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Delaying First Pregnancies: Canadian Women's Knowledge and Perception of the Consequences

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Abstract

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by

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MA, Central Michigan University, 2005

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Many women aged 20-30 are postponing their first pregnancies until their mid 30s and beyond, which has resulted in compressed childbearing years and/or infertility. Little is known about the knowledge and understanding that Canadian women of advanced age (age 35-45) possess of their reproductive capacity. This phenomenological study sought to explore these women's knowledge and perception of their reproductive capacity in relation to the timing of first pregnancy. Research questions using the constructs of Ajzen's theory of planned behavior were developed to explore how the behavioral, normative, and control beliefs of women's childbearing behaviors were based on their perceptions of their reproductive capacity. A purposeful sample of 10 participants provided data in semistructured interviews about their lived experiences of being pregnant for the first time at an advanced age. Thematic analysis was used to analyze interview transcripts. Emergent themes derived from the data included being naïve about natural conception, use of fertility specialist, discussions of childbearing plans by family doctors, lacking energy to care for young children, and feeling judged by others. Results indicated inaccuracies in the women's factual knowledge in terms of the narrow window for fertility, chances of natural conception, the impact of long-term use of contraception, and the use of artificial reproductive technologies to compensate for age-related fertility decline. This study may promote positive social change by offering healthcare providers information that assists them in tailoring reproductive messages for patients that dispel misconceptions regarding women's reproductive potential, which may reduce the number of women experiencing involuntary childlessness and infertility.

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Dedication

I dedicate my dissertation work to God, my family, and my friends, for it was the longest journey I have ever taken.

“On the road to success there are determination, real hard work, perseverance and challenges to tackle.” Ahmet Adam Asar

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Chapter 1: Introduction to the Study

Canadian young women aged 20-30 are postponing childbearing until their mid-30s or later (McIntyre, Newburn-Cook, & O'Brien, 2009). Studies have found that many young women postpone childbearing due to goals of obtaining higher education and career advancement (Kneale & Joshi, 2008; Mynarska, 2010). The trend of postponing childbearing has broad public health implications due to its demographic and medical consequences and its impact on society at large (Macaluso et al., 2010), especially as women may not be aware of the biological, psychological, and sociological consequences of this decision. Even though the perception and understanding of these consequences have been well documented by researchers from other industrialized countries (Eriksson, Larsson, Svanberg, & Tyden, 2013; Nojomi, Haghighi, Bijari, Rezvani, & Tabatabaee, 2010; Ojule, Ibe, & Fiebai, 2011), there is a paucity of research on Canadian young women's perception and knowledge of their reproductive capacity and fertility as they relate to their decision to postpone childbearing to an advanced age.

In this chapter, an overview of the reasons why women are postponing first pregnancy and the consequences of this postponement are presented. Next, I describe the statement of the problem, the purpose of this study, the research questions, the theoretical framework, the nature of the study, and implications for positive social change.

An increase in the age of women at first pregnancy is a phenomenon being seen in many developed countries. McIntyre et al. (2009) confirmed that in the past few decades women in Europe and North America have been postponing first pregnancy until aged 35 years and older. The Centers for Disease Control and Prevention (CDC, 2010) reported

that 1 in 12 women over the age of 35 gave birth in 2006 while the average age of first-time mothers rose to 25.1 years in 2008. This information was also supported by Bayrampour, Heaman, Duncan, and Tough (2013), who documented that for the first time in 30 years, many women are postponing childbearing and the timing of first pregnancy.

According to Nojomi et al. (2010), women are delaying childbearing and focusing on the many choices available to them, such as obtaining higher education, career advancement, and financial security. Women in the developed world have many career, employment, and lifestyle choices, which allow them to postpone marriage and parenthood (Pison, 2010). Researchers have shown that women with higher education and in professional occupations earn more when they postpone motherhood (Nojomi et al., 2010; Pison, 2010).

In a study on the effects of timing of careers on motherhood, Miller (2011) found that for every year of delayed childbearing, women's earnings increased by 9% with an average wage rate by 3%. Only after attaining higher levels of postsecondary education and becoming financially independent do many women focus on forming social relationships (Pison, 2010). Although some researchers have demonstrated that increased education levels and financial freedom are the reasons for new family patterns and delayed childbearing (Benzies et al., 2006; Lesthaeghe, 2001; Ni Bhrolchain & Beaujouan, 2012; Sobotka, 2004), other researchers have demonstrated that the incompatibility of the roles of student and mother leads to postponement of marriage and childbirth (Wu & MacNeil, 2002). Perrier (2013) reported that study participants said

that the timing of their first pregnancy was shaped by biographical, psychosocial, and biological factors. Traditionally, women completed their schooling, married, and had children in their 20s and prepared themselves to take on the role of motherhood.

Background of the Problem

The trend of delaying first pregnancy is likely to continue (Pison, 2010) and has been predicted to have broad public health repercussions (Balasch & Gratacos, 2012; Macaluso et al., 2010). In Canada, women's decisions about the timing of motherhood have been influenced by a number of factors. These include the introduction of the contraceptive pill; the increase in the number of women entering the workforce; the need for further education; lack of lifetime partners; and later marriages (Billari, Liefbroer, & Philipov, 2006; Mills, Rindfuss, McDonald, & te Velde, 2011; Sobotka, 2010). These factors also allow women the independence necessary to remain in the workforce and fulfill their life plans of having a highly successful career.

Researchers have shown that medical advancements in contraception, obstetrical care, and reproductive technologies as well as social acceptance of having a baby at a later age are also allowing many women to postpone childbearing (Johnson & Tough, 2012; McMahon et al., 2011). Wiebe, Chalmers, and Yager (2012) revealed that some women age 33 and older are having abortions to postpone childbearing until a time when they are ready to become mothers. Delayed childbearing has led to smaller family units as women have found that the time to conceive has diminished, which leaves some women very little time to initiate fertility treatment and have a successful outcome (Johnson & Tough, 2012).

Researchers have also shown that women lack knowledge of the impact of age on fertility (Behboudi-Gandevani, Ziaei, Khalajaead-Farahani, & Jasper, 2013; Peterson, Pirritano, Tucker, & Lampic, 2012). Spence and Eberstein (2009) asserted that fertility in terms of timing of childbearing and number of births is central to women, as it shapes their decisions in planning their lives. The Society of Obstetricians and Gynaecologists of Canada (SOGC, 2012) reported that a woman's fertility begins to decline in her early to mid-30s with steep declines by age 35, with some women losing their ability to conceive long before they experience symptoms of menopause. A decline in fertility is due to the loss of oocytes from the ovaries (Liu & Case, 2011). At 20 weeks of gestation, the human fetus has approximately 6 to 7 million oocytes (Liu & Case, 2011), with only 1 to 2 million at birth and a loss of oocytes to 300,000 to 500,000 by the time a girl reaches puberty (Baker, 1963, as cited in Liu & Case, 2011). Aging of oocytes, according to te Velde, Habbema, Leridon, and Eijkeman (2012), can result in spontaneous abortion or a child with Down's syndrome.

The delay in timing of first pregnancy can be seen globally in many developed countries such as Spain, France, Czech Republic, Denmark, Ireland, and Sweden (Schmidt, Sobotka, Bentzen, & Nyboe Anderson, 2012). For instance, since 2002, Spain has had the highest rates of first births in the 30-and-over age group, while birth rates in this age group have doubled in France and had a drastic increase in the Czech Republic from 14% in 1990 to 46% in 2009 (Schmidt et al., 2012). In Canada, 49.6% of first births were to women age 30 and older in 2008 (Statistics Canada, 2011).

Research studies that address Canadian young women's factual knowledge and perception of their reproductive capacity, fertility, and the potential risks of delaying first pregnancies could not be found. Studies of women of advanced maternal age who postpone pregnancy to 35 years and older and the consequences of the delay have been conducted in many international countries (AlShami, Kadasne, Khalfan, Iqbal, & Mirghani, 2011; Biro, Davey, Carolan, & Kealy, 2012; Boivin & Bunting, 2008; Kenny et al., 2013; Nojomi et al., 2010). In an earlier study of pregnancy and motherhood, Leader (2006) demonstrated that Canadian women aged 35 years and older lacked knowledge of the limits of their fertility.

Wojcieszek and Thompson (2013) found that exposing Australian men and women to a brief online information brochure on outcome measures of knowledge of fertility, knowledge of the effectiveness of in vitro fertilization (IVF), and desired age at first pregnancy and at the conclusion of childbearing resulted in a significant increase in knowledge of the exposed outcome measures. In a more recent study, Williamson, Lawson, Downe, and Pierson (2014) discovered that providing Canadian childless women with brief fertility information (age and fertility, Canadian infertility rates, success rates, and financial cost of assisted reproductive technology [ART]) improved their reproductive knowledge and might, in turn, affect childbearing decisions. Lundsberg et al. (2014) also revealed that a general representation of American women of reproductive age lacked knowledge of their reproductive capacity in terms of fertility, the number of oocytes being produced during the reproductive years, and spontaneous conception.

Therefore, this study explored whether lack of factual knowledge regarding the number of eggs women are born with, their ability to experience spontaneous conception, their ability to maintain a pregnancy, and later maternal age as a determinant of infertility affects Canadian women's decision to postpone first pregnancy. I explored women's knowledge and perception of their reproductive capacity as it relates to fertility and timing of first pregnancy.

Consequences of Delayed Childbearing

Researchers have documented that women who delay pregnancy are likely to suffer from infertility and involuntary childlessness (Leridon & Slama, 2008; Roupa et al., 2009; te Velde et al., 2012). The CDC (2010) reported that infertility was an emerging public health priority in many European and North American countries, as evident in a decline in fertility rates. Reiter (2009) conveyed that in the last 3 decades, there has been a consistent decline in global fertility rates. For example, average fertility rates range from 1.4 in Germany to 1.9 in France. In Canada, the total fertility rate increased from 1.66 children per woman in 2007 to 1.68 in 2008 as a result of an increase in fertility in women aged 30-34 and a decrease in women aged 25-29 (Statistics Canada, 2011). From 2009-2010, the prevalence of infertility in Canada was 11.5%-15.7% (Bushnik, Cook, Yuzpe, Tough, & Collins, 2012). Infertility is prevalent in the majority of women who continue to wait until an advanced age to become pregnant for the first time.

Infertility can be the result of declining fecundity related to ovarian aging as women continue to postpone having their first child. The American Society for

Reproductive Medicine (2008) has identified infertility as a disease and defined it as the failure to successfully become pregnant after 12 months or more of regular unprotected sexual activity. There are two types of infertility—primary and secondary infertility. *Primary infertility* is the inability to conceive with regular unprotected sexual activity. *Secondary infertility* is the inability to conceive even after previous spontaneous conception (Mascarenhas, Cheung, Mathers, & Stevens, 2012).

According to Roupa et al. (2009), the increase in the average age of childbearing is causing many women to become infertile. The CDC (2013) reported that 20% of American women are having their first baby at age 35 or older, and that at this advanced age, infertility is increased. With such a large increase in infertility in many women over 30, younger women are not being educated or gaining knowledge about their reproductive capacity.

Carolan (2007) looked at the information needs of first-time well-educated mothers over the age of 35 who identified that the timing of first pregnancy was not addressed in relation to infertility and potential childlessness. These women felt that if their healthcare providers had discussed with them their childbearing plans and provided them with information regarding the potential of infertility and childlessness, they would have planned their pregnancies differently.

Involuntary childlessness is a potential consequence of delayed childbearing. Delay of childbearing until after the age of 30 can result in involuntary childlessness for many women due to an inability to conceive (te Velde et al., 2012). A survey of women's plans and behaviors across their life course found a rise in childlessness in

women below age 35 (Kneale & Joshi, 2008). Leridon and Slama (2008) also found that when first pregnancy is postponed from age 25 to 31, childlessness rates increase by 6%.

Increased maternal age due to delayed childbearing is also a risk factor for obesity, diabetes, chronic hypertension, cardiovascular diseases, and malignancy (Segev, Riskin-Mashiah, Lavie, & Auslender, 2011). Lundsberg et al. (2014) noted that obesity can result in comorbidities such as diabetes and hypertension that, along with dieting, smoking, alcohol, stress, and sexually transmitted diseases, may affect reproduction. Athukorala, Rumbold, Wilson, and Cowther (2010) further confirmed that obese women have increased risk of adverse pregnancy outcomes of gestational diabetes, hypertension, and pre-eclampsia. Hammarberg et al. (2013) found that women and men of reproductive age (18-45) were aware that obesity and smoking influenced a women's fertility. Radin, Hatch, Rothman, Mikkelsen, and Sorensen (2014) found that exposure to heavy and regular active smoking damaged fertility in women.

Statement of the Problem

Canadian women are delaying childbirth until their mid-30s and beyond in order to meet goals related to higher education, career development, and financial security (Daniluk, Koert, & Cheung, 2012). Delay in having children until the mid-30s and beyond may result in risks to the mother (infertility, labor complications), the child (Down syndrome, prematurity), and society (reduced birth rate, increased healthcare costs, and fewer younger citizens to contribute to Canadian society). Infertility has severe consequences for a woman, which may include psychological effects, social consequences, and financial consequences in terms of resources for treatment (Tabong &

Adongo, 2013). There has been little or no research on young women's knowledge of the number of oocytes they have at birth in relation to their reproductive capacity, their ability to conceive spontaneously, and their ability to maintain a pregnancy, as well as young women's knowledge that maternal age is a determinant of fertility. Therefore, the goal of this study was to fill the gap in research on Canadian young women's knowledge and perception of the limits of their reproductive capacity.

Purpose of the Study

I explored Canadian women's knowledge and perception of their reproductive capacity and fertility in relation to the decision to postpone childbearing to an advanced age. Therefore, the purpose of this qualitative study was to explore what Canadian women know about the limits of their reproductive capacity and the effect of age on fertility.

Research Questions

The research was guided by two questions:

1. How do Canadian women perceive their fertility, and how does this perception influence timing of first pregnancy?
2. What are Canadian women's knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to timing of pregnancy?

Theoretical or Conceptual Framework

The theory of planned behavior (TPB) provided the theoretical framework for this study. TPB was used to explain health behavior and behavioral change. In the TPB, a

person is motivated to perform a health behavior change. Motivation to change the health behavior is influenced by two forces: (a) the person's attitude toward taking any action and (b) the person's view of the expectations of significant others with regard to the behavior (Wang et al., 2006). According to Ajzen (2008), the TPB addresses the way in which a person's attitude toward a health behavior can encourage the person to undertake the behavior. Ajzen posited that the three components of the TPB model—the individual's attitude toward a behavior, the individual's subjective norms, and the individual's perceived behavioral control—determine a change of behavior. The National Cancer Institute (2008) reported that theories help to answer questions, such as why a health problem exists, what information a researcher needs to know about the target audience before taking any action, how to reach the target audience, and what strategies can be used to cause a change in behavior.

The TPB has been used in a number of studies to explain or predict behaviors related to a couple's intentions to have children. Blackstock, Mba-Jones, and Sacajiu (2010) explored how information or lack thereof contributes to elements of the TPB model. The authors addressed family planning knowledge sources through the framework of the TPB by addressing attitudes toward family planning, subjective norms of family planning, and perceived behavioral control over contraceptive use and family planning in terms of intention toward family planning, and contraceptive use for family planning. Information alone is insufficient to change a behavior but is enough to make an informed choice about family planning. Dommermuth, Klobas, and Lappegard (2011) compared childbearing parents' and childless individuals' intentions to have a child at the

time of the study and within the next 3 years using the TPB. The researchers used the TPB to understand and predict the attainment of the goal of having a child as a way of gaining insight into trends toward decreased fertility and postponing of first pregnancy. They developed a model of fertility decision making based on the TPB by addressing attitudes toward having a child, perceived norms, and perceived behavioral control as it relates to intention to have a child now or within the next 3 years.

