

IMPROVING CARE OF PREGNANT WOMEN THROUGH PROVIDER EDUCATION OF
GROUP PRENATAL CARE

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ABSTRACT

Prenatal care has been associated with improved pregnancy outcomes for both a mother and her unborn child. However, there are still many disparities that exist in healthcare today, resulting in inadequate access to prenatal care for many groups of women. Women face many barriers to prenatal care that can lead to poor maternal and neonatal outcomes such as lack of transportation, scheduling difficulties, inability to pay for services, and other social factors (Abshire et al. 2019; Akamune, 2018; Crocket et al., 2019). Since the early 1900's, the focus has been on individualized care models, but the benefits of group prenatal care (GPC) have become a pertinent topic of discussion. Both the American College of Obstetrics and Gynecology (ACOG) and the World Health Organization (WHO) have discussed the potential benefits of GPC including improvements in the quality of care, as well as enhanced maternal and neonatal outcomes among diverse populations of women.

The focus of this practice improvement project (PIP) was to increase obstetrics providers' knowledge of barriers to prenatal care and educate on the importance of GPC, more specifically the CP® model of care. To better improve prenatal care of women in a central North Dakota OBGYN clinic, obstetrics providers were invited to watch a 25-minute evidence-based PowerPoint presentation with key topics including barriers to prenatal care, ways to reduce barriers to prenatal care, and the benefits of GPC in clinical practice. Providers completed pre- and post-surveys to assess their change in perceived knowledge following the educational module. Four providers responded to the pre-survey and two responded to the post-survey.

Results of the project indicated an overall increase in providers' perceived knowledge regarding barriers to prenatal care, ways to reduce barriers to prenatal care, and benefits of GPC and CP®. In addition, provider intent to implement GPC services into their practice also assessed

increased following review of the educational module. Key barriers to implementation of GPC identified by the participants included lack of facility support, staffing, space, and scheduling. The educational module was beneficial in promoting the use of evidence-based research to increase providers' knowledge of ways to reduce barriers to care through the utilization of GPC.

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DEDICATION

I would like to dedicate this disquisition to my husband. Casey, your love and support throughout the last three years did not go unnoticed. From planning a wedding, to starting our family, and all the challenges in-between, we finally made it! You have always believed in me and encouraged me to chase my dreams. You made so many sacrifices for our family throughout this journey by taking on new endeavors at work and have stepped into the role as the primary financial supporter without one complaint. You have continued to encourage me and always ensured me that we would make this work for the few years it would take for me to reach my dreams. Here is my written promise that you can retire three years early! Thank you for your patience, understanding, and never-ending encouragement. I could not have done this without you, and I am so excited to see where the future takes us.

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LIST OF ABBREVIATIONS

AAP	American Academy of Pediatrics
ACOG	American College of Obstetrics and Gynecologists
AI/AN	American Indian/Alaskan Native
ALT	Adult Learning Theory
CDC	Centers for Disease Control and Protection
CHI	Centering Healthcare Institution
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CP ®	CenteringPregnancy®
DNP	Doctor of Nursing Practice
GBS	Group B Streptococcus
GPC	Group Prenatal Care
ICP	Individual Prenatal Care
IRB	Institutional Review Board
HIS	Indian Health Services
LBW	Low Birth Weight
NP	Nurse Practitioner
ND	North Dakota
NDSU	North Dakota State University
OBGYN	Obstetrician Gynecologist
PIP	Practice Improvement Project
PTSD	Post-Traumatic Stress Disorder
Q&A	Question and Answer
RN	Registered Nurse

SGASmall for Gestational Age

WHOWorld Health Organization

CHAPTER 1: INTRODUCTION

Background and Significance

Prenatal care is one of the most common preventative health interventions in the United States (U.S.) with approximately 50 million prenatal visits annually and is essential in improving outcomes for both a mother and her unborn child (Alexander & Kotelchuck, 2001; Andrade-Romo et al., 2019; Catling et al., 2017; Novick et al., 2015). The American Academy of Pediatrics (AAP) and the American College of Obstetrics and Gynecologists (ACOG) recommend frequent and high-quality prenatal care for all pregnant patients to prevent adverse effects for the patient and her fetus (Tucker et al., 2021). The primary focus of prenatal care is on prevention of complications during pregnancy and to educate and inform women about important steps they can take to protect their infant and ensure a healthy pregnancy (US. Department of Health and Human Services, 2017).

In 1925, the U.S. Department of Labor Children's Bureau issued a recommendation for standards and schedule of prenatal care visits, similar to today's current model of individual prenatal care (IPC) (Mills, 2019). This recommendation included monthly visits with a healthcare provider for the first six months of pregnancy, bimonthly visits from seven to eight months, and weekly visits for the last four weeks of pregnancy (Mills, 2019). These visits consisted of height and weight, vital signs, a physical exam, and a urinalysis and providers were encouraged to educate patients on topics such as healthy diet, exercise, sleep, and self-care. Prior to this recommendation being issued, the original focus of prenatal care was on decreasing fetal abnormalities and decreasing toxemia, but the focus quickly switched to screening and risk reduction (Gennaro et al., 2016).

Currently, individual prenatal care consists of a series of one-on-one visits between a patient and an obstetric care provider (American College of Obstetricians and Gynecologists [ACOG], 2021). These visits typically begin around 8 weeks gestation and last anywhere from 5 and 15 minutes (Mills, 2019). However, the reality is many women lack access to early prenatal care therefore PNC is initiated after the recommended timeframe. The primary focus is on preventing poor perinatal outcomes while educating women throughout the stages of pregnancy, childbirth, and the postpartum period (ACOG, 2021). Unfortunately, not all women have access to early and ongoing prenatal care during their pregnancy, which can lead to adverse maternal and neonatal health outcomes. Potential drawbacks of individualized prenatal care include long wait times, gaps in the continuity of care, and low user satisfaction with healthcare personnel (Andrade-Romo et al., 2019). Individual prenatal care works well for the traditional patient who has few barriers and has adequate access to care. However, women who experience barriers in healthcare access may have difficulty in participating in individualized prenatal care.

Minority women are statistically more at risk for poor pregnancy, birth, and newborn health outcomes due to increased poverty rates, social determinants of health, and lack of access to prenatal care (Liu et al., 2017). Women of diverse backgrounds face many barriers that can lead to the inability to seek routine prenatal care. These barriers may include limited access to healthcare, cost of services, lower health literacy, transportation issues, and other personal and socioeconomic problems (Abshire et al., 2019; Crocket et al., 2019). In fact, women are less likely to receive adequate prenatal care or attend perinatal education courses if they are of low socioeconomic status or recent immigrants (Hetherington et al., 2018). These barriers can lead to a multitude of problems for the pregnant mother and her unborn child.

Questions remain about whether enhancing the method of prenatal care delivery or the content of prenatal care may be necessary to improve birth outcomes (Gennaro et al., 2016). One emerging solution that has been proposed is the implementation of group prenatal care (GPC). The World Health Organization (WHO) and ACOG have highlighted the potential benefits of the GPC model, as well as improvements in the quality of care and outcomes in both maternal and perinatal health among diverse populations (Andrade-Romo et al., 2019). Expanding GPC services may be beneficial in improving maternal and neonatal outcomes, especially among women who experience barriers in accessing care. There are many renditions of GPC that have been proposed, but the seemingly more popular option is known as CenteringPregnancy®.

Research shows that GPC through Centering Pregnancy® has been associated with reduced rates of preterm birth and low birth weight, increased rates of breastfeeding, improved family planning, and enhanced patient satisfaction (Tubay et al., 2019). Understanding the benefits of attending GPC is essential to ensure health care providers are creating supportive environments and reducing barriers to care. This barrier reduction has the potential to improve maternal and neonatal outcomes, especially for underserved populations of women. This practice improvement project (PIP) aims to bring awareness of barriers to prenatal care and educate providers on the benefits of GPC to achieve successful pregnancy outcomes for all women.

Problem Statement

Lack of access to prenatal care has a negative impact on maternal and fetal outcomes, and access to prenatal care is often limited in rural areas, such as North Dakota. The state of North Dakota (ND) is home to approximately 779,261 people of which includes six minority populations with an estimated 130,916 people. According to the Rural Health Information Hub, (2022), 50.2% of the ND population live in non-metropolitan areas. With a limited number of

rural healthcare facilities and an overall lack of advanced practice providers in these areas, women living in rural populations are more likely to have decreased access to prenatal care. In North Dakota, women often drive over an hour to get to a healthcare facility where prenatal care can be obtained.

Disparities exist in North Dakota (ND) related to maternal and neonatal outcomes. The overall infant mortality in the state of North Dakota in 2019 was 7.5 infant deaths per 1,000 live births (March of Dimes, 2019). The infant mortality rate in ND between 2009 and 2019 increased by 19%. According to Centers for Disease Control and Prevention (2022), the overall infant mortality rate in the U.S. was 5.4 infant deaths per 1,000 live births. As of 2020, the rate of low birthweight infants in ND was 6.9%. The infant mortality rate in ND for the AI/AN population was 9.21 deaths per 1,000, which is almost twice as high when compared to the national average. Action needs to be taken to improve these outcomes in the state of ND.

Social determinants of health such as lack of transportation, lack of insurance, and little support from families or partners all affect patients' ability to access healthcare. Patients who are unable to attend regular appointments have a greater risk of maternal death and severe maternal morbidity (Howell, 2018). Enhancing healthcare providers' awareness and knowledge of barriers to prenatal care and the benefits of GPC may increase access to care and improve maternal and neonatal outcomes for these patients. Educating healthcare providers on GPC has the potential to provide supportive environments and expand evidence-based prenatal services to reduce health disparities among underserved women. Therefore, this PIP focused on increasing local healthcare providers' knowledge of barriers to care experienced by women of childbearing age and the benefits of GPC.

Purpose Statement

The purpose of this evidence-based practice improvement project was to enhance knowledge of barriers to prenatal care and GPC among healthcare providers at a central North Dakota Obstetrics and Gynecology clinic. A 25-minute educational module was provided to increase providers' knowledge of barriers to prenatal care and the benefits of group prenatal care for pregnant women. Intent to incorporate GPC into services offered was also assessed.

Project Objectives

The project was guided by the following objectives:

- Provide evidence-based recommendations to obstetrics providers on ways to reduce barriers to prenatal care through the utilization of group prenatal care after completion of the education module.
- Increase obstetrics providers' knowledge of group prenatal care after completion of the education module.
- Increase obstetrics providers' intent to offer group prenatal care as another option for prenatal care in their clinic after completion of the education module.
- Identify barriers to implementation of group prenatal care among obstetric providers.

CHAPTER 2: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Literature Review

This section discusses the search strategy utilized when searching for evidence-based information about GPC, outcomes of GPC, and CenteringPregnancy®. A list of definitions for commonly used terms throughout this research paper has been included. The theoretical frameworks, Adult Learning Theory, and Iowa Model, utilized to create this PIP are discussed in detail. A thorough review of literature has been performed with recurring themes of increased patient satisfaction, decreased preterm birth rate, and increased maternal and neonatal outcomes.

Search Strategy

To investigate the advantages of GPC and the barriers to prenatal care reported among women of childbearing age, a comprehensive literature review was completed. Multiple databases were utilized when searching for evidence, including Cochrane Database of Systematic Reviews (Cochrane), PubMed, EBSCOhost, Google Scholar, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and hand searching. English, free, full-text, peer-reviewed papers published from 2012-2022 were accessed using the databases above. If applicable articles were not available in full text, they were requested through the interlibrary loan. Keywords included “group prenatal care,” “prenatal care,” “group prenatal care AND maternal outcomes,” “group prenatal care AND neonatal outcomes,” “group prenatal care outcomes,” “Centering,” and “CenteringPregnancy®.” Parameters were set to include articles that were written within the last 10 years and in the English language. Hand-searching was also performed by the co-investigator using references from studies found with the above criteria. References used that were outside of this search criteria were assessed for validity and relevancy to the PIP. Most

articles that were greater than 10 years were excluded, but some were kept if updated information was unavailable.

List of Definitions

Prenatal Care. The definition of prenatal care was difficult to find, thus a search for the term prenatal was performed in both the Cambridge Dictionary and Merriam-Webster. The Cambridge Dictionary (2021, para 1) defines prenatal as “relating to the medical care given to pregnant women before their babies are born.” Additionally, Merriam-Webster Dictionary (2021, para 1) defines prenatal as “occurring, existing, performed, or used before birth and defines care as things that are done to keep someone healthy and safe.” The United States Department of Health and Human Services Office on Women’s Health (2019) described prenatal care as health care that is received during pregnancy. Prenatal care relates to the care provided to a woman during her pregnancy that may help to prevent adverse neonatal outcomes. Early and regular prenatal appointments provide women the opportunity to receive maternal and fetal screenings, lab tests, and ultrasounds, which may be useful in diagnosing and treating the patient to ensure a healthy pregnancy. According to the US. Department of Health and Human Services, (2017), prenatal care can be used to prevent complications and help to inform women about the steps they can take to ensure healthy pregnancy. Prenatal care is a key population-wide intervention to prevent adverse pregnancy outcomes (Alibekova et al., 2013). The concept of prenatal care can be defined using a compilation of all these sources.

Group Prenatal Care. GPC models aim to improve patient education and include opportunities for social support while still incorporating the risk screening and physical assessment portion of individual prenatal care (American College of Obstetricians and Gynecologists, 2021). GPC is facilitated by a provider in a group setting with women around the

same gestational age and provides health assessments, education, and peer support for women. GPC brings patients with similar needs together while increasing the time available for education, improving efficiency, and reducing repetition. The concept of GPC brings together a team of healthcare providers who have expertise in various aspects of prenatal care and it is important to understand its impact on maternal and neonatal outcomes.

Prenatal Care

Prenatal care is recognized as a standard of care during pregnancy and offers cost-effective interventions that improve maternal and child outcomes and help reduce complications during pregnancy, childbirth, and the postpartum period (Andrade-Romo et al., 2019). Prenatal care has been shown to improve birth outcomes and help women to have successful pregnancies. Since the initiation of prenatal care in the early 1900's, the focus has shifted to focusing more on screening and risk reduction instead of individualized care (Gennaro et al., 2016).

Prenatal care includes a variety of screening tests and procedures to assess pregnant women's health risks (Gennaro et al., 2016). These tests may include things like baseline blood work and testing for gestational diabetes and group B streptococcus (GBS). These tests and procedures can be used to determine if treatment is needed for medical conditions present during pregnancy, such as gestational diabetes, gestational hypertension, GBS, and other underlying problems that may affect a healthy pregnancy. Key components of prenatal care visits also include patient education regarding lifestyle, exercise, and nutrition modification (Heatherington et al., 2018). An emphasis is also on tobacco, alcohol, and drug cessation. Early and ongoing prenatal care visits can have many benefits and help to ensure a healthy pregnancy. Another more recent form of prenatal care that has been implemented and studied is group prenatal care. GPC has been shown to increase the number of prenatal visits, improve perinatal outcomes,

increase access to care, and improve maternal and neonatal outcomes for many groups of women (Abshire, 2019; Catling et al., 2017; Cunningham et al., 2019; Mills, 2019).

Typical prenatal care is carried out by a certified medical professional, which may include a medical doctor, nurse practitioner, or another advanced practice provider, depending on the community in which a woman seeks pregnancy care (Catling et al., 2017). Prenatal care involves care visits that monitor the health of both the mother and her baby during the gestational period. Visits can start as soon as the woman knows she is pregnant. With traditional prenatal care, a woman in good health will have a prenatal appointment about every four weeks until she reaches 28 weeks' gestation. From weeks 26 to 36, women have bimonthly visits, and at 36 weeks, women transition to weekly appointments (March of Dimes, 2017). These visits can help to support a healthy pregnancy and increase the likelihood that women will carry their infant to full term.

