  
 Yes, occasionally  
 No      ➔ **GO TO QUESTION 52**

51. Compared to before your pregnancy, are these bladder problems

- Worse  
 The same      ➔ **GO TO QUESTION 62**  
 Better      ➔ **GO TO QUESTION 62**

52. Do you lose urine during sudden physical exertion, lifting, coughing, or sneezing?

- Yes  
 No

53. How often do you experience urinary leakage?

- Less than once a month  
 A few times a month  
 A few times a week  
 Every day and/or night



STUDY ID

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54. How much urine do you lose each time?

- Drops
- Small splashes
- More

**Please answer the next set of questions based on the time period since your baby was 6 weeks old.**

55. How much has urine leakage affected your ability to do household chores (cooking, housecleaning, laundry)?

- Not at all
- Slightly
- Moderately
- Greatly

56. How much has urine leakage affected your physical recreation such as walking, swimming, or other exercise?

- Not at all
- Slightly
- Moderately
- Greatly

57. How much has urine leakage affected your entertainment activities (movies, concerts, etc.)?

- Not at all
- Slightly
- Moderately
- Greatly

58. How much has urine leakage affected your ability to travel by car or bus more than 30 minutes from home?

- Not at all
- Slightly
- Moderately
- Greatly

59. How much has urine leakage affected your participation in social activities outside your home?

- Not at all
- Slightly
- Moderately
- Greatly



STUDY ID

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60. How much has urine leakage affected your emotional health (nervousness, depression, etc.)?

- Not at all
- Slightly
- Moderately
- Greatly

61. Does leakage have you feeling frustrated?

- Not at all
- Slightly
- Moderately
- Greatly

**NEXT I'D LIKE TO ASK YOU SOME QUESTIONS ABOUT BOWEL PROBLEMS YOU MAY HAVE.**

62. Do you experience urgency (a strong desire to move your bowels which makes you rush to the toilet)?

- Never or rarely
- Less than once a week
- More than once a week but less than once a day
- Once a day or more

63. Do you experience such a strong and sudden urge to have a bowel movement that you leak stool before reaching the toilet?

- Yes
- No

64. Do you have other problems with uncontrollable stool loss or bowel leakage?

- Yes
- No

<p>INTERVIEWER NOTE: IF RESPONDENT ANSWERS NO TO <u>BOTH</u> QUESTIONS 63 AND 64, GO TO QUESTION 80.</p>
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STUDY ID

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65. You have indicated that you experience some bowel problems; did you experience these before your pregnancy with this baby?

- Yes, frequently  
 Yes, occasionally  
 No      **→ GO TO QUESTION 67**

66. Compared to before your pregnancy, are these bowel problems

- Worse  
 The same      **→ GO TO QUESTION 80**  
 Better      **→ GO TO QUESTION 80**

67. Do you experience bowel leakage during sudden physical exertion, lifting, coughing, or sneezing?

- Yes  
 No

68. How often do you experience bowel leakage?

- Less than once a month  
 A few times a month  
 A few times a week  
 Every day and/or night

69. How much stool do you lose each time?

- A little  
 A fair amount  
 A lot

**PLEASE ANSWER THE NEXT SET OF QUESTIONS BASED ON THE TIME PERIOD SINCE YOUR BABY WAS 6 WEEKS OLD. INDICATE HOW OFTEN THE ISSUE IS A CONCERN TO YOU DUE TO ACCIDENTAL BOWEL LEAKAGE.**

70. I am afraid to go out

- Most of the time  
 Some of the time  
 A little of the time  
 None of the time



STUDY ID

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71. I avoid visiting friends