Nature of the Study

A qualitative approach was used to explore Canadian young women's understanding of voluntary reproductive delay. Many women do not know the consequences of delaying childbearing, and some of them have unrealistic beliefs about the ability to use assisted reproductive technologies to compensate for age-related fertility declines. A qualitative approach was appropriate for this study because there is lack of research on Canadian women's perception and knowledge of their reproductive capacity as it related to timing of first pregnancies. In addition, this research fills a gap in the literature on factual knowledge of women's reproductive capacity. I conducted in-depth, face-to-face interviews with 10 women. The interviews were guided by open-ended questions and tape recorded using a digital recording device. The interviews were transcribed verbatim.

This study used a hermeneutic phenomenological approach. Standing (2009) stated that "we make sense of lived experience according to its personal significance for us" (p. 20). This design was used to explore Canadian women's perception and knowledge of their reproductive capacity and fertility in relation to the decision to

postpone childbearing to an advanced age. Analysis of the women's feelings and reactions helped in identifying their knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to the timing of pregnancy.

Definition of Terms

The following terms are used throughout the study:

Advanced/late maternal age: Applies to a woman who is pregnant at age 35 or over (Johnson & Tough, 2012)

Delayed childbearing: Applies to a woman who delays getting pregnant until age 35 or older (Johnson & Tough, 2012).

Fertility intention: The number of children a woman intends to have in the future (Loutfy et al., 2009).

Fertility rate: The amount of women expected to bear children during the childbearing period from 15 to 45 years of age (Kent & Haub, 2005).

Infertility: The inability to conceive after at least12 months of regular sexual activity without contraception (Zegers-Hochschild et al., 2009).

Reproductive capacity: My construct of reproductive capacity refers to a woman's factual knowledge about the amount of oocytes she was born with, her ability to have a spontaneous conception, her ability to maintain a pregnancy, and later maternal age as a predisposing factor for infertility.

Reproductive health: The ability of human beings to have a sex life that is practiced responsibly and safely while at the same time being satisfying; the ability to

reproduce and freedom of choice concerning when and how often to reproduce (World Health Organization [WHO], 2015).

Assumptions, Scope and Delimitations, and Limitations

Assumptions

This study involved several assumptions. First, I assumed that the interview questions helped in probing the perceptions of women regarding their reproductive capacity. Second, I assumed that each woman answered the questions honestly and accurately. Third, I assumed that each woman's answer accurately represented her understanding of the questions. Data and constructs from this study may form the basis for further research. Little is known about female reproductive capacity in terms of the complex processes of its functioning. Therefore, it was assumed that the construct of "reproductive capacity" could be best studied using a qualitative methodology.

Scope and Delimitations

The study was limited to women aged 35-45. The study's entire focus was on women because they are the ones who become pregnant. Only women from an obstetric clinic at a metropolitan hospital participated in this study. Lack of factual knowledge was addressed as the research problem because of its impact on society in terms of reduced birth rates, infertility, increases in healthcare cost, and fewer citizens to contribute to Canadian society. This specific focus was chosen because of a knowledge deficit in society, especially among women of childbearing age. In addition, no empirical study had addressed women's knowledge in terms of their reproductive capacity. I

showed that each woman's knowledge and perception of their reproductive capacity were based on their life experiences.

The participants in this study constituted a sample of women from diverse ethnic backgrounds that included women with postsecondary education, women aged 35-45, and women who had experienced difficulty in sustaining a pregnancy. Men from the obstetric clinic were excluded from this study.

Limitations

Research bias is a constant threat in the collection and analysis of data. At the time of the study, I was working as a registered nurse in the hospital, where I cared for women who had delayed pregnancy to an advanced age. Reflexive journaling was used to aid in the reduction of personal bias. I refrained from intentionally leading participants to any desired response. The study was limited by the length of the interviewing period, by interviews being conducted only by me, and by interviews being the only source of data.

Significance of the Study

Although Canadians are being told that the elderly population will soon outnumber the younger population, they may not be aware that the increase in the number of aged persons may be due in part to a lower fertility rate. Women are producing a smaller number of children as they delay marriage and parenthood to a later age. Many young women believe that there is no urgency to have children early in life, as it is more important to have completed higher education and be financially secure while looking for the right partner. This change in ways of thinking can lead many individuals to remain childless or to have fewer children than they would like to have (Pinquart, Stotzka, &

Silbereisen, 2010). Furthermore, this fertility trend affects taxes that are required to sustain Canada's universal health care system, old age security, and other valuable social programs. That is to say, sustainability of the aging population is dependent on the fertility of the younger population.

This study's implications for social change include a better understanding of why women are delaying childbearing until their mid-30s and beyond. As a result of the delay of childbearing, infertility has become a disorder with broad public health implications and consequences that impact society and the population at large. Therefore, there is a need to increase factual knowledge through sexual health education related to conception, reproductive capacity, STDs, fertility, and age. Presently, the Canadian sexual health education curriculum focuses on prevention of pregnancy and safe sexual health but lacks factual information on topics such as the number of eggs women are born with, the impact of postponing pregnancy through oral contraception on spontaneous conception, maintenance of a pregnancy, and the narrow window for fertility associated with later maternal age.

Summary of Chapter 1

Postponement of childbearing has created a decline in fertility rates. Young women aged 20-32 are postponing parenthood to a more advanced age due to lack of knowledge about their reproductive capacity in terms of the number of eggs they are born with, spontaneous conception, maintaining a pregnancy, and late maternal age as it relates to fertility. Traditionally, young women completed school, became married, and had their first child by the age of 25. The voluntary postponement of childbearing can be

attributed to contemporary young women's lack of factual knowledge of their reproductive capacity. This study explored women's knowledge and perception of fertility and what is needed to influence women to bear children at an optimal age of 24-29.

In Chapter 1, I have provided the introduction, background, purpose, and significance of the study. In Chapter 2, I present a review of the current literature as it relates to what women know of the limits of their reproductive capacity and the effect of these limits on their fertility. In Chapter 3, I provide a description of the study design, including the methodology, role of the researcher, participants, data collection, and data analysis. In Chapter 4, I provide the results of the study, data collection methods, and data analysis. In Chapter 5, I provide discussion, conclusions, and recommendations of the study.

Chapter 2: Literature Review

Introduction

In Chapter 2, I present a review of the current literature as it relates to what Canadian women know of the limits of their reproductive capacity and the effect of these limits on their fertility. First, I review the search strategies I used to locate articles. Next, I describe the methodology for this study and how it was used. I provide a summary of the theory of planned behavior (TPB) and explain its relevance to this study. Then, I show how other researchers have applied the concepts of the TPB in their research. Next, I explore delayed childbearing in the context of infertility and childlessness. Then, I conceptualize reproductive capacity by explaining amount of oocytes at birth, spontaneous conception, maintaining a pregnancy, and advanced maternal age by reviewing the applicable literature. Finally, I provide a summary of studies that support the significance of my study.

Young women in the 21st century are challenging traditional ideals of marriage and parenthood by focusing on education and career instead of starting a family. For example, 80% of Canadian women aged 25 to 54 are participants in the paid labor market (Statistics Canada, 2012). This transition reflects societal changes in how women of this century perceive the traditional way of life. To date, no studies have documented Canadian young women's understanding of their fertility and their knowledge and perceptions about the consequences of postponing first pregnancy until their mid- to late 30s and beyond.

Literature Search Strategy

I conducted a literature search using several databases. These databases included Academic Search Premier, CINAHL Plus with full text, CINAHL Select, MEDLINE, and ERIC. I accessed articles from 2006-2014 using the following search terms: *delayed childbearing*, *deferred childbearing*, *late maternal age*, *advanced maternal age*, *conception*, *reproduction*, *reproductive capacity, pregnancy intention, knowledge, timing to pregnancy, attitude, perception, fertility awareness, infertility,* and *postponement.* I read abstracts to determine their relevance to the study. Next, I reviewed the references of relevant articles and chose those based on women aged 30-45 to locate additional resources for this literature review.

My search revealed limited literature on human female reproductive capacity. However, there were a number of studies on human male reproductive capacity and animal reproductive capacity. This gap in the literature was handled by using the search terms *reproductive knowledge, knowledge deficit, spontaneous conception, oocytes, maintaining a pregnancy, late maternal age,* and *advanced maternal age.*

Theoretical Foundation

Ajzen's (1991) theory of planned behavior (TPB) was the theoretical foundation used to inform this study. The TPB is an extension of the theory of reasoned action as developed by Ajzen and Fishbein (1980). The TPB posits that a person's intentions to perform a behavior can be influenced by the beliefs the person has about the behavior he or she intends to perform (Ajzen, 1991). Klobas (2011) further stated that the TPB is a

model "of how humans make choices in their social context, given different perceptions of control over their actions" (p. 47).

As a framework, the TPB provides an understanding of young women's behavior and how this behavior is appropriate for discussing reproductive capacity and its effects on fertility. Klobas (2011) stated that the TPB is a model that is appropriate for investigating human fertility in terms of being conscious or intentional about decisions related to delayed childbearing. For example, the TPB can offer explanations for the choices being made by young women to complete their studies and establish a career, thus delaying first pregnancy. Fishbein and Ajzen (2010) stated that TPB is able to accommodate changes in a person's intentions over time. For example, a woman might decide to have a child at age 25 but, due to her job requiring more education, might delay childbearing until an age when her job can accommodate a pregnancy.

The primary concepts of TPB are attitudes, subjective norms, and perceived control (Ajzen & Klobas, 2013). *Attitudes* comprise personal opinions about a particular behavior and outcome beliefs about how the behavior will be achieved (Bayley, Brown, & Wallace, 2009). Further, attitude is composed of two subcomponents: affective and instrumental. The affective subcomponent relates to whether the intended behavior to be performed is enjoyable or unenjoyable, whereas the instrumental subcomponent addresses whether the intended behavior will be harmful or beneficial (Vallance, Murray, Johnson, & Elavsky, 2011).

The term *subjective norms* refers to the effect that other significant persons have on an individual's behavior. Subjective norms consist of individuals' perceptions of

others' views about a behavior and their willingness to comply with others' wishes (Bayley, Brown, & Wallace, 2009). The subcomponents of subjective norms are injunctive and descriptive. The injunctive subcomponent involves individuals' beliefs that their social networks would want them to perform the behavior, whereas the descriptive subcomponent involves individuals' beliefs that the people of their social network would perform the behavior themselves (Vallance et al., 2011).

Perceived behavioral control (PBC) refers to the individual's beliefs about how easy or difficult it would be to perform the desired behavior with available resources (Ben Natan, Golubev, & Shamrai, 2010). The two subcomponents of PBC are self-efficacy and controllability. Self-efficacy beliefs may influence how appropriate behaviors are initiated and sustained in the face of obstacles, as well as how people think, act, and feel (Bandura, 1977). Controllability is having personal control over the intended behavior (Vallance et al., 2011).

In this section, I discuss the relationship of the TPB to the present study. The TPB concept of attitudes applies to the behavior of Canadian women delaying first pregnancy until they have achieved their desired outcome of completing their education and establishing a career. Thus, for some Canadian young women aged 20-30, becoming pregnant is not an issue to be considered at a time when they are furthering their education. Billari, Philipov, and Testa (2009) stated that completion of education and achievement of stable jobs influence intentions regarding the timing of first pregnancy. Therefore, women may use a form of contraceptive control as they pursue these goals in order to prevent pregnancy from occurring.

Through subjective norms, people in young women's lives influence their behavior. These people include their parents, relatives, close friends, and like-minded peers. For example, some married German women have postponed timing of first pregnancy until 7 years after marriage (Romeu Gordo, 2009). Societal norms and individual values about the role of women might have competing intentions such as the need for further education; the lack of lifetime partner; and later marriages.

Perceived behavioral control speaks to how the behavior of delaying first pregnancy is controlled by individual young women in order to achieve their life plans. For example, according to Spence (2011), the timing of childbearing shapes women's opportunities, attitudes, decisions, and behaviors. Therefore, the TPB is applicable to this research because it clarifies how the behavioral, normative, and control beliefs of Canadian young women affect their intentions to delay first pregnancy until they have completed their education, established a career, and gained financial freedom.

Application of Theory of Planned Behavior to Childbearing Intentions

In this section, I summarize how other researchers have applied and articulated the concepts of the TPB in previous research. Researchers have used the TPB to predict academic misconduct (Stone, Jawahar, & Kisamore, 2010); to measure parenting intentions (Weber et al., 2011); to predict women's intention to take hormonal replacement therapy (Quine & Rubin, 1997); and to explain or predict behaviors related to fertility intentions or intentions to have children (Billari, Philipov, & Testa, 2009; Blackstock, Mba-Jones, &Sacajiu, 2010; Dommermuth, Klobas, & Lappegard, 2011; Philipov, 2009).

Blackstock et al. (2010) explored how information received or lack of information contributes to elements of the TPB model. The authors addressed family planning knowledge sources through the framework of the TPB by addressing attitudes toward family planning, subjective norms of family planning, and perceived behavioral control over contraceptive use and family planning in terms of intention toward family planning and contraceptive use for family planning. Information alone is insufficient to change a behavior but is enough to make an informed choice about family planning.

Dommermuth, Klobas, and Lappegard (2011) compared childbearing parents' and childless individuals' intentions to have a child at the time of the study and within the next 3 years using the TPB. The researchers used the TPB to understand and predict the attainment of the goal of having a child as a way to gain insight into trends toward decreased fertility and postponing of first pregnancy. They developed a model of fertility decision making based on the TPB by addressing attitudes toward having a child, perceived norms, and perceived behavioral control in relation to the intention to have a child now or within the next 3 years.

Philipov (2009) examined the effect that intentions to start studying and to enter into employment may have on Bulgarian women's childbearing intentions and subsequent childbearing decisions using constructs from the TPB. Attitudes of experiencing the behavior "towards having a child within 2 years"; perceived norms "formed under the influence of social pressure" from relatives, friends, and those important to the person; and perceived behavioral control factors that "describe the extent to which persons can exercise control over factors that have a major influence on the

behavior" (Philipov, 2009, p. 530). Philipov found that women who intend to start studying construct childbearing intentions and subsequently behave in a similar manner as those who are already studying do.

Review of the Literature

Advanced Maternal Age (AMA) and Fertility

Multiple European studies have indicated association between advanced maternal age and fertility as well as increased complications during pregnancy and delivery in primiparous or nulliparious women (Kenny et al., 2013; Nojomi et al., 2010). Evidence from these studies suggests that when compared with younger primiparous or nulliparious women, women of advanced maternal age are at increased risk for obstetric complications such as infertility, spontaneous abortion, ectopic pregnancy, pregnancy-induced hypertension, gestational diabetes, and placenta previa, as well as perinatal complications of induction of labor, caesarean section, stillbirth, and neonatal death (Canadian Institute of Health Information [CIHI], 2011).

In a retrospective study, Nojomi et al. (2010) collected data on 293 nulliparious Iranian women aged 18-34 and 245 nulliparious Iranian women aged 35 and older to investigate the association between maternal age at time of delivery and perinatal outcomes. They found that in the older age group, 25.5% of the women had a higher incidence of infertility, compared to 11.3% in the younger age group. They demonstrated that women aged 35 and older had increased incidence of labor complications such as cesarean delivery (92.7%), preterm labor (36.2%), and hypertension in pregnancy (18.8%). The researchers estimated that for women 35 years and older, the risk of

infertility and pregnancy complications is higher than for women aged 18 to 34. This was consistent with findings from Ojule, Ibe, and Fiebai (2011), who compared pregnancy outcomes of primigravidae Nigerian women under age 35 with those of primigravidae Nigerian women aged 35 and older. They also found that older primigravidae are at increased risk of preterm, macrosomic, and caesarean deliveries compared to their younger primigravida counterparts. Additionally, Biro, Davey, Carolan, and Kealy (2012) reported that women 35 years and older giving birth in Victoria, Australia, have increased risk of cesarean delivery, placenta previa, and multiple births. Further, they noted that these older women had the highest odds of developing gestational diabetes.