Impact of Lack of Prenatal Care

The link between lack of prenatal care and adverse effects of the neonate is very strong. Inadequate prenatal care has been associated with poor pregnancy outcomes, such as low birth weight, preterm birth, and infant mortality (Howell, 2018). There are many social and health implications that can result from being small for gestational age (SGA), including neurodevelopmental delays, obesity, and chronic diseases such as adult-onset diabetes and hypertension (Ickovics et al., 2016, p. 363). Ensuring infants are born on or near their due date through the utilization of prenatal care can help mitigate potentially lifelong conditions. Previous delivery of a small for gestational age (SGA) infant increases the risk of future poor reproductive outcomes as well (Barker, 2007; Salihu et al., 2013). Women of childbearing age should be aware of these risks and take necessary precautions to ensure a full-term pregnancy.

Barriers to Prenatal Care

Limited access to healthcare, cost of services, lower health literacy, transportation issues, and other personal and socioeconomic problems are all barriers to care that have been identified (Abshire et al., 2019; Crocket et al., 2019). These barriers may lead to low prenatal care attendance and can severely impact a woman's pregnancy outcomes. The March of Dimes 2023 report written by Fontenot et al., titled "Where You Live Matters" Maternity Care Access in North Dakota" gives some insight into the barriers women face in North Dakota (ND) vs. the rest of the United States. According to this report, 71.7% of counties in ND are defined as maternity care deserts compared to 32.6% in the U.S. and 43.8% of women had no birthing hospital within 30 minutes compared to 9.7% in the U.S. Between 2019 and 2020 there were 1,957 babies born in maternity care deserts, accounting for 19.4% of births. 45.3% of babies were born to women who live in rural counties, while only 26.9% of maternity care providers practice in rural counties in ND. It is important to be aware of these statistics and consider all the other factors that may contribute to a lack of prenatal care.

Mental Health

Maternal health plays an important role in ensuring infant health. Mental health status can positively or negatively impact the neonate and a mother's ability to seek prenatal care (Akamune, 2018). Psychiatric conditions such as anxiety, depression, and post-traumatic stress disorder (PTSD) have been associated with poor birth outcomes such as low birth weight and preterm birth (Accortt et al., 2015; Bell & Seng, 2013; Ding et al., 2014).

While mental health conditions have been associated with poor birth outcomes, women receiving treatment for mental health conditions were more likely to participate in prenatal care (Bell & Seng, 2013). Attending preventative programs or counseling to reduce maternal stress

and depression can have a positive impact on birth outcomes related to preterm birth rates and low birth rates (Feinberg et al., 2016). Substance use and abuse can strongly impact rates of prenatal care. Drugs such as methamphetamines, cocaine, and heroin pose increased risks to the fetus and strongly influence initiation of prenatal care. A retrospective cohort study performed by Holcomb et al. (2021) found a correlation between high rates of substance use and higher preterm birth rates and longer newborn admission lengths.

Health Beliefs and Health Literacy

Health beliefs are formed from personal and life experiences and can act as a facilitator or barrier to prenatal care (Akamune, 2018). It is important to consider that sociocultural backgrounds influence health beliefs, and a woman may be more likely to not initiate prenatal care due to her own personal beliefs or those around her. Ensuring providers are culturally competent is essential in ensuring effective and equitable patient care. This involves providers having a deep understanding and appreciation of diverse cultural backgrounds, beliefs, and practices. Culturally competent healthcare providers not only recognize the impact of culture on health, but also strive to adapt their approaches to meet the needs of their patients. This can be done through effective communication, respect for cultural competence, and the ability to navigate diverse healthcare practices. When providers embrace cultural competence, it allows them to foster trust, improve patient outcomes, and contribute to a more inclusive and responsive healthcare system.

Health literacy plays a key role in determining a mother's health behaviors and may influence both her own health and that of her child (Nawabi et al., 2021). If a mother lacks adequate health literacy, this may put her at risk for poor pregnancy and birth outcomes. Adequate access, understanding, and application of health information is important especially

during pregnancy and women with limited health literacy are less likely to take folic acid during pregnancy, engage in prenatal care at a later gestational age, and have more hospital stays (Nawabi et al., 2021). Due to the increased risks for patients with lower health literacy, it is essential for healthcare providers to focus on the importance of patient education at a level that is understandable for each patient. Action should be taken to develop approaches to improve health literacy among pregnant women to keep both mother and child healthy (Nawabi, et al., 2021).

Social Determinants of Health

Current models of prenatal care often do not account for social determinants of health (Shrader, 2021). Prenatal visits can often be short and feel rushed, leaving not enough time for providers to cover the complexities of social determinants of health. Due to the short length of the visits, establishing therapeutic relationships may be difficult for some women. Edmonds et al. (2015) assessed the prenatal experience of 22 low-income African American women and found that 14 of the 22 women reported wanting more support with their healthcare provider and felt their provider was judgmental toward them. Additional social determinants of health that were identified as common barriers in this study included lack of transportation, insurance problems, long appointment wait times, and little support from families or partners.

Lack of Healthcare Coverage

Lack of healthcare coverage can lead to a multitude of problems for the pregnant woman and result in lack of prenatal care. In 2021, 29.6 million adults under the age of 65 in the United States reported being uninsured (CDC, 2023). If a woman is unable to pay for services due to lack of insurance coverage, she is likely to not seek care due to the financial burden. Lack of prenatal care altogether or fewer prenatal care visits have been associated with maternal death

and severe maternal morbidity (Howell, 2018). Finding ways to mitigate these barriers to care is essential in increasing maternal and neonatal outcomes.

Poverty

Poverty significantly impacts prenatal care and creates barriers to care that can adversely affect maternal and fetal health outcomes. Patients who lack financial resources may not be able to access essential prenatal services, including regular check-ups, ultrasounds, and necessary screenings. These individuals often encounter obstacles such as inadequate transportation, childcare, and the ability to take time off from work, which makes it difficult to attend regular prenatal care appointments. These challenges may lead to delayed or insufficient prenatal care, which in turn increase the risk of complications during pregnancy and childbirth. Addressing poverty-related barriers is a crucial part of promoting optimal prenatal care and improving the overall well-being of both women and their infants.

Racial Discrimination

Alhusen et al. (2016) conducted an integrative review of 15 studies published between 2009-2015 and found a significant relationship between implicit and explicit biases and low birth weight, preterm birth, and small for gestational age infants, as well as problems related to access to care and quality of care among minority women. This not only indicates that racial discrimination is a significant risk factor for adverse neonatal outcomes, but that providers need to provide culturally competent care and address psychosocial factors that impact health outcomes in minority women (Alhusen et al., 2016). Effective interventions need to be put into place to decrease disparities and improve neonatal and maternal outcomes.

North Dakota Demographics

As of 2022, the state of North Dakota was home to 779,261 thousand people with a predominantly white population at 83.2% (United States Census Bureau, 2022). The remainder of the population is as follows: 5.7% American Indian/Alaskan Native, 4.4% Hispanic or Latino, 3.5% Black or African American, 2.4% two or more races, 1.7% Asian, and 0.1% Native Hawaiian or another Pacific Islander. Approximately 16% of people in the state of North Dakota fall into the minority population. A minority is “a culturally, ethnically, or racially distinct group that coexists with but is subordinate to a more dominant group” (Encyclopedia Britannica, 2023, para 1). An emphasis should be placed on minority women and improving the disparities that are faced in order to decrease barriers to care that can lead to poor outcomes for both a mother and her child.

American Indian Women in ND

American Indian women are especially at risk for pregnancy-related health disparities and lack of prenatal health care (Hanson,2012). Understanding the high AI/AN prevalence in ND is important in order to recognize the importance of increasing prenatal care services for this state. There are 573 federally recognized American Indian/Alaskan Native (AI/AN) tribes in the U.S. and approximately 5.2 million members enrolled in Indian Health Services (Indian Health Services [IHS], 2019). North Dakota is home to five federally recognized tribes and one Indian community located within the state. These include the Mandan, Hidatsa, & Arikara Nation (Three Affiliated Tribes), the Spirit Lake Nations, the Standing Rock Sioux Tribe, the Turtle Mountain Band of Chippewa Indians, the Sisseton-Wahpeton Oyate Nation, and the Trenton Indian Service Area (ND Indian Affairs, n.d.). There are a total of 31,329 American Indians

living in ND, making up approximately 5% of the population, of which over 40% are under the age of 20.

According to Johnson (2020, p. 221), “the AI/AN people experience lower health status when compared with the general U.S. population with a lower life expectancy by 5.5 years and a higher disease burden due to inadequate education, disproportionate poverty, discrimination in the delivery of health services, and cultural differences.” AI/AN infants are 2.7 times more likely to die from accidental deaths before they reach one year of age and are 50% more likely to die from complications related to low birthweight when compared with non-Hispanic white infants (U.S. Department of Health and Human Services Office of Minority Health, 2021). Additionally, AI/AN women have been found to be almost three times more likely to receive late or no prenatal care as compared to non-Hispanic white mothers. The AI/AN population has almost twice the infant mortality rate as non-Hispanic whites with a rate of 8.15 deaths per 1,000 live births as of 2018, as compared to the non-Hispanic white population that was 4.63 per 1,000 live births (Ely & Driscoll, 2019). Data also shows that only 63.7% of AI/AN mothers received prenatal care in the first trimester compared to 82.8% of white mothers (Driscoll et al., 2021).

ND has the sixth largest AI/AN population by state. Approximately 60% of the AI/AN population live on reservations, most of which are geographically located anywhere from 50-100 miles from major healthcare facilities. Kozhimannil et al. (2020) have identified the incidence of severe maternal morbidity and mortality was twice as high among AI/AN women when compared to white women and even higher in AI/AN women who lived in a rural setting. This is an ongoing problem that will not be solved until access to care is increased for women in rural areas. This decreased access to care opens the door to a multitude of health concerns that could otherwise be prevented with the implementation of alternative care models.

Group Prenatal Care

Individual prenatal care aids in preventing poor perinatal outcomes and providing women education throughout pregnancy, childbirth, and the postpartum period through a series of one-on-one visits between a woman and her healthcare provider (ACOG, 2018). However, despite the benefits seen in the individualized prenatal care model Catling et al. (2017) found that individualized care may be linked to longer wait times, lack of consistent care providers, and decreased overall patient satisfaction. When comparing group versus individualized care, Catling et al. (2017) also found that individualized care resulted in higher rates of preterm birth (< 35 weeks' gestation), lower birthweight (<2500 g), perinatal mortality (still-birth or neonatal death) and decreased social support. To mitigate the prevalence of neonatal mortality rates, improve birthweights, and decrease preterm birth and NICU admissions, GPC has been suggested due to the ability to increase access to prenatal care, while improving neonatal and maternal outcomes for many groups of women (Catling et al., 2017). Implementation of GPC has also been shown to increase the number of prenatal visits attended.

Group prenatal care is an alternate method of providing pregnancy care that “involves use of a group model rather than a one-to-one approach” (Catling et al., 2017, p. 1). GPC can be provided in a 90-to-120-minute session for groups of pregnant women with similar gestational ages. During this session, women will receive a clinical evaluation by one or more healthcare providers who remain the same throughout the follow-up sessions that occur every 2 to 4 weeks (Andrade-Romo et al., 2023). The main goals of these visits include clinical assessments, perinatal and postpartum education, and most importantly, peer support.

High-quality care can be provided through GPC in addition to the traditional individual one-on-one prenatal care visits with a healthcare provider. According to Cunningham et al.

(2019), “group prenatal care is a promising strategy to improve perinatal outcomes” (p. 17). Research has shown that low-quality and inadequate frequency of prenatal care is associated with lower facility-based deliveries and results in increased maternal and neonatal mortality (Grenier et al., 2019). Another study also demonstrated an association between fewer prenatal visits and poorer pregnancy outcomes such as LBW infants, preterm births, and infant mortality (Howell, 2018). GPC provides health assessments, education, and peer support for pregnant women. The implementation of GPC has been found to have a positive impact on the quality of prenatal care and enhance maternal and neonatal outcomes, such as increased breastfeeding rates, decreased preterm birth rates, increased patient satisfaction, and increased patient compliance (Abshire, 2019; Mills, 2019).

GPC is an effective way to provide care and allows patients to feel socially supported, allows a comfortable place for questions to be asked, and provides patients the ability to collaborate on their shared pregnancy experience with other women around the same gestational age (Tucker et al., 2021). Various models of GPC exist including CenteringPregnancy®, Pregnancy and Parenting Partners, and Expecting and Connecting. CenteringPregnancy® is the most implemented model of GPC throughout the United States. There are more than 400 CP® practice sites across the United States (Gennaro et al., 2016).

Centering Pregnancy®

CenteringPregnancy® (CP®) is a well-established model of GPC. CP® was developed in 1993 by Sharon Rising, a certified nurse midwife, who decided to bring women together for prenatal visits for her to provide more efficient care (Centering Healthcare Institute, 2023a). According to their website, CP® “empowers patients, strengthens patient-provider relationships, and builds communities through the three main concepts of health assessment, interactive

learning, and community building” (Centering Healthcare Institution, 2023b, para 2). CP® uses the concept of health assessment to encourage and empower patients to become engaged with their own healthcare by learning to take their own height, weight, and blood pressure (Mills, 2019). Through the concepts of interactive learning and community building, patients can engage with one another through interactive and educational games and group discussions and are encouraged to learn that they aren’t alone in their fears, doubts, questions, and emotions.

CP® is a nationally recognized model of GPC that incorporates healthcare education and peer support and follows a specific curriculum focused on pregnancy-related issues, childbirth, and parenting and consists of three components; healthcare delivery, health education, and peer support (Crocket et al., 2019; Liu et al., 2017). Currently there are more than 600 CP® sites in practice across 46 states which serve more than 50,000 families (Hinkley, n.d.)

CP® group visits are provided to a group of 6 to 12 women of similar gestational age through the course of 10 prenatal care visits. Each visit lasts 90 to 120 minutes and are started at the beginning of the second trimester. All visits are conducted with the same group of 6 to 12 pregnant women whose due dates are within four to six weeks of one another (Crocket et al., 2019). Each session starts with socializing opportunities between the women, self-data collection, such as women taking their blood pressure, weight, and height, and a brief one-on-one interaction with the OBGYN or other obstetric healthcare provider for individual assessment and solicitation of patient concerns (ACOG, 2021). Care is provided by an obstetrician, midwife, nurse practitioner, or other obstetric healthcare provider and although CP® focuses on a group-style care, patients are also able to spend one-on-one time with their provider during visits (Catling et al., 2017; Mills, 2019). The staffing model suggested by CP® includes one healthcare provider for pregnancy assessments and one registered nurse facilitator. The first session

includes a 30-minute group meeting where healthcare providers perform an individual routine medical assessment. The following sessions consist of 90-to-120-minute sessions in which women participate in facilitated group activities and discussions led by the healthcare provider. “Most of the visits are spent in facilitated discussion of topics suggested by the curriculum but prioritized by the group. (ACOG, 2018, p. e105). Providers are trained to enhance patient learning by avoiding lectures and facilitating peer-to-peer learning through participation of women and their support partners.

CP® allows for more time for caregiver-patient interaction, skill building, and self-management (Van Zwicht et al., 2016). Women still receive an individual checkup, but most of the time is focused on peer support or on receiving group information from the healthcare provider heading the visit (Gennaro et al., 2016). The individual part of the visit allows women time to be taken to a private room for things such as fetal heart monitoring and fundal height measuring (Catling et al., 2017).