- Most of the time
- Some of the time
- A little of the time
- None of the time

72. I avoid staying overnight away from home

- Most of the time
- Some of the time
- A little of the time
- None of the time

73. It is difficult for me to get out and do things like going to a movie or to church

- Most of the time
- Some of the time
- A little of the time
- None of the time

74. I cut down on how much I eat before I go out

- Most of the time
- Some of the time
- A little of the time
- None of the time

75. It is important to plan my schedule (daily activities) around my bowel pattern

- Most of the time
- Some of the time
- A little of the time
- None of the time

76. I avoid traveling

- Most of the time
- Some of the time
- A little of the time
- None of the time



40958

STUDY ID

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**THESE NEXT THREE QUESTIONS MAY SEEM REPETITIVE HOWEVER WE NEED TO ASK THEM TO GET THE INFORMATION WE NEED FOR THE STUDY. DUE TO ACCIDENTAL BOWEL LEAKAGE, PLEASE TELL ME THE EXTENT TO WHICH YOU AGREE OR DISAGREE WITH THE FOLLOWING ITEMS:**

77. I cannot do many of the things I want to do

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

78. I avoid traveling by plane or train

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

79. I avoid going out to eat

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

**NEXT, I'D LIKE TO ASK YOU SOME QUESTIONS ABOUT SEXUAL ACTIVITY AND ANY PROBLEMS YOU MIGHT HAVE. IN ANSWERING THESE QUESTIONS, PLEASE NOTE THAT SEXUAL ACTIVITY CAN INCLUDE CARESSING, FOREPLAY, AND INTERCOURSE. PLEASE REMEMBER TO LET ME KNOW IF YOU DON'T WANT TO ANSWER A QUESTION AND I WILL SKIP TO THE NEXT ONE.**

80. Over the past 4 weeks have you been sexually active?

- Yes
- No → **GO TO QUESTION 89**

81. Over the past 4 weeks, how SATISFIED have you been with the amount of emotional closeness during sexual activity between you and your partner?

- Very satisfied \*
- Moderately satisfied \*
- About equally satisfied and dissatisfied \*
- Moderately dissatisfied
- Very dissatisfied



STUDY ID

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82. Over the past 4 weeks, how SATISFIED have you been with your sexual relationship with your partner?

- Very satisfied \*
- Moderately satisfied \*
- About equally satisfied and dissatisfied \*
- Moderately dissatisfied
- Very dissatisfied

83. Over the past 4 weeks, how SATISFIED have you been with your overall sexual life?

- Very satisfied \*
- Moderately satisfied \*
- About equally satisfied and dissatisfied \*
- Moderately dissatisfied
- Very dissatisfied

84. Over the past 4 weeks, how OFTEN did you experience discomfort or pain DURING vaginal penetration?

- Did not attempt sexual intercourse
- Almost always or always
- Most times (more than half the time)
- Sometimes (about half the time)
- A few times (less than half the time)
- Almost never or never \*

➔ **FILL IN THIS SAME RESPONSE OPTION FOR Q85 AND Q86, GO TO THE NEXT INTERVIEWER NOTE.**

85. Over the past 4 weeks, how OFTEN did you experience discomfort or pain FOLLOWING vaginal penetration?

- Did not attempt sexual intercourse
- Almost always or always
- Most times (more than half the time)
- Sometimes (about half the time)
- A few times (less than half the time)
- Almost never or never \*



41063

STUDY ID

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86. Over the past 4 weeks, how would you rate your LEVEL (degree) of discomfort or pain during or following vaginal penetration?

- Did not attempt sexual intercourse
- Very high
- High
- Moderate
- Low
- Very low or none at all \*

INTERVIEWER NOTE:  
IF RESPONDENT'S ANSWERS INDICATE NO SEXUAL PROBLEMS GO TO QUESTION 89.  
NO SEXUAL PROBLEMS IS INDICATED BY HAVING RESPONSE OPTIONS WITH AN \* FOR ALL  
QUESTIONS IN THIS SECTION

87. You have indicated some dissatisfaction and/or discomfort with sexual activity; did you experience this before your pregnancy with this baby?

- Yes, frequently
- Yes, occasionally
- No      → **GO TO QUESTION 89**

88. Since you delivered this baby, are these sexual problems

- Worse
- The same
- Better

**NOW I WOULD LIKE TO GO ON AND ASK YOU SOME QUESTIONS ABOUT YOUR SERVICE USE. THIS IS THE LAST SECTION OF THE INTERVIEW.**

89. Overall, how would you rate the health services in the community (e.g., health provider office visits, clinics, home visiting services) FOR MOTHERS AND THEIR BABIES?

