DO WOMEN'S SOCIODEMOGRAPHIC CHARACTERISTICS OR TYPE OF PRENATAL CARE PROVIDER INFLUENCE QUALITY OF PRENATAL CARE?

By

Mayura Kandasamy, M. Sc.

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MAYURA KANDASAMY, B.Sc.N.

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TITLE: Do women's sociodemographic characteristics or type of prenatal care provider influence quality of prenatal care?

AUTHOR: Mayura Kandasamy, B. Sc. N. (McMaster University)

SUPERVISOR: Dr. Wendy Sword

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Abstract

Do women's sociodemographic characteristics or type of prenatal care provider influence quality of prenatal care?

Objective: This study examined whether sociodemographic characteristics or type of prenatal care provider influenced the quality of prenatal care received by women in Canada. The main predictors of high quality prenatal care received by Canadian women were identified.

Methods: A secondary analysis of data collected for a primary study that developed and tested the Quality of Prenatal Care Questionnaire (QPCQ) was conducted. Women (n=422), recruited from five cities, completed a background questionnaire and the QPCQ. Data analysis involved examining nine sociodemographic variables and one prenatal care provider variable using independent samples t- tests, one-way analysis of variance, and analysis of covariance.

Results: Statistically significant differences in prenatal care quality were noted among women based on language spoken at home, racial background, marital status, family income, and education level. Women receiving midwifery care reported the highest quality of prenatal care, compared to women receiving care from obstetricians who reported lower quality prenatal care. The strongest predictors of high quality prenatal care were type of prenatal care provider and total family income.

Conclusions: Efforts to universally improve quality of prenatal care in Canada require practice, policy, and research initiatives. Incorporating alternative/ancillary prenatal care services has the potential to improve access, psychosocial supports, appropriate referrals, education, and interventions for women receiving lower quality prenatal care. Systemic practice and policy changes to increase midwifery care capacity would enable midwives to provide high quality prenatal care to a larger portion of low risk Canadian women. Shared care models could reduce the burden on obstetricians, enabling them to provide higher quality prenatal care to high risk Canadian women. Future research needs to focus on identifying the efficacy of each prenatal care component and examining their specific effects on birth outcomes.

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Chapter 1

INTRODUCTION

Prenatal care is one of the most widely utilized services for health promotion and disease prevention (Alexander & Kotelchuck, 2001; Tough, Siever, & Johnston, 2007; White, Fraser-Lee, Tough, & Newburn-Cook, 2006). Statistics Canada reports that 97% of mothers in 2000-2001 received prenatal care (Canadian Institute for Health Information, 2006; Statistics Canada, 2005). Prenatal care uses highly refined clinical skills and technological advancements to address the three overarching areas of prevention, detection, and treatment (Alexander & Kotelchuck, 2001; Bloom, 2007). By focusing on identifying and mitigating pre-existing medical conditions, risk factors, and negative health behaviours through a range of medical, educational, and nutritional interventions, prenatal care can improve health outcomes for mothers and their infants (Alexander & Kotelchuck; Tough et al., 2006; U.S. Department of Health and Human Services, 2000).

1.1 Literature Review

As a preliminary step for the thesis research, a literature review was conducted to garner foundational knowledge specific to prenatal care including: history of prenatal care in Canada, prenatal care standards and guidelines in Canada, prenatal care utilization, benefits of prenatal care, adequacy of prenatal care, quality of prenatal care, and inequities in quality of prenatal care. This basic knowledge of prenatal care research

guided the development of appropriate research questions to address current gaps in the literature.

1.1.1. Search Strategy

A variety of databases were targeted including CINAHL, Cochrane Library, Embase, British Nursing Index, Medline/PubMed, Wed of Science, PsycINFO, NHS Evidence, and SciVerse/Scopus. Grey literature, including theses papers, best practice guidelines, and government reports, were also perused to augment research findings. Main *search terms* used were: prenatal care, antenatal care, maternal health services, benefits of prenatal care, adequate prenatal care, pregnancy care, quality (of) prenatal care, measurement of prenatal care, prenatal care indices, prenatal care guidelines, and prenatal care best practice guidelines. Secondary *search terms* used in combination with those listed above included: adolescent, risk factors, midwifery, disparities, population health, statistics and numerical data, health policy, health services, outcomes, prenatal screening, satisfaction, pregnancy outcomes, public health, and prevention and control. The inclusion criteria were: full text availability, publication in English, from 2000-present, and adult populations (i.e., 19-44 years). It should be noted, that older articles were retrieved and reviewed for the purposes of describing the history of prenatal care in Canada. The original search was conducted between May 2010 and November 2010, and then updated between October 2011 and December 2012.

1.1.2 History of Prenatal Care in Canada

Examining the history of prenatal care in Canada is a valuable starting point because medicalization of pregnancy care by obstetrical involvement led to the conception of prenatal care, which was first formally documented in the 1900s (Meckel, 1998). A leader of this movement, a Scottish physician, John W. Ballantyne advocated for prenatal care as an intervention to reduce the number of stillbirths and neonatal deaths resulting from congenital problems and morbidity during pregnancy (Meckel). Between 1902 and 1904, Ballantyne published the two-volume authoritative text *Manual of Ante-Natal Pathology and Hygiene*, the foundation of our current understanding of physiology, pathophysiology, and therapeutics relating to gestational age (Meckel).

In response to such leading experts, support grew for systemized prenatal care in Canada at the turn of the twentieth century (Mitchinson, 2002). Canadian physicians acknowledged that their medical expertise and experience could positively contribute to identifying problems during early pregnancy and addressing health concerns (Mitchinson). Simultaneously at the beginning of the century, the medical community began its journey of defining prenatal care and reconciling this with prominent culturally-driven care practices of pregnant women (Mitchinson). Canadian practitioners had to understand the current cultural practices, predominantly involving Aboriginal and Eastern-European rituals in the early 1900s (Mitchinson).

Targeted outcomes for early prenatal care were improving maternal morbidity and mortality rates (Alexander & Kotelchuck, 2001; Mitchinson, 2002). Importantly,

managing complications relating to eclampsia and toxemia dominated prenatal care content and scheduling of prenatal care visits in the initial phases (Alexander & Kotelchuck; Mitchinson). The prenatal care agenda further expanded to include reducing the risk of low birthweight and premature delivery (Alexander & Kotelchuck; Mitchinson). Prominent researchers such as Eastman and Schwartz (1962) published research findings that found that the number of prenatal visits and timing of prenatal care initiation affected rates of low birthweights. Such evidence was incorporated into medical recommendations making prenatal care visits more frequent (Alexander & Kotelchuck; Mitchinson).

A representative agency was formed in Canada in 1944, which is known today as the Society of Obstetricians and Gynaecologists of Canada (SOGC) (SOGC, 2011). The SOGC was first formed to enhance physician education, research, and clinical practice in the area of obstetrics and gynaecology (SOGC). Since its inception, the SOGC has further expanded its agenda to include "international women's health, advocacy, aboriginal health, public education, patient safety, and human resources in the obstetric/gynaecological field" (SOGC, p. Mission/History).

1.1.3 Prenatal Care Standards and Guidelines in Canada

In Canada, provincial healthcare systems along with the SOGC guidelines define prenatal care standards (Au et al., 2006). Prenatal care standards require the early and comprehensive delivery of clinical, educational, and psychosocial interventions during the pregnancy period (British Columbia Perinatal Health Program, 2010; SOGC, 2011).

In a systematic format, prenatal care providers offer routine biomedical assessments (i.e., fetal heart auscultations, urinalysis, bloodwork, fundal height measurements, blood pressure assessments), health teaching (related to alcohol use, smoking, illicit drug use, breastfeeding, exercise, nutrition and supplementation, lifestyle), genetic screening and counselling, and psychosocial screening (British Columbia Perinatal Health Program; SOGC). In their delivery of services, prenatal care providers should strive to uphold the key standards of accessibility, women-centred care, normalization of the birthing process, shared decision-making, continuity of care, and interdisciplinary collaboration (British Columbia Perinatal Health Program; Kirkham, Harris, & Grzybowski, 2005; SOGC).

The mission of the SOGC is to "promote excellence in the practice of obstetrics and gynaecology and to advance the health of women through leadership, advocacy, collaboration, outreach and education" (SOGC, 2011, p. Mission/History). The SOGC disseminates evidence-based clinical guidelines generated from current scientific and clinical research that may be modified as appropriate by local institutions (SOGC). These guidelines aid physicians and midwives to provide tailored care in accordance with the SOGC guidelines specific for each patient's individual and unique health status (SOGC).

1.1.4 Prevalence of Prenatal Care Utilization

In Canada, a majority of pregnant women receive some form of prenatal care (Au et al., 2006; Canadian Institute for Health Information, 2006). Statistics Canada reported that 97% of new mothers in 2000 received prenatal care (Canadian Institute for Health

Information; Statistics Canada, 2005). Most women (58.1%) receive their prenatal care from an obstetrician (Public Health Agency of Canada, 2009). Canadian women also receive prenatal care from family physicians (34.2%), midwives (6.1%), and nurses/nurse practitioners (0. 6 %) (Public Health Agency of Canada).

In the past, a majority of family physicians delivered some form of prenatal care (64% in 2001); however, in 2001 a fewer number of family physicians followed pregnancies to term and performed deliveries compared to the previous year (19% vs. 39% in 2000) (Canadian Institute for Health Information, 2006). The number of multiple births and caesarean sections performed by family physicians also decreased, 6% in 1994 versus 3% in 2000 and 7% in 1996 versus 5% in 2000 respectively (Canadian Institute for Health Information). As the number of family physicians attending births decreased from 45% in 1996 to 39% in 2000, an increasing number of family physicians engaged in shared care models of prenatal care (Canadian Institute for Health Information). In these models of prenatal care, family physicians typically follow pregnant women to 24 to 32 weeks gestation, and then transfer care to an obstetrician, midwife, or another family physician for the remainder of the pregnancy as well as the labour and delivery process (Canadian Institute for Health Information).

The trends identified for prenatal care providers in general do not hold true for rural areas of Canada. In rural areas, family physicians are still predominantly the primary prenatal care providers (Canadian Institute for Health Information, 2006). However, there is an "emerging maternity crisis" in rural Canada (Canadian Institute for

Health Information; Dooley et al., 2009, p.76) because of routine "closures and centralization of rural obstetrics program in Canada" (Dooley et al., p.76). There are rising physician shortages in prenatal care, described to be related to the negative impact of obstetrical on-call schedules on physician lifestyle, high cost of insurance relating to obstetrical legislation, disruption in office routine caused by on-call commitment for deliveries, fear of litigation, and perceived clinical limitations by family physicians due to inadequate training in obstetrics (Canadian Institute for Health Information; Dooley et al.).

In recent years the funding and regulation of midwives has increased across jurisdictions in Canada, particularly in Quebec, Ontario, Manitoba, Alberta, and British Columbia (Canadian Institute for Health Information, 2006). This is expectedly coupled with a greater number of trained midwives entering practice (Canadian Institute for Health Information). From 1993 to 2002, there was a 330% increase in the number of trained midwives practicing in Canada from 96 practitioners to 413 practitioners (Canadian Institute for Health Information). This increase in midwifery prenatal care providers is leading to more women reporting increased access to and usage of midwifery prenatal care, with 6.1% of women receiving prenatal care from a midwife in 2006 (Public Health Agency of Canada, 2009).

1.1.5 Benefits of Prenatal Care

Prenatal care has been emphasized as the priority health service effective in preventing, detecting, and treating pregnancy-related conditions that increase the risk for

adverse maternal-child outcomes (Tough et al., 2007). With the majority of pregnant women (97%) accessing prenatal care, prenatal care presents itself as an important opportunity to impact maternal-child health in Canada (Public Health Agency of Canada, 2009). Prenatal care providers are able develop positive, influential relationships with patients, making them capable of identifying at-risk women and facilitating biomedical or psychosocial resolutions for such women and their families (Alexander & Kotelchuck, 2001; Oladapo & Osiberu, 2008; Tough et al.). Prenatal care providers have the unique position of being able to engage new mothers in the Canadian healthcare system (Alexander & Kotelchuck; Tough et al.). The entire family benefits by gaining education about the effective utilization of services and community supports for subsequent health issues (Tough et al.).