Research shows that GPC through CP® has been associated with reduced rates of preterm birth and low birth weight (LBW), increased rates of breastfeeding, and improved patient satisfaction (Tubay et al., 2019). Catling et al. (2015) also found that implementation of CP® was associated with a decrease in prematurity, a reduction in risk of low birth weight, and decreased hospital emergency department visits in the third trimester. A Yale University randomized clinical trial (RCT) found a risk reduction for preterm birth by 33% when using the CP® model (Centering Healthcare Institute [CHI], n.d.). Picklesimer et al. (2012) found a 47% reduction in preterm birth among women using the CP® model, demonstrating the positive impact of CP® on decreasing preterm birth outcomes. Understanding the benefits of attending

GPC, such as CP®, as opposed to traditional individualized prenatal care is essential to ensure we as providers are creating the best possible maternal and neonatal outcomes.

Benefits of GPC

Through their initiation of empowering patients with education and community, CP® and other group-style prenatal care have been shown to improve a variety of patient outcomes (Mills, 2019). These benefits include but are not limited to improved maternal and neonatal outcomes, enhanced quality of care, increased breastfeeding rates, improved patient satisfaction, and decreased healthcare costs.

Maternal Outcomes

GPC has been shown to not only improve neonatal outcomes, but maternal outcomes as well (Kominiarek, et al., 2017). A retrospective cohort analysis comparing 1,292 GPC patients and 8,703 IPC patients showed significantly lower rates of preeclampsia among patients receiving GPC (Abshire, 2019). Another retrospective cohort analysis determined that women who received GPC were less likely to have gestational diabetes when compared to those who received IPC (Kominiarek, et al., 2017). Studies have also shown increase in prenatal care adequacy, increased satisfaction with care, increased treatment compliance in gestational diabetes patients, and increased compliance in adolescent patients (Lathrop, 2013; Novick et al., 2015; Trotman et al., 2015).

Neonatal Outcomes

GPC has been shown to decrease preterm birth rates and low birth weight infants in high-risk populations (Lathrop, 2013; Tubay et al., 2019). One infant born prematurely costs, on average, \$54,149, and the medical costs for the first year of life are 10 times higher among infants born prematurely compared to full-term infants (Centering Health Institute [CHI], n.d.).

This cost is substantial, and an effort should be made to decrease this cost burden for all women. One retrospective matched cohort study performed by Cunningham et al. (2019) analyzed 9,348 pregnant women who received either group prenatal care or individual prenatal care over the course of an 8.5-year timespan. Data showed those who received GPC has a significantly lower risk of having a preterm birth or a low-birth-weight infant compared to women who received individual care (Cunningham et al., 2019). Women who attended five or more GPC visits had even less of a risk for having a preterm or low birth weight infant. GPC through CP® has been shown to decrease disparities for preterm birth in Hispanic women and reduced the odds of preterm delivery by 41% in African American women (CHI, n.d.).

Enhanced Quality of Care

High-quality prenatal care is essential to enhance maternal and fetal outcomes. Liu et al. (2016) conducted a study among low-income women and found women who received GPC reported higher levels of satisfaction, decreased stress, and an appreciation for the extra support and education they received. Some of the most important factors in determining the quality of the birth experience is whether patient feels heard and can make their own decisions. CP® allows women to prepare for childbirth by learning strategies to cope with the pain of labor and birth and it was found that CP® successfully prepared this group of women with feasible approaches to manage their labor pain. Women reported they were able to advocate for themselves and had increased levels of satisfaction with their birth experiences based on the knowledge they had gained in CP®.

Increased Breastfeeding Rates

GPC has been shown to increase initial breastfeeding rates significantly when compared to those who received individual prenatal care (Brumley et al., 2016; Lathrop, 2013); Tanner-

Smith et al., 2013). There have been well-documented long- and short-term health benefits associated with breastfeeding for both mothers and children (Segura-Perez et al., 2021). Breastfeeding helps in the defense of illnesses and diseases (Centers for Disease Control, 2021). Infants who are breastfed have lower rates of infectious disease, childhood obesity, and improved cognitive outcomes. In addition, breastfeeding helps to protect mothers against type 2 diabetes, breast and ovarian cancers, and cardiovascular disease (Segura-Perez et al., 2021).

Improved Patient Satisfaction

GPC has been found to increase patient satisfaction by increasing social networks and offering a sense of community and support for women in high-stress situations (Tubay et al., 2019). Having a sense of community can not only help to enhance pregnancy outcomes but can also allow women to feel supported by like-minded individuals who are going through the same thing they are. Patients have stated that GPC was helpful for learning how to have a healthy pregnancy and reduce stress, as well as provided skills for managing labor pain and caring for a newborn (Liu et al., 2017). All these skills are essential in having a successful pregnancy, birth, and postpartum experience. Women participating in GPC are more likely to attend the recommended number of prenatal visits, return for postpartum visits, and consistently rate their satisfaction with care higher than women receiving individual patient care (CHI, n.d.).

Decreased Healthcare Costs

One of the most discussed benefits of GPC in literature is regarding cost. “Group prenatal care has been found to be sustainable and cost-effective” (Gennaro et al., 2016, p. 3). GPC not only saves the patient money, but healthcare facilities as well. Medicaid covers more than four in ten (42%) births nationally and approximately two-thirds of births among Black and AI/AN patients (Gifford et al., 2022). Recent attention has been devoted to maternal health in response

to the substantially higher rate of pregnancy-related deaths experienced by Black and AI/AN people. “Recent studies of Medicaid payment models in South Carolina have incentivized providers to deliver GPC and produced significant returns on investment for all stakeholders” (Cunningham et al., 2019, p. 21). CP® has been credited with saving more than 100 approved CP® sites an estimated \$41 million through its reduction of preterm births and has saved health systems approximately \$2,094 per mother who received prenatal care through CP® (CHI, n.d.). These savings are substantial and should be strongly considered when contemplating the initiation of GPC services.

Barriers to Implementation of GPC

GPC has been shown to improve perinatal outcomes, but implementation of this complex model of care can be demanding on care settings that are designed for individual care (Novick et al., 2015). Sites that have successfully implemented GPC were found to have organized cultures who supported innovation, champions that advocated for CP®, and staff who viewed logistical demands as manageable hurdles (Novick et al., 2015). Organizational support, lack of buy-in, and limited financial resources are associated with difficult implementation of GPC.

Lack of Organizational Support

There are many barriers to GPC that are present today and should be addressed in order to increase the efficacy of GPC. One major problem that exists is the lack of GPC services being offered in many facilities. This may be due to lack of funding, lack of staff, or provider comfort with traditional care models. An organized culture that supports innovation is required for health systems to transition to the GPC model, as well as a substantial investment of provider and support staff time and clinical space (Cunningham et al., 2019). Despite most providers’ enthusiasm and commitment to GPC, Lazar et al. (2021, p. 16) found “providers experienced

challenges such as issues around scheduling, staffing, charting and following up on labs, lack of support or recognition from colleagues or management, or generalized system dysfunction” that made implementation of GPC difficult.

Lack of Healthcare Coverage

Upon further investigation, there seems to be limited data on whether health insurance companies cover GPC services such as CP®. There is some literature however, regarding Medicaid coverage proposals regarding CP® written by Kara Hinkley in the Maternal and Child Health Database in 2021. This proposal included a model policy recommendation for states to use when creating their enhanced payment for CP® and GPC policies including the proposal of a separate billing code for GPC, incentives for sites utilizing GPC visits, and a provider retention payment. It is unclear if this policy ever went passed legislation. Further research is needed to determine healthcare coverage regarding GPC prior to the implementation of GPC services in the clinical setting.

Lack of Patient Knowledge of GPC

Barriers to GPC exist when women aren't aware that GPC services are offered at a facility, or women are unaware of what GPC is. “Inadequate systems for recruitment and retention can contribute to low group prenatal care enrollment” (Cunningham et al., 2019, p. 21). This lack of knowledge of GPC can lead women into only partaking in IPC solely because of the knowledge barrier. It is important that facilities who offer GPC are educating patients on this model of care and encouraging their participation if they may benefit from this type of care.

Patient-Specific Factors

Patient adherence can also influence the efficacy of GPC. Scheduling conflicts, lack of transportation or childcare, and privacy concerns all need to be considered when assessing if a

patient is right for this model of care (Cunningham et al, 2019). Group dates and meeting times are typically set and cannot be changed, which could lead to problems for some women. Despite these barriers, if facility and provider support is present, GPC has been shown to flourish.

Lack of Provider Reimbursement

According to the CP® website, providers are reimbursed for the patient encounter that is included as part of CP®, but not all are reimbursed for the time and costs related to providing GPC services. Centering Health Institute [CHI], (n.d.), states that CP® sites in thirteen states have made great progress toward payment for GPC services through Medicaid-managed care organizations and as of 2021, there were five state Medicaid programs and 14 health plans that participated in payment strategies for CP®, which are tracked by CHI to enhance reimbursement. Although there are some commercial insurance companies and several states that reimburse at a higher level for Medicaid patients who are participating in validated GPC models, enhanced reimbursement is not widely available (ACOG, 2018). More information is needed regarding provider reimbursement to determine the cost effectiveness of GPC services.

Start-up Cost

The cost of initiating GPC in current obstetric practices may be a barrier to implementation (ACOG, 2021). Costs incurred for the start-up of CP® include instructor training and site approval and ongoing costs include supplies for group activities, program coordination, meeting space set-up and take-down, and many others). These costs may prohibit healthcare facilities from providing GPC without a sustainable funding source or the availability of enhanced reimbursement above the standard set for prenatal visits (ACOG, 2018).

Provider Role in GPC

GPC is not possible without the support of providers willing to offer this service. Clinicians who provide GPC report higher satisfaction with their practice and are better able to understand individuals' cultural values and beliefs (Centering Healthcare Institute [CHI], n.d.). Provider understanding is essential in the success of pregnancies and for helping to support women in making the right choices for themselves to have the best neonatal outcomes.

With the rapid expansion of alternative prenatal care, such as GPC, it is critical to assess the perspective of the provider facilitating the care. Lazar et al. (2021) examined healthcare professionals' experiences of facilitating GPC and identified three overarching themes. These identified themes included providing high-quality care to women, the experience of skill building and role change, and addressing provider investment and workload. For each overarching theme, there were underlying subthemes.

Providers were able to give women the more personalized care they wanted and were able to make better use of their time when providing GPC visits (Lazar et al., 2021). In addition, GPC allowed providers to better tailor their care and listen and respond to feedback from numerous women. GPC allowed additional opportunities for women to ask questions and for providers to spend more time on education. Additional benefits identified in this theme include increased support and enhanced continuity of care.

Providers also appreciated the peer component of GPC and saw this as a supportive environment that helped to normalize the pregnancy experience (Lazar et al., 2021). Providers witnessed the community-like bond develop among women who participated in GPC, which allowed for transformative support among young or vulnerable members of the community. This bond between women "allowed for an exchange of personal details and valuable information that

filled important knowledge and support gaps” (p. 13). Providers also reported enhanced autonomy as another benefit of GPC.

Providers differed in opinion regarding the increase or decrease in workload (Lazar et al., 2021). Many stated their workload was increased prior to implementing GPC, as providers had to invest more time into preparation. Overall providers did report that GPC reduced repetition and allowed more time for supporting women, building relationships, and in-depth education. With proper support, most providers found the implementation of GPC seemed to outweigh the upfront investment when looking at the overall benefits for patients.

Summary

Prenatal care is an essential part of the care a woman receives during her pregnancy. To improve outcomes for both the mother and baby, providers need to be aware of the barriers present in society and have strategies to help decrease the barriers. One well-studied technique for improving outcomes is GPC through the implementation of CP®. The benefits of GPC should be strongly considered in order to adopt practice change. GPC will only achieve large-scale impact on maternal and neonatal health outcomes if it is adopted by patients and providers (Cunningham et al., 2019). Healthcare providers who offer GPC tend to have more positive attitudes towards the model and are more likely to adapt it into their practice (Lazar et al., 2021). Providers must be willing to transform their practice in order to enhance outcomes for both the mother and neonate.

Theoretical Framework

Adult Learning Theory

This PIP utilized the Adult Learning Theory (ALT) to guide development and implementation. The ALT is a theory that was developed by Malcolm Knowles in 1973. It

explains the concept of "andragogy," a term developed by German teacher, Alexander Kapp that was later linked to the work of Knowles (Mukhalalati & Taylor, 2019). Knowles used this concept of andragogy, which is also known as the art and science of adult learning (Cercone, 2008), to discuss the difference in how adults learn as opposed to children. This theory relates well to this PIP's objective of educating adult learners, in this case obstetrics healthcare providers. The ALT is composed of five assumptions, which have been incorporated into an educational session focused on the identification and reduction of barriers to prenatal care and GPC benefits to improve the healthcare experience for patients.

Assumption One

The first assumption underlying andragogy refers to adult learners' independent self-concept and ability to direct their own learning (Cercone, 2008). Adult learners are internally motivated and determine their individual goals when it comes to learning. If adult learners feel as though information is being forced upon them, they may resist learning (Fidishun, 2000). To facilitate learning and allow providers to guide themselves, educational sessions were designed to offer clear, concise, and focused information. Topic areas included barriers to prenatal care and ways to reduce barriers to prenatal care, as well as education regarding GPC and CenteringPregnancy®. This PIP allowed providers to increase their existing knowledge while also allowing them to set their own goals when it comes to learning. The PowerPoint presentation was accessible using an online format allowing providers to access it whenever best fit their schedule. Utilizing an online format allowed providers the flexibility to complete the education in a timeframe that is conducive to their personal schedules.

Assumption Two

The second assumption underlying andragogy is that “an adult accumulates a growing reservoir of experience, which is a rich resource for learning” (Merriam & Caffarella, 1999, p 272). Adult learners can relate new information to previous events and experience to build on their previous knowledge (Cercone, 2008). This PIP acknowledged and built upon the providers’ previous knowledge of barriers to prenatal care and allowed them to relate new information to their past clinical experiences. The co-investigator considered the providers’ previous knowledge base into account when creating the provider education PowerPoint for this PIP.

Assumption Three

The third assumption underlying andragogy is that “the readiness of an adult to learn is closely related to the developmental tasks of his or her social role” (Merriam & Caffarella, 1999, p 272.). Adult learners are goal oriented and become ready to learn when they experience a need to learn in order to cope with real-life tasks or problems (Knowles, 1980, p 44, as cited in Fidishun, 2000). During the co-investigators time in this clinic, time spent working as a labor and delivery nurse, and through reviewing literature, there has been clear evidence that there is often a lack of prenatal care for minority groups of women due to multifactorial circumstances (Abshire et al., 2019; Crocket et al., 2019; Edmonds et al., 2015; Nawabi et al., 2021). Lack of prenatal care can lead to health complications for the mother and their fetus. Through the use of a PowerPoint presentation, the co-investigator indicated why there is a need for GPC implementation by explaining its increased success in improving birth outcomes and increasing access to care, all of which could be improved at this specific OBGYN clinic.

Assumption Four

The fourth assumption underlying andragogy is that “there is a change in time perspective as people mature-from future application of knowledge to immediacy of application. Thus, an adult is more problem-centered than subject-centered in learning” (Merriam & Caffarella, 1999, p 272.). Adult learners want to know the relevancy of what they are learning and how they will benefit from it. This PIP educated providers on the relevancy of GPC and the benefits it may have on themselves and their patients. The education module was limited to 25 minutes in order to deliver the most relevant information to the providers. It allowed some time for the providers to reflect on how the implementation of GPC may benefit their clinic.