In a more recent study, Kenny et al. (2013) investigated the association between advanced maternal age and adverse pregnancy outcomes. They reported that with increasing age, English women 35 years and older had increased risk of cesarean deliveries, preterm birth, low birth weight, stillbirth, and unexplained fetal death compared to women aged 20-29. In addition to the outcomes mentioned above in Ojule et al. (2011) and Biro et al. (2012), Kenny et al. (2013) was the only study to examine the size of babies: large for gestational age (LGA), very large for gestational age (VLGA), and extremely large for gestational age (ELGA). They found that women of increasing age, 40 years and over, tended to have VLGA babies.

Moretensen, Hegaard, Andersen, and Bentzen (2012) addressed attitudes toward motherhood and awareness of fertility in Danish female healthcare professionals aged 20-40. They found that 50% of participants intended to have their last pregnancy after age 35, with 50% underrating the impact of maternal age and fertility. These researchers

suggested that for women to make well-informed decisions about their fertility, they should be provided with more information about the timing of childbearing.

Among the limited number of studies in this area that have been non-European in their focus, findings have been similar to those of the European studies. In a retrospective cohort study, Hsieh, Liou, Hiu, and Lo (2010) examined 39,763 Taiwanese women who delivered after 24 weeks of gestation over a 10-year period. They not only looked at the association between advanced maternal age and adverse perinatal outcomes, but also wanted to find out if there is an increasing trend in the mean maternal age at first birth in women aged 35 and older. The researchers also found increased odds of gestational diabetes, placenta previa, and placenta abruption as well as a high risk of c-section due to breech presentation in an Asian population. Additionally, in uncomplicated pregnancies and normal deliveries, advanced maternal age (AMA) was significantly associated with early preterm delivery of less than 34 weeks gestation, fetal demise, and neonatal death compared to women aged 20-34 at delivery. Moreover, Hsieh et al. found that women 35 years and older were at increased risk for operative vaginal deliveries.

Hoque (2012) compared pregnancy outcomes in South African women aged 34 years and older (n = 341) and South African women aged 20-34 years (n = 1604). They found that women of AMA also had a high risk for c-section deliveries due to breech presentation (7% vs. 3.9%) and low birthweight (LBW) infants compared to their younger counterparts. This was consistent with findings from Alberto, Marta, Olga, and Raul (2014), who reported that Argentinian women aged 40 years and older had a higher

incidence of adverse pregnancy outcomes when compared to pregnant women aged 20-29.

Behboudi-Gandevani, Ziaei, Khalajabadi-Farahani, and Jasper's (2013) cross-sectional survey of Iranian primigravid women (n = 675) demonstrated that women 35 years and older lacked knowledge related to maternal age and fertility and the potential complications of delayed first pregnancy. The researchers identified from another study they researched on delayed childbearing that education in Iran about fertility was focused mainly on family planning, with risk of delayed childbearing being a missing component in the education of women about family planning.

Takahashi, Watanabe, Sugibayashi, and Aoki (2012) sought to determine whether the rate of cesarean section is similar between primiparous Japanese women aged 35-39 and those 40 and older. They found that c-section rates were significantly higher in primiparous women 40 and older, with indications for c-section being nonprogressive labor or dystocia (19.4%). Among primiparous women 35-39 years of age, 11.0% delivered by c-section due to nonprogressive labor or dystocia. In addition, Takahashi et al. found that perinatal outcomes were the same in both groups. This was consistent with previous research done by Valadan, Tanha, and Sepahi (2011), who investigated prenatal and obstetrical outcomes of women aged 40 years and older with a control group of women aged 20-29. In the older group, Valadan et al. found statistically significant increases in rates not only of c-section, but also of preeclampsia, gestational diabetes, and breech presentations.

Knowledge Deficit and Fertility

Researchers suggest that there is not much emphasis on the provision of information to reproductive aged women regarding their decision to delay childbearing and the increased risks of adverse perinatal events (Balasch, & Gratacos, 2010; Hirschfeld-Cytron, 2013). Balasch and Gratacos (2010) reported that many women of advanced age were unaware of the potential perinatal risks associated with delaying childbearing due to lack of knowledge of their fertility. Evidence from the literature suggested that women who delay childbearing are more likely to lack knowledge of their fertility. Hirschfeld-Cytron (2013) argued that the general population does not fully understand female fertility in terms of optimal age at which to have a first pregnancy. Johnson and Tough (2012) identified that the optimal age of having a biological child is between age 20 and 35 years. According to Daniluk et al. (2012), in a study of 3,345 Canadian women's knowledge about fertility, assisted human reproduction (AHR) and risks associated with delaying childbirth, 54.4% of participants had some knowledge of fertility, 35.4% of participants were fairly knowledgeable, 5.6% were very knowledgeable and 22.4% had no knowledge of fertility. However, the majority of participants (90.3%) reported they were aware that fertility declined with age.

Many researchers have recommended education about female fertility due to the inaccuracies of information and perceptions in order for men and women to make informed decisions as to the timing of pregnancy (Behboudi-Gandevani et al., 2013; Carolan, 2007; Leader, 2006; Peterson, Pirritano, Tucker, & Lampic, 2012). Peterson et al. (2012) online study assessed 246 American undergraduate university students'

knowledge of fertility and their attitude toward parenting. They found that of the participants, 75% of the women and 56% of the men wanted to have their first child between the ages of 25 and 29 where as 19% of the women and 37% of the men wanted to have their first child between ages 30 and 34. With regard to fertility and infertility issues, 46% of participants reported their knowledge of fertility came from school, while 5% indicated that their knowledge came from doctors with 20% reporting their knowledge came from family, while 32% of women and 36% of men overestimated the age at which women were the most fertile. Additionally, the researchers found that 67% of women and 81% men overestimated the age at which women experience a marked decrease in fertility.

Although the study is 8 years old, Leader (2006) found that women articulated that they had not been provided with enough reproduction information about the implications of age and fertility. This was particularly evident among baby boomers who voiced that their physicians had not adequately provided them with health information about the consequences of a decline in their fertility due to aging. The participants of this study believed that their healthcare provider should have provided them with information about timing of first birth and fertility. Similarly, Carolan (2007) reported that first-time, well-educated mothers aged 35 and older who were privy to a considerable amount of health information, were only aware of being high risk after becoming pregnant. These mothers argued that some of their health education on topics such as timing of first pregnancy was not addressed. According to Behboudi-Gandevani et al. (2013), in a

study of Iranian primigravid women age 35 years and older, fertility education was focused only on family planning but not on risk of delaying childbearing.

Many studies have implications to this study as they indicated that study participants lack the factual knowledge of their reproductive capacity in terms of the number of eggs they are born with, knowledge of spontaneous conception, their ability to maintain a pregnancy, and maternal age as it relates to fertility. This was evident in Hammarberg et al. (2013) exploration of Australian women and men of reproductive age (18-45) knowledge of the effects of age, obesity, smoking and timing of sex on fertility. Although they found that 26% of respondents (n = 462) were aware that a women's fertility declines before age 35, 30% of respondents had good knowledge of the influence of age on fertility but 40% lacked the knowledge of conception in the menstrual cycle.

In a retrospective study, Mac Dougall, Beyene, and Nachtigall (2013) asked American women aged 40 years and older "What information did you have about fertility and age before you started trying to get pregnant?" and "What did you learn once you proceeded with fertility treatment?" (p. 351). This explorative study was conducted in order to gain a better understanding of their knowledge of the relationship between age and fertility before and after delivery of their first child through IVF. They found that of 61 women participants, 31 said they expected spontaneous conception at age 40, while 30 said they expected fertility to decline until menopause around age 50. Additionally, Mac Dougall et al. found that although 48% were aware of the decline in fertility related to age, the women attempted their first pregnancy at around age 39.

Similarly, Bayrampour et al. (2013) study compared pregnancy risk perception and knowledge of 159 nulliparous pregnant AMA Canadian women 35 years and older (*n* = 54), and younger Canadian women aged 20-29 (*n* = 105). They found that AMA participants had more knowledge of age related pregnancy risk of multiple births, eligibility for amniocentesis, risk of a child with Down syndrome, or risk for congenital anomaly compared to the younger participants (Bayrampour et al.). Incidentally, Tough et al. (2007) survey of first time Canadian mothers found that 85.3% of participants had knowledge of conception difficulties, 24% knowledge of C-sections, 21.8% knowledge of preterm delivery, and 11.2% LBW.

Knowledge Deficit and Fertility Treatment

Studies have demonstrated that some women believe that assisted reproductive technology (ART) is the solution for infertility associated with aging and have unrealistic beliefs about the extent to which ART can help them to conceive (Callaway, Lust, & McIntyre, 2005; Hirshfeld-Cytron, 2013; Maheshwari, Porter, Shetty, & Bhattacharya, 2008). Hirshfeld-Cytron (2013) reported that many women view ART as a way to achieve a pregnancy when diagnosed as infertile. This was consistent with what Callaway, Lust, and McIntyre (2005) had previously found when they assessed the outcome of pregnancies greater that 20 weeks gestation in women aged 45 years and older. Although the young women in their retrospective study realized that ART might assist them with attaining a pregnancy, they failed to realize there are a number of prenatal complications that were age related (Callaway et al.). According to Maheshwari et al. (2008), 85.1% of British women were aware that chances of becoming pregnant

decrease between ages 30 and 40, 73.2% reported that they had postponed their first planned pregnancy. However, the majority of the subfertile group, those who were unsuccessful in becoming pregnant naturally, (84.6%) believed that they could become pregnant through in vitro fertilization (IVF) treatment despite their age.

In a previous study, Benzies et al. (2006) found that Canadian women aged 30 felt that when they were ready reproductive technology would extend their reproductive cycle. Similarly Whitten, Remes, Sabarre, Khan, and Phillips (2013) discovered that Canadian university undergraduate students had unrealistic expectations in that it would be easy to get pregnant at ovulation and that they would get help through in vitro fertilization (IVF). Craig, Donovon, Fraenkel, Watson, Hawley, and Quinn (2013) confirmed the importance of providing young women who are in their mid-30s, not only about the consequences of age related fertility, but with information of the costs and success rates of ART for women of advanced maternal age.

Knowledge Deficit and Reproductive Capacity

The literature suggested that even high school students lack the knowledge about their reproductive systems and their reproductive capacity. Hammarberg et al. (2013) reported that their study participations aged 18-24 acquired their knowledge through school about the impact of age (47%), weight (29%), and smoking (55%) on fertility. According to Quach and Librach (2008), sex education is not a priority in high school and any reproductive education received informs students about preventing a pregnancy (Daly & Bewley, 2013) but not on their reproductive capacity and fertility. In addition Quach and Librach (2008) reported that because the majority of participants lacked the

knowledge to protect their future fertility, it may be necessary to educate Canadian high school students about infertility prevention thus providing them with the ability to make informed decisions about their reproductive health. Quach and Librach assessed grade 11 and 12 Canadian high school students' knowledge and attitudes towards infertility. The researchers discovered that when the students were questioned about their ability to have children someday, 48% of female students and 33.1% of male students had concerns. Of those surveyed, 66% female and 58% male students indicated that they wanted information on how to protect their fertility. In regard to the effect of age on fertility, Quach and Librach also found that 84% of female students recognized fertility as being age related, while 89% of female and 71.2% of male students agreed that infertility was a problem that only affects women 40 years and older.

Likewise, Ekelin, Akesson, Angerud, and Kvist (2012) recommended that high school students be provided with education about the factors involved in increasing their chances of natural through sex education classes, at youth centers, and at school. Through their investigation of the views of female and male high school student's general knowledge of fertility, they found students overestimated a female's fertility lifespan, and the success rate of ART. Additionally, they realized that the participants lacked knowledge of success rate of ART, and that STDs such as Chlamydia and gonorrhea can affect their fertility. Furthermore, Virtala, Vilska, Huttunen, and Kunttu (2011) suggested that sexual education include information about reproductive aging as it relates to fertility so that people could make informed choices as to timing of first pregnancy.

A number of studies further highlighted that undergraduate student's lack

knowledge of the capability of their reproductive system in terms of the optimal age to achieve and maintain a pregnancy (Bretherick, Fairbrother, Avila, Harbord, & Robinson, 2010; Whitten Remes et al., 2013). Bretherick et al. (2010) surveyed single Canadian female undergraduate students' (n = 360) knowledge about fertility and ageing. The researchers found that 89% of the reproductive-aged university students intend to have children, with 22.1% before age 25, 63.7% between ages 25 and 30, 32.1% between age 30 and 35 and 2.1% after age 35. Additionally, they discovered that the participants overestimated the chances of a woman aged 20 (66%), aged 30 (57%), and aged 40 (41.6%) becoming pregnant after only one month of regular intercourse. However, the majority of participants, 70.3%, were aware that fertility declines well before menopause while 45.5% identified age as a risk factor associated with infertility and 24.7% identified age as the strongest risk factor for miscarriage. These findings indicated university female students' lack of knowledge about declining fertility associated with age.

Similarly, Whitten et al. (2013) examination of Canadian male and female university student's perception, knowledge and understanding of infertility, risk factors, and infertility treatments found that students were more concerned with completing their education than about their fertility and future infertility. They concluded that the women had an acceptable understanding of fertility but not of a woman's reproductive capacity.

Tyden, Svanberg, Karlstrom, Lihoff, and Lampic (2006), and Virtala et al. (2011) explored college and university students understanding of fertility and postponement of motherhood. Tyden et al. (2006) discovered that 95% of the students planned to have two to three children with the first child at an average of 29 years old and last child by

age 35. Of these 95%, those students aged 19-23 wanted their first child at age 28, those age 24 and older at age 30, while 4.7% postgraduate students wanted their first child around age 31, and last child by age 37. Tyden et al. also found that students understanding about fertility showed that they were more concerned about timing of future pregnancy, as opposed to age and fertility. Likewise, Virtala et al. (2011) noted that the majority of Finnish university students wanted children in the future but noted a majority wanted to have their first child at age 35 years and older when a female's fertility decreases. Additionally, the researchers also found that 43% of the female students (n = 3,222) and over half of the male students (n = 1,864) overestimated a couple aged 35-40 chances of spontaneous conception during one year of unprotected sex.

Peterson et al. (2012) assessment of American undergraduate university students' knowledge of fertility and their attitude toward parenting aligned with Tyden et al. (2006) in these ways. Peterson et al. (2012) found that the majority of women participants wanted to have their first child between age 25 and 29, whereas Tyden et al. (2006) undergraduate students wanted their first child at between age 28 and 30 within the optimal age 20-30 of maintaining a pregnancy. With regard to fertility and infertility issues, participants reported their knowledge of fertility came from school, family, media, friends, and doctors, while 32% women and 36% men overestimated the age at which women were the most fertile; and 83% of women and 91% of men overestimated the age at which women experience a decline in their fertility. Additionally, Peterson et al. (2012) found that 67% of women and 81% men overestimated the age at which women

experience a marked decrease in fertility. Likewise, Bretherick et al. (2010) found that there participants overestimated the chances of a woman aged 20 (66%), aged 30 (57%) and aged 40 (41.6%) becoming pregnant after one month of unprotected, regular intercourse.

Lundsberg et al. (2014) used an online survey which examined American women 18-40 years of age knowledge, attitudes, and practices regarding conception and fertility. They found that participants aged 25-40 in comparison with those aged 18-24 believed that the ovaries continues to produce new eggs during the reproductive years. They also discovered that women had little knowledge of ovulation and optimizing of spontaneous conception. Lundsberg et al. study showed that they lacked knowledge of their reproductive capacity in terms of fertility, the number of oocytes being produced during the reproductive years, and spontaneous conception.