- Excellent
- Good
- Fair
- Poor

***INSERT MOTHER AND INFANT CARE RECORD QUESTIONS***



STUDY ID   -

**NOW THAT YOU HAVE TOLD ME ABOUT SERVICES THAT YOU HAVE USED FOR YOU AND YOUR BABY, I WOULD LIKE TO KNOW IF AT ANY TIME SINCE YOUR BABY WAS 6 WEEKS OLD YOU HAVE EVER HAD DIFFICULTY GETTING THE CARE OR HELP THAT YOU NEEDED.**

90. Did you ever need care or help related to your baby's health but were not able to get the care or help needed?

- Yes
- No      **→ GO TO QUESTION 92**

91. What was the main reason you didn't get the care or help needed?  
**DO NOT READ LIST. FILL ONE ONLY.**

- Not available in the area
- Not available at the time needed
- Waiting time too long
- Didn't bother/decided not to seek care
- Didn't know where to go
- Language barrier
- No child care
- Transportation difficulties
- Other (specify)


92. Did you ever need care or help for a physical problem related to YOURSELF but were not able to get the care or help needed?

- Yes
- No      **→ GO TO QUESTION 94**



Appendix C  
12 Month Interview



STUDY ID   -

**TOMIS III 12 MONTH INTERVIEW**

INTERVIEWER:

INTERVIEW DATE:

/   /

Month                  Day                  Year

**THIS INTERVIEW STARTS WITH SOME QUESTIONS ABOUT THE HEALTH AND FEEDING OF YOUR BABY.**

6. Would you say that, in general, YOUR BABY'S health is:

- Excellent
- Very good
- Good
- Fair
- Poor











STUDY ID

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15. During the PAST 4 WEEKS, how much of your time have you ACCOMPLISHED LESS than you would like when thinking about your work or other daily activities AS A RESULT OF YOUR PHYSICAL HEALTH?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
16. During the PAST 4 WEEKS, how much were you limited in the KIND of work or other activities you could do AS A RESULT OF YOUR PHYSICAL HEALTH?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
17. During the PAST 4 WEEKS, how much of the time have you ACCOMPLISHED LESS than you would like when thinking about your work or other regular daily activities AS A RESULT OF ANY EMOTIONAL PROBLEMS (such as feeling depressed or anxious)?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
18. During the PAST 4 WEEKS, how much of the time did you carry out your work or other activities LESS CAREFULLY THAN USUAL AS A RESULT OF ANY EMOTIONAL PROBLEMS (such as feeling depressed or anxious)?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
19. During the PAST 4 WEEKS, how much did PAIN interfere with your normal work (including both work outside the home and housework)?
- Not at all
  - A little bit
  - Moderately
  - Quite a bit
  - Extremely



STUDY ID

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**THE NEXT QUESTIONS ASK ABOUT HOW YOU FELT AND HOW THINGS HAVE BEEN WITH YOU DURING THE PAST 4 WEEKS. FOR EACH QUESTION, PLEASE GIVE THE ONE ANSWER THAT COMES CLOSEST TO THE WAY YOU HAVE BEEN FEELING.**

20. How much of the time during the PAST 4 WEEKS have you felt calm and peaceful?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
21. How much time during the PAST 4 WEEKS did you have a lot of energy?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
22. How much time during the PAST 4 WEEKS have you felt downhearted and depressed?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time
23. During the PAST 4 WEEKS, how much of the time has your PHYSICAL HEALTH OR EMOTIONAL PROBLEMS interfered with your social activities (like visiting friends, relatives, etc)?
- All of the time
  - Most of the time
  - Some of the time
  - A little of the time
  - None of the time

<p>INTERVIEWER NOTE: IF RESPONDENT HAS NO LIMITATIONS WITH THEIR DAILY ACTIVITIES GO TO QUESTION 25.</p>
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24. Did you have any of these limitations before you were pregnant with this baby?
- Yes, frequently
  - Yes, occasionally
  - No





55453

STUDY ID

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28. You get invitations to go out and do things with other people:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