Assumption Five

The fifth assumption underlying andragogy is that “adults are motivated to learn by internal factors rather than external ones” (Merriam & Caffarella, 1999, p 272.). Factors in this PIP that may have increased provider’s motivation for change include increasing access to prenatal care and improved maternal and neonatal outcomes through the implementation of GPC in their clinic. Adult learners often want to know that what they are learning will make them feel good internally. They may also be motivated by things that increase their job satisfaction (Cercone, 2008). Participating in the educational session has the potential to increase healthcare providers’ job satisfaction through improving access to care and outcomes for patients.

Assumption Six

The sixth assumption is that adults must know why they need to learn new knowledge (Purwati et al., 2021). Adults want to know what is in it for them when they’re obtaining new knowledge and how this new knowledge will help them to solve a problem or how it can be applied to their daily life. A thorough explanation was provided as to why providers needed to

learn the information presented in the educational module to encourage learners to participate in the PIP.

Iowa Model

The theoretical framework that was utilized to guide the construction and implementation of this project is the Iowa Model. This model consists of seven steps. These steps include 1. Identifying an issue or opportunity; 2. Stating the purpose; 3. Forming a team; 4. Assembling, appraising, and synthesizing the body of evidence; 5. Designing and piloting the practice change; 6. Integrating and sustaining the practice change; 7. Dissemination (Cullen et al., 2022).

Issue Identification

The first step has been completed in identifying the health disparities experienced by minority women, which may be related to decreased access to prenatal care. Healthcare providers in the obstetric clinic identified a need for education regarding GPC and its benefits. This need was identified through the co-investigator's time working with the staff at this clinic during a clinical rotation and as a nurse on the obstetrics unit. The obstetric healthcare providers felt this PIP would be a good fit for the clinic and may help to reduce some of the barriers to prenatal care experienced by women in the community.

Purpose

The next step of the Iowa Model, stating the purpose, is identified through the objectives of this project. The purpose of the project was to identify barriers to prenatal care found in literature among women of childbearing age and to provide education to providers on ways to reduce these barriers through the utilization of GPC. Provider barriers to implementing group prenatal in their clinical setting was also assessed.

Forming a Team

Prior to developing and implementing this PIP, a team was formed. Step three includes forming a team (Cullen et al., 2022). The “team” for this project consists of the co-investigator, project champion, and multidisciplinary dissertation committee selected based on their areas of expertise, background, interests, experience, and level of education who helped to evaluate evidence and provide feedback on the design and evaluation of the project. The co-investigator worked in conjunction with team members to research this topic, develop the research project, implement the project, educate providers, and assess the results obtained from the project. The project champion consisted of an obstetrics healthcare provider, who was the main contact for the co-investigator at the implementation site and had an interest in implementing this PIP at the chosen site. The healthcare providers in the OBGYN clinic were participants in the PIP.

Assemble, Appraise, and Synthesize

The fourth step of the Iowa Model is assembling, appraising, and synthesizing the body of evidence (Cullen et al., 2022). Evidence supports the need for implementation of GPC to reduce barriers, which has the potential to improve maternal and fetal outcomes. Decreased rates of gestational diabetes, increased satisfaction with care, increased treatment compliance, and lower rates of preeclampsia are just a few of the benefits that are associated with maternal well-being when GPC is utilized (Lathrop 2013; Novick et al., 2015; Trotman et al., 2015) Improved neonatal outcomes have also been associated with GPC including decreased preterm birth rates and increased overall newborn birth weight (Cunningham et al., 2019; Lathrop 2013; Tubay et al., 2019). GPC also has shown to enhance quality of care, improve breastfeeding rates, improve patient satisfaction, and decrease healthcare costs (Brumley et al., 2016; Cunningham, et al.,

2019; Gennaro et al., 2016; Lathrop 2013; Liu et al., 2016; Tanner-Smith et al., 2013; Tubay et al., 2019)

Design and Pilot

Step five, designing and piloting the practice change, was completed through implementation of an evidence-based education session for healthcare providers at an obstetric clinic. Healthcare providers' schedules were taken into consideration when designing the educational session in order to ensure provider participation. The educational module was kept within the allotted time frame as requested by two of the healthcare providers in the clinic to ensure adequate participation. A more detailed design of this project can be found under the section titled Methods.

Integrating and Sustaining

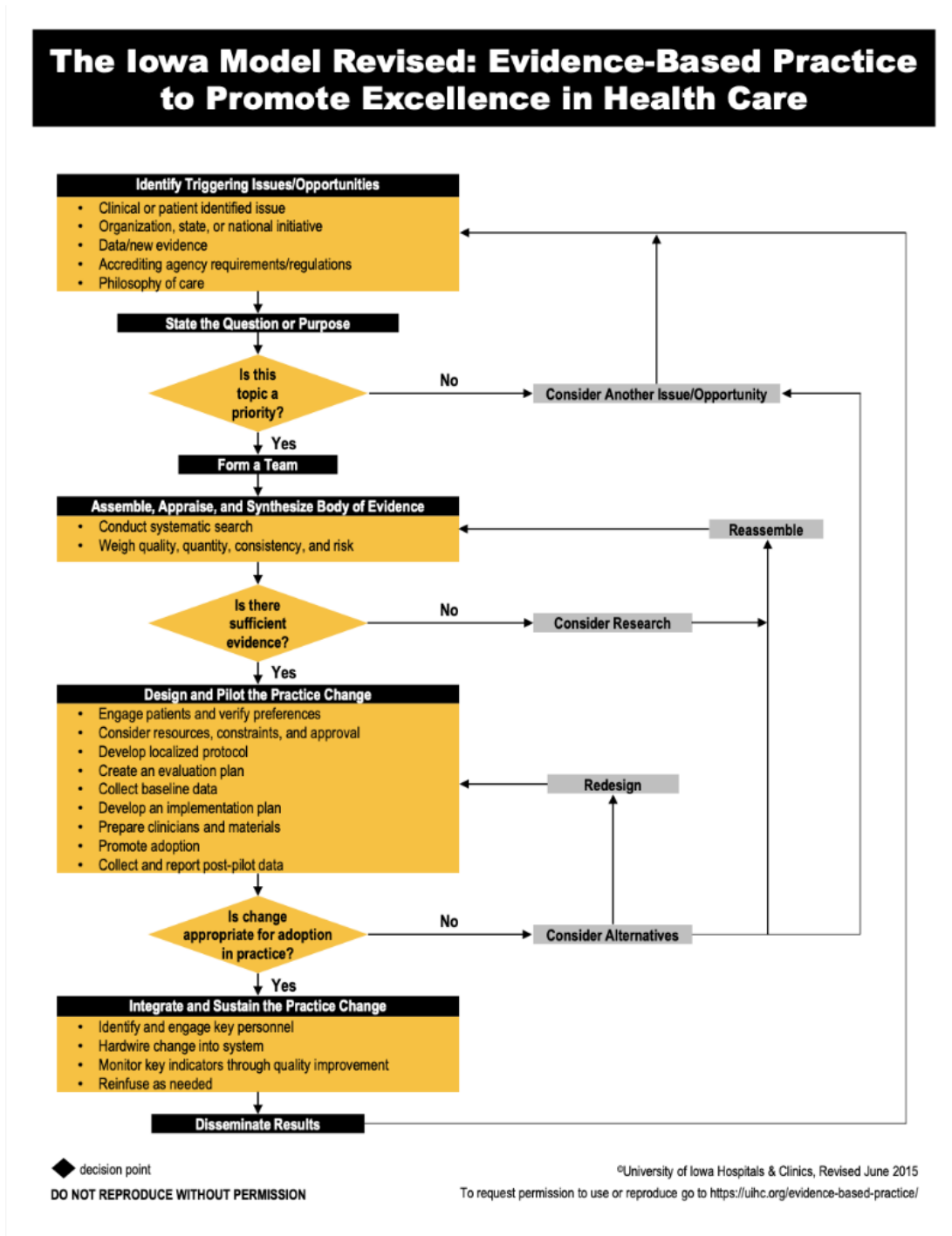
Step six of the Iowa Model consists of integrating and sustaining practice change (Cullen et al., 2022). Post-education surveys were utilized to assess healthcare provider's knowledge of barriers to prenatal care, knowledge of GPC, intent to implement GPC into their practice, and barriers to implementation of GPC in their clinic. Key personnel were identified to continue discussions of implementing GPC as an additional service into practice.

Dissemination

The final phase of the Iowa Model is to disseminate the results. The results of this PIP were disseminated through poster presentations at conferences, as well as through the NDSU ProQuest database.

Figure 1

Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care.



Note. University of Iowa Hospitals & Clinicals, (June 2015). Iowa Model revised: Evidence-based practice to promote excellence in health care. <https://uihc.org/iowa-model-revised-evidence-based-practice-promote-excellence-healthcare>

CHAPTER 3: METHODS

Overall Project Design

Understanding the benefits of GPC is essential to ensure healthcare providers are creating supportive environments and reducing barriers, which has the potential to improve maternal and neonatal outcomes. This PIP aimed to bring awareness to barriers to care and educate providers on the benefits of GPC for their patients to achieve successful pregnancy outcomes for all women. This PIP included a 25-minute educational module with information on barriers to prenatal care, as well as GPC and its benefits. The educational module was distributed to healthcare providers working in an obstetric clinic and gynecology clinic in ND. Participants were asked to complete a pre-education survey and post-education survey via Qualtrics to determine perceived knowledge and confidence levels of obstetrics providers before and after the educational module and to determine the effectiveness of the education. Qualitative numerical data was collected and analyzed using Qualtrics tools. One open-ended question was utilized in the post-survey to assess providers' intent to change their current practice.

Project Objectives

The project was guided by the following objectives:

1. Provide evidence-based recommendations to providers on ways to reduce barriers to prenatal care through the utilization of group prenatal care after completion of the education module.
2. Increase obstetrics providers' knowledge of group prenatal care after completion of the education module.
3. Increase obstetrics providers' intent to offer group prenatal care as another option for prenatal care in their clinic after completion of the education module.

4. Identify barriers to implementation of group prenatal care among obstetric providers.

Setting

The state of North Dakota (ND) is 70,705 square miles and according to the Centers for Rural Health (2023), has 47 licensed and certified general and acute care hospitals, two Indian Health Service Units, and three psychiatric facilities. North Dakota is home to 38 rural hospitals. The March of Dimes (2023, para 3), defines a maternity care desert as “any county without a hospital or birth center that offers obstetric care and without any obstetric providers.” According to the 2020 Maternity Care Desert report, 77.4% of counties in ND are maternity care deserts. These numbers are alarming and demonstrate the need for PIPs with a focus on improving maternal and fetal outcomes.

This PIP took place in an Obstetrics and Gynecology clinic located in central ND. This facility lies within a city of approximately 74,000 people and provides a variety of services for women of all ages including obstetric and gynecologic health care, reproductive endocrinology, and maternal-fetal medicine services. The implementation site was chosen because of the co-investigator's relationship with the providers and staff at this clinic following clinical rotations. This facility is home to ten OBGYNs, three NPs, and one physician assistant who provide prenatal care to a diverse population of women.

Sample/Sample Size/Recruitment

The co-investigator for this PIP was a DNP student at North Dakota State University. The project participants were MDs, NPs, and PAs from the Obstetrics and Gynecology clinic who voluntarily chose to participate in the educational module and complete pre- and post-surveys. Participants were recruited through a recruitment email sent by the co-investigator, see Appendix

A, to all healthcare providers working in the clinic. Inclusion criteria for this PIP includes MDs, NPs, and PAs who were currently practicing in this clinic. All 14 providers in the clinic were eligible to participate and encouraged to participate in this PIP. The consent for this project was the willingness to answer the pre- and post-survey survey questions.

Implementation Plan

Evidence-based Practice Model

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care (Figure 1) was utilized as the evidence-based model to guide this PIP. This model is widely used by healthcare professionals when integrating research findings for evidence-based practice changes through the process of problem identification, research collection, implementation, revision, and sustainability (University of Iowa Hospitals and Clinics, 2020). In 2017, this model was revised to become the Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care. The model has been used over time to help guide nurses and clinicians in clinical decision making through the evidence-based practice process and a series of feedback loops (Melnik & Fineout-Overholt, 2019). The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care was chosen to guide this PIP through the steps necessary to incorporate research into potential practice change. Please see Appendix B for permission that was granted from the University of Iowa Hospitals and Clinics to use the Iowa Model prior to the implementation of this PIP.

Step 1: Identifying an Issue

The topic for this PIP was selected based on collaboration with providers from an OBGYN clinic located in central ND. Healthcare providers in this clinic voiced concern regarding patient education and the amount of time it took to educate patients during short

prenatal care visits. When the co-investigator questioned providers' knowledge of GPC, most stated they had limited knowledge and would be interested in learning more about its benefits. The co-investigator had a personal connection with this patient population due to working as registered labor and delivery nurse and seeing a need for an implementation of interventions that could be used to reduce adverse neonatal outcomes and increase maternal education during pregnancy. Through further education and research, the co-investigator became passionate about the need to educate healthcare providers on the importance of GPC and its benefits in improving neonatal outcomes, increasing maternal support and education, and the impact on overall patient satisfaction (Cunningham et al., 2019; Grenier et al., 2019; Kominiarek et al., 2017; Tubay et al., 2019). A desire to improve patient outcomes and bridge an educational gap was the foundation for the development of this PIP. Healthcare providers in a central ND OBGYN clinic were the target population for this PIP.

Step 2: Stating the Purpose

The purpose of this PIP is identified through the objectives of this project. The purpose of the project was to enhance knowledge of barriers to prenatal care and GPC among healthcare providers at a central ND OBGYN clinic. Intent to incorporate GPC into services offered was also assessed.

Step 3: Forming a Team

The formation of a team was crucial in the development of this PIP. A multidisciplinary team approach was required for this PIP. The team included professors within the North Dakota State University (NDSU) School of Nursing, one NP project champion from the OBGYN clinic implementation site, an evidence-based practice council at the hospital that oversaw the clinic,

and a nurse practitioner student. Team members were selected based on their background, interest, previous practice experience, and level of education.

The committee chair for this PIP was a DNP faculty member at NDSU with current NP practice experience and a specific interest in improving patient access to care and increasing provider education to close gaps in healthcare. The second member of the committee was a DNP faculty member and a practicing NP with specific interest in prenatal care education. The third member of the committee was a DNP faculty member and a practicing NP with specific interest in increasing access to prenatal care. The fourth member of the committee was a graduate appointee faculty member at NDSU with a PhD in Philosophy, Foundations of Education and Research Methodologies, a master's in public health, and is a certified Registered Dietitian, Diabetes Educator and Health Education Specialist. Her specific interests include group training and facilitation and patient-centered care.

A NP from the chosen implementation site OBGYN clinic was also included on the team and referred to as the project champion. She was available to facilitate communication between providers and the co-investigator to ensure the best use of time for both parties. She also allowed the co-investigator access to provider email addresses to distribute the pre- and post-survey and educational module. The hospital EBP council was also included as part of the team for this PIP. The co-investigator presented to the council prior to project implementation. The hospital EBP council ensured IRB approval was granted from the project implementation site, see Appendix C, and played a key role in ensuring the project was able to be implemented at the chosen clinic.