Researchers suggested that there was not much emphasis on the provision of information to childbearing women regarding their reproductive decisions. Carolan's (2007) study addressed the information needs of first-time mothers aged 35 and older. The women in this study *(n* = 22) were well educated and planned their pregnancies as they would plan their career. The study underscored the fact that although women over 35 years of age were privy to a considerable amount of health information, some of their health education on topics such as timing of first pregnancy was not addressed. These women felt that if their healthcare providers had discussed childbearing with them, and had provided them with preconception education, they would have planned their pregnancies differently. Furthermore, Cooke, Mills and Lavender (2010) research

indicated that there was limited information from which women can use to make informed decisions regarding timing of first pregnancy.

Timing of Motherhood and Childbearing Intentions

Research was well documented of the impact of fertility intentions as a result of a shift in modern day societal attitudes towards parenthood. The shift to postponing parenthood has resulted in fertility rates below replacement levels. In a study of fertility intentions and behavior in the United States (US), Morgan and Rackin (2010) collected data of reproductive history from the 1979 National Longitudinal Survey of Youth (NLSY79) a national probability sample of youth aged 14 to 21 years old. Over a 27-year period these individuals were asked 16 times about their fertility intentions until the youngest reached the age of 41. Although this birth cohort was found to have achieved their intended fertility, many American women and men who postponed childbearing had fewer births than intended due to a reduction of fecundity, lack of a suitable partner, and competing nonfamily activities (Morgan & Rackin, 2010).

Likewise Dommermuth et al. (2011) decided to investigate childbearing parents and childless individuals' intentions to have children when they released a large percentage of women in Norway were having children at aged 45. Furthermore, Moos, et al. (2008) recognized the importance of health promotion in terms of reproductive planning and the consequences of timing of pregnancy to a woman's health. They felt that routine visits to the primary physician are the ideal time to discuss women's reproductive health, the effects of postponing and timing of first pregnancy.

The postponing of first pregnancy is a continuing trend as more and more women are pursuing higher education in order to achieve aspired career goals. Today, young women have increased opportunities in education, and career as part of their life course transition into adulthood. This is an era of career choices for women that were not seen in the past. In an earlier study, Benzies et al. (2006) examined factors that influence younger Canadian women's decision about the timing of motherhood. The factors that emerged from this research were perceived independence from having higher education, secure employment, and financial stability. It was only after achieving their personal goals that the women would be ready for childbearing. In addition, Van Beval (2010) analysis of the postponement of motherhood by European college-graduate women aged 20-40 found that greater postponement of first pregnancy was associated with level of the starting wage and the steepness of the earning profile.

Through her examination of fertility trends in Germany Romeu Gordo (2009), reported that women are having their first child at a later age to ensure that their career was secure before starting a family. The sample was composed of married West German women (n = 532) with an average age of 25.5 at marriage, an average of 12 years of education, and a history of full-time work experience of 6.4 years. The majority of these women had their first child within 4 years of marriage with only 4% waiting for a 7-year period before having their first child. Romeu Gordo's research demonstrated that women's years of education and work experiences have a statistically significant impact on women postponing timing of first pregnancy.

Similarly, Nicolette and Tanturri (2008) using an economic approach found that women tended to delay motherhood due to financial considerations. They also found that women in a number of European countries on average have first births at 2 to 7 years after completing highest education and starting their first job. More than 15% of participants completed their highest education at age 24 and older, with 40% or more in Denmark, and Germany completing their education at that age. The conclusion reached was that women who attained higher education postpone first birth with age at first birth increasing and decreasing after age 30.

As shown by Aronson (2008), young women aged 23 and 24 years old view attaining a college degree and employment as transitions into adulthood. The researcher examined young women's perception of their transition from adolescence to adulthood found that contemporary young women are focused on education, establishing careers, being financially independent, finding the right partner, feeling secure with the right partner, and achieving fulfilling relationship. Although some women acknowledge that they were still dependent on their parents due to the amount of debt they had acquired as a result of student loans, they believed that achieving financial independence from parents was an important factor of becoming an adult. The researcher noted that completing school provided young women with the skills necessary for the work force. The women concurred that marriage is no longer a central part of women's goals to achieving financial independence as it had been in the past.

The trend of young women focusing on completing school and gaining full time employment was also see in Amato et al. (2008) descriptive study of the most common

pathways that a sample of 2,290 young women aged 23 to 25 follow with respect to cohabitation, marriage, parenthood, school, and full time employment. They noted that there have been changes in recent decade in the transition from adolescence to adulthood. Amato et al. found that young adults of today were building their career path and having children later in adulthood.

Holton, Fisher, and Rowe (2009) study examined women's attitudes to motherhood and childbearing desires and outcomes as this has been under-investigated to date in low fertility countries such as Australia. A broadly representative sample of 569 women 30–34 years living in Victoria, one Australian state, were recruited from the Australian Electoral Roll in order to obtain a sample of women who were of reproductive age, for whom childbearing decisions are salient, and a proportion of who already had children. This enabled comparison between mothers and women who did not have children. They found that the majority of Australian women are making decisions about childbearing and having children when they are between 30–34 years of age.

Delayed Childbearing and Involuntary Childlessness

Research has shown that a number of women are involuntary childless due to postponement of childbearing and also as a result of decrease of fecundity (Koert, 2013; Malik & Coulson, 2013; te Velde et al., 2012). te Velde et al. (2012) reported that women who postponed first pregnancies become involuntary childless. Malik and Coulson (2013) used the phenomenological approach to analyze online bulletin board postings of women (n = 49) lived experiences and meaning of being permanently involuntary childless. They found that being childless pervaded all aspects of these

women's lives. Malik and Coulson (2013) identified 4 themes that resonated with these women: 1) feeling like an outsider when interacting with peers who are mothers, being at family gatherings, and hearing pregnancy news in their social network; 2) a whole lifetime of loss throughout their life goals such as loss of unborn children, experiences of motherhood becoming grandparents, and experiencing a child's growth from birth to adulthood; 3) coming to terms with childlessness of trying to accept even after no success with infertility treatments, the reality of being permanently infertile, going for counseling help, or using self-help strategies; and 4) finding a safe haven online which allowed to hear other women with similar experiences who understood their feelings and emotions of pain and anguish, and experiencing the recurring loss periodically through their lives.

Likewise, Koert (2013) paralleled similar themes in her phenomenological study of women who postponed parenthood and are now permanently childless as a result of this delay. Similar to Malik and Coulson (2013), the women in Koert (2013) study experienced a sense of grief and loss of not having a child and the experiences of motherhood and seeing their child grow into adulthood with all the experiences afforded them from the child. Koert also identified that the women felt a sense of being outsiders in a world of mothers, which was similar to Malik and Coulson (2013) participants who identified how they felt being with peers and at family gatherings where children were present. Additionally, Koert (2013) identified that the women who experienced unintentional childlessness after delaying pregnancy felt they were being treated negatively as people made judgment and assumptions about their childlessness as well. These women also felt a sense of powerlessness as they had planned their life goals to

obtain higher education, career advancement, and financial security before finding a life partner. Koert also highlighted that the women in her study came to terms with their childlessness through reconciliation related to their life choices and acceptance through being nurtures in their line of work, volunteering, or being godparents.

Delayed Childbearing and Lifestyle Factors

It is important to include lifestyle factors as they might impact fertility. Co-morbidities such as obesity, diabetes, and hypertension, dieting, smoking, alcohol, stress and sexually transmitted diseases may affect reproduction (Davies et al., 2010; Hammarberg et al., 2013; Lundsberg et al., 2014). Being obese in pregnancy is a serious issue. Women with a BMI >30kg/m are at risk for a number of health and medical complications. These include: obstructive sleep apnea, cardiac and pulmonary diseases, and increased risk for C-section deliveries (Davies et al., 2010). Hammarberg et al. (2013) found that 59% Australian women and men's of reproductive age (18-45) were aware that obesity and smoking influenced a women's fertility, while 30% and 36% were aware that obesity and smoking respectively influences a man's fertility. Lundsberg et al. (2014) also noted that women aged 18-24 lack knowledge of the impact of obesity on fertility. However, Kort, Winger, Kim, and Lathi (2014) found that a reduction in weight loss of 10% produced higher conception and live birth rates.

In a study of the effect of stress on fertility, Buck Louis et al. (2011) found that British women 18-40 years of age with had higher concentrations of the salivary stress biomarker alpha-amylase showed a significantly high reduction of the probability of conception each day of their fertile window.

Summary and Conclusions

Chapter 2 contained the literature review that identified a gap in the literature in relation to Canadian women's knowledge and perception of their reproductive capacity in relation to timing of first pregnancies. As evident from the literature review, the increase in age of women having first pregnancy is a phenomenon being seen in many developed countries and is expected to continue. The majority of the reviewed literature confirmed that young women lack the factual knowledge of their reproductive system, which is why they are not aware of the limits of their reproductive capacity. This gap in literature was addressed by exploring Canadian women's knowledge and perceptions of their reproductive capacity as it pertains to timing of first pregnancies.

Chapter 3: Research Method

Introduction

In the 2 previous Chapters, I provided an introduction to the study, the background of the study, the purpose of the study, the significance of the study, and a review of the literature that demonstrated gaps related to women's knowledge and perception of their reproductive capacity as it relates to timing of first pregnancy. In this chapter, I outline the qualitative method used to gain a better understanding of why Canadian young women lack factual knowledge of their reproductive capacity. In this chapter, I also describe the research design, role of the researcher, criteria for participant selection, method of data collection, data analysis, and ethical considerations.

Research Design and Rationale

I used qualitative methodology to explore Canadian women's knowledge and perceptions of their reproductive capacity as it pertains to timing of first pregnancy. According to Creswell (2009), qualitative research provides the researcher with an understanding of an issue from the participant's perspective while also examining the participant's real-world experience. Qualitative research strategies include exploring participants' experiences through interviews, observation, and documentation (Davies, 2007). Qualitative research can be used to explore phenomena about which little is known (Polit & Beck, 2014). Qualitative researchers view individuals in the context of how they perceive the world and how they interpret their own realities and those of others (Munhall, 2012). Toles and Barroso (2014, as cited in LoBiondo-Wood & Haber, 2014) further articulated that qualitative researchers seek out individuals who have experiences

related to their research in order to understand what meaning the phenomenon has in their life situations.

In qualitative research, there are a number of approaches that can be used. Toles and Barroso (2014, as cited in LoBiondo-Wood & Haber, 2014) posited that a researcher's selection of a type of qualitative research method is based on the phenomenon of interest. Researchers seeking to understand the human experience should choose a phenomenological method, which involves learning from research participants about their perceptions of lived experiences of the phenomenon being studied (Toles & Barroso, 2014, as cited in LoBiondo-Wood & Haber, 2014) In a grounded theory method, the researcher attempts to develop a formal theory (Sandelowski, 2004). If a researcher is interested in learning about participants' culture group, an ethnographic method should be chosen (LoBiondo-Wood & Haber, 2014). The case study qualitative approach is used if a researcher is interested in understanding issues that are relevant to the history, development, or circumstances of an individual, family, group, community, or institution (Polit & Beck, 2014).

The phenomenology approach allows a researcher to discover the true essence of an experience through the eyes of the research participant (Freda, Devine, & Semelsberger, 2003). It involves description of participants' points of view, capturing how they consciously perceive and experience the world through their own interactions and relationships with others and things in the world. The findings from this study provide insight into participants' knowledge and perception of their reproductive capacity and fertility in relation to the timing of first pregnancy.

Role of the Researcher

According to Merriam (2002), the researcher is "the primary instrument for data collection and data analysis" (p. 5). Merriam posits that the researcher as the instrument is able to process information from research participants immediately, have participants clarify or expand on the information provided, and explore any unanticipated information in order to gain a better understanding of the issue or phenomenon under study.

In this study, I asked research participants to complete a brief questionnaire identifying demographic characteristics of age, educational level, and cultural background at the beginning of each interview (Appendix C). Next, I conducted face-to-face interviews by using a digital recorder so that I would not miss any unwritten themes that might be derived from the information. According to Patton (2002), through the interview process, the qualitative researcher can garner participants' opinions, views, and perceptions of the issue or problem being researched. I was familiar with the topic of this study in that I am a woman who has been through the process of delaying childbearing in order to achieve many life goals. I had also cared for women who delayed first pregnancy to an advanced age. It was through this experience that I knew which questions to ask about the topic that would generate the data. Throughout the interview process, any aspect of my experience that might have contributed to potential bias was documented, and I took personal notes.

Methodology

Participants and Setting

The participants in this study were women aged 35-45 years. These participants were women from an obstetrical clinic at a urban center located in Ontario, Canada. Purposive sampling was used to obtain participants who would be representative of the population. The women met the following criteria: (a) they were between the ages of 35 and 45 years; (b) they were thinking about starting a family at the time of the interview; (c) they were not pregnant at the time of the study; (d) they were interested in information about the timing of first pregnancy; (e) they planned to have children in the future; and (f) they could be pregnant at the time of the interview.

The participants came to the clinic for routine pregnancy check-ups and/or gynecological care. A poster was placed in the obstetrical outpatient clinic indicating a need for research participants (Appendix A). It identified the type of research, criteria for inclusion in the research, and my name and contact information.

Research Questions

I used purposeful sampling to select participants for interviews. The interviews were composed of some open-ended questions (Appendix D). The research questions were the following:

> *Research Question 1 (RQ1)*: How do Canadian women perceive their fertility, and how does this perception influence timing of first pregnancy?

Research Question 2 (RQ2): What are Canadian women's knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to timing of pregnancy?

Instrumentation

I had knowledge of the topic and understood which questions I should ask about the topic in order to generate much of the data. I documented my experiences as an instrument and noted potential sources of bias. I kept personal notes in a journal to document my thinking throughout the research process. Morrow (2005) suggested that the researcher as instrument keep a self-reflexive journal from start to completion of the research because this practice helps to bring self-awareness of reactions, experiences, assumptions, and biases that might be elicited in interviewing participants. She further stated that these can be set aside or incorporated into the analysis of the data (Morrow, 2005).

Data Collection and Analysis

The participants were recruited through posters placed in the obstetrical clinic. A purposeful sampling strategy was used in this study to recruit 10 participants, as the goal was to collect data to explore Canadian young women's knowledge and perception of delayed childbearing.

Data Collection

For this qualitative study, data were collected through in-depth interviews. Interviewing was an appropriate way to collect data for this qualitative study because this approach to collecting information can increase response rates as more accurate

information is obtained through probing, noting visual cues, and developing rapport with the participants (McKenzie, Neiger, & Thackeray, 2009). I conducted face-to-face interviews in order to explore Canadian women's factual knowledge of their reproductive capacity, how this knowledge and understanding influence their perceptions of fertility, and their decisions regarding timing of first pregnancy. Semistructured, audiotaped interviews with research participants allow a researcher to get as much information as possible about participants' perceptions. Janesick (2011) stated that in interviews, the research interviewer should be able to read the interviewees' body language, be well prepared with questions that probe, clarify, and that are descriptive in nature.

I had research participants complete a brief questionnaire identifying demographic characteristics of age, educational level, gender, and cultural background at the beginning of the interviews (Appendix C).

Data Analysis

In qualitative research, the researcher seeks to understand a phenomenon from the lived experiences of the research participants. From the interviews conducted for this study, a vast amount of data was collected that consisted of the participants' own words. I read and reread the information I received from the participants. The data were coded into themes through the process of reading and rereading interview transcripts. Data collection and data analysis were done simultaneously until theme saturation occurred. This was done over a 2-week period. Patton (2002) validated the importance of software being part of the data analysis process and of picking the right qualitative software, given

that there are software options to store data, code data, and retrieve data. The interviews with participants were subjected to thematic and content analysis (Creswell, 2009).