Suggestions have been put forth to invest and improve prenatal care delivery in order to yield long-term cost savings for the Canadian healthcare system through enhanced maternal-child health outcomes (Alexander & Kotelchuck, 2001; Tough et al., 2007). However, despite the widespread acceptance of prenatal care, research substantiating the benefits of prenatal care is controversial (Alexander & Kotelchuck). Prenatal care was prematurely introduced as the minimum standard of care prior to the establishment of clinical trials to confirm its efficacy (Alexander & Kotelchuck). As a randomized controlled trial (RCT) cannot be conducted because ethically women are entitled to the minimum standard of care, selection bias becomes a research issue in all subsequent studies designed to examine the efficacy of prenatal care (Alexander & Kotelchuck). A particular cohort of women may be more likely to use prenatal care,

pursue care in a timely manner, be more consistent with their visits, be more inclined to healthy behaviours and choices, seek particular prenatal care providers, or even influence and receive higher quality care from their health care practitioners (Alexander & Kotelchuck). It can be argued that benefits previously attributed to prenatal care usage among women with positive health behaviours and health-seeking attitudes, may be a proxy indicator rather than a measure of prenatal care (Alexander & Kotelchuck).

Equivocal support for the benefits of prenatal care originally surfaced when flaws were revealed in the measurement tool used to assess adequacy of prenatal care (Alexander & Kotelchuck, 2001; Heaman, Newburn-Cook, Green, Elliot, & Helewa, 2008). The traditionally accepted Kessner/IOM index had raised concerns among the obstetrical community as its content did not directly coincide with the prenatal care recommendations put forth by American College of Obstetricians and Gynecologists (ACOG) (ACOG, 2013; Alexander & Kotelchuck). It was suggested that the use of the Kessner/IOM index in research inaccurately or biasedly affirmed positive relationships between prenatal care usage and the prevention of low birthweight deliveries and preterm births (Alexander & Kotelchuck; Heaman at el., 2008). To address the acknowledged faults of the traditional Kessner/IOM index, it was revamped to more accurately reflect the clinical criteria outlined by the ACOG (Alexander & Kotelchuck). Replication of previous research studies that reported benefits of prenatal care, using the upgraded Kessner/IOM index, no longer revealed positive relationships (Alexander & Kotelchuck). Alexander and Kotelchuck describe a "lack of a clear relationship between very low birthweight and adequacy of prenatal care use" (p. 310). Similarly, when other indices to

measure adequacy of care are utilized, such as the Revised-Graduated Prenatal Care Utilization Index (R-GINDEX) and the Adequacy of Prenatal Care Utilization (APNCU), studies produce conflicting findings regarding the association of prenatal care and selected birth outcomes (Heaman et al., 2008**)**

Inconsistent findings jeopardize deliberate, widespread policy movements to invest in and improve prenatal care (Alexander & Kotelchuck, 2001; Tough et al., 2007). It can be hypothesized that inconsistencies in prenatal care benefits may be related to a lack of knowledge relating to the underlying mechanisms of effective prenatal care (Tough et al., Heaman et al., 2007). Prenatal care providers need to understand the components of effective prenatal care that will yield positive maternal-child outcomes, both short-term and long-term (Tough et al.; Heaman et al.). One such critical research gap is identifying the characteristics of high quality prenatal care (Oladapo & Osiberu, 2008). By identifying underlying characteristics, prenatal care providers will be able to administer targeted and effective prenatal care that can be replicated across prenatal populations universally (Heaman et al.; Oladapo & Osiberu).

1.1.6 Adequacy of Prenatal Care Use

The primary focus of prenatal care research to date has been on defining adequate prenatal care and determining its effects on maternal-child outcomes (Alexander & Kotelchuck, 2001). Traditionally, adequate prenatal care has been defined as "first trimester initiation of care, specified number of prenatal visits for the gestational age, and delivery by an obstetric service" (Alexander & Kotelchuck, 1996, p.409). Extensive

research focusing on adequacy of prenatal care has revealed select subgroups, of varying racial, ethnic, and socioeconomic backgrounds, who report inadequate prenatal care and subsequently fail to demonstrate positive health outcomes equal to their counterparts (Heaman et al., 2007; Kogan et al., 2002; Sword et al., 2012).

Clinical guidelines recommend that initial visits occur within the first trimester of pregnancy (Alexander & Kotelchuck, 2001; Kirkham et al., 2005). Early initiation of prenatal care enables prenatal care providers to correctly date the pregnancy, detect irregular blood counts in a timely manner, complete immunity screening for different infections, provide early dietary and behaviour counselling, and thoroughly assess medical and pregnancy history (Beeckman, Louckx, & Putnam, 2011). Most Canadian women (94.9%) in 2006 initiated prenatal care within the first trimester of pregnancy (Public Health Agency of Canada, 2009). Associations have been demonstrated between the late initiation of prenatal care and negative maternal outcomes and neonatal outcomes (Alderliesten et al., 2007; Beeckman, Louckx & Putnam, 2011). Evidence indicates an increased incidence of high perinatal mortality, growth restriction, and preterm birth with late commencement of prenatal care (Alderliesten et al.; Alexander & Kotelchuck). Despite such evidence, researchers have not directly attributed early prenatal care with causing a decrease in negative health outcomes among mothers and their infants (Alderliesten et al.). This is because researchers are unable to control for selection bias on the part of pregnant women who choose to initiate prenatal care in a timely manner (Alexander & Kotelchuck). Pregnant women who seek early prenatal care may have a predisposition for health conscious behaviours, such as maintaining regular clinical visits,

planning their pregnancies, and engaging in preconceptual care (Alderlisten et al.; Alexander & Kotelchuck).

The typical prenatal care schedule recommended for Canadian women is to visit their practitioners on average once a month for the first 6 months of their pregnancy, have biweekly consults for the next 2 months, and finally have weekly visits until the end of the pregnancy (Canadian Institute of Health Information, 2006; Oladapo & Osiberu, 2008, Public Health Agency of Canada, 2009). On average, the majority of Canadian women attended 12.9 prenatal care visits in 2006, with only 1.1% of women receiving four or less prenatal care visits (Public Health Agency of Canada). Researchers hypothesize that trends depicting increased prenatal care visits and specialized services can be attributed to the rising numbers of preterm or multiple births, developments in obstetrical diagnostic tools, and the advancement of perinatal care as a specialty area (Alexander, Kogan, & Nabukera, 2002).

Prenatal care research has revealed the existence of distinct disparities in the adequacy of prenatal care as defined above. For example, a Dutch study conducted with more than 12 000 women noted that women who sought prenatal care late tended to have distinct characteristics such as "young age, low level of education, unwanted or unplanned pregnancy, poor language proficiency in English, high parity, a high obstetric risk, or being part of a non-white Ethnic group" (Alderliesten, Vrijkotte, Van Der Wal, & Bonsel, 2007, p.3). These findings are echoed by Beeckman, Loucks, and Putnam (2011) in their study identifying determinants of late prenatal care initiation as: being inactive in

the labour market, non-European origin, receiving welfare benefits, not having a regular obstetrician, and barriers to booking a first appointment.

Heaman et al. (2007) conducted a research study analyzing regional variations in prenatal care usage in order to identify individual-level and neighbourhood-level determinants of inadequate prenatal care among Manitoban women. Variations in rates of inadequate prenatal care, ranged from 1.1% to 21. 5%. It was reported that women with the lowest family incomes, high rates of unemployment, recent immigrants, Aboriginal status women, single-parent families, and women with fewer than nine years of education have not experienced the improving trends in prenatal care, particularly specialized services (Heaman et al.). In another study, expectant mothers with "less social capital" such as lower income, lack of transportation, and limited community supports were found to experience inadequate prenatal care (Attar, Hanrahan, Lang, Gates, & Bratton, 2006).

Such disparities among subgroups of women challenge the status quo of routine prenatal care content and delivery (Odalapo & Osiberu). Standard prenatal care likely has disparate effects and inconsistent efficacy in various pregnant populations leading to differential maternal and neonatal health outcomes (Alexander & Kotelchuck; Heaman et al., 2007).

1.1.7 Quality of Prenatal Care

Prenatal care research is now focusing on the quality of prenatal care provided because research trends have exposed quality of care as an equal or greater predictor than

adequacy of care for usage of prenatal care services (Alexander & Kotelchuck, 200; Oladapo & Osiberu, 2008; Sword et al., 2012). Factors contributing to quality prenatal care have been divided into three categories reflective of Donabedian's (2005) model of quality care: structural factors, clinical processes of care, and interpersonal care processes (Sword et al.).

There are three major structural elements that promote high quality prenatal care (Sword et al., 2012). One element of quality prenatal care is having access to prenatal care services (Sword et al.). This involves women having the ability to initiate prenatal care services as early as possible with a prenatal care provider of the woman's choosing, and then maintaining this care over the duration of her pregnancy (Sword et al.). Women describe access to include having practice locations that are close to their home or place of work, being close to public transportation, and having free or inexpensive parking (Sword et al.). Another component of access is being able to easily schedule convenient appointments and having telephone access to prenatal care providers in order to address any pressing questions or concerns (Sword et al.). Finally, women describe having access to educational materials such as handouts, pamphlets, and videos as an element of quality prenatal care (Sword et al.).

The physical setting of prenatal care has an impact on its quality (Sword et al., 2012). Contributing factors include cleanliness, aesthetics and comfort, as well as privacy (Sword et al.). Privacy is a priority when patients are being assessed, and when discussing personal information with prenatal care providers (Sword et al.).

Staff and care provider characteristics are structural elements that affect the quality of prenatal care. Staff members with a pleasant demeanour, knowledge of patient information, and the ability to efficiently complete care are preferred (Sword et al., 2012). Prenatal care providers that are knowledgeable and confident also contribute to higher quality prenatal care (Sword et al.).

Clinical care processes represent a substantial component of prenatal care. Quality prenatal care includes the confirmation of pregnancy, the estimation of date of delivery based on the last menstrual period or ultrasonography in the absence of an accurate last menstrual period (Kirkham et al.; National Institute for Health and Clinical Excellence, 2008). Routine blood work must be incorporated into these visits to complete ABO and Rh blood typing and anemia screening (National Institute for Health and Clinical Excellence; Vause & Maresh, 1999), along with routine fetal heart monitoring and assessment of maternal blood pressure, weight, urine, and fundal height (Kirkham et al., 2005; National Institute for Health and Clinical Excellence). At the discretion of the prenatal care provider, additional bloodwork should be ordered based on patient consent, abnormal findings during pregnancy (i.e., gestational hypertension) or indications for genetic testing (Kirkham et al.; National Institute for Health and Clinical Excellence; Vause & Maresh).

As part of quality care, pregnant women should understand the screening tests (e.g., bloodwork, ultrasonography, urine) that are being completed in terms of the purpose of each test, the method of conducting screening tests, the potential risks to

herself and the baby, the type of results to be reported, the likelihood for false-negative or false-positive results, and the decisions that will need to be made in response to results received (Kirkham et al.2005; Vause & Maresh, 1999; Sword et al., 2012). Special attention needs to be provided by prenatal care providers to patients with significant medical/genetic health history undergoing genetic testing (Kirkham et al.; National Institute for Health and Clinical Excellence, 2008). Providers need to counsel patients and clarify the limitations and risks involved in the clinical tests being performed (Alexander & Kotelchuck; Kirkham et al.; National Institute for Health and Clinical Excellence; Sword et al.). Facilitating a dialogue about the psychological implications for the patient and her family is necessary (Kirkham et al.).

Health teaching and counselling are important components of quality prenatal care (Kirkham et al., 2005; Sword et al., 2012; Wheatley, Kelley, Peacock, & Delgado, 2008). A primary teaching agenda should focus on educating mothers about physiological changes that occur during pregnancy and discussing dietary guidelines for pregnant women, appropriate weight gain, and perhaps nutritional supplements (Kirkham et al.; National Institute for Health and Clinical Excellence, 2008; Sword et al.). This agenda can be augmented by addressing questions relating to exercise, medication use, sexual activity, air travel, hair treatments, and the use of hot tubs and saunas (Kirkham et al.; National Institute for Health and Clinical Excellence). Another prominent focus of health teaching and counselling, is prescription, over-the-counter, and herbal medication use, alcohol use, smoking, illicit drug use, and workplace hazardous materials (Kirkham et al., National Institute for Health and Clinical Excellence; Public Health Agency of

Canada, 2009). Exposure to toxic chemicals is particularly important in the first trimester as it is a period of organogenesis making the fetus especially vulnerable to teratogens (Kirkham et al., Public Health Agency of Canada). If prenatal care providers identify negative health behaviours in pregnancy, providing resources and counselling for the cessation or reduction in risk behaviours needs to become a priority, and has been shown to positively impact the cessation or modification of negative health behaviours (Bodner-Adler et al., Kirkham et al., 2005; Ricketts, Murray, & Schwalberg, 2005). Receiving direct advice from a physician is one of the most significant contributors to smoking cessation (Bodner-Adler et al.).