29. There are people who care about what happens to you:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

30. You get chances to talk about money matters:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

31. You get useful advice about important things in life:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

32. You get help when you need transportation:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

33. You get help when you are sick in bed:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like



55513

STUDY ID

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34. You get help with cooking and housework:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

35. You get help taking care of your children:

- Much less than you would like
- Less than you would like
- A moderate amount
- Nearly as much as you would like
- As much as you would like

**A LOT OF WOMEN, AFTER HAVING A BABY, EXPERIENCE CHANGES IN THEIR EMOTIONS AND MAY EXPERIENCE FEELINGS OF DEPRESSION. THE NEXT FEW QUESTIONS ASK ABOUT YOUR EMOTIONAL WELL-BEING.**

Please choose the answer that comes closest to how you have felt IN THE PAST SEVEN DAYS, not just how you feel today.

**READ ALL RESPONSE OPTIONS FOR EACH QUESTION.**

36. In the past seven days, have you been able to laugh and see the funny side of things?

- As much as you always could
- Not quite so much now
- Definitely not so much now
- Not at all

37. In the past seven days, have you looked forward with enjoyment to things?

- As much as you ever did
- Rather less than you used to
- Definitely less than you used to
- Hardly at all

38. In the past seven days, have you blamed yourself unnecessarily when things went wrong?

- Yes, most of the time
- Yes, some of the time
- Not very often
- No, never



STUDY ID

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39. In the past seven days, have you been anxious or worried for no good reason?
- No, not at all
  - Hardly ever
  - Yes, sometimes
  - Yes, very often
40. In the past seven days, have you felt scared or panicky for no very good reason?
- Yes, quite a lot
  - Yes, sometimes
  - No, not much
  - No, not at all
41. In the past seven days, have things been getting on top of you?
- Yes, most of the time you haven't been able to cope at all
  - Yes, sometimes you haven't been coping as well as usual
  - No, most of the time you have coped quite well
  - No, you have been coping as well as ever
42. In the past seven days, have you been so unhappy that you have difficulty sleeping?
- Yes, most of the time
  - Yes, sometimes
  - Not very often
  - No, not at all
43. In the past seven days, have you felt sad or miserable?
- Yes, most of the time
  - Yes, quite often
  - Not very often
  - No, not at all
44. In the past seven days, have you been so unhappy that you have been crying?
- Yes, most of the time
  - Yes, quite often
  - Only occasionally
  - No, never



55636

STUDY ID

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45. In the past seven days, has the thought of harming yourself occurred to you?

- Yes, quite often
- Sometimes
- Hardly ever
- Never

INTERVIEWER NOTE:  
IF RESPONDENT INDICATES THAT THEY HAVE HAD THOUGHTS OF HARMING THEMSELVES,  
PLEASE ACKNOWLEDGE THIS BY SAYING "THAT MUST BE VERY DIFFICULT. AT THE END OF  
THE INTERVIEW WE CAN TALK ABOUT THIS A LITTLE MORE."

**MANY WOMEN EXPERIENCE BLADDER PROBLEMS, BOWEL PROBLEMS AND SEXUAL PROBLEMS FOLLOWING CHILDBIRTH. SOME WOMEN FIND THESE PROBLEMS AFFECT THEIR ACTIVITIES, RELATIONSHIPS AND FEELINGS.**

**I WOULD LIKE TO ASK YOU ABOUT SPECIFIC PROBLEMS YOU MIGHT HAVE, AND ABOUT AREAS IN YOUR LIFE THAT MIGHT BE INFLUENCED OR CHANGED BY THESE PROBLEMS. PLEASE REMEMBER TO LET ME KNOW IF YOU DON'T WANT TO ANSWER A QUESTION AND I WILL SKIP TO THE NEXT ONE. SOME OF THESE QUESTIONS MAY SEEM REPETITIVE, BUT WE NEED TO ASK THEM TO GET ALL THE INFORMATION WE NEED FOR THE STUDY.**

First, I would like to ask you some questions about bladder problems.

47. Do you experience urgency (the sensation to empty your bladder that is so strong that you are worried you will leak urine)?

- Never or rarely
- Less than once a week
- More than once a week but less than once a day
- Once a day or more



STUDY ID

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48. Do you experience such a strong and sudden urge to void or empty your bladder that you leak before reaching the toilet?