Thematic analysis is a method that qualitative researchers use to identify, analyze, and report themes. It draws on the principles of phenomenology in order to gain insight into the lived experiences of participants. Themes are concepts in qualitative research that make meaning out of the research participant's words and represent aspects of the lives of the research participants (DeSantis & Ugarriza, 2000). The themes were supported by quotations from the interviewees' perspectives and experiences identified in the interviews. The identified themes were also reviewed in order to make sure they worked with the extracted codes and the data collected from the interviews.

The transcribed answers were imported into NVivo 9 qualitative data analysis software during the data collection period in order to manage the amount of data and facilitate coding. During analysis, the data were coded into a number of themes. I used reflexive journaling in order to prevent researcher bias. NVivo supported the analysis of qualitative data by managing and organizing data, storing data, managing ideas, querying data, and reporting from the data. NVivo is good for small or large amounts of data and allows for importation of interviews (Bergin, 2011). Importing the interviews allowed me to play, analyze, transcribe, and relisten to the audio of the interviews. NVivo kept the data organized and served as a data management tool to store and retrieve the large amount of data that was generated from this research.

Inductive content analysis was used to analyze the themes that came from participants' descriptions of their experience (Creswell, 2009). In the process of

analyzing the data, I read the transcribed data from the interviews, made notes as the data were read, and developed categories that were similar and reflected the research topic. According to Elo and Kyngas (2008), inductive content analysis was best suited for this type of research, as there were no previous studies on Canadian young women's knowledge of their reproductive capacity and literature in this area was limited.

Issues of Trustworthiness

Credibility

In qualitative research, determining credibility is an important first step in verifying trustworthiness of the findings. Strategies to determine the rigor of study findings include prolonged engagement and persistent observation, triangulation, peer debriefing, and member checking. The strategy of member checking was used to determine credibility in this study by having some participants check the transcribed data for accuracy and clarification of the information.

Transferability

Transferability is demonstrated through the information that researchers provide about themselves as the instrument, about the participants, and about the relationship between the researcher and the participant (Morrow, 2005). The selection of participants was based on the availability of those who met the criteria for this study and were clients of the hospital.

Dependability

Dependability involves the stability of the data, in that the research process must be clearly documented. This is achieved by the researcher keeping an audit trail that

shows details about the "research activities and processes; influences on the data collection and analysis, emerging themes" (Morrow, 2005, p. 255). An audit trail was used to outline decisions made during the research process (Houghton, Casey, Shaw, & Murphy, 2013).

Conformability

Conformability is confirmed when the researcher uses the participants' own words extracted from the data (Polit & Beck, 2014). The data and the researcher's findings reflected in the integrity of the data are clear and credible. Reflexivity was also used in order for me to keep an account of my experience of the process, thoughts, and feelings throughout the interviews, transcription of the data, and data analysis.

Ethical Procedure

I obtained Institutional Review Board (IRB) approval from Walden University (04-06-15-00061763). The IRB review of the study ensured that safety and privacy concerns were minimized, that research participants were not exposed to any risks, and that the research design was sound (Walden University, 2011). I also obtained approval from the board of ethics at the hospital.

Three ethical principles are of relevance to the conduct of research involving human subjects. These principles are (a) respect for persons, which involves giving individuals the freedom to participate or not participate in research; (b) beneficence, whereby there is an obligation to do no harm and make every effort to secure a person's well-being; and (c) justice, whereby individuals and communities are treated fairly (Crosby, DiClemente, & Salazar, 2006). I told research participants that the interview

would be tape recorded and that the tapes would destroyed once I had obtained my doctorate.

Informed consent was obtained from participants without any form of manipulation or coercion. The participants were told about the research; the risks and benefits of participation, if any; and the purpose of the research, and they were assured that refusal to participate would not involve any penalty.

Health research involves human subjects. A *human subject* is defined as "a living individual about whom an investigator obtains data through intervention and interaction with the individual or about whom the investigator has recorded individually identifiable private information" (Crosby, DiClemente, &Salazar, 2006, p. 46). The participants who were invited to participate received detailed information about the research study. I told them that confidentiality would be maintained through codes corresponding to each person's name and age. When the women agreed to participate, I gave them a consent form to sign. I told the participants that they could change their minds at any time.

Summary

Chapter 3 has included a review of the methods used in conducting this study and a description of the steps undertaken to conduct this study. This qualitative exploratory study allowed me to collect rich data on Canadian young women's knowledge and perceptions of their reproductive capacity. In Chapter 4, I present the results of the study, which include verbatim quotations from each participant. Chapter 4 ends with a summary that links to the discussion in Chapter 5. In Chapter 5, I present discussion, conclusions, and recommendations.

Chapter 4: Results

Introduction

The purpose of this phenomenological study was to explore Canadian women's knowledge and perceptions of the consequences of delaying their first pregnancy and what is needed to encourage women to bear children at an optimal age of 24-29. An important part of this study was the exploration of Canadian women's knowledge and perceptions of their reproductive capacity and fertility in relation to the decision to postpone childbearing to an advanced age.

The findings from the data in a study must be described so that readers are able to identify the data collection methods, where the data came from, the amount of data, and the amount of time spent gathering the data. The reader must be able to discover what the researcher has learnt from the research and how the researcher acquired the information. In presenting the findings to the reader, the researcher ensures that there is evidence of quality.

In this Chapter, I describe the setting in which the study took place, participant demographics, data collection, data analysis, and steps taken to ensure trustworthiness when answering the research questions:

Research Question 1 (RQ1): How do Canadian women perceive their fertility, and how does this perception influence timing of first pregnancy?

Research Question 2 (RQ2): What are Canadian women's knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to timing of pregnancy?

The purpose of this phenomenological study was to explore Canadian women's knowledge and perceptions of the consequences of delaying their first pregnancy. Analysis of the women's feelings and reactions helped in identifying their knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to timing of pregnancy.

Research Setting

I conducted the study at an urban hospital in downtown Toronto, Canada. I was allowed to put up a poster in a number of obstetricians' offices to obtain participants. I did not have previous knowledge or information about any of the participants, other than knowing that they had visited an obstetrician for a scheduled prenatal checkup with regard to the progress of their pregnancy. The recommendation of the Society of Obstetricians and Gynaecologists of Canada (SOGC, 2015) is for women with normal pregnancies to have an initial appointment with an obstetrician, with subsequent appointments every 4-6 weeks during the beginning of the pregnancy, every 2-3 weeks after 30 weeks, and every 1-2 weeks after 36 weeks until they go into labor. Many of the participants were in their 24th-39th week of gestation, with only one of them at 19 weeks of gestation at the time of the interview. The participants were directed by a number of nurses to a poster that identified the type of research and criteria for inclusion in the study. I was then contacted about their willingness to participate in the study.

The women in the study met me in a meeting room on one of the postpartum units of the hospital, with the exception of five participants who were antenatal admissions in the hospital. These five women were each in a private room and were interviewed in their

rooms because they were on bathroom privileges only. At the first meeting, I went over what was involved in the study and obtained demographic information, which included the participant's age, marital status, ethnicity, and education. Informed consent was obtained from participants without any form of manipulation or coercion. The consent document explained the reasons for conducting the study; it also provided the participants with information about the interview process as well as my email address. In addition, the consent form included a sample of interview questions. The participants were told about the research; the risks and benefits, if any; and the purpose of the research, and they were assured that refusal to participate would not involve any penalty.

After reading the information provided in the consent form, each woman signed the form and asked if she could be interviewed at the same time. None of the women asked any questions about the research. I reinforced that the interview could take about 60 minutes, but the women felt that they could answer the questions listed on the consent form in less than the allotted time. This proved to be true, as the interviews lasted 10-45 minutes even with added questions elicited from the answers provided by each woman.

Demographics

Ten first-time pregnant women agreed to the interview. I knew only one of the participants selected. I obtained demographic information from each of the participants before the interview began. This included age, marital status, cultural background (race), and education (Table 1). The basic requirements for participating in the study were that participants were between age 35 and 40 or age 40 and 45. The participants represented various ethnic backgrounds; six identified themselves as Caucasian, two as other, and two

as Black. Eight of the participants were married, with only two being single. All of the women had completed a bachelor's degree, with one having a master's degree. All of the participants were currently pregnant with their first child and were eagerly looking forward to the birth. One participant had started trying to conceive just after she got married at 34.5 years of age and was pregnant with her first child at 19 weeks gestation at the time of the interview. Another of the participants had been trying to conceive since the age of 29, 6 years prior. Some of the women were self-referred, having seen the poster, whereas others were referred by nurses at the hospital to the research poster. All of the participants met the criteria for inclusion in the study.

Table 1

Demographic Information of Participants

Participant	Age	Education	Marital status	Ethnicity
1	42	Bachelor's degree	Single	Other
2	40	Bachelor's degree	Married	Caucasian
3	40	Bachelor's degree	Married	Other
4	45	Master's degree	Married	Caucasian
5	37	Bachelor's degree	Married	Caucasian
6	35	Bachelor's degree	Married	Black
7	37	Bachelor's degree	Married	Caucasian
8	37	Bachelor's degree	Married	Caucasian
9	35	Bachelor's degree	Single	Caucasian
10	43	Bachelor's degree	Married	Black

Data Collection

Ten women participated in the study. All in-depth interviews were conducted at the hospital and were audio taped, which allowed me to get as much information as possible about the participants' knowledge of their reproductive capacity, how their knowledge and understanding influenced their perception of fertility, and their decision regarding the timing of first pregnancy. The women were eager and willing to talk and share their knowledge and perception of why they had delayed childbearing to a late maternal age. Al-Yateem (2012) suggested that interviewers "allow time before interviews to tell participants something about themselves and create a feeling of being known" (p. 34) in order to build a sense of trust "in a relatively short space of time" (Al-Yateem, 2012, p. 34). I identified myself as a nurse working on the Mother and Baby unit of the hospital and as a nurse with experience in caring for women who had delayed first pregnancy to a late maternal age.

All of the women wanted to be interviewed at the time that consent was obtained. A number of the participants were admitted to the hospital at/or around 28-32 weeks gestation, and 1 was admitted at 24 weeks due to issues with the pregnancy. One participant was at the obstetrician for her initial visit and was 11 weeks pregnant. I obtained permission from the participants to use a digital recorder to record the interviews. I told the participants that confidentiality would be maintained through codes corresponding to a number and age.

I conducted face-to-face interviews by asking open-ended questions that explored the women's factual knowledge of their reproductive capacity, how this knowledge and

understanding had influenced their perception of fertility, and their decision regarding the timing of first pregnancy. All interviews took place between June and November 2015. Each interview was guided by unplanned questions that came out of the interview as well as some structured questions. Audiotaped semistructured interviews with research participants allowed me to get as much information as possible about participants' perceptions. Additional questions emerged from the interviews and were used to clarify, expand, and probe the information provided in order to gain a deeper and richer explanation of the phenomena under study. This allowed for saturation of information. Each interview was expected to last for an hour. However, the average length of interviews was 10-35 minutes. At the end of each interview, I asked the participant if she had anything else she would like to share or clarify regarding her experience of having a first pregnancy at a late maternal age. I concluded the interviews by thanking participants for agreeing to the interview. I also reminded them that they could contact me at any time if they wanted to clarify anything that was said in the interviews.

Throughout the interview process, I was aware of the knowledge and experience I had about the topic, which may have been potential sources of bias. Participants were aware of my role in the hospital as a mother-and-baby nurse, as it was declared in the study proposal. I ensured that I did not share personal opinions or viewpoints reflecting my own experience of delaying childbearing to a late maternal age throughout the interview process. Each digital recording was sent to my hospital email address so that I could have recordings safely transferred to my home desktop computer. The recorded interviews were transferred to my home office computer, where each has been stored and

password protected. At the end of each interview, I made notes in a journal regarding my feelings, any assumptions or biases that might affect the research, and the participant's nonverbal reactions. I listened to each recorded interview to get a sense of what each woman said in the interview. I transcribed the recordings verbatim, including nonverbal cues such as a laugh or giggle. I then saved them numerically in a Microsoft Word document, which was accessible only by password. I also printed a hard copy of the transcribed data for easy access during the data analysis process.

Proper names were not used; I assigned numbers to each study participant to protect her privacy and as a means to de-identify the data. There were two variations in data collection from what was presented in Chapter 3. One variation was that the participants were interviewed immediately after consent was obtained. The second variation was that some participants were interviewed in their private hospital room.

Data Analysis

Regarding the analysis of phenomenological data, Creswell (2013) suggested that transcripts be reviewed and that significant statements be put into themes. The transcribed answers from the Microsoft Word document were imported into NVivo 9 qualitative data analysis software during the data collection period in order to manage the amount of data and facilitate coding. The data were coded into a number of themes through the process of reading and re-reading interview transcripts. Data collection and data analysis were done simultaneously until theme saturation occurred. This was done over a 2- to 4-week period. I used reflexive journaling in order to prevent researcher bias. NVivo supported the analysis of qualitative data by managing and organizing data,

storing data, managing ideas, querying data, and reporting from the data. The importing of interviews allowed me to play, analyze, transcribe, and relisten to the audio of the interviews. It kept the data organized and served as a data management tool that enabled me to store and retrieve the data that were generated from this research. Throughout the process of analyzing the data, I read the transcribed data from the interviews a number of times to ensure accuracy, made notes as I read the data, and developed categories that were similar and reflected the research topic.

Inductive content analysis was used to analyze the themes that came from participants' descriptions of their experience (Creswell, 2009). Through the process of analyzing the data, I read and reread the transcribed data from the interviews, made notes as the data were read, and developed categories that were similar and reflected the research topic. I listened to the recorded interviews a number of times to ensure that I had captured each word verbatim. This process allowed me to recall the connections gained with the majority of the participants as well as the laughter and giggles at the time of the interviews. As I listened to each interview, I noted on a hard copy of the interview transcript frequently used words that could be coded. According to Elo and Kyngäs (2008), the organization phase of inductive analysis includes open coding and creating categories.

The themes were supported by quotations from the interviewees' perspectives and experiences identified in the interviews. The identified themes were also reviewed in order to make sure that they worked with the extracted codes and the data collected from the interviews. In the thematic analysis, the themes that emerged from the data were the

following: a) pregnancy prevention, b) priority of life course transitions, c) lack of a partner, and d) feeling judged. Verbatim statements made by the participants supported these themes.

Evidence of Trustworthiness

In this section, I discuss the standards used to describe the trustworthiness of the data: credibility, transferability, dependability, and conformability (Polit & Beck, 2014). Cullum, Ciliska, Haynes, and Marks (2009) advised that good quality research should demonstrate findings in a way that is easily accessible by readers, that there should be a clear relationship between the actual data and conclusions about the data, and that the claims made about the data should be credible and trustworthy. Credibility and trustworthiness ensure the quality of research findings. The reader of the research must be able to trust that the presented research findings are true to the data collected.

Credibility

In qualitative research, credibility is an important first step in verifying the trustworthiness of the findings. Strategies to determine the rigor of study findings include prolonged engagement and persistent observation, triangulation, peer debriefing, and member checking. The strategy of member checking was used to determine credibility in this study by having some participants check the transcribed data for accuracy and clarification of the information. Member checking was only done with 3 of the participants. They were given a copy of the transcript and asked to review and make any additional comments. One participant chose to clarify verbally what she had been trying to say about communication between her and her child. Another participant added

more information via email. To verify the credibility of this study, quotes from the participants were also used to support the research findings. This ensures credibility because the participants are able to recognize the transcribed information as their own. However, contact was only made with 2 participants, which was a limitation of the study.

Transferability

Transferability is demonstrated through the information that a researcher provides about him- or herself as the instrument, about the participants, and about the relationship between the researcher and the participants (Morrow, 2005). I made notes on the process of data collection and analysis so that a reader could use this information to replicate this study.