Step 4: Retrieval and Grading the Evidence

A thorough review of literature was completed through the NDSU library and other databases, Cochrane, PubMed, EBSCOhost, Google Scholar, CINAHL, and hand searching were used to obtain literature. Peer reviewed journal articles from the past 10 years were used, with most of them written within the last five years to ensure the most relevant and up to date information was included. When updated information was unavailable and information pertinent to this PIP was provided, articles older than five years were utilized. Feedback from committee members and the project chair was obtained regarding relevant research information and utilized to create the evidence-based provider pre- and post-education surveys.

Evidence-based Project Interventions/Activities

This project included a pre-education survey, 25-minute PowerPoint educational module, and post-educational survey. Providers were recruited to participate in this PIP via an email sent by the co-investigator. The pre-education survey was utilized to assess providers' knowledge of common prenatal care barriers and their knowledge of GPC and its benefits. A PowerPoint educational module was developed and distributed via email to all healthcare providers working on the obstetric clinic. Upon completion of the educational module, participants were asked to complete a post-survey to assess change in knowledge and intent to change practice based on the information presented during the educational module.

Step 5: Designing and Piloting the Practice Change

The development of this PIP required collaboration between the co-investigator, OBGYN clinic staff, project champion, hospital EBP council, and the dissertation committee. In preliminary discussions between the co-investigator, project chair, and the NP project champion, a recommendation was made to provide a 25-minute pre-recorded PowerPoint educational

module to allow for adequate time to provide comprehensive and meaningful education to providers, while ensuring to respect provider's time. The educational module was pre-recorded using a voiceover PowerPoint presentation and distributed via facility email. Providers were able to review this presentation on their own time over the course of four weeks. Reminder emails were sent to all providers at three-, two-, and one-week intervals to encourage provider participation.

The co-investigator and project chair collaborated to determine relevant evidence from literature that could be used to guide the provider education module. The educational module included information regarding the importance of prenatal care, disparities in prenatal care, world-wide and ND statistics, barriers to prenatal care, interventions to reduce barriers to prenatal care, adverse maternal and neonatal outcomes because of disparities in prenatal care, a description of GPC, benefits, and outcomes of GPC, and in-depth information regarding CP® and its benefits for patients and providers. The provider education module was delivered by the co-investigator via a pre-recorded voiceover Microsoft PowerPoint. Access to the educational module was available using a Microsoft OneDrive link that was emailed to all providers in the OBGYN clinic using their facility email addresses. Microsoft OneDrive will allow continued access to the presentation for providers to refer to at their convenience after the initial review of the presentation for this PIP.

Participants were recruited to participate via email, and participation was voluntary. Pre- and post-surveys were created using Qualtrics. Allison Mills' original pre- and post-education surveys (Appendix D) were used as a guide for the projects pre- and post-surveys. However, questions utilized for the PIP's pre- and post-survey were developed based on the project's objectives. Effort was made to contact Allison to ask permission to use her survey, but no

response was obtained. The surveys were administered through an online survey tool, Qualtrics. Qualtrics is capable of pre- and post-survey data comparison and ensures participant confidentiality. Collected data was stored in the co-investigator's computer, which is password protected. A pre-survey (Appendix E) was sent as a link with the recruitment email along with the consent information (Appendix A). Participants were able to complete the pre-survey, and upon completion of the pre-survey, a link to the educational module (Appendix F) was provided. Following completion of the 25-minute educational module, providers were prompted to complete a post-survey (Appendix G) via a Qualtrics link. This project ran over four weeks from August 16th to September 13th, 2023. Providers who participated in this PIP had the chance to win a \$50 Visa gift card if they attended a question-and-answer session held by the co-investigator. The Q&A session was scheduled for October 30th at 12:15 p.m. at the OBGYN clinic for all providers who participated in the PIP. Details about this Q&A session and the chance to win a gift card was sent out to providers with the recruitment email and again at the end of the four-week implementation timeframe to remind providers of the Q&A session. This session allowed providers to ask questions regarding the educational module and the co-investigator to answer. Providers were able to put their name into a drawing for the gift card upon entrance to the Q&A session and the co-investigator drew for the winner at the conclusion of the session. Pre- and post-surveys were created in Qualtrics. Participation was voluntary, and consent was provided by starting the pre-survey.

There were no consequences for providers who wished to not participate or chose to withdraw after partial completion, although to be eligible for the gift card, providers must have completed both the pre- and post-surveys, the educational module, and attended the Q&A session.

Step 6: Integrating and Sustaining Practice Change

Post-education surveys were utilized to assess healthcare providers' intent to implement GPC into their practice. Key personnel were identified to continue discussions of implementing GPC as an additional service into practice. Providers who indicated intent to change practice were responsible for moving forward with the implementation portion of GPC in the OBGYN clinic. Education was provided regarding initial GPC implementation steps in the provider educational module along with contact information.

Step 7: Dissemination

Results of this PIP were disseminated through the NDSU ProQuest database following its completion. Results may also be disseminated through poster presentation opportunities that present themselves to the co-investigator prior to graduation. Project results will also be disseminated to key stakeholders.

Evaluation

Evaluation of data was done in regard to each objective to help assess if the objectives were met. The following sections will dive into further detail on how each objective was evaluated.

Objective One

Objective one was to provide evidence-based recommendations to obstetrics providers on interventions to reduce barriers to prenatal care through the utilization of GPC. An educational module was provided with information on strategies to reduce barriers to prenatal care. Questions, five, six, and seven on both the pre- and post-survey were utilized to evaluate if this objective was met. Question five was a select all that apply knowledge-based question regarding barriers to prenatal care that have been reported in literature. Question six was a culture-based

knowledge question regarding barriers faced by American Indian/Alaskan Native women due to the high prevalence of this culture located near the implementation site. Question seven was a knowledge-based question regarding providers' understanding of ways to reduce barriers to prenatal care. Questions six and seven were Likert-scale style questions which were analyzed to provide the co-investigator with quantitative data. This quantitative data helped to define if there was an increase in knowledge regarding ways to reduce barriers to prenatal care.

Objective Two

Objective two was to increase obstetrics providers' knowledge of GPC. Objective two was analyzed by comparing answers from questions eight through twelve on the pre- and post-surveys. A five-point Likert scale was utilized for questions eight, eleven, and twelve to evaluate for a perceived knowledge change among providers of benefits of GPC in clinical practice, provider understanding of CenteringPregnancy® and its impact on neonatal and maternal outcomes, and provider comfortability with GPC. Data was evaluated via the Likert-scale to provide quantitative data, which offered further information regarding providers' knowledge of GPC. Question nine was a knowledge-based "select all that apply" style question regarding outcomes of GPC. Question ten was a true or false question that provided data regarding providers' knowledge of the cost-effectiveness of GPC.

Objective Three

Objective three was to increase obstetrics providers' intent to offer GPC as another option for prenatal care in their clinic. Objective three was evaluated through question number thirteen on the pre- and post-survey. A Likert-style question was used and analyzed to provide the co-investigator with quantitative data. This quantitative data helped to determine if there was an increase in provider intent to offer GPC.

Objective Four

Objective four was to identify barriers to implementation of GPC among obstetric providers. This objective was assessed by utilizing data from question number fourteen on the post-survey. Qualitative data was obtained via feedback provided to the co-investigator through this multiple selection question regarding barriers identified by providers. There was also a space for providers to type in barriers not already listed in the post-survey question.

Logic Model

Inputs within this practice improvement project included what went into this project to generate success (CDC, 2018). These included dedicating time, engaging key stakeholders, money for the participation gift card drawing, integration of the latest evidence-based research, and selecting an appropriate venue for the Q&A session. The project's activities included events that took place by the co-investigator to achieve the necessary outcomes. These activities involved hours of extensive research, development of pre- and post-surveys, and the creation of a PowerPoint educational module with a voiceover recording for future healthcare provider reference. The outputs were the result of the activities, and the outcomes are the desired results. Specifically, the desired results were to increase healthcare providers' knowledge of barriers to prenatal care and GPC and assess providers' intent to incorporate GPC into their practice following the education module. Lastly, the impact is the ultimate goal, which was to bring provider awareness to barriers women experience in obtaining prenatal care and increasing providers' awareness of the benefits of GPC.

Figure 2

Logic Model



Protection of Human Subjects

IRB approval was obtained from both North Dakota State University (Appendix H) and from the tertiary care center's EBP council associated with the central ND OBGYN clinic (Appendix C) where this project took place. Participants were eighteen years and older and voluntarily chose to participate in this PIP. One potential risk that participants may have encountered during project implementation includes loss of time. Loss of time may include time spent completing the pre- and post-surveys and educational module. Because of this potential risk, the healthcare organization may endure loss of productivity by healthcare providers due to the time spent on the project. Potential benefits included enhanced provider education and increase prenatal care opportunities for patients in the community.

Conclusion

A team approach was essential for the success of this project. Integration of the Adult Learning Theory with the Iowa Model helped create an educational module that is applicable to obstetrics providers. The measurement of data obtained with this PIP allowed the co-investigator to determine the success of the objectives and if any changes are needed for future educational implementations. By establishing providers' baseline perceived knowledge and comparing that data to post-implementation data using pre- and post-surveys, the co-investigator was able to establish if learning took place. The results can also be utilized for guidance of future educational efforts for obstetrics healthcare providers.

CHAPTER 4: RESULTS

The following sections will review the results of the pre- and post-surveys. The surveys included questions regarding healthcare providers' demographic information, their current practice knowledge regarding GPC and solutions to reduce disparities among women of child-bearing age, and a Likert survey to assess healthcare providers' self-confidence regarding GPC. In addition, feedback received during the Q&A session hosted at the implementation site will be reviewed.

Magnitude of the Shift from Pre- to Post-Survey

Magnitude of the shift calculations were utilized to determine if there was an increase in healthcare providers' level of knowledge. This is done by comparing pre-survey data to the post-survey data. To calculate this, each option was given a numerical value. "Strongly agree" represents a value of 5, "somewhat agree" a 4, "neither agree nor disagree" a 3, "somewhat disagree" a 2, and "strongly disagree" a 1. Each statement's scores were added up from the pre- and post-test and divided by the number of people who completed the pre- and post-survey; this determined the magnitude of the shift. Overall, there was an increase in the magnitude of the shift seen for all questions that were analyzed using the MOS.

Demographics

Questions one through four on the pre- and post-survey focused on the demographics of the healthcare providers. There were four providers who responded to the pre-survey. Of the four providers, 50% (N=4; n=2) identified themselves as nurse practitioners, 25% (n=1) identified themselves as a medical doctor, and 25% (n=1) identified themselves as a physician assistant. One hundred percent of providers (N=4) identified themselves as female. Twenty-five percent (n=1) reported being employed at the implementation site for one to five years, 25% (n=1)

reported being employed at the implementation site for five to ten years, 25% (n=1) reported being employed at the implementation site for 10-15 years, and 25% (n=1) reported being employed at the implementation site for 15 or more years. Twenty-five percent (n=1) reported being a healthcare provider for one to five years, 25% (n=1) reported being a healthcare provider for five to ten years, and 50% (n=2) reported being a healthcare provider for 15 or more years.

There were two providers who responded to the post-survey. Of these two providers, 100% (N=2; n=2) identified themselves as nurse practitioners. One hundred percent (n=2) participants identified as female. 25% (n=1) reported being employed at the implementation site for one to five years, 50% (n=1) and 50% (n=1) reported being employed at the implementation site for one to five years. Fifty percent (n=1) reported being a healthcare provider for less than one year and 50% (n=1) reported being a healthcare provider for one to five years. Please see Table 1 for additional information.

Table 1*Sample Demographics Questions and Responses*

Question	Response to pre-test (N=4)	Percent (%)	Response to post-test (N=2)	Percent (%)
Profession				
Nurse	2	50%	2	100%
Practitioner	1	25%	0	0%
Medical Doctor	1	25%	0	0%
Physician	0	0%	0	0%
Assistant				
Other				
Years in Practice at Implementation Site				
Less than 1 year	0	0%	1	50%
1-5 years	1	25%	1	50%
5-10 years	1	25%	0	0%
10-15 years	1	25%	0	0%
15+ years	1	25%	0	0%
Years as a Healthcare Provider				
Less than 1 year	0	0%	1	50%
1-5 years	1	25%	1	50%
5-10 years	1	25%	0	0%
10-15 years	0	0%	0	0%
15+ years	2	50%	0	0%

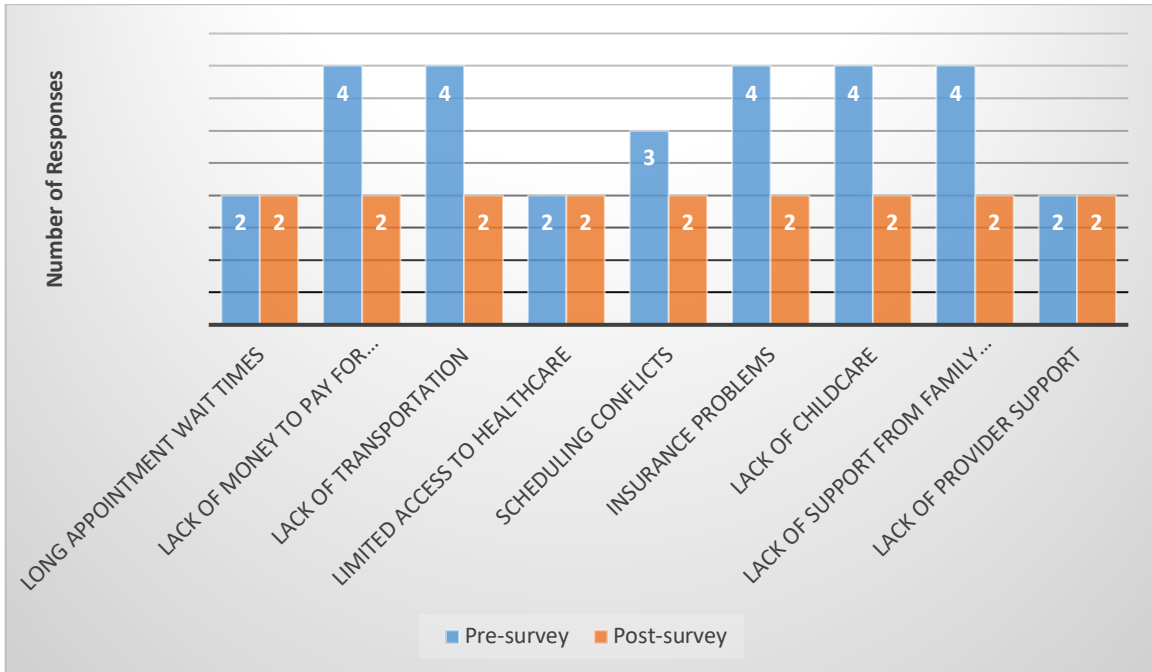
Objective One

Objective one was to provide evidence-based recommendations to obstetrics providers on interventions to reduce barriers to prenatal care through the utilization of GPC. The educational module included information on strategies to reduce barriers to prenatal care. Questions five, six, and seven on both the pre- and post-survey were utilized to evaluate if this objective was met.

Question five was a “select all that apply question” that asked providers to identify barriers to prenatal care that had been reported in literature. Of the four responses to the pre-survey regarding barriers to prenatal care, 50% (N=4; n=2) selected “*long appointments wait times,*” 100% (n=4) selected “*lack of money to pay for services,*” 100% (n=4) selected “*lack of transportation,*” 50% (n=2) selected “*limited access to healthcare,*” 75% (n=3) selected “*scheduling conflicts,*” 100% (n=4) selected “*insurance problems,*” 100% (n=4) selected “*lack of childcare,*” 100% (n=4) selected “*lack of support from family or partner,*” and 50% (n=2) selected “*lack of provider support as barriers.*” On the post-survey, 100% (N=2; n=2) providers selected all that apply and correctly identified “*long appointment wait times, lack of money to pay for services, lack of transportation, limited access to healthcare, scheduling conflicts, insurance problems, lack of childcare, lack of support from family or partner, and lack of provider support*” as barriers to prenatal care that were reported in literature.