- Yes  
 No

49. Do you have other problems with uncontrollable urine loss or leakage?

- Yes  
 No

INTERVIEWER NOTE:  
 IF RESPONDENT ANSWERS NEVER OR RARELY TO QUESTION 47 AND NO TO BOTH  
 QUESTIONS 48 AND 49, GO TO QUESTION 62.

50. You have indicated that you experience some bladder problems; did you experience these before your pregnancy with this baby?

- Yes, frequently  
 Yes, occasionally  
 No      ➔ **GO TO QUESTION 52**

51. Compared to before your pregnancy, are these bladder problems

- Worse  
 The same      ➔ **GO TO QUESTION 62**  
 Better      ➔ **GO TO QUESTION 62**

52. Do you lose urine during sudden physical exertion, lifting, coughing, or sneezing?

- Yes  
 No

53. How often do you experience urinary leakage?

- Less than once a month  
 A few times a month  
 A few times a week  
 Every day and/or night



STUDY ID

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54. How much urine do you lose each time?

- Drops
- Small splashes
- More

**Please answer the next set of questions based on the time period since your baby was 6 months old.**

55. How much has urine leakage affected your ability to do household chores (cooking, housecleaning, laundry)?

- Not at all
- Slightly
- Moderately
- Greatly

56. How much has urine leakage affected your physical recreation such as walking, swimming, or other exercise?

- Not at all
- Slightly
- Moderately
- Greatly

57. How much has urine leakage affected your entertainment activities (movies, concerts, etc.)?

- Not at all
- Slightly
- Moderately
- Greatly

58. How much has urine leakage affected your ability to travel by car or bus more than 30 minutes from home?

- Not at all
- Slightly
- Moderately
- Greatly

59. How much has urine leakage affected your participation in social activities outside your home?

- Not at all
- Slightly
- Moderately
- Greatly



55940

STUDY ID

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60. How much has urine leakage affected your emotional health (nervousness, depression, etc.)?

- Not at all
- Slightly
- Moderately
- Greatly

61. Does leakage have you feeling frustrated?

- Not at all
- Slightly
- Moderately
- Greatly

**NEXT I'D LIKE TO ASK YOU SOME QUESTIONS ABOUT BOWEL PROBLEMS YOU MAY HAVE.**

62. Do you experience urgency (a strong desire to move your bowels which makes you rush to the toilet)?

- Never or rarely
- Less than once a week
- More than once a week but less than once a day
- Once a day or more

63. Do you experience such a strong and sudden urge to have a bowel movement that you leak stool before reaching the toilet?

- Yes
- No

64. Do you have other problems with uncontrollable stool loss or bowel leakage?

- Yes
- No

INTERVIEWER NOTE:  
IF RESPONDENT ANSWERS NO TO BOTH QUESTIONS 63 AND 64, GO TO QUESTION 80.

STUDY ID   -      

65. You have indicated that you experience some bowel problems; did you experience these before your pregnancy with this baby?

- Yes, frequently  
 Yes, occasionally  
 No      ➔ **GO TO QUESTION 67**

66. Compared to before your pregnancy, are these bowel problems

- Worse  
 The same      ➔ **GO TO QUESTION 80**  
 Better      ➔ **GO TO QUESTION 80**

67. Do you experience bowel leakage during sudden physical exertion, lifting, coughing, or sneezing?

- Yes  
 No

68. How often do you experience bowel leakage?

- Less than once a month  
 A few times a month  
 A few times a week  
 Every day and/or night

69. How much stool do you lose each time?

- A little  
 A fair amount  
 A lot

**PLEASE ANSWER THE NEXT SET OF QUESTIONS BASED ON THE TIME PERIOD SINCE YOUR BABY WAS 6 MONTHS OLD. INDICATE HOW OFTEN THE ISSUE IS A CONCERN TO YOU DUE TO ACCIDENTAL BOWEL LEAKAGE.**

70. I am afraid to go out

- Most of the time  
 Some of the time  
 A little of the time  
 None of the time