Dependability

Dependability addresses the issue of the stability of the data, in that the research process is clearly documented. This is done by the researcher keeping an audit trail that shows details about the "research activities and processes; influences on the data collection and analysis, [and] emerging themes" (Morrow, 2005, p. 255). Reflexivity was also used in order for me to keep an account of my experience of the process, my thoughts and feelings throughout the interviews, the transcription of the data, and data analysis.

Conformability

Conformability is confirmed when the researcher uses the participants' own words extracted from the data (Polit & Beck, 2014). The data and the researcher's findings reflected in the integrity of the data are clear and credible. According to Morrow

(2005), "the researcher must adequately tie together the data, analysis and findings in such a way that the reader is able to confirm the adequacy of the findings" (p. 255). An audit trail was used to outline decisions made during the research process (Houghton et al. 2013). The use of NVivo 9 allowed me to be objective when analyzing and interpreting each interview, as it kept a record of decisions made.

Study Results

In qualitative research examples of participants' verbatim statements are used to add credibility to interpretations of their experiences as identified by the researcher. The themes were supported by quotations from the interviewees' perspectives and experiences identified in the interviews. The identified themes were also reviewed in order to make sure they worked with the extracted codes and the data collected from the interviews.

Research Question 1

The data collected from the 10 participants were used to answer the 2 research questions. The first research question: How do Canadian women perceive their fertility and how does this perception influence timing of first pregnancy? This question sought to gain an understanding of the women's feelings about their fertility. The specific interview questions that relate to this research question asked were:

Table 2

Interview Questions Used to Answer RQ1

1. Where did you get your knowledge about sexual health education?
2. What type of sexual education did they provide?
3. What is your understanding of your fertility
4. Did you think about your fertility in your twenties?
5. Why did you wait until your age to become pregnant for the first time?

The themes derived from the data related to Research Question 1 were: *Pregnancy prevention, priority of life course transitions, lack of a suitable partner, and personal choice*. These themes were discussed below.

Pregnancy prevention

Most of the participants said that their sexual education knowledge came mainly from middle school in form of abstinence or protection. In Canada, children between the ages of 11-15 attend middle school and are in grades 6-9. The sexual education curriculum of Canadian schools does not provide information to students about their reproductive capacity or fertility.

> Participant-01: School mainly. I don't remember discussing anything about fertility. I don't remember in high school they stressing about having kids at a younger time.

Participant-02 said that she did not learn about sexual education in school. I went to a private school. They don't do it. They do a general health not sex education.

It is not part of the curriculum. Learnt from friends. Research when I became older and in my twenties Maybe in my late 20's, just reading and the Internet and things like that.

Participant-03 stated that sexual education was part of school curriculum in high school but I don't remember. So long time.

Participant-06 also mentioned that middle school was where she learnt about sexual education. "Only about protection. No fertility."

Participant-07 also said she was learnt sex education at school: Yes but they did not really talk about age of getting pregnant. They did not talk about fertility; not that I remember and I probably wouldn't have cared about it back then.

Participant-08 said in reference to school of how not to get pregnant, said it was 'it is so drilled into you to not do it"

Participant-09: School more or less talked about how to not get pregnant. The very basic; more like the mechanics.

Participant-10 said that in her country of origin sexual education at school provided students with the basics. "They talked about diseases and how to prevent unwanted pregnancies but they never talked to you about age at which to get pregnant or about fertility."

Priority of life course transitions

Although participants were aware that their fertility influenced the timing of their first pregnancy, they did not think about their fertility in their twenties. The majority of

the participants stated that school and career took priority over relationships and pregnancy.

> Participant-01: I did not think about my fertility because I was still going to school, getting a university degree, getting my foot wet in nursing so I had lots of time. Initially it was school. I wanted to get that out of the way, then after that I needed to work, get a full time job.
>
> Participant-02 said that you never really think about your fertility as a young person. You know, you don't really think about it. I have done everything up until, you know, I have had a very fruitful life, in a sense with school, and travel, and I have done all of that, so now I'm content and ready to be a parent. I had to conquer everything before I could kind of settle down.
>
> Participant-03 was a new immigrant to this country. She said that she came to Canada and her focus on studying and finding a job. I came here. I studied and time passed.
>
> Participant-04 said that it wasn't so much about what made her wait to delay first pregnancy. She completed her studies which took many years and then 'having a busy job."
>
> Participant-09: I don't think it was an option for me really because of career, and trying to get through school and get stabilized in a job and you probably hear that a lot. You don't have time for it in your twenties anymore because you are stuck in school. Once school was over, had a house and felt that financially able to do this.

Lack of a suitable partner

The majority of participants said that after they had achieved the many life course transitions of school, being financially stable, and enjoying life they lacked a suitable partner for marriage and family. Many of them met their husbands in their late thirties and tried to get pregnancy immediately.

Participant-01: The main reason why I delayed is because I did not have a partner.

Participant-02: I didn't meet my husband until a later age. She giggles as she said she was enjoying life.

Participant-03: Also commented that she got married later; "last year." In her culture women shouldn't get pregnant unless they are married. She further clarifies this by saying that in her culture "we have, usually they get married. After that they are going to have the children."

Participant-06: I got married only when I was 34 and that was the main factor. I had only met my husband a few years before that.

Participant-07: I wasn't with the right person. This participant said that people shouldn't get pregnant with the wrong person and have kids with the wrong person because they were in a rush to get pregnant due to late maternal age.

Participant-08 said she was with anybody "I would have felt supportive having children with. I met my husband in 2012. I was in my mid 30s. I got married in 2014".

Participant-10: This participant said that she would have wanted to get married early but there were obstacles, which she chose not to elaborate about. She further

said, “It wasn’t that I wanted to wait. It is my belief and culture. I wanted to be married before I had a baby. I didn’t want to have children out of wedlock.”

Conscious choice

Although two of the participants had some knowledge of fertility to timing of first pregnancy, they still chose to wait until a time when they had found themselves a partner.

Participant-01: I have endometriosis and I know it would affect my fertility but I never really thought it would affect my fertility that much.

Participant-02: I think it is an individual choice. It’s not a bad thing, to have a child in your late 30’s or early 40’s. We’ve got science now and it’s so easy. You know fertility meds, IVF, surrogate mothers, so I think it’s just a choice. I think it’s a personal.

Participant-03 had no choice but to wait based on her cultural values and beliefs even though she knew there might be possible issues with her fertility. “My periods were so irregular. Maybe twice a year, and at the time I had checkup, doctor said I had to have operation.”

However, participant-09 said she made a conscious choice to wait until she was in her thirties before considering a pregnancy as a single woman. She said, “I always knew I would try around 32-33 depending on my financial situation.” She also described herself as asexual. She said, “I have never had any interest in the opposite sex.”

***Research Question 1* summary**

The findings of research question one which sought to gain insight into women’s understanding of their fertility are consistent with the literature review in Chapter 2. The

themes that emerged from this question were pregnancy prevention, priority of life course transitions, lack of a suitable partner, and personal choice.

Reflecting on their perception caused many participants to realize it was the right decision they made for their life. These participants had accomplished the things they wanted to do such as having a career they enjoyed, travelling, meeting a suitable partner to start a family, and being financially secure. Most of the participants felt that having babies before they were financially stable would not be good for them or their babies. They all agreed that they were physically and mentally ready to be parents as they were healthy and in good physical shape for whatever comes their way.

Research Question 2

The second research question asked: What are Canadian women's knowledge and understanding of late maternal age, fertility, reproductive health and reproductive capacity as they relate to timing of pregnancy? Table 3 shows sub-questions were used to support the research question during the semi-structured interviews:

Table 3

Interview Questions Used to Answer RQ2

1. What is the recommended age to become pregnant for the first time?
2. What do you know and understand about your reproductive capacity?
3. What do you know about the physical and medical consequences of delaying pregnancy to late maternal age?
4. Do you go to your doctor for a physical, annual checkup?
5. Do you think that family doctors should be having discussions with women about their reproductive system and if they plan to have babies?

The following themes emerged that answered the research question two include: *Age 30, Naive about Natural Conception, Age Gap, Fertility Specialist, Family Doctor, Having Energy, and Feeling Judged.*

Age 30.

To gain information about the women's knowledge and understanding of late maternal age, I asked the women if they knew what is the recommended age to become pregnant for the first time. The majority of women responded 30 or under 30.

Participant-01: Under 35. Because of what I know now I would have changed when I got pregnant, 30, 31

Participant-03: I think 20-30 and when asked if it is something she knows or what you think it is, she replied "I know" because in the country from which she immigrated, ("back home") "women got married when they get to 20, 25 and they will have children then". Most of them before 35.

Participant-05: Younger than I am now.

Participant-07 said from reading blogs and during fertility treatment she found out that the recommended age to become pregnant for the first time is age 28

Participants were further asked what knowledge do you have about late maternal age, of 35 and older.

Participant-01: That it is not ideal to have a baby that that time because your eggs are older and the quality is not as good and your health may be at higher risk than if you had a baby younger.

Participant-03 said that based on her knowledge from her country of origin it is better to have babies before that age of 35. She said, "It is a risk. I know so much of medical issues, I will get and baby will get. Down's syndrome for baby. They found out I have a genetic problem and they send my blood umm.. after that they couldn't find, no nothing.'

Participant-04 said as an older woman going through menopause 'the risks are slightly higher, the risk of preeclampsia goes from 3% to 6%. It's not like it goes from 3% to 60%. So it didn't seem outlandish to me."

Participant-06 said that through nursing, she learnt that 35+ is considered late maternal age. She said, "Increased miscarriage rate, increased rate of disorders like Down's syndrome and stuff like that. Other complications that could arise, like premature birth.

Participant-07: That it would be better at a slightly younger age. I knew that over 40 was getting late, but I didn't have any specific age cut off mark in mind.

Participant-08: I guess my question is. I did a project where there were these women rushing to have babies because it was safe to have pregnancies done by age 25, 28; whatever the arbitrary number. My question is 35 is an arbitrary number and ar e all the women having their babies when they are more established may actually be making a correct for them. My family history; my mother's mother was in the 1940's, my grandmother got married at 36 and she had 5 children and my mother was the last one. My mother only remembers her mother having grey hair. My father's mother, my grandmother got married in her

30s and she was in her 40s when she had identical twins with a midwife at home and they are all fine.

Naive about natural conception

Participants were provided with a definition of reproductive capacity as the amount of eggs you have, the ability to get pregnant, and maintain a pregnancy in late maternal age in order to find out their perceptions of their fertility.

Participant-01: For me to get pregnant it took me 2 years and I never in my wildest dreams thought it would take that long. I thought it would be like bang, bang, and done. Game over but no.

Participant-02: In terms of reproductive capacity, participant friends did talk a bit about their reproductive capacity in terms of the number of eggs you have and through research of the Internet on her own.

Participant-06: In terms of fertility, I know your eggs start to decline when you hit 30, and your miscarriage rate is about 1 in 5? From 30 onward, and by 42 its almost one in every two. So I figured my chances are 1 in 4, 1 in 3½ or so.

Participant-07: I guess before this pregnancy my understanding of my reproductive capacity was slim to none but since this pregnancy and the troubles I have had with it is probably pretty good now.

Participant-05: I thought that as long as I was having periods, there was a chance that I was going to get pregnant, and I didn't realize how low, low, low, that chance was. I was actually a bit naive that way.

Participant-10: I probably thought that if I have a period I would get pregnant for the first time. We had issues but we found out early so we have been trying for about 6 months to a year.

Age gap

Of the 10 participants interviewed, 2 of them were concerned about the age gap between them and their children. Participant-05 was having difficulty articulating what is the issue between the age of the older parent and the child. Many times I had to have her clarify what she was trying to say. For example, "What I am hearing you say, that having younger parents as the children grow there are some similarities in the way that they are growing and there is not a big divide between their thinking and how society is being portrayed between the younger parent and their child as opposed to the older parent and their child. So you are seeing there is a gap?

Participant-03: When they have babies at younger ages, good for everyone. I mean, so good for the children and the parents. The growing. When the children grow old, if their parents are so young, they can understand them better. Children have to have some age growth and should be close with the parents. They have to be close to the parent. When the parents are growing away from them it is not good for the children growth mentally and physically. Maybe they would turn into if we can be the same age as them, we can provide love and friendships and least stay away from bad way. Guide children the proper way to go away from the bad side and find your way like that.

Participant-07: I am older and do not have enough energy. I always kind of worried about the gap that would be between my child and me. When you are younger maybe you can be closer. My husband for example his mother is 40 years older than him. She was 40 when she had him. It is a different level of a relationship when your parent is that much older. I am going to have a younger child when I am close to retirement. Those things cross your mind.

Following the mention of age gap by a couple of participants, two more participants were asked about age gap between them and their children.

Participant-08: I think I have a young outlook. I spend a lot of my time with people in their twenties. I am not concerned about connecting with them but when they turn 16, I am going to be 53 and I am going to have teach somebody how to drive my 53-year-old person's car. I am not worried about connecting with them.

Participant-06: I am concerned about the age gap in terms of spending less time with my own child, and most likely not knowing my grandchildren for very long if at all, especially if the trend to get married and have children at a later age continues. The older you are, the more likely you are to miss those milestones that younger parents don't really worry about. You won't be close to retiring when your child gets married and will have more energy to help with grandkids if you have your children at an earlier age. Children tend to be dependent on their parents for longer nowadays as education becomes increasingly lengthy and more expensive, and my own parents worry about seeing myself and my sisters "settled" into a career and marriage, as they are about to retire and were hoping

> we would all be financially secure and they could rely on us when their own health issues become too burdensome for them. When there's a large age gap, it's less likely you'll have a child who owns a home (that parents may visit or move in with eventually) and have saved enough money to be financially secure enough for the future.

Member checking was done with participant-03 to clarify what she meant about there being a big divide between parent and child thinking. However, she delivered about 7 days later and with the stress of dealing with a premature baby, being in the NICU, I mainly asked for clarification of the theme about age gap that emerged and that other participants did not address in their answers.

> Participant-03: Society is changing and as society change and I grow older and he is becoming a teenager, we will see things differently. Our views will be different of what is going on. I will have to research how to talk to him; how to understand his views of the world; how to connect with him.

Fertility specialist

Five of the participants consulted fertility specialist for different reasons but all related to reproductive issues including gamete donations. Participant-07 because she and her husband had been trying for years to get pregnant. Participant-10 because she could not understand why she was not getting pregnant. Participant-01 was single and still had no partner. Participant-09 who wanted to be a single mother while participant-04 was menopausal when she decided to have a baby.

> Participant-01: If I didn't have a partner, I would delay even more which is the

main reason why I delayed because I did not have a partner. I don't have a partner.

Participant-04: I actually thought that I was too old, but I met with a fertility specialist. I was already 6 months into menopause, probably. Well I left it too late, using my own eggs.

Participant-07: We tried on our own for about 4 or 5 years without any success so we went to see a fertility specialist and then doing treatments for 2-21/2 years and none of it worked.

Participant-09: I figure donor sperm would be the best route for me. I could pick something. Have it done medically and not have to go through all that stuff to get to pregnancy.

Family doctor

To find out if participants had discussions with their family doctor about their reproductive system they were asked if they had annual checkups with their doctors and if there was anything the doctor said about their reproductive system and if they plan to have babies? The majority of participants said that their family doctor never asked them if they were planning on getting pregnant at some point in your life but they felt it might be a good idea for the family doctor to have had this discussion with them.

Participant-01: She knows my history so I have endometriosis. But she did say I could have babies and when are you thinking about having a child. She was good about that. I would say I am getting there.

Participant-02: felt it was a good idea when you get to a certain age, the family doctor should be asking you if you plan to have kids at all.