Figure 3

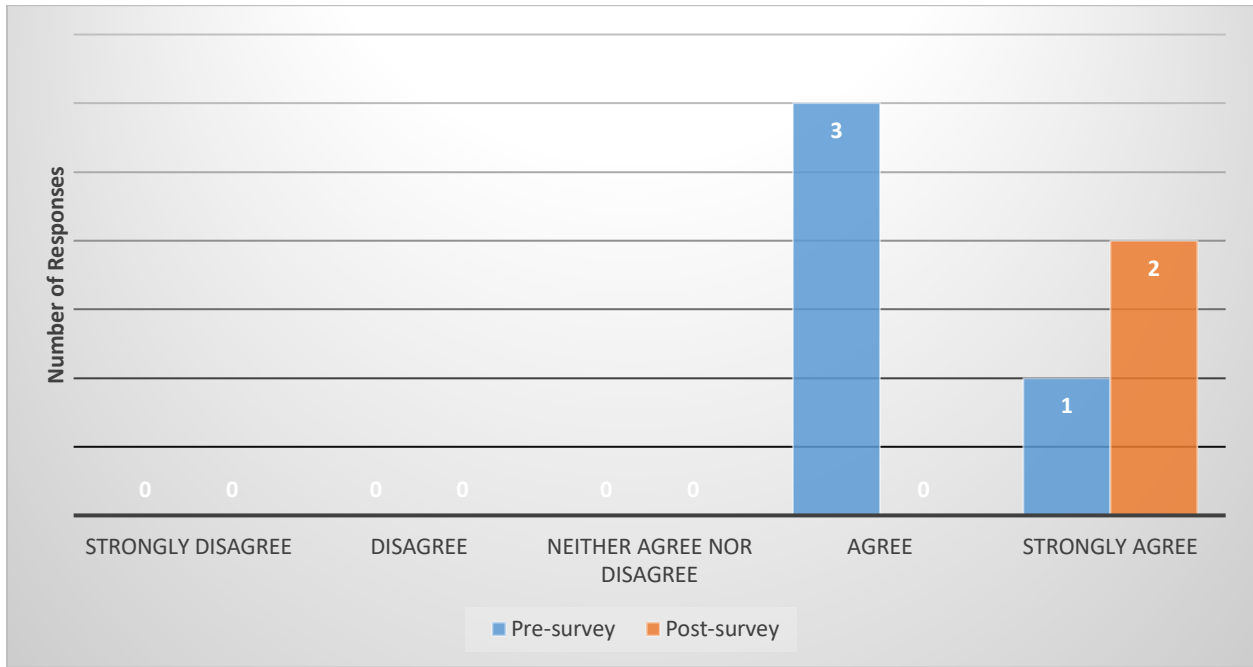
Question Five: Perceived Knowledge of Barriers to Prenatal Care Reported in Literature



Question six stated, “American Indian/Alaskan Native women face barriers to care such as lack of access to care, dissimilar communication styles, and inconsistent continuity of care.” All (n=2) providers selected “strongly agree” on the post-survey, as compared to 75% (n=3) selecting “agree” on the pre-survey and 25% (n=1) selecting “strongly agree” on the pre-survey.

Figure 4

Question Six: Perceived Knowledge of Barriers to Care Faced by AI/AN Women



Question number seven stated: “Based on my current level of knowledge, I have a good understanding of ways to reduce barriers to prenatal care.” Prior to the educational module, 25% (N=4; n=1) of participants selected “neither agree nor disagree”, and 75% (n=3) participants selected “agree.” After completing the educational module, 50% (n=1) selected “agree” and 50% (n=1) selected “strongly agree” to having a good understanding of ways to reduce barriers to prenatal care. Please see Table 2 for the magnitude of the shift calculations for objective 1.

Figure 5

Question Seven: Perceived Knowledge of Understanding of Ways to Reduce Barriers to Prenatal Care

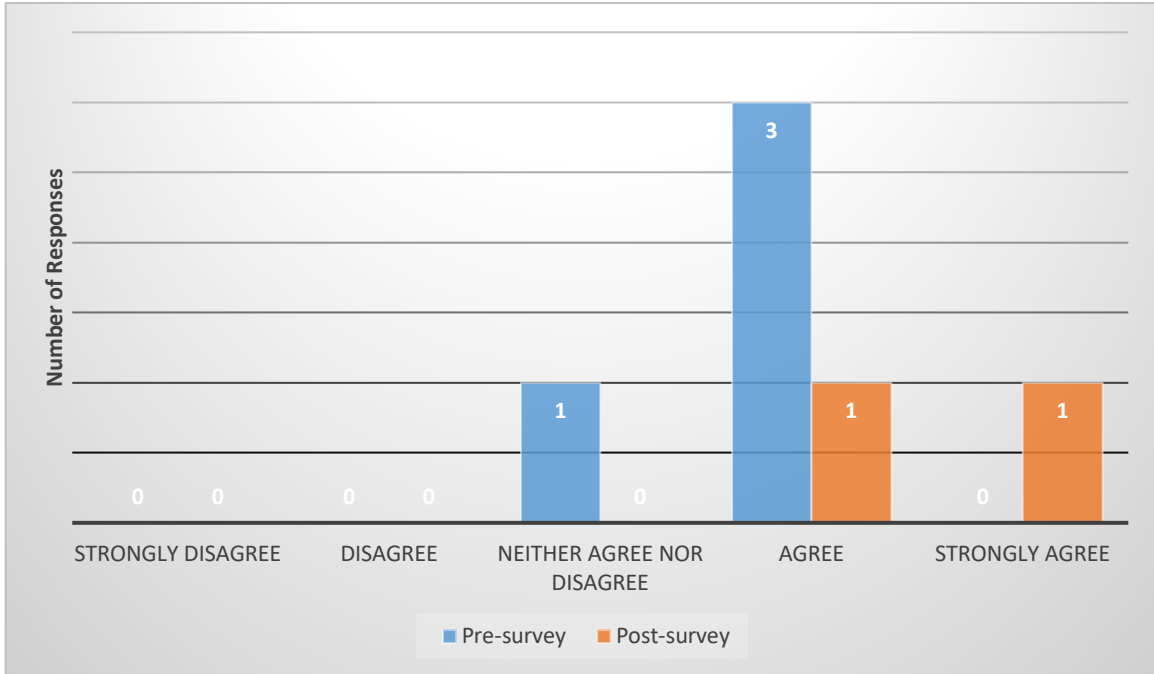


Table 2

Magnitude of Shift for Provider Knowledge Regarding Barriers to Care

Question	Mean of Pre-survey Responses	Mean of Post-survey Responses
Q6. American Indian/Alaskan Native women face barriers to care such as lack of access to care, dissimilar communication styles, and inconsistent continuity of care.	4.25	5.0
Q7. I have a good understanding of ways to reduce barriers to prenatal care.	3.75	4.5

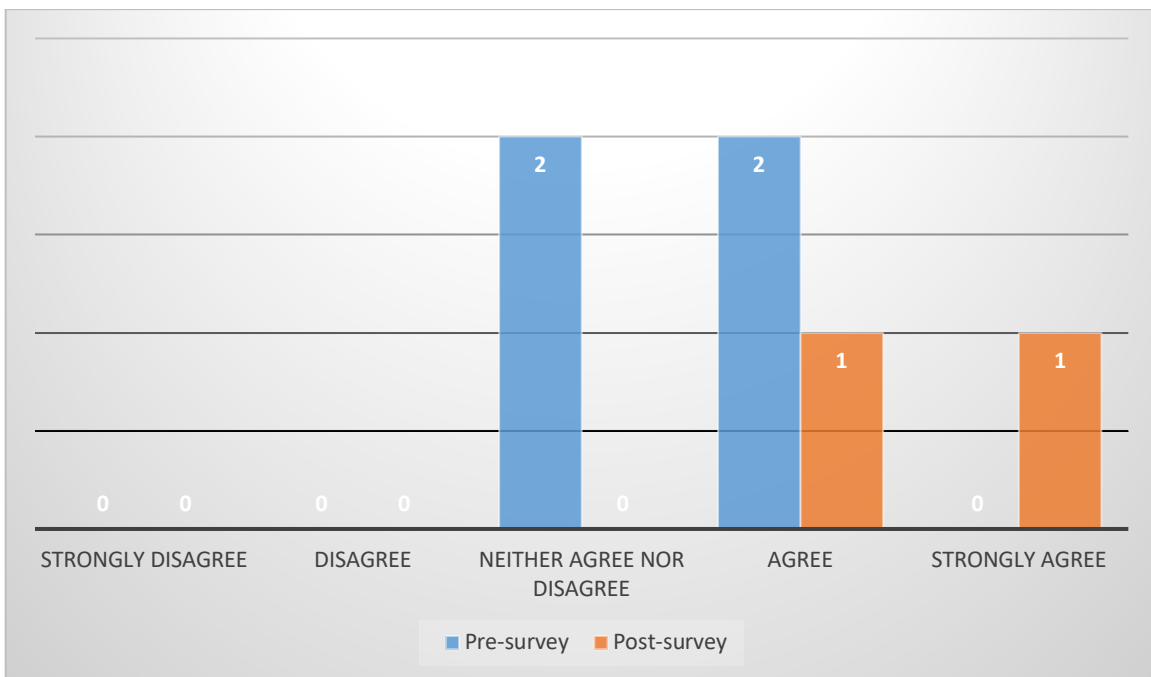
Objective Two

Objective two was to increase obstetrics providers' knowledge of GPC following the completion of the educational module. Pre-and post-survey results from questions eight through twelve were analyzed to determine if there was an increase in provider knowledge.

Question eight on the pre-survey was a Likert-style question that stated, "Based on my current level of knowledge, I have a good understanding of the benefits of group prenatal care in clinical practice." Of the four providers who responded to the pre-survey, 50% (N=4; n=2) selected "neither agree nor disagree," and 50% (n=2) selected "agree." There were two providers who responded to question number eight on the post-survey, of which 50% (n=1) answered "agree," and 50% (n=1) answered "strongly agree."

Figure 6

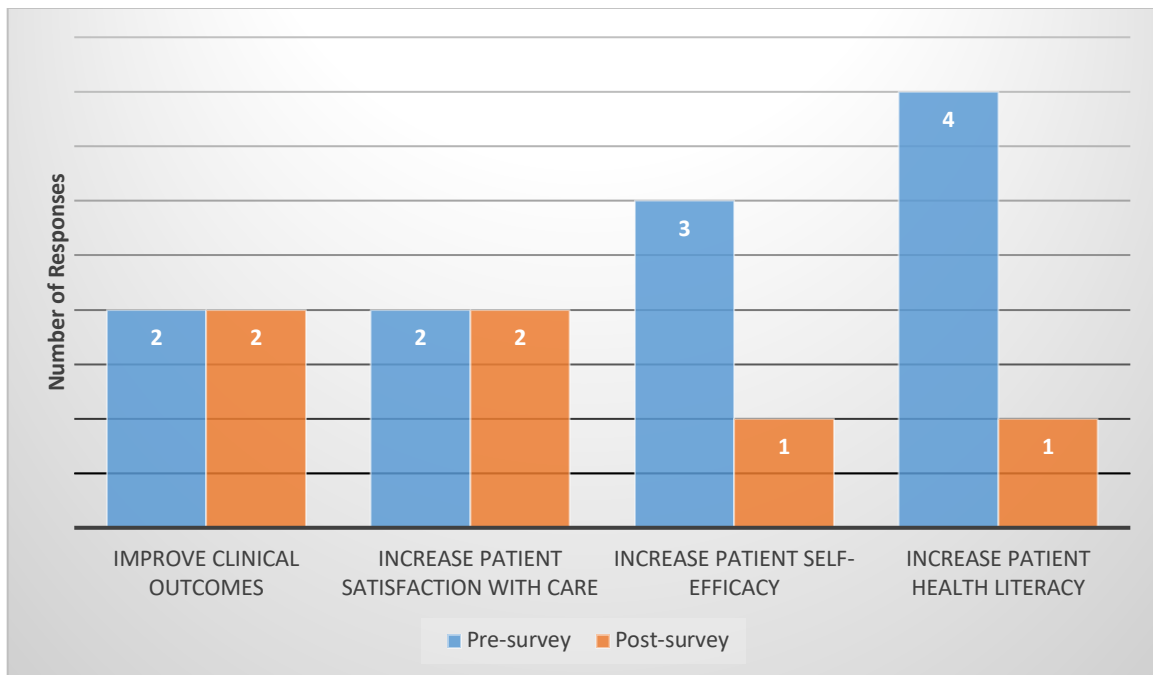
Question Eight: Understanding of Benefits of GPC in Clinical Practice.



Question nine on the pre-survey stated, “Group prenatal care has been noted to (select all that apply).” Of the four providers who responded to the pre-survey, 50% (N=4; n=2) selected “improve clinical outcomes,” 50% (n=2) selected “increase patient satisfaction with care,” 75% (n=3) selected “increase patient self-efficacy,” and 100% (n=4) selected “increase patient health literacy.” Of the two providers who responded to the post-survey 100% (N=2; n=2) selected “improve clinical outcomes,” 100% (n=2) selected “increase patient satisfaction with care,” 50% (n=1) selected “increase patient self-efficacy,” and 50% (n=1) selected “increase patient health literacy.”

Figure 7

Question Nine: Group Prenatal Care Outcomes.



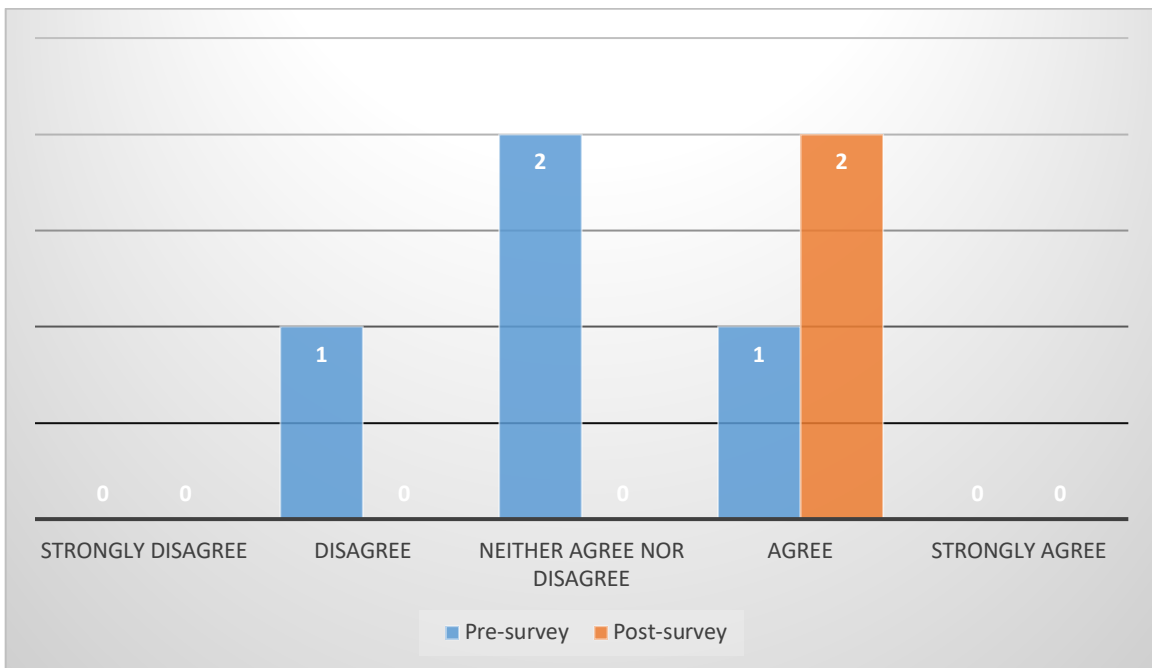
Question number ten was a true or false question as follows: “while group prenatal care has many benefits for patients, cost analyses have shown that it is not a cost-effective option.”