Another element of quality prenatal care is routine psychosocial screening of women for emotional health and well-being (Austin, Highet, & Guidelines Expert Advisory Committee, 2011; Kirkham et al., 2005; Sword et al., 2012). Depression and anxiety have been reported to affect as many as one in ten women prenatally (Austin et al.). National guidelines produced in the U.S. (ACOG, 2013) and Australia (Austin et al., 2011) recommend routine psychosocial assessment of all women receiving prenatal care a minimum of once each trimester, indiscriminate of sociodemographic factors of income, education, race or ethnicity (ACOG; Austin et al.). Women should not be exempted based on the perceptions of the health care provider during the first visit; psychosocial problems may develop as the pregnancy progresses (Austin et al.). Routine psychosocial assessment increases the probability that health care providers will identify psychosocial risk that is associated with negative birth outcomes (Austin et al., National Institute for Health and Clinical Excellence). Similarly, pregnancy is an opportune

clinical situation for routine standardized screening for intimate partner violence in that it is acceptable to women, low cost, and has significant potential health benefit for the pregnant women and her newborn or other children (Kirkham et al.).

Research demonstrates that optimal quality prenatal care is achieved when clinical elements of prenatal care, like those described above, are systematically introduced and incorporated into the patient's care. The sharing of information between prenatal care providers and their patients needs to be clear, easy to understand, and honest particularly when distressing information is being relayed (Sword et al., 2012).

Continuity of care is another component of quality prenatal care as it permits women to develop a mutual, positive relationship with their prenatal care providers (Sword et al., 2012). When transitioning between multiple providers, women appreciate timely and efficient transfer of patient information between prenatal care providers (Sword et al.). It instills confidence among women that their prenatal care provider is knowledgeable about their status and therefore capable of effectively monitoring their progress (Sword et al.).

Other important components of quality prenatal care are non-medicalization of pregnancy and women-centred care (Sword et al., 2012). Prenatal care providers need to provide prenatal care that is highly personalized, focusing on the patient's lifestyle, circumstances, and social determinants of health (Sword et al.). By actively engaging in their own care, women have meaningful participation in shared decision making. Shared decision making is a vehicle to successfully consolidate the varied clinical elements

(Kirkham et al., 2005). It encompasses the concept of healthcare decisions being made by doctors and patients working collaboratively to synthesize current evidence-based practice and the characteristics and values of the patient in order to improve the healthcare status of both the mother and her baby (Godolphin, 2009; Sword et al.).

The final category of quality prenatal care described by Sword et al. (2012) is interpersonal care processes. Quality care is characterized by the prenatal care provider having a respectful attitude, an approachable demeanour, and non judgmental interactions (Sword et al., 2012). Provision of emotional support, characterized by listening, expressing care and concern, and acknowledging feelings, is another important interpersonal process (Sword et al.). Incorporating cultural sensitivity in prenatal care for non-ethnic populations also contributes to quality prenatal care (Sword et al.).

1.1.8 Inequities in Quality of Prenatal care

Research exploring inequities in quality of prenatal care specifically, is minimal and inconclusive (Oladapo & Osiberu, 2008). Despite this, recognition of widespread disparities among Canadian women reveals the need for improvements in our prenatal care system (Heaman et al., 2007; Tough et al., 2007). Focusing on improving the quality of prenatal care experienced by Canadian women may expedite the prenatal care system's ability to reduce disparities in prenatal care among Canadian women (Alexander & Kotelchuck, 2001; Oladapo & Osiberu, 2008).

In an international context, inequities in prenatal care quality have been recognized. In 2004, a study conducted in Pelotas, Brazil, analyzed discrepancies in

prenatal care quality focusing on the variables of "family income, self-assessed skin colour, parity, and type of provider" (Victora et al., 2010, p. 253). Study findings revealed lower quality of prenatal care among women who received care in the public sector, women with lower family incomes, and women who identified themselves as black (Victora et al.).

Oladapo and Osiberu (2008) conducted a study to investigate women's sociodemographic determinants and their link to perceived quality of prenatal care in Southwest Nigeria. Only about 58% of women in Nigeria receive prenatal care. An additional concern is the high rate at which women discontinue participation in prenatal care (Oladapo & Osiberu). Oladapo and Osiberu analyzed the relationship between 13 sociodemographic characteristics and women's overall perception of the quality of prenatal care. They identified that increasing parity, increasing number of living children, and being more involved in the Islamic religion or the patient's specified religion increased the likelihood of reporting a positive perception of the prenatal care quality. Other potential determinants, including age, marital status, women's monthly earnings, ethnicity, employment status of husband, educational level, gestation, frequency of prenatal care visits, and previous use of prenatal care in the same setting were not associated with perceptions of prenatal care quality.

There is little research on the impact of different types of prenatal care providers on the quality of prenatal care delivered. Following the legalization of midwifery practice in the 1980s in British Columbia, Buhler, Glick, and Sheps (1988) conducted a study to assess the quality and feasibility of nurse-midwifery prenatal care practices within the

Canadian healthcare system. As part of this study, the researchers analyzed differences in quality of care by type of prenatal care provider. The study used retrospective data to compare the care provided by four nurse-midwives in a tertiary obstetric hospital to that provided by family physicians in their offices. The nurse-midwives were all registered graduates of a midwifery school acknowledged by the International Confederation of Midwives and the family physicians were all registered with the College of Physicians and Surgeons of British Columbia. Criteria adapted from the Burlington Randomized Controlled Trial (BRCT) criteria were utilized to assess quality of prenatal care as adequate, superior, or inadequate. In terms of the quality of prenatal care, 84% of midwifery patients reported that their care was adequate in comparison to 40% of family physicians' patients. The rate of reporting superior care was 2.3 times higher among patients of midwives compared to those of family physicians.

1.2 Statement of the Problem

Research evidence indicates that the quality of prenatal care may be as critical as the quantity of prenatal care in predicting effective prenatal care usage (Oladapo & Osiberu; Sword et al., 2012). Quality of prenatal care has an impact on maternal-child outcomes and future health services uptake by new mothers and their families (Oladapo & Osiberu, Sword et al.). However, a research gap exists relating to prenatal care quality (Sword et al.). In 2012, Sword and colleagues began to address the research gap relating to a lack of a conceptual and operational definition of quality prenatal care by publishing the article, 'Women's and care providers' perspectives of quality prenatal

care: a qualitative descriptive study'. As an extension, this research team also developed the Quality of Prenatal Care Questionnaire. This addresses the research void that previously existed regarding psychometrically-sound measurement tools to assess quality of prenatal care. As part of the resurgence in prenatal care quality research, identifying sociodemographic factors and prenatal care provider types that are determinants of quality prenatal care is an important area of study. Knowledge of the determinants of quality prenatal care is a prerequisite for improving the delivery of care.

1.3 Objective of the Study

The objective of this study was to determine whether specific sociodemographic factors or type of prenatal care provider associated with quality of prenatal care received by Canadian women. The research questions of interest are as follows: (1) Do sociodemographic characteristics of pregnant women influence the quality of prenatal care received by women in Canada? (2) Does the type of prenatal care provider determine the quality of care received by women in Canada? and (3) What are the main predictors of quality prenatal care received by Canadian women?

1.4 Significance of the Study

Research has suggested the importance of quality prenatal care as a predictor of prenatal care use and continued health services uptake among Canadian women and their families (Oladapo & Osiberu, 2008). The study findings are significant in providing the Canadian healthcare system with relevant knowledge that can be strategically used to improve the quality of prenatal care for all Canadian women.

In the quest to achieve quality prenatal care, researchers need to identify disparities in the delivery of quality prenatal care in Canada (Tough et al., 2007). The thesis research will identify sociodemographic subgroups receiving lower quality prenatal care. Subgroups of women receiving lower quality of prenatal care may need augmented services that address their specific needs (e.g., accessibility issues, educational needs, cultural sensitivity). Similarly, if it becomes apparent that clients of certain prenatal care providers report higher quality of care, then it becomes important to identify the elements contributing to this higher quality care and to widely promote these with other prenatal care providers.

Although the primary focus of these research questions is to identify disparities in quality of prenatal care and ultimately identify strategies to improve quality of care, the research has additional relevance due to ripple effects of quality prenatal care on health service uptake, and consequently, long-term financial gain (Alexander & Kotelchuck, 2001). For many first-time mothers, prenatal care is their first interaction with the healthcare system as adults. The quality of the care received and women's satisfaction with their care influences future engagement with the healthcare system (Alexander & Kotelchuck). The use of health promotion and illness prevention services by the women is impacted as well as the use of services by her offspring and partner (Alexander & Kotelchuck; Tough et al., 2007).

Chapter 2

RESEARCH METHODOLOGY

2.1 Statement of Problem and Research Questions

The fundamental objectives of prenatal care involve identifying and mitigating pre-existing medical conditions, risk factors, and negative health behaviours during the pregnancy period to decrease negative health outcomes for mothers and their infants (Alexander & Kotelchuck, 2001). Prenatal care has important implications for the health of a mother-baby dyad during pregnancy and childbirth, and progressively impacts health outcomes for women, children, and their families. The quality of prenatal care has become a forerunning construct in its potential to predict women's usage of prenatal care, and their continued uptake of other health services for themselves and their families (Oladapo & Osiberu, 2009; Sword et al., 2012).

In current research pertaining to prenatal care, a consensus on both the operational and concrete definition of quality prenatal care is lacking. To address this gap in the literature, Sword et al. (2012) conducted a study aimed at developing and psychometrically testing a tool to measure quality of prenatal care. Firstly, a qualitative descriptive study was conducted to capture women's and health care providers' perceptions of specific dimensions of quality prenatal care. A process of item generation, selection, presentation, and reduction through exploratory factor analysis was then completed. In this process, best practice clinical guidelines were utilized as a secondary source in generating items. Following this, psychometric testing was performed to

culminate in the development of the Quality of Prenatal Care Questionnaire (QPCQ) (Heaman, Sword, Akhtar-Danesh, Bradford, & QPCQ Research Team, 2012). This thesis project will use data collected as part of this described primary study. The objective of the thesis research is to determine whether specific sociodemographic factors or the type of prenatal care provider are associated with the quality of prenatal care received by Canadian women.

In this study, answers to the following research questions are being sought: (1) Do sociodemographic characteristics of pregnant women influence the quality of prenatal care received by women in Canada? (2) Does the type of prenatal care provider determine the quality of care received by women in Canada? (3) What are the main predictors of high quality prenatal care received by Canadian women? Answers to the above research questions will generate an evidentiary foundation of factors contributing to quality prenatal care.

2.2 Definition of Key Terms

Relevant key terms have been defined below for the purposes of this research protocol:

2.2.1 Prenatal Care

Clinical care provided during the pregnancy period by a health care professional encompassing medical, nutritional, and health teaching to prevent, diagnose, and treat pre-existing medical conditions, risk factors, and negative health behaviours (Alexander & Kotelchuck, 2001).

2.2.2 Prenatal Care Provider

A trained professional providing prenatal care services in the role of obstetrician, midwife, family physician, nurse, or nurse practitioner.

2.3 Theoretical Framework: Donabedian's Model of Quality Care

Donabedian's Model of Quality Assurance in Health Care (1980, 1986, 1988) was used to guide the primary study. The model is a conceptual integration of three dimensions contributing to quality of healthcare: structure, process, and outcomes of care (Donabedian, 2005). *Structure* refers to the features of the setting in which the care is being provided including material resources (e.g., electronic charting), human resources (e.g., nurse expertise), and organizational structure (e.g., room availability) (Donabedian).