Participant-06: They could. I think that they do ask you just about relationship stuff. So probably when I was 30 I was single, so if they asked that I don't remember. They definitely didn't ask anything about thinking about pregnancy, or fertility or anything. But yes, I think that that would be a good idea, to at least give that information so that you're aware. They definitely should, because if I was not a nurse I would not have any of this information. I would have probably waited a year or two after I got married, and thought 'ok I can wait until I'm 36'. You don't think about all the risks that are involved because it's just more commonplace.

Participants-08: This 35 number is just a construct and maybe we should have doctors talking to women about life coaching and planning. Do not like my family doctor. He is my father and brother's doctor. He tried to talk to me about going on birth control. I am engaged in a serious relationship. The assumption of the conversation, he did not follow-up what are your plans for your life.

Having energy

The participants in this study were all over the age of 35 and working full time. When I asked the participants if they were physically and mentally ready to have a child, a number of participants mention having no energy to look after their children and keep up with them as they get older.

Participant-03: When the parents are young they would be so many ways they have the energy to work and feed the children. The parents when they grow old they have not much energy.

Participant-06: the younger you are, the more energy you have to keep up with children, and after 35, or 40, you energy levels naturally begin to fall which I think would make it more difficult to cope with small children and working at the same time

Participant-07: Physically no. Just because I am older and do not have enough energy.

Feeling judged

One participant felt that because she was over 35, and having a baby at a later age she felt that the healthcare professionals were pointing fingers at her because she was doing this now. Another participant felt she was being judged by her community each time she visited her country of origin.

Participant-8: In every medical appointment I had gone to through the entire pregnancy I felt that when people brought up my age they were pointing a finger at me, wagging a finger at me and that I left so many appointments feeling like the crypt keeper. I got asked for my Id at the liquor store on the same day that I had been to a medical appointment and I was thinking how strange it is that so much of that was pointing at me was for being doing and doing this whereas I was at the liquor store and they wanted to make sure I was old enough. The way the doctor thinks. It oozes into everything you do when you are treating somebody I

you think that about them and I mean if everybody is having their kids at this age and if that is the friend then maybe all of the doctors that we are going to deal with then maybe they should pull their socks up, start dealing with this as if it is the new normal and don't way the finger at the person who is doing it now.

Participant -10: Each time I visited my country people would be whispering behind my back

Research Question 2 **summary**

The findings of research question 2 sought Canadian women's knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to timing of pregnancy. The women's knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity were consistent with the literature review in Chapter 2. However, the themes that emerged from this question; *Age 30, Naive about Natural Conception, Age Gap, Fertility Specialist, Family Doctor, Having Energy, and Feeling Judged* were not consistent with the literature review.

Summary

In Chapter 4 I discussed the results of this study. Results of this study indicated that women's understanding of the limits of their fertility is inaccurate in terms of the narrow window for fertility, chances of natural conception, the impact of long term use of conception, and the use of ART to compensate for age-related fertility decline. Although participants were aware that late maternal age could affect fertility, I found that participants do not believe it is necessary to have a first child at the optimal age of 25-29.

I also found that participants were conscious of their decision to delay timing of first pregnancy by choosing to complete their studies, pay off their school debt, establish a career, be financially secure and travel. These participants came from an attitude of completing some of life's biggest accomplishments before contemplating the expected societal norms of marriage and family. To ensure that they met their life plans participants maintained conception control and seem unaware of the impact of long term use of contraception on their fertility.

In Chapter 5, I discuss interpretation of the findings, limitations of the study, recommendations for future research, implications of the study, methodological, theoretical, and empirical implications and positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this phenomenological study was to explore Canadian women's knowledge and perception of the consequences of delaying first pregnancy. This study fills a gap in the literature regarding factual knowledge of women's reproductive capacity. Data were collected from 10 participants to explore their knowledge and perception of their reproductive capacity and fertility in relation to their decision to postpone childbearing to an advanced age.

Participants of this study were asked semistructured questions that addressed the following two research questions:

1. How do Canadian women perceive their fertility, and how does this perception influence timing of first pregnancy?
2. What are Canadian women's knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to timing of pregnancy?

Findings from this study were compared to the literature review in Chapter 2. I also used the theory of planned behavior to analyze the findings in order to find out if participants' knowledge and perception of their reproductive capacity aligned with those in the literature.

In this study, several themes were identified for each of the research questions. Themes that emerged from this study confirmed what was found in the peer-reviewed literature described in Chapter 2. These included pregnancy prevention, conscious

choice, priority of life course transitions, age 30, naive about natural conception, age gap, fertility specialist, family doctor, having energy, and feeling judged. However, there were four unexpected findings that addressed some of the other concerns Canadian women have as first-time mothers at a later maternal age. These themes—age gap, having energy, use of donor gametes, and being judged—appeared to be unique to this group of first-time pregnant women. Limitations, recommendations, implications, and conclusions of this study are addressed in this chapter.

Interpretation of Findings

Literature and Research Question 1

How do Canadian women perceive their fertility, and how does this perception influence timing of first pregnancy? Results indicated that the majority of participants in this study were aware of the association between later maternal age and conception. Participants in this study revealed that their focus in their 20s to early 30s had been on completing their education, finding a job, obtaining financial security, and traveling before considering marriage and parenthood. The majority of participants in this study married at a later age and attempted conception immediately. Participants knew how to prevent unwanted pregnancies, as this information was part of their sexual education curriculum in middle to high school. Participants were taught how to prevent unwanted pregnancy but nothing about their reproductive capacity or their fertility.

The school curriculum only covered the basics of the reproductive system, prevention of pregnancy, and sexually transmitted diseases. These findings were somewhat similar to information reported by MacDougall et al. (2013) indicating that

highly educated women focused on pregnancy prevention as it had been presented at school. This information confirmed Quach and Librach's (2008) report that sex education is not a priority in Canadian high schools and that any reproductive education received informs students about preventing a pregnancy (Daly & Bewley, 2013). Education focused on the reproductive system (in terms of anatomy and physiology) and pregnancy prevention with the omission of any information related to reproductive capacity and fertility.

Participants in this study agreed that it would be a good idea for school sex education programs to include information about reproductive capacity as it relates to age and fertility. This finding was comparable to results presented by Benzies et al. (2006) and MacDougall et al. (2013) indicating that women believed that young women should be educated about their fertility at an earlier age in order to make informed decisions about timing of first pregnancy. This further highlights the importance of having the school sexual education curriculum include information about reproductive aging as it relates to fertility so that people can make informed choices as to timing of first pregnancy (Virtala et al., 2011).

Participants in this study revealed that the timing of their first pregnancy had been their choice. A majority of the participants were aware of the medical and physical consequences of delaying a first pregnancy for the mother and the fetus. However, they believed that the decision as to timing was the choice of each individual based on various life events. These life events included furthering education, having a full-time job, and finding the ideal mate before marrying and achieving a pregnancy. This was in

accordance with Cooke, Mills, and Lavender's (2012) qualitative phenomenological study of English women aged 35 and older, which indicated that delay of childbearing is rarely a conscious choice and that timing of childbearing was "within or beyond women's control" (p. 1317). This was also confirmed by a study conducted by Benzies et al. (2006), which indicated that younger Canadian women's decisions about the timing of motherhood were influenced by perceived independence through higher education, secure employment, and financial stability. All of the participants shared this perspective, as they felt that they had no control over the timing of their first pregnancy. As indicated by one of the participants, she knew of the issues related to fertility and aging, and had perceived that she might have fertility issues but had still choose to wait for the right partner before starting her family. Unfortunately, for this participant, the right partner did not come along, so she had to achieve her desire to be a mother with the help of a fertility specialist.

Participants in this study are part of the continuing trend of delaying first pregnancy to pursue higher education and achieve career goals as young women transition into adulthood. As indicated in the literature, Canadian young women are delaying first pregnancy until they have completed their education, established a career, and gained financial freedom. The participants were all in alignment with the finding of Billari et al. (2009) that the completion of education and stable jobs are competing attitudes that influence timing of first pregnancy. Participants also noted that members of their peer group had been delaying first pregnancy for the above-mentioned reasons. It is because of these events that the decision to postpone a first pregnancy to late maternal

age is still trending.

Literature and Research Question 2

What are Canadian women's knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to timing of pregnancy? The results for this question demonstrated that participants' knowledge and understanding of late maternal age, fertility, reproductive health, and reproductive capacity as they relate to timing of pregnancy varied. The majority of the participants were aware that women should ideally have a first baby at age 30 or younger. However, many had never thought about their fertility, as they had never had any issues or concerns or been aware of any issues about their reproductive health in terms of irregular menstruation.

Participants asked for a definition of *reproductive capacity*. When told that it is related to a woman's factual knowledge that she is born with a certain amount of oocytes and about her ability to have a spontaneous conception, her ability to maintain a pregnancy, and later maternal age as a predisposing factor for infertility, they were able to answer the related questions. Participants in this study not only had some knowledge of the optimal age at which women should have a first pregnancy, but also would have liked to have had their first pregnancy at an earlier age. These participants' knowledge of the recommended age of first pregnancy aligned with what Johnson and Tough (2012) identified as the optimal age for having a biological child: between 20 and 35 years. These findings were also in alignment with those of Peterson et al. (2012), who found

that the majority of women wanted to have their first child between ages 25 and 29 within the optimal range of 20-30 for maintaining a pregnancy.

Although these participants were aware of the optimal age for a first pregnancy, they had become pregnant for the first time in their mid- to late 30s. This confirmed what the literature indicated concerning reproductive-aged women's intentions on when to become pregnant for the first time. Holton, Fisher, and Rowe (2009) found that the majority of Australian women were having children when they were between 30 and 34 years of age, whereas Virtala et al. (2011) noted that the majority of Finnish university students in their research wanted to have their first pregnancy at age 35 years or older.

Participants admitted that they believed that when they attempted their first pregnancy, they would spontaneously conceive. Participants based this on the fact that there were no problems with their reproductive system, as they had no issues with their menstrual cycle. They had no indication that anything was wrong or could be wrong with their reproductive system in its ability to naturally conceive. A study by Hammarberg et al. (2013) indicated that 40% of Australian women and men of reproductive age (18-45) lacked knowledge of conception in the menstrual cycle. This finding was corroborated by Ekelin, Akesson, Angerud, and Kvist (2012), who found that female and male high school students lacked knowledge of conception. Virtala et al. (2011) also found that in the population of a Finnish university (female students [n = 3,222]; male students [n = 1,864]), students overestimated the chances of a couple aged 35-40 years achieving spontaneous conception during 1 year of unprotected sex.

Findings in this study indicated that the majority of the participants had visited their family doctors for yearly checkups and pap smears. However, these visits with a health care professional had not included discussions about their age in terms of fertility or about their reproductive capacity. Participants indicated that although it would not have made a difference in the timing of first pregnancy, they would have liked their family doctor to educate them about their reproductive system in terms of reproductive capacity and fertility. This was confirmed by Carolan's (2007) research, which indicated that first-time well educated mothers over the age of 35 wanted their family doctor to discuss their childbearing plans with them and that if their doctor had provided them with information regarding the potential of infertility and childlessness, they would have planned their pregnancies differently. Additionally, a study of first-time pregnant Iranian women age 35 years and older Behboudi-Gandevani et al. (2013) indicated that fertility education was focused only on family planning and did not address the risks of delaying childbearing. However, participants of this study all agreed that although it might not have made a difference to the timing of their first pregnancy, it would have been a good idea for their family doctors to have provided them with knowledge on delaying first pregnancy to age 35 or older, and any consequences this might have for the mother and child. The results of this study indicated that the family doctor has a role to play in informing childless patients of the limits of their reproductive capacity and their plans regarding childbearing.

Additional literature was reviewed based on the new themes that emerged in this study. A number of participants indicated a concern about the difference in age between

them and their child. This concern related to communicating with the child and the potential of missing out on important events in their child's adult life. One participant was concerned about how she would communicate with her child, as they might not share the same interests or values, and about the possibility that she would communicate in language that the child would not understand. To ensure that she would not have these difficulties, she planned to research how to communicate with her child as the child grows into adolescence. Another participant said that she was not concerned about communicating with her child because, as a teacher, she had worked and continued to work with children of various age groups.

Participants' concerns about communicating with their children were not found in the literature on older first-time mothers. However, the literature did address the well being of children born to women who used assisted reproductive technologies to become pregnant. Boivin et al. (2009) demonstrated that first-time parents who attained a pregnancy through assisted reproductive technology due to decreased reproductive capacity reported that in early and middle childhood, their children were happy and healthy in terms of emotional and behavioral factors, despite the age of their mothers.

The findings of this study also identified concern regarding the possibility of not living to see the child as an adult and missing all that would entail, even if the women maintained a healthy lifestyle. This finding was similar to what Friese, Becker, and Nachtgill (2008) found as concerns indicated by older mothers who used assisted reproductive technologies. These real-life concerns centered on staying healthy and living until their child was an adult as they considered the possibility of missing their child's

adulthood, marriage, or grandchildren. This confirmed the concerns of one participant about her child's adult milestones, as she might not know her grandchildren for very long or at all.

The peer-reviewed literature in Chapter 2 did not address any issues that would indicate a need for a visit to a fertility specialist. However, through the interviews for this study, it was discovered that four of the participants had visited a fertility specialist for various reasons. Subsequent literature review for this study concerning the reasons why there would be a need for fertility specialist aligned with what was discovered during interviews of participants for this study.

Two of the participants in the study chose to be single mothers for a number of reasons, including having no partner and being asexual. One participant, realizing that she was getting older, was financially stable, and was without a partner, informed her family doctor that she was ready at age 40 to conceive. Likewise, the other participant paid off her student debt from teacher's college and saved some money before deciding to become pregnant for the first time at age 35. This confirmed what Jadva, Badger, Morrissette, and Golombok (2009) reported about professional, middle-class women in their late 30s or early 40s who had saved their money and found support from family members and friends in their decision to become single parents. In order to achieve their goal of becoming pregnant, both participants went to a fertility clinic for donor sperm.

Two other participants visited the fertility specialist because they had been trying to get pregnant without success. One of them, at age 29, had been trying to achieve spontaneous conception for 5 years before she decided to visit the fertility specialist.

Although she went through 3 years of treatments, she was not successful until she stopped the treatments a year before achieving spontaneous conception. Although the participant did not go into detail about the reasons for stopping, McDowell and Murray (2011) confirmed that couples stopped fertility treatment for many reasons, including the stress of the treatment, cost, and failure to conceive. Zegers-Hochschild et al. (2009) stated that fertility treatments include medications for ovulation induction or controlled ovarian stimulation, artificial insemination procedures (AI), use of husband/partner's semen, and assisted reproduction technologies (ART) such as in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI). Craig et al. (2013) confirmed the importance of providing young women who are in their mid-30s with information on the costs and success rates of ART for women of advanced maternal age.

Another participant, at age 43, had been trying to conceive for 6 months of unprotected sex after she got married. Because of her age, she sought treatment early and found out from the fertility specialist that she had fibroids. The participant was unaware that she had fibroids, as there were no symptoms. According to a study by Carranza-Mamane, Havelock, and Hemmings (2015), women may or may not have symptoms from fibroids, and these fibroids can only be seen through ultrasounds. Vitalea, Padulab, and Gulino (2015) found that the prevalence of fibroids increases with advanced maternal age, peaking when women are in their 40s, and is the main cause of fertility issues. The participant was given a choice of options to achieve a pregnancy, of which she opted for IVF.

One participant was going through menopause and hoping to achieve a pregnancy after marriage. She was advised to visit a fertility specialist to learn of available options because she had reduced reproductive capacity. This healthcare professional's knowledge of fertility was consistent with a study by Moretensen et al. (2012) that indicated that 50% of Danish female healthcare professionals underrated the impact of maternal age and fertility. Boivin et al. (2009) confirmed that because of reduced reproductive capacity, women who delay pregnancy are likely to need the donated oocytes of a younger woman to conceive. As women continue to wait until late maternal age to become pregnant for the first time, some of them become menopausal; which results in an inability to become pregnant. This participant was informed that she could achieve a pregnancy with donor eggs and her husband's sperm.