STUDY ID  - 

71. I avoid visiting friends

- Most of the time
- Some of the time
- A little of the time
- None of the time

72. I avoid staying overnight away from home

- Most of the time
- Some of the time
- A little of the time
- None of the time

73. It is difficult for me to get out and do things like going to a movie or to church

- Most of the time
- Some of the time
- A little of the time
- None of the time

74. I cut down on how much I eat before I go out

- Most of the time
- Some of the time
- A little of the time
- None of the time

75. It is important to plan my schedule (daily activities) around my bowel pattern

- Most of the time
- Some of the time
- A little of the time
- None of the time

76. I avoid traveling

- Most of the time
- Some of the time
- A little of the time
- None of the time



STUDY ID

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**THESE NEXT THREE QUESTIONS MAY SEEM REPETITIVE HOWEVER WE NEED TO ASK THEM TO GET THE INFORMATION WE NEED FOR THE STUDY. DUE TO ACCIDENTAL BOWEL LEAKAGE, PLEASE TELL ME THE EXTENT TO WHICH YOU AGREE OR DISAGREE WITH THE FOLLOWING ITEMS:**

77. I cannot do many of the things I want to do

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

78. I avoid traveling by plane or train

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

79. I avoid going out to eat

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

**NEXT, I'D LIKE TO ASK YOU SOME QUESTIONS ABOUT SEXUAL ACTIVITY AND ANY PROBLEMS YOU MIGHT HAVE. IN ANSWERING THESE QUESTIONS, PLEASE NOTE THAT SEXUAL ACTIVITY CAN INCLUDE CARESSING, FOREPLAY, AND INTERCOURSE. PLEASE REMEMBER TO LET ME KNOW IF YOU DON'T WANT TO ANSWER A QUESTION AND I WILL SKIP TO THE NEXT ONE.**

80. Over the past 4 weeks have you been sexually active?

- Yes
- No → **GO TO QUESTION 89**

81. Over the past 4 weeks, how SATISFIED have you been with the amount of emotional closeness during sexual activity between you and your partner?

- Very satisfied \*
- Moderately satisfied \*
- About equally satisfied and dissatisfied \*
- Moderately dissatisfied
- Very dissatisfied



57221

STUDY ID

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82. Over the past 4 weeks, how SATISFIED have you been with your sexual relationship with your partner?

- Very satisfied \*
- Moderately satisfied \*
- About equally satisfied and dissatisfied \*
- Moderately dissatisfied
- Very dissatisfied

83. Over the past 4 weeks, how SATISFIED have you been with your overall sexual life?

- Very satisfied \*
- Moderately satisfied \*
- About equally satisfied and dissatisfied \*
- Moderately dissatisfied
- Very dissatisfied

84. Over the past 4 weeks, how OFTEN did you experience discomfort or pain DURING vaginal penetration?

- Did not attempt sexual intercourse
- Almost always or always
- Most times (more than half the time)
- Sometimes (about half the time)
- A few times (less than half the time)
- Almost never or never \*

➔ **FILL IN THIS SAME RESPONSE OPTION FOR Q85 AND Q86, GO TO THE NEXT INTERVIEWER NOTE.**

85. Over the past 4 weeks, how OFTEN did you experience discomfort or pain FOLLOWING vaginal penetration?

- Did not attempt sexual intercourse
- Almost always or always
- Most times (more than half the time)
- Sometimes (about half the time)
- A few times (less than half the time)
- Almost never or never \*



57313

STUDY ID

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86. Over the past 4 weeks, how would you rate your LEVEL (degree) of discomfort or pain during or following vaginal penetration?

- Did not attempt sexual intercourse
- Very high
- High
- Moderate
- Low
- Very low or none at all \*

INTERVIEWER NOTE:  
IF RESPONDENT'S ANSWERS INDICATE NO SEXUAL PROBLEMS GO TO QUESTION 89.  
NO SEXUAL PROBLEMS IS INDICATED BY HAVING RESPONSE OPTIONS WITH AN \* FOR ALL  
QUESTIONS IN THIS SECTION

87. You have indicated some dissatisfaction and/or discomfort with sexual activity; did you experience this before your pregnancy with this baby?