In the QPCQ, elements that addressed Donabedian's construct of structure relate to access, physical setting, and staff and care provider characteristics (Heaman, Sword, Akhtar-Danesh, Bradford, & QPCQ Research Team, 2012). Some QPCQ items related to structure of care included: patient accessibility to the care setting through easily obtainable contact information for the office; and patient ability to contact prenatal care provider as needed for questions and concerns. For example, questionnaire items include: *I knew how to get in touch with my prenatal care provider(s)* and *Someone in my prenatal care provider(s)'s office always returned my calls* (Heaman, Sword, Akhtar-Danesh, Bradford, & QPCQ Research Team).

Process denotes the nature of the clinical practices being performed (Donabedian, 2005). In the primary study, investigators further divided this concept into *clinical care process* and *interpersonal care processes* (Sword et al., 2012). *Clinical care processes* captured themes relating to: health promotion and illness prevention, screening and assessment, sharing of information, continuity of care, non-medicalization of pregnancy, and women-centredness (Sword et al.). *Interpersonal care processes* incorporated quality elements relating to respectful attitude, emotional support, approachable interaction style, and taking time (Sword et al.). Items in the QPCQ reflective of *clinical care processes* include: prenatal care providers providing options for the birth experience and reviewing patient expectations for labour and delivery; adequate screening for potential problems during pregnancy; providers addressing the effect of pregnancy on the patient's lifestyle; and patients being provided adequate information about prenatal tests, procedures, blood work, diet, breastfeeding, safe moderate exercise, alcohol use, and depression during pregnancy (Heaman, Sword, Akhtar-Danesh, Bradford, & QPCQ Research Team, 2012). Examples of QPCQ questions are: *I was given adequate information about prenatal tests and procedures*; *I was given enough information to meet my needs about breastfeeding*; *I was given enough information about the safety of moderate exercise during pregnancy*; and *I was screened adequately for potential problems with my pregnancy* (Heaman, Sword, Akhtar-Danesh, Bradford, & QPCQ Research Team).

QPCQ items that capture *interpersonal care processes* include: prenatal care providers being respectful and attentive; patients having enough time with their prenatal care providers; and prenatal care providers having honest and supportive discussions

about patient decisions and concerns. Some item examples are: *My prenatal care provider(s) was abrupt with me*; *I was supported by my prenatal care provider(s) in doing what I felt was right for me*; and *My prenatal care provider(s) paid close attention when I was speaking* (Heaman, Sword, Akhtar-Danesh, Bradford, & QPCQ Research Team).

The dimension of the Donabedian's model, *outcome*, refers to the impact of the care on health status (2005). For example, a favourable outcome of prenatal care could be a patient being accurately diagnosed with gestational diabetes and utilizing insulin appropriately, or a patient commencing an exercise regimen during their pregnancy to prepare for labour and delivery. Clinical outcomes are not captured in the QPCQ (Heaman, Sword, Akhtar-Danesh, Bradford, & QPCQ Research Team, 2012).

Donabedian (2005) describes the three concepts as being both interrelated and circular. Most simplistically, structure affects process and process then affects outcomes. Interdependence between these concepts can also be observed as structure can affect both processes and outcomes, and an outcome can reflect the compounded effects of both structure and process.

2.4 Research Design

The thesis study is a secondary analysis of data collected in Phase 2 of the primary study which was focused on item reduction and exploratory factor analysis.

2.4.1 Study Subjects

For the primary study, a convenience sample of women from five Canadian cities – Vancouver, Calgary, Winnipeg, Hamilton, and Halifax – was recruited into the study from September to November of 2010. Eligibility criteria were as follows: over 16 years of age; and gave birth to a live, singleton, term infant (≥37 weeks). Women were ineligible if they had experienced a neonatal death/stillbirth, were unable to read and write English, or had a mental health disorder that precluded participation.

2.4.2 Sample size and Recruitment

The target sample size for the multi-site primary study was approximately 400 women (≅ 80 women/site). This sample size was determined appropriate for Phase 2 based on Devilis (1991) suggesting a sample size of 200 being adequate for factor analysis, and Comrey and Lee (1992) indicating a sample size of 300 was deemed good and 500 was very good.

Women were recruited across five clinical sites: BC Women's Hospital in Vancouver, Foothills Hospital in Calgary, St. Boniface General Hospital in Winnipeg, St. Joseph's Healthcare Hamilton, and the IWK Health Centre in Halifax. Within these clinical sites, women were recruited from in-hospital postpartum units.

Potential research participants were initially screened for eligibility by nursing staff on the postpartum units. Nursing staff identified women who met the eligibility criteria and determined their willingness to hear more about the study. Subsequently

research assistants provided potential participants with an invitation letter outlining the study and the responsibility of participants. Research assistants were available to provide additional information about the study and answer any questions. Women who were interested in participating were instructed to sign and return the consent form (Please refer to Appendix A for Participant Information and Consent Form). On recruitment, research participants were given and asked to complete the QPCQ, the Prenatal Interpersonal Processes of Care (PIPC) (Korenbrot, Wong, & Stewart, 2005), the Patient Expectations and Satisfaction with Prenatal Care (PESPC) (Omar, Schiffman, & Bingham, 2001), and the postnatal background questionnaire.

2.4.3 Data Collection

The QPCQ is a 46-item self-report questionnaire that uses a 5-point Likert scale with answers ranging from strongly disagree (1) to strongly agree (5) (Heaman, Sword, Akhtar-Danesh, Bradford & QPCQ Research Team, 2012). An overall score is calculated to measure the quality of prenatal care received by women.

The background questionnaire was divided into four sections: 1) Maternal Health and Healthcare; 2) Labour and Delivery; 3) Baby; and 4) Background Information. Health and healthcare captured information about pregnancy complications and medical history relevant to pregnancy (i.e., diabetes, preterm labour, high blood pressure, bleeding requiring hospitalization/bed rest, or nausea and vomiting requiring hospitalization). It included approximate gestation at the time of the initial prenatal visit and approximate number of prenatal visits. Participants were asked about the types of prenatal care

providers involved in their care (i.e., family physician, obstetrician, midwife, nurse practitioner, other), the clinical settings in which they obtained prenatal care (i.e., private office, clinic, outpatient department of a hospital), and information about pregnancy complications and medical history. The questionnaire asked whether women delivered vaginally or by caesarean section and, when appropriate, if the caesarean section was unplanned or planned. Baby information included gender, birth weight, and type of feeding. Finally, background information captured age, gestation, parity, number of living children, predominant language spoken at home, racial background, place of birth, marital status, highest level of education, and family income.

2.4.4 Data Analysis

The outcome or dependent variable of interest was the mean QPCQ score. A total of nine sociodemographic predictor variables were included in the analysis. The variables were: age (16-24, 25-34, ≥ 35 years); parity (primagravida vs. multigravida); language spoken at home (English vs. other than English); racial background (Caucasian vs. non-Caucasian); place of birth (Canada vs. outside of Canada); marital status (partnered vs. non-partnered); total family income (under $39 999, $40 000 - $79 999, ≥ $80 000); and education level (completed high school or less, some community college, technical school, or university, or completed community college, technical school, or a university degree) (Refer to Table 1 for definitions of predictor variables).

Type of prenatal care provider was also examined as a predictor variable. Type of prenatal care provider was classified as: family doctor only, obstetrician only, midwife

Table 1

Definition of Predictor Variables

Name of Variable	Definition
Age of Mother 16-24 years 25-34 years ≥ 35 years	Exact age was reported by participants, and results were then categorized into three groups.
Parity Primagravida	Participants reporting the current pregnancy to result in their first live birth.
Multigravida	Participants reporting having one or more previous live birth.
Language Spoken at Home English	Participants reporting speaking English most often at home.
Other than English	Participants who reported any other language being spoken most often at home.
Racial Background Caucasian	Participants reporting their racial background as White (Caucasian)
Other than Caucasian	Participants reporting any other racial background.

Place of Birth	
Canada	Participants reporting yes to being born in Canada.
Outside of Canada	Participants reporting no to being born in Canada.
Marital Status	
Partnered	Participants reporting being married, in a common-law relationship, or living with a partner.
Non-Partnered	Participants reporting being single (never married), widowed, or divorced.
Total Family Income	
Under $39 999	Participants reporting a total family income of: no income, under $10 000, $10 000 - $19 999, or $20 000 - $39 999
$40 000 - $79 999	Participants reporting a total family income of: $40 000 - $59 999, or $60 000 - $79 999
Over $80 000	Participants reporting a total family income greater than $80 000
Education Level	
Completed high school or less	Participants reporting their highest level of education as being elementary school or less, some high school, or completed high school.
Some community college, technical school, or university	Participants reporting their highest level of education as being some community college or technical school, or some university.

Completed community college, technical school, or a university degree	Participants reporting their highest level of education as being completed community college or technical school, completed bachelors degree, or graduate degree.
Prenatal Care Provider	
Family Doctor Only	Participants reporting seeing a family doctor exclusively.
Obstetrician Only	Participants reporting seeing an obstetrician exclusively.
Midwife Only	Participants reporting seeing a midwife exclusively.
Mixed Care	Participants reporting seeing multiple prenatal care providers (i.e. midwife-obstetrician, family doctor-obstetrician, nurse practitioner-obstetrician, etc.)
Other	Participants reporting seeing a nurse practitioner exclusively or any other type of health care professional not mentioned above such as nurses, residents, doulas, chiropractors, maternity clinics, and prenatal care workers

only, mixed care, and other. On the demographic questionnaire, if women indicated prenatal care attendance with more than one type of prenatal care provider they were classified as having received mixed care. The second classification divided participants by each specific discipline: seeing only family doctor vs. not seeing a family doctor; seeing only an obstetrician vs. not seeing an obstetrician; seeing only a midwife vs. not seeing a midwife; and seeing multiple prenatal care providers vs. not seeing multiple prenatal care providers.

Frequency tables were generated for the nominal and ordinal independent variables to show the distribution of the sociodemographic characteristics and prenatal care provider types among total participants in the study (n=422). Analysis of age, as the only independent continuous variable, included measures of mean, median, and standard deviation.

Summary measures of the QPCQ score (i.e., mean, median, standard deviation) were calculated. Independent samples t-tests were conducted to determine statistically significant differences in the QPCQ scores of women based on parity, language spoken at home, racial background, place of birth, and marital status, with $p<0.05$ used to establish statistical significance. Prenatal care provider type variables that were dichotomized were similarly analyzed to identify statistical differences between disciplines ($p<0.05$).

A one-way analysis of variance (ANOVA) was conducted to compare the means of sociodemographic characteristics and prenatal care provider types with more than two samples, which included the variables of age, total family income, education level, and

type of prenatal care provider. Tukey-HSD post-hoc tests were conducted to identify which groups in each variable were statistically different from the others.

An analysis of variance was used to determine the best predictors of high quality prenatal care. The outcome variable (i.e., QPCQ mean score) was entered as the dependent variable. The independent variables included ordinal variables (i.e., age, total family income, education level, and type of prenatal care provider) and dichotomized variables (i.e., parity, language spoken at home, racial background, place of birth, and marital status). A type III Sum of Squares was utilized to estimate the effect size for each variable in the model. From this, a backward approach was manually applied to the custom, main effects model to eliminate the non-significant variables based on the statistical significance of their predictive value. Based on the results, the variable with the highest p-value was identified and manually removed from the model equation. The model was run again to examine the between-subject effects. Based on this second run, the variable with the highest p-value among the remaining variables was removed. This backward approach of creating a general linear model, was repeated until all variables remaining in the model had a p-value <0.05. The remaining variables were considered the best predictors of higher quality prenatal care. Subsequently for each variable with more than two groups a post-hoc test was conducted to determine differences between the groups of each variable when interacting with the other factors of the model.

2.5 Protection of Human Subjects/Ethics Approval

The research protocol maintained the ethical standards established by the Tri-Council Policy Statement (TCPS) in all aspects of its research design. As per the TCPS guidelines secondary use of data does not require a Research Ethics Board review, provided researchers are utilizing data that are anonymous and cannot be linked back to participants (Panel on Research Ethics, 2011). The written consent form for the primary study included a clause to facilitate the use of the collected data for related research questions: "It is possible that your information might be used to answer additional questions about prenatal care." Additionally, an amendment was submitted by the research coordinator of the primary study indicating the addition of a student co-investigator to conduct a secondary analysis. This submission was approved by the Hamilton Health Sciences/McMaster University Faculty of Health Sciences Research Ethics Board.