The literature on ART shows that women can conceive through IVF using donor eggs. The donated oocyte is fertilized with the woman's husband or partner's sperm and transferred to the older woman's uterus. Shufaro and Schenker, (2014) reported that it is an acceptable norm for postmenopausal women to have pregnancies beyond the biological capability of the human ovary due to the availability of donor oocytes.

Participants highlighted that as older mothers they were concerned about the energy level required to keep up with small children and working at the same time. Participants believed that physical energy level naturally begin to fall in your late 30s to early 40s. The literature did not address these findings.

Out of the 10 participants, two reported that they felt judged because of their age, one from her culture community in her former homeland and the other from the medical

establishment. The participant reported that in her culture if you are a certain age, not married and no children you are judged. She stated that each time she has returned to her country of origin she is judged because she has not followed cultural norms of the traditional gender roles and expectations. In African cultures the expectation is for a woman to be married at an early age and have children. According to Dimka and Dein, (2013), in a pronatalist cultural African women who are childless are social deviants and their childlessness is a source of open discussion and gossip in their villages

The other participant felt that she was being judged because of her age. Her perception was of people pointing fingers at her for becoming pregnant at an advanced age. No evidence was obtained in the literature that supported this theme of being judged by healthcare professionals. However, in contrast Kavanaugh and Hershberger (2008) found that donor oocyte recipient women's perceptions of the behaviours of nurses and other healthcare providers encountered in the clinic environment demonstrated the appropriated caring and positive behaviors for these types of clients.

The majority of the literature reviewed in Chapter 2 supported most of my findings. Participants demonstrated that they were waiting for the right partner to come along before contemplating pregnancy. Participants recalled that during middle and high schools it was drilled into them how not to become pregnant and to focus on academia; furthering their education. Participant's knowledge and perception of their reproductive capacity aligns with those in the literature in that they assumed they would become pregnant at first attempt.

The theory of planned behavior asserts that individual's perceptions are influenced by their attitude, by subjective norms, and by perceived behavioral control forces. Klobas (2011) further informed that is a model "of how humans make choices in their social context, given different perceptions of control over their actions" (p. 47). The theory of planned behavior was used to analyze Canadian women's views on reasons for delayed timing of first pregnancy and knowledge of their reproductive capacity in terms of its effects on fertility.

Findings from this study indicated that through a subjective norms lens people in these participants' lives such as close friends and like-minded peers who comprise their social network influence their behavior in terms of timing of first pregnancy. As demonstrated by these participants, many of their peers have delayed first pregnancy until they accomplished many of the traditional life course events and were financially secured. Kim and Cheung (2015) confirms that life course transitions affect people's everyday life experiences, how they define themselves, and with whom they interact, thereby influencing their attitudes to timing of first pregnancy. This trend to delayed timing of first pregnancy will continue as women extend their years in school, try to find a suitable partner, and be financially stable.

The theory of planned behavior as an analytic theory helped to answer the question of why Canadian women continue to delaying timing of first pregnancy, why this as a public health problem exists, and from the findings what strategies can be used to influence change in this behavior.

Limitations of the Study

Of the limitations identified in Chapter 1 of this study, I found because of my experience working as a registered nurse in maternity, I was familiar with the experiences of the participants. I am also a woman who delayed pregnancy until my late 30s in order to meet the accomplishments as identified in the study, and factors that delayed timing of first pregnancy. In order to ensure trustworthiness, I did not inform participants before the study of my own journey through the process of delay, and reduction of my own reproductive capacity. I refrained from intentionally leading participants to any desired response.

This study was also limited by the length of the interviewing period, by only me doing the interview, and by interviewing being the only source of collecting data. The interpretations of the findings are also limited to me.

Recommendations

Research studies have shown that young women are delaying first pregnancies into their late 30s and beyond. Presently, the information about Canadian women's knowledge and perception of their reproductive capacity and fertility as it relates to their decision to postpone first pregnancy to an advanced age of 35-45 is limited. Therefore, it is my recommendation that future studies should follow these women throughout their gestational period to see the outcomes of these first pregnancies, if they have been able to maintain the pregnancy to full term, and the stress of dealing with the consequences of the behavior of delaying timing of first pregnancies.

A second recommendation is that research be conducted of Canadian women of various cultural backgrounds to identify if the behavioral change is related to the influences of Canadian society, or to their countries of origin. A third recommendation is that middle and high schools sexual health education programs include reproductive health education that provides students with the knowledge and awareness of the female reproductive capacity as it relates to fertility and the timing of first pregnancy.

Implications

Positive Social Change

The implication for positive social change includes a better understanding of why women 20-32 years are delaying childbearing until their mid-30s and beyond. As a result of the delay of childbearing, there is a need to increase factual knowledge in sexual health education related to conception, chances of conception, STDs, and age. Presently, Canadian sexual health education curriculum is based on pregnancy prevention and safe sexual health but lacks components of factual knowledge on the following: the number of eggs women are born with; impact on spontaneous conception by postponing of pregnancy through oral contraception; education on pregnancy maintenance that later maternal age provides a narrow window for fertility.

Canadian women provided their perception and knowledge of delaying timing of first pregnancy. Delaying timing to first pregnancy to late 30s can result in medical and physical consequences for both mother and child. This delay can result in many women becoming childless or becoming infertile. Infertility has now become a disorder with broad public health implications and consequences that impact society and the population

at large. The trend of postponing childbearing has broad public health implications due to the impact on demographic and medical consequences and on society at large (Macaluso et al., 2010).

This study provided information about women's real-life experiences and reasons for the continued delay of first pregnancy to a late age. It is hoped that health-care workers, family physicians, nurse practitioners, and nurses would be encouraged to provide education as part of routine checkups as to the limits of women's reproductive capacity to timing of first pregnancy. This study also provides public health nurses the information to encourage them to advocate for policies that would mandate that public and school sex educational programs include topics related to reproductive capacity, conception, fertility and aging.

Methodological, Theoretical, and/or Empirical Implications

As a framework TPB provided an understanding of young women's behavior and how this behavior was appropriate for discussing reproductive capacity and its effects on fertility. The framework provided an insight into the trend of delaying timing of first pregnancy. The primary concepts of TPB are attitudes, subjective norms, and perceived control (Ajzen & Klobas, 2013). The perception of the participants in this study had been influenced by their attitude, by subjective norms. and by perceived behavioral control forces. Participants in this study attitude toward having a child were determined to be positive as they all planned to have children at some point in the future. According to the TPB (Ajzen & Klobas, 2013), through subjective norms people in the young women's life such as close friends and like-minded peers influences their behavior in terms of

timing of first pregnancy. The majority of the study participants reported that those in their social network were also themselves accomplishing many of the life transitions of young adulthood before marrying and having a first pregnancy in their mid 30s and beyond.

Fishbein and Ajzen (2010) stated that TPB is able to accommodate changes in a person's intentions over time. Participants all indicated that they wanted to have children but they also wanted to have a good education, a career that provided them with the finances to work and travel, and a suitable partner before having their first child. The participant's attitude towards having a career and being financially secure was more important in their 20s and early 30s than childbearing. For example, one of the participants decided that she wanted to have a child but finances and paying off student debt delayed childbearing until an age when she was financially secure.

Philipov (2009) explained that perceived behavioral control shows factors that "describe the extent to which persons can exercise control over factors that have a major influence in the behavior" (p. 530). The participant's pregnancies were all planned as they had the available resources to prevent a pregnancy. Their schools had educated them on how to prevent a pregnancy and because of this information they took oral contraception to prevent unwanted pregnancies.

Conclusion

Chapter 5 presented a discussion of study conclusions, implications for the study and recommendations for future research. The study explored Canadian women's knowledge and perception of childbearing and the consequences of delaying timing to

first pregnancy. The current study provided narratives of the lived experiences of participants that were consistent with the literature about the reasons for delaying of first pregnancies to the mid 30s and beyond. However, the current study also discovered 4 themes from participants' narrative of their lived experience that were not consistent with the literature. These lived experiences of participants highlight the need for further education about the limits of their reproductive capacity.

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Appendix A: Poster

PARTICIPANTS NEEDED FOR A RESEARCH STUDY

Canadian women's knowledge and perception of childbearing and consequences of delaying timing of first pregnancy

Inviting women to participate who are:

Between the ages of 35 and 45;

- Currently pregnant with their first child, or planning to start a family (now or in future).

Participation involves 2 sessions:

- Visit 1 (20-30 minutes): Answer any questions you may have, provide you with a Consent form to review, and, if you agree to participate, collect demographic information;

- Visit 2 (1 hour): Audio-recorded interview.

Participation is entirely voluntary.

All information you provide during the study will be kept confidential.

For more information, or to volunteer for this study, please contact:

Deborah Haynes RN

Appendix B: Consent Form

Title Canadian women's knowledge and perception of delayed childbearing and the consequences of this delay to timing of first pregnancy

Investigator Deborah Haynes RN, BScN, M'Ed, PhD (C)
(905) 767-2255

Introduction

You are being invited to take part in a research study of Canadian women's knowledge and perception of delayed childbearing and the consequences of this delay to timing of first pregnancy. Please read this explanation about the study and its risks and benefits before you decide if you would like to take part. You should take as much time as you need to make your decision. You should ask the investigator to explain anything that you do not understand and make sure that all of your questions have been answered before signing this consent form. Before you make your decision, feel free to talk about this study with anyone you wish. Participation in this study is voluntary. The researcher is inviting women who are between age 35-45 years, who are currently pregnant with their child, or planning to start a family (now or in future) to be in the study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Deborah Haynes who is a doctoral student at Walden University. You may already know the researcher as a registered nurse at the Hospital on the Mother Baby unit, but this study is separate from that role.

Background Information:
You are have been asked to participate in this research study because you are becoming pregnant for the first time at a later age. While we have known that many women are delaying pregnancy to a later age, there is a lack of recent research that have examined whether knowledge of postponing first pregnancy until a later age affects fertility intentions among women of childbearing age. Additionally, there are only a few studies which have examined women's perceptions and beliefs about delayed childbearing; and timing to first pregnancy. However, there is little or no Canadian research that addresses whether knowledge and perception of the consequences of postponing timing of childbirth has an impact on a woman's decision of when to bear children.

Purpose:
The purpose of this study is to explore what Canadian women knowledge about the limits of their reproductive capacity and the effect on fertility.

Procedures:

If you agree to be in this study, you will be asked to meet with the investigator in consult room 17-318 on the 17th floor of the Mother Baby Unit. There will be 2 visits during this study. The first visit is a screening visit at which time the principal investigator will answer any questions, have you sign the consent, and then collect demographic information. It will take approximately 20 minutes.

The second visit will be the interviews, which will take place in, consult room 17-318 on the 17th floor of the Mother Baby Unit at the Hospital. At this time you will be asked 4 questions and your answers will be digitally recorded. The investigator will listen to your answers, transcribe them for analysis and may call you with questions to probe or clarify your answers. This interview will take approximately one hour

Here are some sample questions:

1. Do you know the recommended age to become pregnant for the first time?
2. How would the information about your reproductive capacity affect the decision about when to become pregnant?
3. If you were provided with information about the physical and psychosocial consequences associated with delaying your first pregnancy, what factors would cause you to continue this delay?
4. At what age and by whom did you receive sexual health education that discussed your reproductive capacity?

Reminders
It is important to remember the following things during this study:

Ask the investigator about anything that worries you
Tell the investigator if you change your mind about being in this study

Risks of Being in the Study:
There are no medical risks if you take part in this study, but being in this study may make you feel uncomfortable. You may refuse to answer questions or stop the interview at any time if there is any discomfort. Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as fatigue, stress, or becoming upset. Being in this study would not pose risk to your safety or wellbeing.

Benefits of Being in the Study:
You will not receive any direct benefits from being in this study. Information learned from this study may help others in the future.

Voluntary Nature of the Study:
Your participation in this study is voluntary. You may decide not to be in this study, or to be in this study now and then change your mind later. You may leave the study at any

time without affecting your care. You may refuse to answer any question you do not want to answer, or not answer an interview question by saying "pass".

Expenses Associated with Participating in the Study:
Research participants will be reimbursed for their parking/travel expenses.

Confidentiality
If you agree to join this study, the investigator will collect only the information needed for the study. Personal health information is any information that could be used to identify you and includes your:

- name
- address
- date of birth
- new or existing medical records, that includes types, dates and results of medical tests or procedures.

The information that is collected for the study will be kept in a locked and secure area by the study investigator for 7 years. Only the study investigator or the people or groups listed below will be allowed to look at your records.

Representatives of the Hospital Research Ethics Board may look at the study records and at your personal health information to check that the information collected for the study is correct and to make sure the study followed proper laws and guidelines.

All information collected during this study, including your personal health information, will be kept confidential and will not be shared with anyone outside the study unless required by law. You will not be named in any reports, publications, or presentations that may come from this study.

If you decide to leave the study, the information about you that was collected before you left the study will still be used. No new information will be collected without your permission.

Conflict of Interest
The investigator has an interest in completing this study. The investigator's interest should not influence your decision to participate in this study. You should not feel pressured to join this study

Questions about the study
If you have any questions, concerns or would like to speak to the researcher for any reason, please call: Principal Investigator Deborah Haynes at (905) 767-2255.

If you have any questions about your rights as a research participant or have concerns about this study, call Ronald Heslegrave, Ph. D., Chair of the Mount Sinai Hospital

Research Ethics Board (REB) or the Research Ethics office number at 416-586-4875. The REB is a group of people who oversee the ethical conduct of research studies. These people are not part of the study team. Everything that you discuss will be kept confidential.

Statement of Consent:

This study has been explained to me and any questions I had have been answered. I know that I may leave the study at any time. I agree to take part in this study.

_____	_____	_____
Print Study Participant's Name	Signature	Date

(You will be given a signed copy of this consent form)

My signature means that I have explained the study to the participant named above. I have answered all questions..

_____	_____	_____
Print Name of Person Obtaining Consent	Signature	Date

Was the participant assisted during the consent process? ☐ **YES** ☐ **NO**

If **YES**, please check the relevant box and complete the signature space below:

_____	_____	_____
Print Name of Translator	Signature	Date

_____	_____
Relationship to Participant	Language

☐ The consent form was read to the participant. The person signing below attests that the study as set out in this form was accurately explained to, and has had any questions answered.

_____	_____	_____
Print Name of Witness	Signature	Date

_____

Relationship to Participant

Appendix C: Demographic Information

TITLE: *Canadian women's knowledge and perception of childbearing and the consequences of delaying to timing of first pregnancy*

INSTRUCTIONS: Please fill in this that will provide me with some basic background information about you. Please do not put your name on this sheet.

1. I'm (Check one):
   [ ] between the ages of 35-40
   [ ] between the ages of 40-45

2. I'm (Check one):
   [ ] single
   [ ] married
   [ ] separated
   [ ] divorced
   [ ] common law
   [ ] prefer not to answer

3. I'm (Check one):
   [ ] Caucasian
   [ ] Black
   [ ] Asian
   [ ] Chinese
   [ ] Other
   [ ] prefer not to answer

4. I have a (Check one):
   [ ] high school diploma
   [ ] bachelor degree
   [ ] master's degree
   [ ] doctorate
   [ ] other
   [ ] prefer not to answer

Appendix D: Main Interview Questions

1. Do you know the recommended age to become pregnant for the first time?

2. How would the information about your reproductive capacity affect the decision about when to become pregnant?

3. If you were provided with information about the physical and psychosocial consequences associated with delaying your first pregnancy, what factors would cause you to continue this delay?

4. At what age and by whom did you receive sexual health education that discussed your reproductive capacity?