All (N=4; n=4) of the providers responded “false” to question ten on the pre-survey, and 100% (N=2; n=2) of the providers responded “false” on the post-survey.

Question number eleven on the pre-survey stated, “based on my current level of knowledge, I have a good understanding of CenteringPregnancy® and its impact on neonatal and maternal outcomes.” Twenty-five percent (N=4; n=1) responded “disagree,” 50% (n=2) responded “neither agree nor disagree,” and 25% (n=1) responded “agree” on the pre-survey. After the educational module, 100% (N=2; n=2) of the providers responded “agree” to having a good understanding of CenteringPregnancy® and its impact on neonatal and maternal outcomes.

Figure 8

Question Eleven: Provider Understanding of CP® and its Impact on Neonatal and Maternal Outcomes.



Providers were also asked how comfortable they felt with GPC based on their current level of knowledge before and after the educational module. Prior to the education, 25% (N=4, n=1) responded “uncomfortable,” 50% (n=2) responded “neither comfortable nor

uncomfortable,” and 25% (n=1) responded *“comfortable.”* One hundred percent (N=2, n=2) of the providers responded *“comfortable”* on the post-survey.

Figure 9

Question Twelve: Provider Comfortability with GPC.

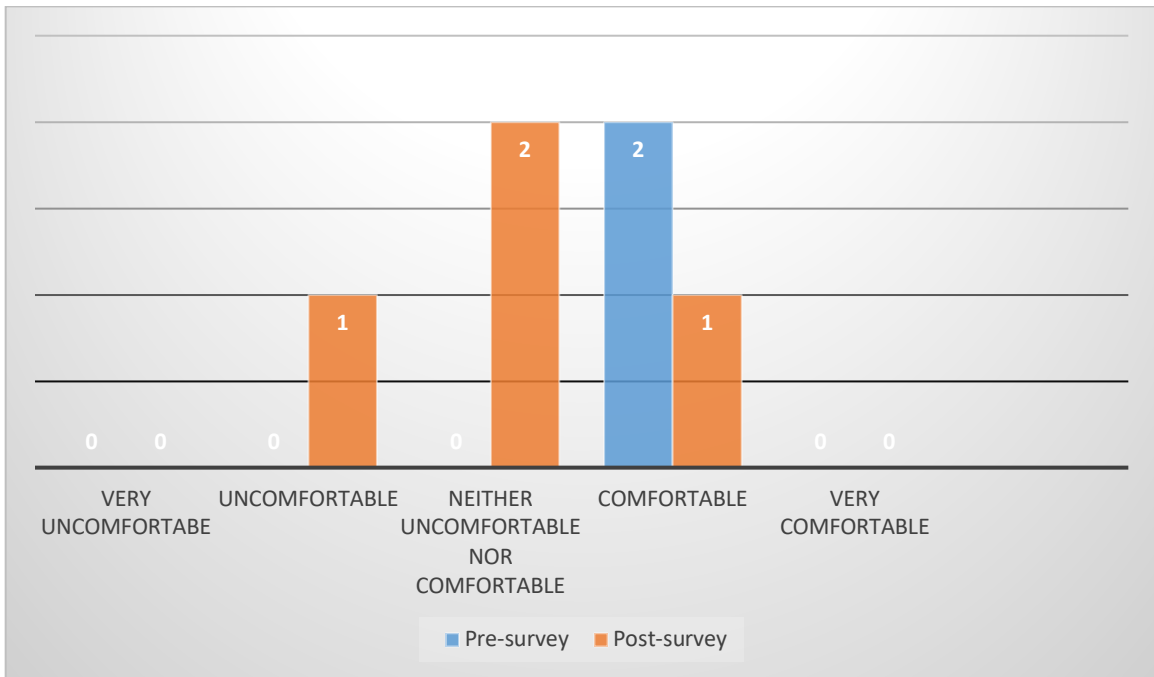


Table 3 illustrates sample knowledge from questions nine and ten on the pre- and post-surveys and Table 4 illustrates perceived knowledge from questions eight, eleven, and twelve on the pre- and post-surveys. Please see Table 5 for the magnitude of the shift calculations for objective 2.

Table 3*Sample Knowledge Questions and Responses*

Question	Response to pre-survey (N=4)	Mean (%)	Response to post-survey (N=2)	Mean (%)
Q9. Group prenatal care has been noted to (select all that apply):				
Improve clinical outcomes.	2	50%	2	100%
Increase patient satisfaction with care.	2	50%	2	100%
Increase patient self-efficacy.	3	75%	1	50%
Increase patient health literacy.	4	100%	1	50%
Q10. While group prenatal care has many benefits for patients, cost analyses have shown that it is not a cost-effective option. True or False?				
True	0	0%	0	0%
False	4	100%	2	100%

Table 4*Sample Perceived Knowledge Questions and Responses*

Question	Response to pre-survey (N=4)	Mean (%)	Response to post-survey (N=2)	Mean (%)
Q8. Based on my current level of knowledge, I have a good understanding of the benefits of group prenatal care in clinical practice.				
Strongly Disagree	0	0%	0	0%
Disagree	0	0%	0	0%
Neither Agree nor Disagree	2	50%	0	0%
Agree	2	50%	1	50%
Strongly Agree	0	0%	1	50%
Q11. Based on my current level of knowledge, I have a good understanding of CenteringPregnancy® and its impact on maternal and neonatal outcomes.				
Strongly Disagree	0	0%	0	0%
Disagree	1	25%	0	0%
Neither Agree nor Disagree	2	50%	0	0%
Agree	1	25%	2	100%
Strongly Agree	0	0%	0	0%
Q12. After review of the educational module, how comfortable are you with group prenatal care?				
Very Uncomfortable	0	0%	0	0%
Uncomfortable	1	25%	0	0%
Neither Uncomfortable nor Comfortable	2	50%	0	0%
Comfortable	1	25%	2	100%
Very Comfortable	0	0%	0	0%

Table 5

Magnitude of Shift for Increased Provider Knowledge Questions

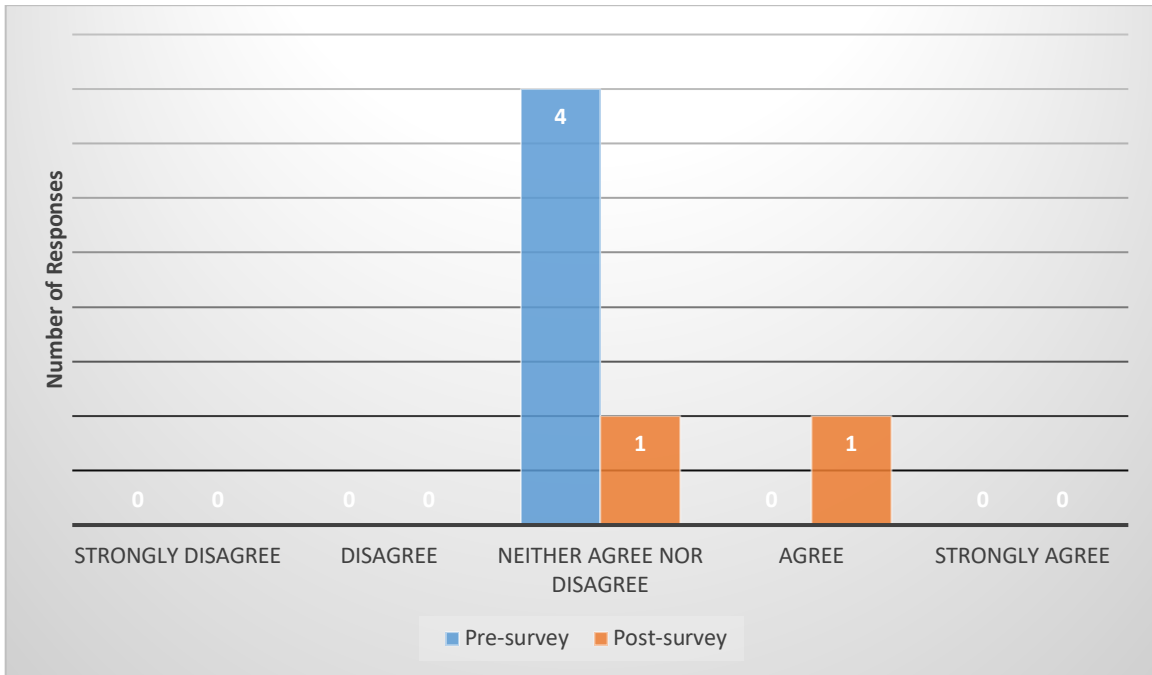
Question	Mean of Pre-survey Responses	Mean of Post-survey Responses
Q8. I have a good understanding of the benefits of group prenatal care in clinical practice.	3.5	4.5
Q11. I have a good understanding of CenteringPregnancy® and its impact on neonatal and maternal outcomes.	3.0	4.0
Q12. How comfortable are you with group prenatal care?	3.0	4.0

Objective Three

Objective three was to increase obstetrics providers' intent to offer GPC as another option for prenatal care in their clinic after completion of the provider education module. This objective was assessed through analyzing pre- and post-survey data for questions 13 and 14 on the post-survey. Question thirteen on the pre-survey stated, *“Based on my current level of knowledge and familiarity regarding group prenatal care (GPC), and CenteringPregnancy®, I intend to implement GPC serviced into my practice.”* Prior to the educational module, 100% (N=4) of providers responded, *“neither agree nor disagree.”* After reviewing the group prenatal care (GPC) educational module, 50% (N=2; n=1) responded, *“neither agree nor disagree,”* and 50% (n=1) responded *“agree”* that they had a good understanding of GPC and intend to utilize the information to change their practice. The magnitude of the shift from the pre-survey to the post-survey was 3.0 to 3.5.

Figure 10

Question Thirteen: Provider Intent to Implement GPC.



Providers were also asked an open response question to provide a rationale regarding their intent to utilize the information to change practice. Two providers responded to this question and the responses were as follows:

“From the information provided, it is clear that incorporating group prenatal care into my practice can result in enhanced patient outcomes, cost-effectiveness, strengthened provider-patient relationships, and reduced healthcare disparities. Additionally, it aligns with evidence-based practices, increases patient satisfaction, and fosters holistic care, making it a valuable enhancement to maternity services.”

-Healthcare provider participant

“Would be happy to utilize this if there were more support from enterprise, providers, admin, etc.”

- Healthcare provider participant

Objective Four

The fourth objective of this PIP was to identify barriers to implementation of GPC among obstetrics providers. This objective was assessed by utilizing data from question number 15 on the post-survey, which was a multiple selection question assessing barriers that may make implementation of GPC difficult in the provider's practice. Identified barriers include lack of time (n=1, 50%) and other (n=1, 50%), which was further identified as staffing, space, and scheduling.

CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

Summary

The purpose of this PIP was to educate obstetrics and gynecology healthcare providers on barriers to prenatal care faced by women of childbearing age and strategies to decrease these barriers, as well as to increase providers' knowledge of GPC, more specifically the CenteringPregnancy® model of care through the use of a PowerPoint education module. Provider intent to implement GPC into their current practice was also assessed. Cost of prenatal care services, trouble with transportation to facilities, limited access to healthcare, maternal mental health, and other socioeconomic problems act as barriers to prenatal care that may limit women from seeking prenatal care during their pregnancy (Abshire et al. 2019; Akamune, 2018; Crocket et al., 2019). This lack of prenatal care can have negative impacts of the health of both the mother and her unborn child, demonstrating the importance of interventions to reduce barriers and improve access to prenatal care (Ickovics et al., 2016).

In summary, this project assessed providers' perceived knowledge regarding ways to decrease barriers to prenatal care. Providers' knowledge regarding the benefits of GPC and CP® may have increased as a result of the education module. Provider intent to change practice also may have increased as a result of the education module. All four objectives of this project were met. Important findings included providers stated possible intent to implement GPC into their practice, provider comfortability with GPC following the provider education module, and a possible increase in perceived knowledge regarding barriers to prenatal care from the pre- to post-survey following completion of the educational module, however this cannot be certain due to pre- and post-surveys not being linked.

Previous literature focused on the benefits of GPC for patients and providers; however, there was a gap in literature regarding provider education of GPC (Alexander & Kotelchuck, 2001; Andrade-Romo et al., 2019; Catling et al., 2017; Novick et al., 2015). The success of GPC heavily relies on the support and involvement of healthcare providers. Clinicians who offer GPC not only find increased satisfaction with their practice, but also demonstrate a deeper understanding of individual cultural values and beliefs, which are crucial for optimizing neonatal outcomes (Lazar et al., 2021). The introduction and expansion of alternative prenatal care models, such as GPC, allow for a thorough examination of providers' perspectives.

GPC has shown promise in improving maternal and neonatal outcomes while offering expectant mothers a supportive environment to share experiences and concerns (Abshire, 2019; Catling et al., 2017; Cunningham et al., 2019; Mills, 2019). By facilitating multiple patient interactions at the same time, providers can manage their time more efficiently and can address diverse cultural and individual needs effectively. In addition, the cost-effectiveness and professional satisfaction that has been associated with GPC accentuate its relevance in the modern healthcare setting and ensures providers are offering evidence-based, comprehensive care to pregnant women.

Discussion

Objective One

The first objective was aimed at providing evidence-based recommendations to obstetrics providers regarding interventions to reduce barriers to prenatal care through the utilization of group prenatal care. GPC has been suggested as an alternative method of prenatal care, which can mitigate barriers to prenatal care by allowing women increased access to prenatal care (Catling et al., 2017). There is a lack of literature surrounding provider understanding of barriers

to prenatal care, which led to the development of survey question five, six, and seven to obtain data regarding this topic.

Because there is limited data regarding provider knowledge of barriers to prenatal care, data obtained from this PIP allowed the co-investigator to determine if there was an increase in perceived knowledge regarding barriers to prenatal care following the educational module. Comparing the selected answers from the pre-survey to the post-survey revealed an overall increase in percentage of providers who were correctly able to identify barriers to prenatal care as a result of the educational module. After the educational module, 100% of providers were able to correctly identify all nine barriers to prenatal care that have been reported in literature, which differed from the pre-survey. This showed a possible increase in providers' perceived knowledge regarding barriers to prenatal care.

It was important to assess providers' knowledge of barriers to care faced by AI/AN women, due to the high prevalence of AI/AN women in North Dakota, but more specifically near the location of the implementation site. AI/AN women face barriers to prenatal care due to cultural and socioeconomic factors, which ultimately puts this population of women at risk for increased maternal and infant mortality (Ely & Driscoll, 2019; Johnson, 2020). AI/AN women are also at an increased risk for obtaining late or no prenatal care during pregnancy (Driscoll et al., 2021; U.S. Department of Health and Human Services Office of Minority Health, 2021).