In the primary study, each of the questionnaires was labelled with a study ID number. Once the research coordinator received the completed survey packages, personal identifying information (i.e., name, address, phone number) was removed from the data. A list linking the study ID number with participant names was kept separate from participant data. All information was securely stored in locked filing cabinets in a locked research office at McMaster University.

Chapter 3

RESULTS

3.1 Study Participant Characteristics

Sociodemographic characteristics and the types of prenatal care providers for the study sample of 422 women are shown in Table 2. The majority of women in the sample were between the ages of 25 and 34 years with an average age of 30.1 years (*SD* = 5.7). There was a relatively even distribution of primagravida and multigravida women. A majority of the women in the sample size most often spoke English at home, were Caucasian, born in Canada, reported a total family income of greater than $80 000, and had completed a community college, technical school, or university program.

Women in the sample most often reported having received mixed care rather than having seen only one type of prenatal care provider. Among women seeing only one type of prenatal care provider, obstetricians provided the majority of prenatal care to the sample population (29.3%), followed by family physicians (22.4%), and then midwives and other prenatal care providers (i.e., nurse practitioners, nurses, residents, and "prenatal care workers") who cared for less than 10**%** of the population.

3.2 Quality of Prenatal Care in Study Sample

The mean QPCQ score for the sample was 4.19 (*SD* = 0.494). Figure 1 shows the histogram of the mean QPCQ scores superimposed with a normal distribution curve. A Kolmogorov-Smirnov test indicates that distribution of the mean QPCQ is

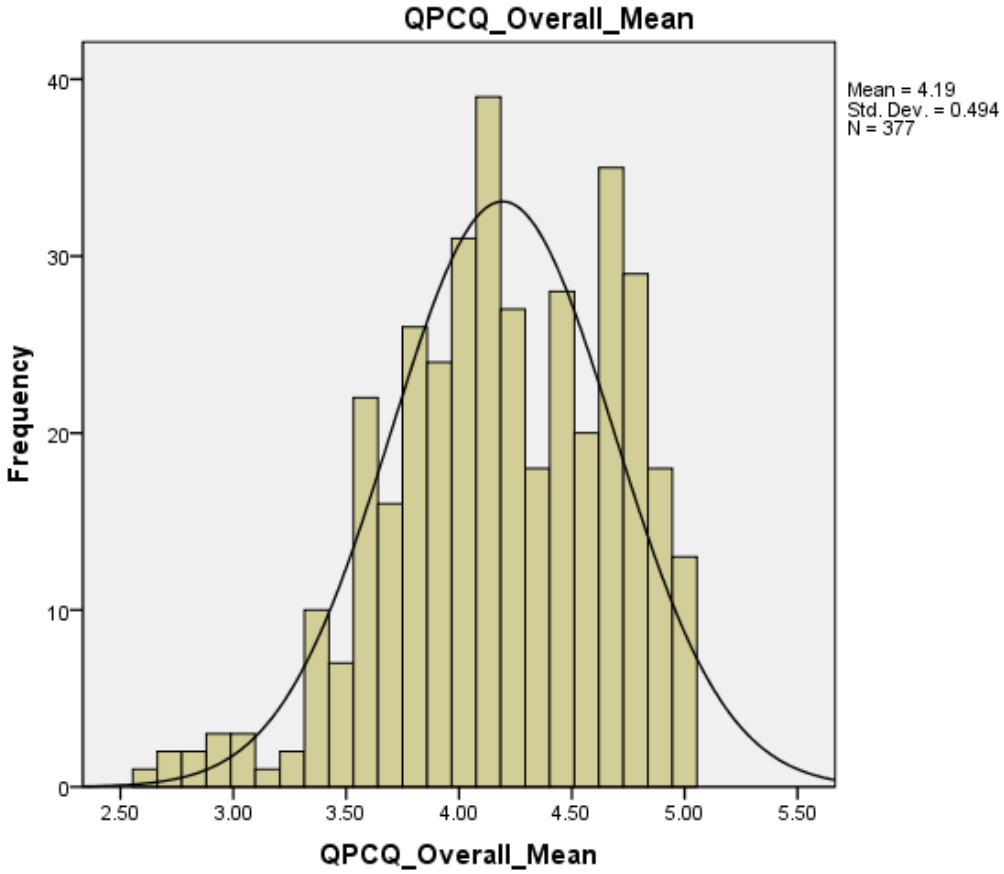
Table 2

Sociodemographic Characteristics and Prenatal Care Provider Types of Study Participants (n=422)

Variables	Frequency Number (%)
Age of Mother (n=422)	
16-24 years	69 (16.4)
25-34 years	250 (59.2)
≥ 35 years	103 (24.4)
Parity (n=409)	
Primagravida	207 (50. 6)
Multigravida	202 (49.4)
Language Spoken at Home (n=403)	
English	352 (87.3)
Other than English	51 (12. 7)
Racial Background (n=412)	
Caucasian	291 (70. 6)
Other than Caucasian	121 (29.4)
Place of Birth (n=420)	
Canada	318 (75.7)
Outside of Canada	102 (24.3)
Marital Status (n=419)	
Partnered	373 (89.0)
Non-partnered	46 (11.0)
Total Family Income (n=407)	
Under $39 999	115 (28.3)
$40 000 - $79 999	113 (27.8)
Over $80 000	179 (44.0)
Education Level (n=420)	
Completed high school or less	88 (21.0)
Some community college, technical school, or university	162 (16.7)
Completed community college, technical school, or a university degree	262 (62.4)
Prenatal Care Provider (n=420)	
Family doctor only	94 (22.4)
Obstetrician only	123 (29.3)
Midwife only	24 (5.7)
Mixed care	165 (39.3)
Other	14 (3.3)

Figure 1

Histogram of Overall QPCQ Mean Scores



not a normal distribution (D=0.072, df=377, p=0.0001). However, due to the large sample size of the study, study results are not significantly affected. While the potential range of QPCQ mean scores was from 1 to 5, the overall QPCQ mean scores in the study varied between 2.61 and 5.00, indicating the scores tended towards higher quality of prenatal care.

3.3 Associations between Sociodemographic Determinants and Quality of Prenatal Care

Tables 2 and 3 show that the highest prenatal care quality of all subgroups categorized by sociodemographic characteristics was reported by women with a total family income of $40 000 to $79 999 (mean = 4.27), followed by Caucasian women (mean = 4.23), women with a total family income of greater than $80 000 (mean = 4.23), and women who completed a community college, technical school, or university program (mean = 4.23). Women who reported the lowest quality of prenatal care were those who most often spoke a language other than English at home (mean = 4.02), those who had an education level of high school or less (mean = 4.03), and those who were non-partnered (mean = 4.05).

Table 3 shows that there was a statistically significant difference in quality of prenatal care between groups depending on whether women reported most often speaking English or another language at home (mean 4.22 vs. 4.02). Quality of prenatal care also was statistically different based upon racial background; women who identified

Table 3

Independent Samples t-tests: Sociodemographic Characteristics

Variables	N	QPCQ mean score	SD	t-value	df	*p*-value
Parity						
Primagravida	188	4.17	0.49	- 0.924	366	0.356
Multigravida	180	4.22	0.49			
Language Spoken at Home						
English	322	4.22	0.48	2.315	358	0.021*
Non-English	38	4.02	0.53			
Racial Background						
Caucasian	272	4.23	0.49	2.201	369	0.028*
Non-Caucasian	99	4.10	0.50			
Place of Birth						
Canada	294	4.19	0.50	0.121	373	0.904
Outside of Canada	81	4.19	0.45			
Marital Status						
Partnered	333	4.21	0.49	1.962	372	0.050*
Non-partnered	41	4.05	0.49			

* Statistically significant

themselves as Caucasian reported higher quality of care (mean=4.23) compared to those women who self-identified as non-Caucasian (mean=4.10). Finally, marital status influenced the quality of prenatal care reported by women. Women who were partnered reported higher quality of care (mean=4.21) than those who were non-partnered (mean=4.05). No differences were found between groups based on parity or place of birth.

Table 4 reports differences between groups identified through one-way analysis of variance. Differences in quality of care were revealed among women based upon their total family income. There was a statistically significant difference in the overall QPCQ mean score between women reporting a total family income of less than $39 999 (mean = 4.09) and women reporting a total family income of $40 000 - $79 999 (mean = 4.27), and between women reporting a totally family income of less than $39 999 (mean= 4.09) and women reporting a total family income greater than $80 000 (mean = 4.23).

Also shown in Table 4 are differences in quality of care among participants relating to their highest education level. There was a statistically significant difference in prenatal care quality between women who had completed high school or less (mean=4.03) and women who have some community college, technical school, or university (mean = 4.21) or completed community college, technical school, or university degree (mean = 4.23).

There was no difference in quality of prenatal care by the age of the women.

Table 4

One-Way Analysis of Variance (ANOVA) in Overall QPCQ Mean Score

Variables	N	QPCQ mean score	SD	F (df_1, df_2)	*p*-value	Post-hoc test (Tukey test)
Age						
16-24	61	4.09	0.48	1. 628 (2, 374)	0.198	
25-34	220	4.22	0.49			
≥ 35	96	4.20	0.51			
Total Family Income						
Under $39 999	99	4.06	0.51	5.091 (2,362)	0.007*	Statistically significant difference: less than $39 999 & $40 000 - $79 999 (p=0.009)
$40 000 - $79 999	99	4.27	0.44			
Over $80 000	167	4.23	0.50			Statistically significant difference: less than $39 999 & greater than $80 000 (p=0.023)
Education Level						
Completed high school or less	67	4.03	0.52	4.238 (2, 373)	0.015*	Statistically significant difference: completed high school & completed community college, technical school, or university (p=0.011)
Some community college, technical school, or university	63	4.21	0.48			
Completed community college, technical school, or university degree	246	4.23	0.48			
Type of Prenatal Care Provider						
Family doctor only	85	4.14	0.51	4.033 (4, 370)	0.003*	Statistically significant difference: seeing only a family doctor & seeing only a midwife (p=0.024)
Obstetrician only	112	4.11	0.45			
Midwife only	19	4.50	0.42			Statistically significant difference: seeing only an obstetrician and seeing only a midwife (p=0.010)
Mixed care	148	4.26	0.50			
Other	11	4.07	0.43			

* Statistically significant

3.4 Types of Prenatal Care Providers and Quality of Prenatal Care

As shown in Table 5, women who saw a midwife only reported the highest level of prenatal care quality. There was a statistically significant difference in quality of care between women reporting midwifery care only (mean = 4. 51) and those who did not receive midwifery care (mean=4.17). Women who received mixed care reported higher quality of prenatal care than those who received care from only a family physician or only an obstetrician (see Table 5). More specifically, there was a statistically significant difference in the quality of care between women who received mixed care (mean = 4.26) and those who did not receive mixed care (mean = 4.15). Similarly, there was a difference between those who saw only an obstetrician (mean = 4.10) and those who did not see an obstetrician (mean = 4.23). Also, there was a statistically significant difference in quality of prenatal care between women who reported seeing only a family doctor (mean = 4.14) and women who reported seeing only a midwife (mean = 4. 50).

3. 5 Analysis of Co-variance

The variable of highest education level was the first to be eliminated from the model equation, as it was the least predictive of high quality prenatal care (p = 0.714). The remaining variables were least predictive of high quality prenatal care in the following order: age (p = 0.494), marital status (p = 0. 655), parity (p = 0.306), racial background (p = 0. 258), place of birth (p = 0. 121), and language most spoken (p = 0. 287). The strongest predictor of high quality prenatal care was the type of prenatal care

Table 5

Independent Samples t-tests: Prenatal Care Providers

Variables	N	QPCQ mean score	SD	t-value	Df	*p*-value
Family Doctor						
Seeing only family doctor	85	4.14	0.51	-1.159	375	0.247
Not seeing a family doctor	242	4.21	0.49			
Obstetrician						
Seeing only an obstetrician	110	4.10	0.45	-2.259	375	0.024*
Not seeing an obstetrician	267	4.23	0. 51			
Midwife						
Seeing only a midwife	21	4.51	0.41	3.073	375	0.002*
Not seeing a midwife	356	4.17	0.49			
Mixed Care						
Seeing multiple care providers	148	4.26	0. 50	2.173	369	0.030*
Not seeing multiple care providers	223	4.15	0.48			

* Statistically significant

Table 6

Analysis of Covariance

Variable	Sum of Squares	Df	Mean Square	F	p-value	Post-Hoc Test (Tukey Test)
Total family income	1. 622	2	0.811	3. 537	0.030	Statistically significant difference: less than $39 999 & $40 000 - $79 999 (p=0.014) Statistically significant difference: less than $39 999 & greater than $80 000 (p=0.035)
Prenatal care provider type	3.119	4	0.780	3.401	0.010	Statistically significant difference: seeing only a family doctor & seeing only a midwife (p=0.036) Statistically significant difference: seeing only an obstetrician & seeing only a midwife (p=0.008) Moderately significant difference: seeing an obstetrician & receiving mixed care (p=0.067)

***** Statistically significant

provider seen by women (p = 0. 010) (Refer to Table 6). The only other predictor that remained in the final model was total family income (p = 0. 030) (Refer to Table 6).