- Yes, frequently
- Yes, occasionally
- No      → **GO TO QUESTION 89**

88. Since you delivered this baby, are these sexual problems

- Worse
- The same
- Better

**NOW I WOULD LIKE TO GO ON AND ASK YOU SOME QUESTIONS ABOUT YOUR SERVICE USE. THIS IS THE LAST SECTION OF THE INTERVIEW.**

89. Overall, how would you rate the health services in the community (e.g., health provider office visits, clinics, home visiting services) FOR MOTHERS AND THEIR BABIES?

- Excellent
- Good
- Fair
- Poor

**INSERT MOTHER AND INFANT CARE RECORD QUESTIONS**



STUDY ID   -

**NOW THAT YOU HAVE TOLD ME ABOUT SERVICES THAT YOU HAVE USED FOR YOU AND YOUR BABY, I WOULD LIKE TO KNOW IF AT ANY TIME SINCE YOUR BABY WAS 6 MONTHS OLD YOU HAVE EVER HAD DIFFICULTY GETTING THE CARE OR HELP THAT YOU NEEDED.**

90. Did you ever need care or help related to your baby's health but were not able to get the care or help needed?

- Yes
- No      **→ GO TO QUESTION 92**

91. What was the main reason you didn't get the care or help needed?  
**DO NOT READ LIST. FILL ONE ONLY.**

- Not available in the area
- Not available at the time needed
- Waiting time too long
- Didn't bother/decided not to seek care
- Didn't know where to go
- Language barrier
- No child care
- Transportation difficulties
- Other (specify)


92. Did you ever need care or help for a physical problem related to YOURSELF but were not able to get the care or help needed?

- Yes
- No      **→ GO TO QUESTION 94**



Appendix D  
Ethics Certificates

Hi Aqleema,

Please note the TD1 Research Submission for the following student has been approved by an Associate Dean. Please check GEM for details.

**Debora Cateni**

Regards,

Meisha.

**Student Affairs Thesis Coordinator**  
Office of the Dean  
Faculty of Graduate Studies

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**RESEARCH ETHICS BOARD**

February 17, 2006

**PROJECT NUMBER:** 06-456  
**PROJECT TITLE:** Postpartum health and service use: Does delivery method matter?  
**PRINCIPAL INVESTIGATOR:** Dr. Wendy Sword

This will acknowledge receipt of your letter dated January 26, 2006 which enclosed a copy of the outstanding signatures on the REB application along with documentation clarifying the process of determining eligibility and recruiting women into the above-named study. These issues were raised by the Research Ethics Board at their meeting held on December 20, 2005. Based on this additional information, we wish to advise your study has been given *final* approval from the full REB. The submission including the Participant Information Sheet and Consent Form, version 1 dated November 24, 2005 was found to be acceptable on both ethical and scientific grounds. Please note attached you will find the Information Sheet/Consent forms with the REB approval affixed; all consent forms and recruitment materials used in this study must be copies of the attached materials.

We are pleased to issue final approval for the above-named study for a period of 12 months from the date of this approval letter. Continuation beyond that date will require further review and renewal of REB approval. Any changes or amendments to the protocol or consent form must be approved by the Research Ethics Board.

We wish to advise the Research Ethics Board operates in compliance with ICH Good Clinical Practice Guidelines and the Tri-Council Policy Statement.

PLEASE QUOTE THE ABOVE-REFERENCED PROJECT NUMBER ON ALL FUTURE CORRESPONDENCE

Sincerely,

  
 F. Jack Holland, MD, FRCP, FRCP(C)  
 Chair, Research Ethics Board

/dm

All correspondence should be addressed to the REB Chair and forwarded to:  
 REB Coordinator, Hamilton Health Sciences, REB Office  
 1057 Main Street West, Suite 1  
 Hamilton ON L8S 1B7  
 Telephone: 905-521-2100, Ext. 42013  
 Fax: 905-577-8379