Chapter 4

DISCUSSION & RECOMMENDATIONS

The study found that the sociodemographic factors of language spoken at home, racial background, marital status, total family income, and highest education level influenced the quality of prenatal care received by Canadian women. The type of prenatal care provider also affected the quality of prenatal care, with midwifery patients reporting the highest quality of care and patients of obstetricians reporting poorer quality of care. The strongest predictors of high quality prenatal care for Canadian women were type of prenatal care provider and total family income.

4.1 Sociodemographic Factors

The language spoken at home by women was associated with the quality of prenatal care received. Women who primarily spoke a language other than English at home reported lower quality of prenatal care than their counterparts who spoke English as their primary language, suggesting communication issues have an impact on quality of prenatal care. Crucial elements of quality prenatal care requiring clear communication include effective health teaching, counselling, and respectful interpersonal care (Sword et al., 2012). However, effective communication is jeopardized when a patient with limited English proficiency is receiving prenatal care from a health care provider that is proficient only in English (Schyve, 2007). Language barriers between patients and their health care providers result in "less health education, worse interpersonal care, and lower patient satisfaction" (Schyve, 2007, p. 360). In situations in which patients report they

are sufficiently proficient in English, or health care providers believe they are reasonably proficient in effectively communicating in another language, significant language barriers affecting communication are often underestimated and can impinge on the delivery of quality prenatal care.

Language issues also can impact quality of prenatal care through misjudgements of how cultural differences influence a patient's health perceptions (Schyve, 2007). Prenatal care providers need to recognize that patients' competence in English does not always result in a mutual understanding of cultural norms. Similarly, a common native language among patients does not imply a uniformly shared culture. Such assumptions lead to provider-client situations that are heavily influenced by stereotyping of the patient based on culture, and underestimation of the impact of culture on a patient's understanding, perception, and even compliance in prenatal care. Finally, in the presence of language issues, low health literacy should also be assessed (Schyve). When low health literacy is suspected, health care professionals need to ensure patients understand both oral and written communication. This is necessary to eliminate late discovery of patients who find medical jargon and complex instructions incomprehensible leading to poor quality of prenatal care, insufficient health teaching, and sometimes even adverse events (Schyve).

This thesis study revealed non-Caucasian women received lower quality of prenatal care than Caucasian women, which is in agreement with previous research that found the adequacy of prenatal care varies for women of different races. Heaman,

Blancard, Gupton, Moffatt, and Currie (2005) reported a higher proportion of Aboriginal women (15.7%) received inadequate prenatal care compared to their non-Aboriginal counterparts (3.6%). Alexander, Kogan, and Nabukera (2002) conducted a study examining racial disparities in prenatal care outcomes between White and African women. Disparities in prenatal care outcomes were noted, calling for further strategies to address barriers in prenatal care impact on non-Caucasian racial groups (Alexander et al.).

In an American study, Tossounian, Schoenderf, and Kiely (1997) examined racial disparities by exploring financial, service, and personal barriers to prenatal care reported by black and white women. Financial barriers in the study included: not having coverage for prenatal care, office requiring cash deposits, unspecified money problems, and unclassifiable money problems. Service barriers were no transportation, no child care, not being able to miss work or school, no doctor or clinic nearby, not knowing where to go, not being able to get an appointment, having to wait too long, and hours being inconvenient. Finally, personal barriers acknowledged issues relating to fear of tests, not liking the doctor's or nurse's attitude, not knowing she is pregnant, not wanting everyone else to know she is pregnant, having too many other problems, and not wanting to be pregnant. Among married women, more black women reported barriers of any type compared to white women. Contrastingly, among unmarried women more white women reported any type of barriers than black women. Further analysis revealed that "11.7% of unmarried white mothers perceived financial barriers to prenatal care as compared to 6.3% of unmarried black mothers, even though a greater proportion of unmarried black

mothers fell below the poverty line" (Tossounian et al., p.232). Although black women received less prenatal care, they were less likely to report barriers to prenatal care potentially due to differing expectations relating to prenatal care quality. Perhaps black women have lower expectations for the health care system and its delivery of prenatal care. This results in a greater tolerance for the listed barriers, and a failure to identify them as a variation from the norm of high quality prenatal care services. LaVesit, Keith, and Gutierrez (1995) concluded that black women were challenged by more structural barriers than white women when engaging in prenatal care services. Such studies evidenced the racial disparities in adequacy of prenatal health care, and the thesis findings suggested a significant difference in the quality of prenatal care between Caucasian Canadian women and non-Caucasian Canadian women.

Marital status had an impact on quality of prenatal care. Women with partners reported significantly higher quality of prenatal care compared to women who did not have partners. Single marital status is also often correlated with inadequate prenatal care (Abel, 1996; D'Ascoli, Alexander, Petersen, & Kogan, 1997). Unmarried mothers are more likely to experience barriers in accessing prenatal care and delay the initiation of their care (Kiely & Kogan, 2006; Tossounian, Schoendorf, & Kiely, 1997). This disparity is marginally mitigated with age, but persists (Kiely & Kogan). Current evidence supporting the premise that marital status affects prenatal care is mixed. This may be because research findings are being confounded by the related variable of partner involvement being more predictive of adequate and quality prenatal care (Halverson, 2007). Halverson suggested that categorizing all unmarried women together is imprecise.

The type of relationship – married, cohabiting, romantic, non-romantic – needs to be considered in addition to traditional labels of marital status (Halverson). For example, Teitler (2001) identified that partner involvement had the most influential effect on use of prenatal care when analyzing marital status and relationship types. Granted, married women exhibited optimal use of prenatal care resulting in decreased rates of low birthweights when compared to unmarried mothers. However among unmarried mothers, greater partner involvement yielded a positive effect on early prenatal care initiation, prenatal care usage, and even compliance to prenatal care relating to smoking and drug use during pregnancy (Teitler).

Findings revealed that one of the strongest predictors of quality of prenatal care is total family income. There was a significant difference in the quality of prenatal care reported by women with a total family income of less than $39 999 compared to women reporting a total family income of over $60 000. One element of quality prenatal care is access (Sword et al., 2012). A higher proportion of low income women live in unsafe neighbourhoods, have restricted access to transportation, and struggle with childcare issues preventing them from attending prenatal care visits (Novick, 2009). Some low income women also report not liking their prenatal care setting due to lack of cleanliness and privacy, which further impacts quality of prenatal care (Novick; Sword et al.). Women of lower income experience discrimination and stereotyping, which negatively impacts their prenatal care experience (Novick). More specifically, women of lower income express that they feel "stereotyped as single, welfare mothers" (Novick, p.232). In Novick's integrative review, multiple studies have noted lower income women

reporting "harsh, rude, or impersonal treatment, long wait times for short visits, and inadequate information" (p.232). A respectful attitude and sharing information are important elements of quality prenatal care (Sword et al.).

Education was the final sociodemographic factor that influenced the quality of prenatal care among Canadian women. Findings revealed a significant difference in the quality of care based on the highest education level of women. Those who had completed only high school reported lower quality of care compared to women with higher levels of education. Women with completed degrees reported the highest level of quality prenatal care. In the literature, lower maternal education is consistently included in the constellation of sociodemographic factors that contribute to poor prenatal care uptake – lower income, lower education, no employment outside the home, non-Caucasian, non-English speaking, and multiparity (D'Ascoli et al., 1997; Delgado-Rodriguez, Gomez-Olmedo, Bueno-Cavanellas, & Galvez-Vargas, 1997).

Consistent correlations between the sociodemographic risk factors listed above and poor prenatal care adequacy, uptake, and quality provided the impetus for an investigation into prejudices within the prenatal care system. Guilfoyle, Kelly and St. Pierre-Hansen (2008) investigated prejudice in the Canadian health care system. The Institute of Medicine define this concept in a report, *Unequal Treatment* (2002), as "differences in the quality of healthcare that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention" (p.4). This type of discriminatory health practices is divided into two levels: the health care structure

(systemic discrimination) and discrimination that results from "biases, prejudices, stereotyping, and uncertainty in clinical communication" (Guilfoyle, Kelly, & St.Pierre-Hansen, p.1512). Guilfoyle, Kelly, and St. Pierre-Hansen describe that health inequities still persist within the universal health care system of Canada. However, disadvantaged constituent groups should not just be identified and labelled as aboriginal, foreign-born, or speaking a different language. The complex consequences of these inequities, requires comprehensive analysis of the contributing sociopolitical and historical factors in order to address prejudice and discrimination in prenatal care.

Novick (2009) reported that women with sociodemographic risk factors (i.e., racial background, income, language spoken at home) experienced discrimination or stereotyping during their prenatal care, which is captured in the definition of prejudice. Minority women were less likely to report being treated respectfully and felt they were being treated differently based on their racial background. This negatively impacts quality of prenatal care as a respectful attitude is a key element of interpersonal care processes in high quality prenatal care (Sword et al., 2012). Women with lower family income reported feeling stereotyped as "single, welfare mothers", and homeless women describe being treated "like crap" (Novick, p. 233). Studies capturing such issues highlight the predisposition of such women with sociodemographic risk factors to receive poor quality prenatal care.

4.2 Type of Prenatal Care Provider

The type of prenatal care provider was the strongest predictor of quality prenatal care received by Canadian women. The highest quality of prenatal care was reported among women who received prenatal care from only a midwife. Midwifery care espouses many components of quality prenatal care, such as the tenants of women-centred care, shared-decision making, and emotional care (Novick, 2009; Sword et al., 2012). This finding is supported by Novick's integrative review of women's experience of prenatal care in which women placed great value on the close rapport and friendship developed with their midwives. Higher quality prenatal care can be achieved as midwives "spend more time with patients during prenatal visits, and put more emphasis on patient counselling and education, establishing trust, and providing emotional support and empowerment to the pregnant women" (MacDorman & Singh, 1998, p. 316). Buhler et al. (1988) echoed this observation by stating that midwifery patients reported their care to be 2.3 times more superior than patients who received care from family physicians. However, the demand for midwifery prenatal care in Canada is outstripping the availability of services (Novick; British Columbia Centre of Excellence for Women's Health, 2003). Most urban midwifery practices report waiting lists and rural communities are competing to employ midwives (British Columbia Centre of Excellence for Women's Health).

Thesis findings revealed a majority of Canadian women see only an obstetrician for their prenatal care. These findings are supported by the Public Health Agency of

Canada (2009) reporting 58.1% of women received care from an obstetrician. However these women reported the poorest quality of prenatal care in comparison to any other prenatal care provider types. A chief cause of dissatisfaction among patients of obstetricians arises from time constraints in prenatal care visits (MacDorman & Singh, 1998). Yankou, Petersen, Oakley, and Mayes (1993) reported that on average physicians spent 29.8 minutes for initial prenatal visits and 14. 6 minutes for subsequent visits, which contrasted with 49.3 minutes for initial midwife visits and 29.3 minutes for return visits. Such time constraints compromise many elements of quality prenatal care, including health teaching and counselling, psychosocial screening, development of a mutual, respectful patient-provider relationship, women-centred care, and shared-decision making (Sword et al., 2012). Furthermore MacDorman and Singh reported that midwives, when compared to obstetricians, actually provided care to women with more sociodemographic risk factors. Women who are non-Caucasian, teenagers, have had three or more previous births, unmarried, or have less than a highschool education were more likely to receive care from a midwife.

MacDorman and Singh (1998) reported that obstetricians delivered women with more biomedical risk factors such as placental abnormalities, breech/malpresentation, fetal distress, and hydramnois/oligohydramnios. In a study analyzing women's dissatisfaction with prenatal care in pregnancies complicated by congenital anomalies, Yang et al. (2007) found that although the majority of women reported high levels of satisfaction, those with reduced knowledge of testing being completed, delivery of information that was deemed not useful, and poorer understanding of information being

relayed reported higher rates of prenatal care dissatisfaction. Although satisfaction and quality of prenatal care are distinctly different concepts, perhaps similar issues, in part, are at the crux of poorer quality of prenatal care associated with obstetricians. Because obstetricians provide a majority of the care to high risk women and are restricted by time constraints, they may fail to focus on effective teaching, counselling, and developing a close, mutual relationship with their patients, thus contributing to poor quality prenatal care.

In Canada, an increased burden is placed on obstetricians to provide the majority of prenatal care to both high and low risk women. This is a result of a high attrition rate for family physicians as prenatal care providers and low numbers of midwives administering prenatal care (British Columbia Centre of Excellence for Women's Health, 2003). Furthermore, fee-for-service models of compensating very busy obstetricians are disincentives for spending time with pregnant women, thus compromising the quality of care (Emery, Auld, & Lu, 1999). Obstetricians' use of volume of services as a means to maintain income level in a fee-for-service framework leads to patients being "over serviced" and experiencing lower quality of care (Emery et al.). In the thesis study, patients receiving care from only family physicians, who are also paid by fee-for-service models, reported similar poorer quality prenatal care. The slightly higher quality of care compared to obstetrician only care perhaps may be related to an already existing patient-provider relationship that serves as a positive foundation for the delivery of quality care. The argument against fee-for-service models is that a capitation-based system will prevent the over-treatment of patients in order to receive an income, provide

incentives to physicians to provide quality care as they need to be competitive in keeping a patient base for income retrieval, and finally overall quality perhaps can be improved as resources can be allocated based on patient-population need rather than physician activities (Emery et al.).

Most women in the study received mixed care, meaning they received prenatal care from more than one prenatal care provider. Women receiving mixed care, second to those seeking prenatal care only from only a midwife, reported higher quality of prenatal care than their counterparts. In order to avoid any confusion in concepts, the thesis study used the term mixed care rather than shared care as this term was not explicitly defined in the data collection. For coding purposes, if study participants selected more than one of family doctor, obstetrician, midwife, nurse practitioner, or other as their prenatal care provider, they were coded as receiving mixed care. Moorehead (1995) defined shared care as "an approach to care which uses the skills and knowledge of a range of health professionals who share joint responsibility in relation to an individual's care. This also implies monitoring and exchanging patient data and sharing skills and knowledge between disciplines" (p.11). The objective of shared care is to "have the right people doing the right things, in the right order, at the right time" in order to achieve quality health care (Provincial Health Services Authority, 2005, p.1).

Shared care antenatal programs are a recognized model of shared care and facilitate higher quality of prenatal care by improving prenatal care quality for the individual women and by strengthening prenatal care provider networks (Provincial

Health Services Authority, 2005). For the individual woman, shared care models improve access to coordinated high quality prenatal care within her community in a timely manner (Provincial Health Services Authority; Boyle, Banks, Petrizzi, & Larimore, 2003). Shared care models have shown to yield high levels of women satisfaction, enhanced compliance among patients, enhanced continuity of care, appropriate use of obstetrical interventions, and favourable perinatal outcomes (Boyle et al.; Ontario Maternity Care Expert Panel, 2006). In shared care models a healthy work environment and peer group are developed to support prenatal care practitioners, which encourage the development and refinement of clinical skills (Ontario Maternity Care Expert Panel). Within a shared care model, prenatal care providers are implicated to participate in continued quality control via processes used to standardize care across all practitioners (Ontario Maternity Care Expert Panel; Provincial Health Services Authority). This leads to the gradual adoption of best practice standards (Ontario Maternity Care Expert Panel; Provincial Health Services Authority). Finally, the lifestyle of prenatal care providers is improved through shared models. Patient loads are distributed among all practitioners in the shared care model, decreasing the overburden on one practitioner. Additionally, within the model, practitioners are able to provide break coverage to their colleagues as needed. These changes in demands affecting practitioner lifestyle encourage recruitment of new practitioners and renew the interest of old practitioners (Provincial Health Services Authority).

4.3 Study Strengths and Limitations

The sample size of the secondary analysis comprised 422 women from across the country. The study sample was representative of women with diverse sociodemographic characteristics (i.e., age, marital status, total family income, education level, racial background) and women with different prenatal care providers (i.e., obstetricians, family physicians, midwives, mixed care). Additionally, having five study sites representing difference geopolitical regions contributes to the external validity of the thesis findings.

Despite the diversity of the sample population, the sample size of this study presented an issue. The creation of variable categories resulted in very small samples in certain subgroups, giving rise to questions relating to external validity. For example, only 24 women (5.7%) had received prenatal care from a midwife. Although this percentage is a very close approximation of the proportion of women receiving midwifery care in Canada (6.1%) (Public Health Agency of Canada, 2009), findings may be affected by the small sample size. Similarly, only 51 women (12. 7%) reported primarily speaking a language other than English at home and there were only 46 women (11.0%) who were not partnered.

The lack of data to be able to assign shared care rather than mixed care as a model of care is a limitation of the study. There were inadequate data to determine receipt of shared care versus a mixed care or collaborative care model. For future studies, shared care should be a clearly defined option for participants to select.

Selection bias also needs to be considered with this study sample because a majority of the sample was Caucasian, Canadian-born, high income, partnered, post-

secondary educated women. Research methodology could potentially have contributed to this bias. An eligibility criterion of the study required women to read and write English, so women could independently complete the QPCQ questionnaire. However, this could potentially have affected the recruitment of non-Caucasian women who often spoke a language other than English at home. Additionally having a convenience sample, in which the recruitment strategy required research assistants to approach participants and sign them for the study, a particular cohort of women may have been more amenable to being approached for the study or consenting to the study.

In considering the data collection method, using a questionnaire, acquiescence bias may have also impacted study results. As described previously, study findings revealed prenatal care ratings were skewed to higher quality. Women may have been more likely to report a more positive result when completing the QPCQ questionnaire. As stated by Lavrakas (2008), this type of bias is especially pronounced when participants are asked questions in the format of agree-disagree. Such effects could potentially have been diminished in the QPCQ because questions were phrased in positive and negative statements.

4.4 Implications

4.4.1 Practice and Policy

Practice and policy changes are necessary to develop national strategies that will improve prenatal care quality for women identified in the thesis findings as receiving poor quality prenatal care. Targeted strategies to provide alternative and ancillary

prenatal care services need to be practically explored to improve the quality of prenatal care (Korenbrot, 2005). Alternative and ancillary forms of prenatal services include free prenatal classes, group prenatal care, supplementary prenatal nursing, and home visitation (Korenbrot; Tough et al., 2006). These prenatal care services improve access to prenatal care for varying subgroup populations (Tough et al.). Such changes can strengthen timely screening and interventions for special needs in pregnant Canadian women (Tough et al.). Alternate forms of prenatal care delivery permit early "psychosocial supports, referrals, preventive education and interventions, and provision of information and resources" (Tough et al., p.184). Key elements of quality prenatal care addressed by these prenatal care services include access, health teaching, counselling, and emotional support (Sword et al., 2012). Such prenatal care service forums are less burdensome on already limited time, finances, and personnel (Ickovicks et al., 2003).

Group prenatal care is an innovative approach to providing prenatal care within the current Canadian health care system (Ickovicks et al., 2003). Group prenatal care can be offered by any type of prenatal care provider, including obstetricians, midwives, or nurse practitioners, and often involves shared care models, which can yield higher quality of prenatal care. Group prenatal care is often structured into 10, 2-hour sessions occurring during the 16^{th}-40^{th} week of pregnancy with approximately 10-15 women in attendance (Ickovicks et al.). Prenatal care is provided in the group setting, excluding the initial assessment that occurs prior to group assignment, confidential medical issues, and vaginal examinations conducted once women are full-term (Ickovicks et al.). Together,

women of similar gestational age are provided thorough health teaching and counselling to gain knowledge relating to pregnancy, childbirth, and parenting, undergo preliminary risk assessments, and network with each other to create social supports (Ickovics et al.). This format addresses significant barriers to achieving quality prenatal care by decreasing wait times, affording women more time with prenatal care providers during visits, providing comprehensive teaching, developing meaningful and supportive relationships, and enabling women to become active participants in their prenatal care (Novicks, 2009; Sword et al., 2012). Women in a study who received routine prenatal care with additional group prenatal care revealed greater satisfaction with prenatal care when compared to their counterparts who received only routine prenatal care (Novick). Women reported that they felt supported, their problems were normalized, their self esteem was elevated, and their learning was improved (Novick).

After the integration of ancillary or alternate prenatal care services for at risk women, these changes to prenatal care delivery systems need to be assessed for quality improvement as well as impact on finance and resource allocation. This will result in the identification of a prenatal care delivery vehicle that is most effective and efficient in producing high quality prenatal care.

The implication of the type of prenatal care provider type having a significant impact on prenatal care quality suggests a systemic need to examine practice and policy changes relating to efficient allocation and use of prenatal care providers within the Canadian health care system. The intensifying maternity crisis occurring in the nation

due to insufficient prenatal care providers makes reconsideration of prenatal care structure even more timely.

Midwives were found to provide the highest quality of prenatal care. However, midwives provide care to only 6.1% of pregnant Canadian women (PHAC, 2009). Current demands for midwifery care are not being met (Novick, 2009). Therefore, a coordinated effort needs to be executed to expand midwifery care across the nation. Currently, publicly funded midwifery care is available only in Ontario, British Columbia, Manitoba, and Quebec. Other regions have limited midwifery care, but require patients to pay high costs for care. Changes need to be initiated at the government level to provide universal access to midwifery care. Secondly, midwifery education in the country is limited. Approximately, only 80 to 100 new graduates enter practice every year (British Columbia Centre of Excellence for Women's Health, 2003). A deliberate effort is needed to increase the number of midwives being graduated in Canada and recruited from other countries. Practicing midwives in Canada are often clustered in urban centres, with long waiting lists even in such practice settings. In rural areas, midwifery practice is challenged by "limited access to specialists, diagnostic technologies, peer support, and continuing medical education" (British Columbia Centre of Excellence for Women's Health, p. 3), creating a negative practice environment leading to high attrition rates for rural midwifery. More technological and peer support needs to be provided to midwifery care in non-urban centres, as well as financial compensation for practicing in high need areas. The above strategies will affect prenatal care quality by contributing to an increase

in number of midwives available through increased recruitment and distribution across the nation.

Concurrently, the scope of practice of the individual midwife needs to be expanded in order reduce the overburden encountered by obstetricians and family physicians. For example, in Ontario, British Columbia, and Manitoba, full midwifery scope of practice encompasses admitting privileges to the hospital, specific diagnostic and prescribing capabilities (British Columbia Centre of Excellence for Women's Health, 2003). However, in Quebec midwives are restricted to attend births in birthing centres (British Columbia Centre of Excellence for Women's Health). Further, even in regions where midwives have full scope of practice, further enhancement is necessary to increase the uptake of midwifery care and redistribute patient load. Some areas of consideration should include: second assisting in cesearean section, independently initiating oxytocin induction of labour, and performing assisted deliveries. Supported expansion of the midwifery scope of practice and autonomy, as described above, will enable midwives to safely, efficiently, and effectively provide high quality prenatal care to a larger portion of low risk Canadian women. Secondarily, a reduced burden, affords obstetricians the time to provide high quality prenatal care for pregnant Canadian women with high risk pregnancies. Active incorporation of shared care models between midwives, obstetricians and family physicians in the Canadian prenatal care system will provide higher quality care and address the needs of a diverse population.

4.4.2 Future Research

Future research on quality of prenatal care is needed, specifically identification of the efficacy of each prenatal care component and its impact on intended birth outcomes. Components of quality prenatal care that need further examination include: structure of care (i.e., access, physical setting, staff and care provider characteristics); clinical processes (i.e., health promotion and illness prevention, screening and assessment, sharing of information, continuity of care, non-medicalization of pregnancy, women-centredness); and interpersonal care processes (i.e., respectful attitude, emotional support, approachable interaction style, taking time). For example, recent evidence has challenged the efficacy of a strictly biomedical model that focuses on screening and assessments through routine laboratory and diagnostic tests at a specified gestation. Quality of prenatal care research suggests a focus on lifestyle, health counselling, and emotional support, to be more contributory to positive prenatal care outcomes (MacDorman & Singh, 1998; Sword, 2012). Similarly, Kogan, Alexander, and Kotelchuck (1994) linked inadequate prenatal health counselling to an increased risk of low birthweight. However, the same study did not find an association between risk for low birthweight and women not receiving all recommended biomedical procedures within their prenatal care.