## Appendix E

## Summary of Participant Characteristics Based on Sexual Activity

*Participant Characteristics Based on Sexual Activity at 6 Months Postpartum*

<i>Characteristics</i>	<i>Overall (n=1780)</i>	<i>Sexually active (n=1498) No. (%)</i>	<i>Sexually inactive (n=282) No. (%)</i>	<i>P</i>
<b>Parity</b> (n = 1778)				0.3485
Primiparas	894 (50.28)	745 (83.33)	149 (16.67)	
Multiparas	884 (49.72)	752 (85.07)	132 (14.93)	
<b>Age</b> (yr.) (n=1758)				0.0007
<25	197 (11.21)	173 (87.82)	24 (12.18)	
25 –35	1101(62.63)	945 (85.83)	156 (14.17)	
>35	460 (26.17)	362 (78.70)	98 (21.30)	
<b>Marital Status</b> (n=1771)				<0.0001
Married, Common-Law,	1684 (95.09)	1435 (85.21)	249 (14.79)	
Single, Divorced, Widowed	87 (4.91)	55 (63.22)	32 (36.78)	
<b>Household Income</b> (n=1727)				0.0041
<40,000	289 (16.73)	225 (77.85)	64 (22.15)	
40,000 – 79,999	549 (31.79)	466 (84.88)	83 (15.12)	
≥80,000	889 (51.48)	764 (85.94)	125 (14.06)	
<b>Born in Canada</b> (n=1774)				<0.0001
yes	1296 (73.06)	1127 (86.96)	169 (13.04)	
no	478 (26.94)	365 (76.36)	113 (23.64)	
<b>Highest Level Educ</b> (n=1772)				0.0185
High school and below	217 (12.25)	174 (80.18)	43 (19.82)	
Some college, college	631 (35.61)	547 (86.69)	84 (13.31)	
Bachelor's degree	603 (34.03)	513 (85.07)	90 (14.93)	
Graduate degree	321 (18.12)	257 (80.06)	64 (19.94)	
<b>Method of delivery</b> (n=1780)				0.3934
C-section	589 (33.09)	489 (83.02)	100 (16.98)	
Vaginal	1191 (66.91)	1009 (84.72)	182 (15.28)	

*Participant Characteristics Based on Sexual Activity at 12 Months Postpartum*

<i>Characteristics</i>	<i>Overall (n=1265)</i>	<i>Sexually active (n=1100) No. (%)</i>	<i>Sexually inactive (n=165) No. (%)</i>	<i>P</i>
<b>Parity</b> (n = 1263)				
Primiparas	638 (50.51)	540 (84.64)	98 (15.36)	0.0181
Multiparas	625 (49.49)	558 (89.26)	67 (10.72)	
<b>Age</b> (yr.) (n=1248)				0.0006
<25	128 (10.26)	101 (78.91)	27 (21.09)	
25 –35	769 (61.62)	690 (89.73)	79 (10.27)	
>35	351 (28.13)	296 (84.33)	55 (15.67)	
<b>Marital Status</b> (n=1257)				0.0061
Married, Common-Law, Single, Divorced, Widowed	1204 (95.78)	1054 (87.54)	150 (12.46)	
	53 (4.22)	39 (73.58)	14 (26.42)	
<b>Household Income</b> (n=1232)				0.0022
<40,000	220 (17.86)	176 (80.00)	44 (20.00)	
40,000 – 79,999	355 (28.81)	308 (86.76)	47 (13.24)	
≥80,000	657 (53.32)	586 (89.19)	71 (10.81)	
<b>Born in Canada</b> (n=1260)				0.0715
yes	910 (72.22)	801 (88.02)	109 (11.98)	
no	350 (27.78)	294 (84.00)	56 (16.00)	
<b>Highest Level Educ</b> (n=1260)				0.0796
High school and below	137 (10.87)	110 (80.29)	27 (19.71)	
Some college, college	435 (34.52)	377 (86.67)	58 (13.33)	
Bachelor's degree	437 (34.68)	388 (88.79)	49 (11.21)	
Graduate degree	251 (19.92)	220 (87.65)	31 (12.35)	
<b>Method of delivery</b> (n=1265)				0.5656
C-section	443 (35.02)	389 (87.81)	54 (12.19)	
Vaginal	822 (64.98)	711 (86.50)	111 (13.50)	