As an extension, future research also needs to explore the differing effects of prenatal care on women with varying sociodemographic risk factors. In deriving solutions to address the disparities among Canadian women based on characteristics such as race, income, education, and language, there is a need for researchers to use the thesis results as a basis to conduct similar Canadian studies analyzing inequities in quality prenatal care

based on the many categories of women represented in the Canadian population. Such research efforts are a prerequisite to universally improving quality of prenatal care for all Canadian women coming from diverse backgrounds that report poorer quality of prenatal care.

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Appendix A

PARTICIPANT INFORMATION AND CONSENT FORM

Title of Study:	**Quality of Prenatal Care Questionnaire: Instrument Development and Testing**
Principal Investigators:	**Dr. Wendy Sword, McMaster University**
	Dr. Maureen Heaman, University of Manitoba
Co-Investigators:	**Dr. Noori Ahktar-Danesh (McMaster University), Dr. Michael Helewa (University of Manitoba), Eileen Hutton (McMaster University), Dr. Patti Janssen (University of British Columbia), Prof. Dawn Kingston (McMaster University), Dr. Suzanne Tough (University of Calgary), and Dr. David Young (Dalhousie University)**
Sponsor:	**Canadian Institutes of Health Research**

You are being invited to participate in a research study conducted by Dr. Wendy Sword of McMaster University and Dr. Maureen Heaman of the University of Manitoba. In order to decide whether or not you want to be a part of this research study, you should understand what is involved and the potential risks and benefits. This form gives detailed information about the research study, which will be discussed with you. Once you understand the study, you will be asked to sign this form if you wish to participate. Please take your time to make your decision.

WHY IS THIS RESEARCH BEING DONE?

This research is being done because, at present, there is no questionnaire that determines the quality of prenatal care a woman receives. The questionnaire can then be used by researchers to determine if there is a relationship between the quality of prenatal care a woman receives and outcomes for herself and her baby. People who plan and provide prenatal services will be able to use the questionnaire to collect information to guide planning of these services

WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this study is to develop a questionnaire that will provide information about quality of prenatal care.

WHAT WILL MY RESPONSIBILITIES BE IF I TAKE PART IN THE STUDY?

If you volunteer to participate in this study, we will ask you to do the following things:

- Fill out a questionnaire to provide background information about yourself and your baby.
- Fill out a questionnaire in hospital related to prenatal care.

WHAT ARE THE POSSIBLE RISKS?

There are no known risks to you if you take part in this study.

HOW MANY PEOPLE WILL BE IN THIS STUDY?

Approximately 750 women and 50 health care providers will be involved in this study.

WHAT ARE THE POSSIBLE BENEFITS FOR ME AND/OR FOR SOCIETY?

We cannot promise any personal benefits to you from your participation in this study. However, your participation will help us in developing a questionnaire that will be useful to researchers and to people who plan and provide prenatal services.

IF I DO NOT WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

It is important for you to know that you can choose not to take part in the study. If you decide not to participate, this decision will in no way affect the care or services you receive.

WHAT INFORMATION WILL BE KEPT PRIVATE?

The fact that you are taking part in this study is confidential. Your information will not be shared with anyone except with your consent or as required by law. All personal information such as your name, address, phone number, and hospital ID will be removed from the data and will be replaced with a study number. A list linking the number with your name will be kept in a secure place, separate from your file. All information will be securely stored in a locked filing cabinet in a locked research office at McMaster University. When the results of the study are published or presented at scientific meetings, your name will not be used. Your identity will be anonymous and there will be no way that you can be identified.

For the purposes of ensuring the proper monitoring of the research study, it is possible that a member of the Hamilton Health Sciences/McMaster University Faculty of Health

Sciences Research Ethics Board may consult your research data. By signing the consent form, you authorize such access.

It is possible that your information might be used to answer additional questions about prenatal care. If this happens, your information will remain confidential and your identity will be kept anonymous.

Your personal information will be destroyed within one year after the study is completed. All other information collected during the study will be retained for 5 years after the funding for the study ends as recommended by the Canadian Institutes of Health Research.

CAN PARTICIPATION IN THE STUDY END EARLY?

You may decide at any time that you do not want to be in the study. If you withdraw from the study, this will in no way affect the quality of care you receive at this institution or services you receive after discharge. However, any information you have provided will be used for the study. You also may refuse to answer any questions you don't want to answer and still remain in the study.

WILL I BE PAID TO PARTICIPATE IN THIS STUDY?

Participation in the study is entirely voluntary. You will receive a $20 gift certificate in appreciation for your time and contribution to the study.

WILL THERE BE ANY COSTS?

Your participation in the study will not involve any additional costs to you.

IF I HAVE ANY QUESTIONS OR PROBLEMS, WHOM CAN I CALL?

If you have any questions about the research now or later, please contact Dr. Wendy Sword at McMaster University, 905-525-9140 ext. 22307 (sword@mcmaster.ca), Dr. Maureen Heaman at the University of Manitoba, 204-474-6771 (heamanmi@cc.umanitoba.ca) or the Research Assistant, Sandy Brooks, at 905-525-9140 ext. 20215 (sbrooks@mcmaster.ca).

If you have any questions regarding your rights as a research participant, you may contact the Office of the Chair of the Hamilton Health Sciences/McMaster University Faculty of Health Sciences Research Ethics Board at 905-522-2100 ext. 42013.

There is a consent form attached to this information sheet. By signing the consent form, you are agreeing to take part in the study. We hope that you will participate because it is

very important that we have a means to determine quality of prenatal care and ensure that women receive the care they need.

CONSENT TO PARTICIPATE

I understand that I am being asked to take part in a research study to develop a questionnaire that will provide information about quality of prenatal care. I have received a copy of the Participant Information Sheet and have read it thoroughly. I have had the opportunity to ask questions, and all of my questions have been answered to my satisfaction.

I understand that:

- I will be asked to fill out a questionnaire to provide background information about myself.
- I will be expected to complete a prenatal care questionnaire while I am in hospital.
- The questionnaire will take about 15-20 minutes to complete.
- All information will be kept confidential.
- I will in no way be identified in any reports of the study.
- My participation is entirely voluntary.
- I will receive a $20 gift certificate in appreciation for my time and contribution to the study.
- I can refuse to answer specific questions or withdraw from the study at any time.
- If I do not want to answer a question or decide to withdraw from the study, this will not affect any services that I might receive either in the hospital or in the community.
- If I decide to withdraw from the study, any information I have provided can be used.
- I will not benefit in any direct way as a result of my participation.
- I will receive a signed copy of this form.

If I have any questions about the study, I can contact Dr. Wendy Sword at McMaster University at 905-525-9140 ext. 22307 (sword@mcmaster.ca), Dr. Maureen Heaman at the University of Manitoba, 204-474-6771 (heamanmi@cc.umanitoba.ca) or the Research Assistant, Sandy Brooks, at 905-525-9140 ext. 20215 (sbrooks@mcmaster.ca).

I agree to participate in this study titled *Quality of Prenatal Care Questionnaire: Instrument Development and Testing*.

_____	_____	_____
Name of Participant	Signature of Participant	Date

Consent form administered and explained in person by:

_____	_____	_____
Name	Signature	Date

Principal Investigator:

_____	_____	_____
Name	Signature	Date

Appendix B

Quality of Prenatal Care Study

Postnatal Background Questionnaire

Thank you for agreeing to participate in this study of prenatal care. Remember, all information you provide will be kept confidential.2

Section 1: You, Your Health and Health Care

1. Your age: ☐☐ years

2. How many weeks pregnant were you when your baby was born? ☐☐ weeks

3. Including this pregnancy, how many times have you been pregnant? ☐☐

(This includes pregnancies ending in miscarriage, abortion, ectopic pregnancy, stillbirth and live birth)

4. Including the birth of this baby, how many times have you give birth to a live baby?

☐☐

5. How many weeks or months pregnant were you when you had your first visit for prenatal care? *(Do not count a visit that was only for a pregnancy test).*

☐☐ weeks OR ☐☐ months

6. About how many visits for prenatal care did you have during your pregnancy? If you don't know how many, please give your best guess.

☐☐ visits

7. Who took care of you during your pregnancy?

(check ALL that apply)
- ❍ Family doctor
- ❍ Obstetrician
- ❍ Midwife
- ❍ Nurse practitioner

- ❍ Other

(please describe) _____

8. Where did you receive most of your prenatal care?

(check ONE)
- ❍ Private office
- ❍ Clinic
- ❍ Outpatient department of a hospital
- ❍ Other

(please describe) _____

9. Did you have any complications with this pregnancy prior to delivery?

❍ Yes
❍ No → **Go to question 11** 3

10. What complications did you experience?

(check ALL that apply)
❍ Nausea and vomiting requiring hospitalization
❍ Bleeding requiring hospitalization or bed rest at home
❍ High blood pressure
❍ Preterm labour
❍ Diabetes
❍ Other
(please describe)

11. Have **YOU** had any medical problems since giving birth?

❍ Yes describe:
❍ No

12. Do you have any chronic health problems (physical or emotional)?

(Chronic health problems are conditions that have lasted or are expected to last 6 months or more and have been diagnosed by a health professional.)
❍ Yes describe:
❍ No

Section 2: Your Labour and Delivery

13. Did you have a c-section or a vaginal delivery?

❍ C-section
❍ Vaginal delivery → **Go to question 15**

14. Was the c-section planned *before* you went into labour?

❍ Yes
❍ No

Section 3: Your Baby

15. Is your baby a

❍ Boy?
❍ Girl?

16. How much did your baby weigh at birth?

☐☐☐☐☐ gms OR ☐☐ lbs ☐☐ oz 4

17. How are you currently feeding your baby?

(check ALL that apply)
❍ Breast feeding/expressing milk
❍ Formula feeding
❍ Other describe:_____

18. Has your **baby** had any health problems since birth?

❍ Yes describe:
❍ No

Section 4: Background Information

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

19. What language do you speak ***most often*** at home?

(check ONE)
❍ English ❍ Persian (Farsi)
❍ French ❍ Polish
❍ Arabic ❍ Portugese
❍ Chinese ❍ Punjabi
❍ Cree ❍ Spanish
❍ German ❍ Tagalog (Filipino)
❍ Greek ❍ Ukranian
❍ Hungarian ❍ Vietnamese
❍ Italian ❍ Korean
❍ Other
describe: _____

20. Which of the following ***best describes*** your racial background?

(check ONE)
❍ Aboriginal (Inuit, Métis, First Nations)
❍ Arab/West Asian (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan)
❍ Black (e.g., African, Haitian, Jamaican, Somali)
❍ Chinese
❍ Filipino
❍ Japanese
❍ Korean
❍ Latin American
❍ South Asian (e.g., East Indian, Pakistani, Punjabi, Sri Lankan)
❍ South East Asian (e.g., Cambodian, Indonesian) ❍ White (Caucasian)
❍ Other
describe: _____ 5

21. Were you born in Canada?

❍ Yes → **Go to question 24**
❍ No

22. In what country were you born? _____

23. How long have you lived in Canada? ☐☐ years

24. What is your marital status?

(check ONE)
❍ Married
❍ Common-Law
❍ Living with a partner
❍ Single (never married)
❍ Widowed
❍ Divorced

25. What is your *best estimate* of your ***total family income***, before taxes and deductions, from all sources in the past 12 months?

(check ONE)
❍ No income
❍ Under $10 000
❍ $10 000 - $19 999
❍ $20 000 - $39 999
❍ $40 000 - $59 999
❍ $60 000 - $79 999
❍ Over $80 000

26. What is your ***highest*** level of education?

(check ONE)
- ❍ Elementary school or less
- ❍ Some high school
- ❍ Completed high school
- ❍ Some community college or technical school
- ❍ Completed community college or technical school
- ❍ Some university
- ❍ Completed bachelor's degree
- ❍ Graduate degree

Thank you for taking the time to fill in this questionnaire.