Question six allowed the co-investigator to assess for an increase in providers' perceived knowledge of barriers to care faced by AI/AN woman, which demonstrated a magnitude of the shift from 4.25 to 5.0. Question seven was utilized to assess providers' perceived knowledge of ways to reduce barriers to prenatal care, and the magnitude of the shift before compared to after the educational module went from 3.75 to 4.5. Overall, survey results showed a likely increase in

perceived knowledge regarding barriers to prenatal care reported in literature, barriers to care faced by AI/AN women, and an increase in provider knowledge of ways to reduce barriers to prenatal care for providers. Objective one was determined to be met due to examining the quantitative data from questions five, six, and seven.

Objective Two

The second objective was aimed at increasing obstetrics providers' perceived knowledge of GPC, which was an essential part of this PIP. GPC has also been shown to increase access to prenatal care, while improving maternal and neonatal outcomes for many groups of women (Catling et al., 2017). The magnitude of the shift calculation in provider understanding of the benefits of GPC was noted from the pre- to post-survey as 3.5 to 4.5. This calculation shows a likely increase in providers' understanding of benefits of GPC in clinical practice following review of the education module. These findings are similar to those found in literature, as providers have emphasized the value of GPC, highlighting its capacity to offer women a more personalized and supportive healthcare experience (Lazar et al., 2021).

GPC has been shown to have many benefits including, but not limited to, improved clinical outcomes, increased number of prenatal visits attended, increased quality of care, increased patient self-efficacy, and increased patient health literacy (Abshire, 2019; Catling et al., 2017; Mills, 2019; Tucker et al, 2021). Providers were able to correctly identify benefits of GPC including improved clinical outcomes and increased patient satisfaction on question nine. Fifty percent (N=2; n=1) of providers correctly identified all correct outcomes of GPC on the post-survey.

CP® has been shown to reduce rates of preterm birth and low birth weight, increase rates of breastfeeding, and improve patient satisfaction with care (Tubay et al., 2019). There was a

possible increase in provider understanding of CP® and its impact on neonatal and maternal outcomes was noted with a magnitude of the shift from pre- to post-survey of 3.0 to 4.0. This showed a possible increase in provider understanding of CP®, which is a critical part of understanding why GPC is so beneficial. Understanding and endorsing GPC is vital for providers when offering care in a group setting (Lazar et al., 2021). If providers lack comprehension of its benefits or are uncomfortable with this approach, it could adversely impact patients. Without adequate support and comfort from providers, patients may not receive the full advantages of GPC, potentially compromising their overall experience and outcomes.

GPC has been shown to be sustainable and cost-effective (Gennaro, 2016). Pre- and post-survey data was used to assess providers' understanding of the cost-effectiveness of GPC. Providers had a good baseline knowledge regarding the cost-effectiveness of GPC as a model for prenatal care, as 100% (n=4) of the providers answered correctly to question ten on the pre-survey and 100% (n=2) on the post-survey. Overall, providers' perceived knowledge of GPC may have increased following review of the educational module, therefore objective two was met.

Objective Three

The third objective was to increase obstetrics providers' intent to offer GPC as another option for prenatal care in their clinic after completion of the education module. This clinic does not currently offer GPC services and as previously mentioned, lack of buy-in is one of the most common barriers to implementation for GPC (Novick et al., 2015). Therefore, it was important for the co-investigator to assess for provider intent to offer GPC services at the implementation site, following the educational module. This allowed the co-investigator to not only know if the educational module was beneficial, but also to see if there would be any future project

opportunities regarding implementation of GPC. The magnitude of the shift from the pre- to post-survey was 3.0 to 3.5, demonstrating a possible increase in providers' understanding of GPC and intent to change practice following completion of the education module. Additional provider feedback included that GPC aligns with evidence-based practice and is a value to maternity services. Another provider reported they would implement GPC if there was additional support from the enterprise. This objective was met, as there was a possible increase in provider intent to change practice as a result of the educational module.

Objective Four

Despite its benefits, there have been barriers to the implementation of GPC discussed in literature. Implementation is complex and can be demanding on a facility that is designed for individual care (Novick et al, 2015). Implementing GPC calls for supportive work cultures, advocacy for GPC, and staff that is willing to implement change. The fourth objective of this PIP was to identify barriers to implementation of GPC among obstetrics providers. Providers should be aware of barriers to implementation of GPC prior to implementing this into their practice in order to meet any challenges head on prior to the adoption of this care model. The barriers to implementation of GPC identified by providers in this PIP included lack of facility support, staffing, space, and scheduling which align with literature discussed by Cunningham et al. (2019). Objective four was met.

Recommendations

Healthcare providers should be well-versed and educated in GPC given its advantages for both patients and providers (Abshire, 2019; Kominiarek et al., 2017; Lathrop, 2013; Mills, 2019; Novick et al., 2015; Trotman et al., 2015; Tubay et al., 2019). This emphasizes the importance of enhancing education on this subject, potentially prompting future DNP/FNP

graduate students to focus on this essential topic. For future projects, recommendations include offering an in-person educational session, or multiple options for attendance such as Zoom, in-person, or completely online with no co-investigator contact, similar to the original project. In addition, offering continuing education (CE) hours for the topic of GPC may aid in overall provider recruitment.

Future Practice Improvement Projects

Offering this PIP in a multitude of formats would ensure that providers had the best opportunity to attend this educational session. Offering this project in-person, as well as via Zoom, would allow providers to attend over their lunch break or after clinic hours, as well as from their office or at home if they were not in the clinic on the day of the offered educational session. Kemp and Grieve (2014) compared learning in a classroom setting to learning online and found that learning in a face-to-face setting offered more engagement, and participants liked the immediate feedback they obtained. Allowing providers to also complete the pre- and post-surveys and educational module from home in a similar fashion to the original project may allow for more participation for those providers who do not want to have in-person contact with the co-investigator in in form due to anonymity. This would also optimize provider time and give providers an option of what would work best for them to attend. Linking provider's pre- and post-survey results would help to enhance data analysis. This could be done by assigning each provider who takes the pre-survey a randomized number and the same number would be used when they answer the post-survey. This would allow for clearer data analysis and the ability to determine if each individual provider had increased perceived knowledge.

The Adult Learning Theory (ALT) has significant implications for future projects by using online learning environments which can be tailored to the learning of healthcare providers.

Recognizing that adults are self-directed learners, motivated by relevance, and oriented towards problem-solving, online platforms can be designed to meet these specific needs (Mukhalalati & Taylor, 2019). Incorporating online courses with interactive modules would allow healthcare providers to choose topics relevant to their practice, enabling self-directed learning. In addition, incorporating features such as peer discussions would promote a sense of community and shared learning experiences between healthcare providers. Ensuring flexibility in accessing resources is crucial in future projects in order to obtain the most participation and can be done by allowing providers the ability to download materials for future use in practice. Overall, aligning online learning experiences with the principals of the ALT, ensures that healthcare providers receive relevant, engaging, and practical education that enhances their professional skills and knowledge.

Another recommendation for future projects would be to offer this project at a rural healthcare clinic or at multiple clinics if able. This would allow for more provider participation and a larger sample pool. Changing the project site may also benefit the co-investigator by allowing an in-person session to be held. An online recruitment and module were chosen for this site with the help of the project champion and project chair. Research suggests that providers have a strong preference towards online and on-demand options for learning such as videos, podcasts, and written materials (Kalnow et al., 2021). An in-person session at the current site was discussed with the project champion at the implementation site for this project, however, was decided against as providers in this clinic typically have full daily schedules and often have meetings over their lunch hour. The project champion also stated that providers typically will go home after work and would more than likely not be willing to stay after hours for an un-paid educational session. An additional recommendation to increase participation is to have the educational module approved for continuing education credits. Robinson et al. (2020), found an

overall increase in participation when offering CE credits. Even with the chance to win a \$50 gift card, provider participation was still limited. Offering CE credits serves as a significant incentive for healthcare providers to participate in educational activities and may increase participation.

Being this clinic does not currently offer GPC services, the last recommendation includes a future project that would assess the possibility of a pilot project regarding policy and practice change within this implementation site. This project could acquire knowledge from providers and executive members of this facility to assess if practice change to implement GPC services into this clinic would be possible. Having provider buy-in and organizational support may increase the possibility of implementing GPC into this practice (Cunningham et al., 2019).

Dissemination

The concluding phase of the Iowa Model of Evidence-Based Practice is to disseminate the practice improvement project results (Melnyk & Fineout-Overholt, 2019). This involved spreading the findings throughout the healthcare system and promoting the adoption of evidence-based research and recommendations. Initially, the findings of the project were disseminated at the North Dakota Nurse Practitioner Association Fifteenth Annual Pharmacology Conference via a poster presentation in September 2023. Project results were also disseminated to providers who participated in the PIP and chose to attend the Q&A session at the conclusion of the project. Although the EBP council at the implementation site approached the co-investigator regarding further dissemination, a subsequent communication from the co-investigator to the committee remained unanswered. Moving forward, the outcomes of the project will be showcased through a concise three-minute thesis video. Additionally, a comprehensive poster detailing the project findings will be presented at the Annual Research Day at North Dakota State University in the spring of 2024.

Strengths and Limitations

After implementation and evaluation of this PIP, strengths and limitations were noted. Limitations that were identified within this project include a small sample size, the lack of provider participation, lack of in-person contact, length of the provider education module, and Qualtrics survey error. In addition, there was a response rate difference between the pre- and post-surveys, making analysis of the results challenging. Furthermore, the co-investigator chose the setting and was familiar with one of the participating healthcare providers, which served as both a strength and limitation for this project.

The first limitations in the PIP included a small sample size of healthcare providers in which the project was distributed to via a facility-based email address and the lack of provider participation. This affected the generalizability of the results. This target population was fourteen healthcare providers; however, not all providers participated in the project. All fourteen healthcare providers were sent the same recruitment email via their facility-based email addresses on three different occasions. Therefore, providers who may have missed the first recruitment email had multiple chances to read the email over the course of one month, attempting to ensure provider participation. Even though providers were recruited with multiple attempts, there was still a lack of provider participation. The response rate to the pre-survey was 29%, as four providers responded to the pre-survey. Two providers responded to the post-survey with a response rate of 14%. Due to the different number of response rates, comparison of the pre- and post-survey data was challenging. The percentages of increase shown in knowledge and self-confidence questions may not accurately reflect the changes due to the differing number of responses.

Another limitation was the lack of in-person contact with the healthcare providers. This PIP was done fully online with no provider contact. The initial intention of the co-investigator facilitating an in-person meeting was discussed with the project chair and project champion, and it was decided that there may be a lack of provider participation in an in-person setting due to workday structure; therefore, online pre- and post-surveys and a recorded educational module were decided upon and created. The lack of in-person contact, and the use of technology alone could have impacted the response rates on the pre- and post-surveys.

An additional factor contributing to the differing response rates could have been that the pre-survey was sent out in an emailed link to providers, which was easily accessible by clicking the link at the top of the recruitment email highlighted in red font. The post-survey link was accessible through the completion of the provider education module or through a link listed at the bottom of the recruitment email, also in red font. If providers were required to attend the educational session in person, there may have been a better overall survey response rate and a more equal response rate on both the pre- and post-surveys. Participation may have also increased through the co-investigator offering continuing education credits to the healthcare providers who participated as an added incentive to participate and complete both the pre- and post-surveys.

The length of the provider education module may have impacted the differing response rates. The module was created to be less than 30 minutes in an attempt to hold providers' attention, while also providing them with the education needed. Access to the post-survey was listed on the last slide of the educational module prior to the reference slides. The length of the module may not have interested providers; therefore, they were unable to make it to the slide where the post-survey was linked.

The last limitation identified was regarding a Qualtrics survey error on behalf of the co-investigator. Although this survey was tested by the project chair prior to completion, question 15 still had an error when it was sent out to the healthcare providers. Question 15 was supposed to allow providers to select their top three answers; however, it only allowed providers to provide a single response. This error led to one provider only selecting one barrier to implementation and the other provider selecting the “other, please explain” option and typing out their top three limitations. This possibly led to skewed data collection, although objective four was still met using this survey question.

No project is without limitations, however there were some key strengths of this project that should be recognized. First, adding qualitative data to the quantitative data allowed for further assessment of the qualitative data, preventing potential misinterpretations that may have taken place. Most specifically for question number 15 on the post-survey, which didn’t allow providers to select multiple answers due to an error on behalf of the co-investigator. Providers were able to provide their thoughts for question 14 as well, allowing the co-investigator to assess provider intent to implement GPC into their current practice further. This was useful in evaluating if objective three was met, due to question 13 being a in essence a two-part question. The inclusion of qualitative elements allowed for a holistic assessment of provider responses and overall helped to meet objectives three and four.

Application to Practice

Nurse practitioners are responsible for providing prenatal care to women, especially in rural and underserved areas. Through the utilization of evidence-based practice and guidelines, advanced practice nurses allow themselves to maximize their knowledge regarding important patient care topics, such as recognizing and decreasing barriers to care. Through this project’s

focus of educating obstetrics healthcare providers, a profound, multifaceted impact on advanced nursing practice can be seen, influencing various aspects of care delivery. Using pre- and post-survey data analysis, it was clear that by providing education to healthcare providers in this OBGYN clinic, there was an increased understanding of ways to reduce barriers to prenatal care, increased comfortability with GPC, and expressed intentions to apply the acquired knowledge to change their current practice. This project underscored the nurse practitioner's vital role in not just clinical care, but also in educating peers, emphasizing education's potent capacity to drive transformative change in healthcare settings.

The percentage of women who received no prenatal care or inadequate prenatal care from 2019 to 2020 was unchanged, and the percentage of women with adequate care declined by 9% (Martin & Osterman, 2023). This underscores the importance of improving access to prenatal care for all women and ensuring healthcare providers understand ways to mitigate barriers to care through the implementation of GPC. Group prenatal care offers a transformative approach that can significantly benefit the practice of a NP by promoting holistic and patient-centered care. In the context of GPC, a nurse practitioner can create a supportive environment where expectant mothers can share experiences, concerns, and insights. Though the facilitation of group discussions, the NP fosters peer support, enabling women to build connections, share resources, and navigate their pregnancy journey collaboratively. This collaborative setting can empower women, enhance their knowledge about prenatal care, and address common concerns, thereby promoting positive maternal and fetal outcomes.

NPs are an essential voice in the world of health policy and can use their clinical expertise and background to create change in their practice setting (Chilton, 2015). One provider who participated in this PIP expressed interest in wanting to implement GPC if there was more

support from enterprise, providers, and administration at the implementation site. Lack of organizational support is one barrier to GPC (Cunningham et al., 2019). Having even one provider's buy-in for implementing GPC at the implementation site may be enough to get the ball rolling in trying to implement practice and policy change. Clinics that have successfully implemented GPC have been found to have a champion advocate for CP® and staff who saw the demands of implementation as manageable hurdles (Novick et al., 2015). This provider could act as the advocate for practice and policy change in this facility and increase the likelihood of GPC services being offered. Offering GPC at the implementation site would allow for improved neonatal and maternal outcomes for the patients served in this area of North Dakota.

Conclusion

The aim of this practice improvement project was to deploy an evidence-based educational module, focusing on enlightening obstetrics providers about potential barriers to prenatal care and strategies to address them, notably through the CenteringPregnancy® model. The project gauged providers' intentions to incorporate GPC into their existing practices. By delivering the educational module and employing both pre- and post- surveys, the initiative discerned a notable uptick in providers' perceived knowledge aligned with the project's objectives. Furthermore, there was a clear tendency among providers to modify their clinical practices to include GPC services with enterprise support. Consequently, this initiative positions participating healthcare providers to efficiently identify prenatal care obstacles and utilize evidence-based approaches like CP® to navigate and alleviate these challenges. By endorsing evidence-based interventions to enhance prenatal care accessibility, patients stand to benefit from heightened prenatal care engagement and subsequent improvements in maternal and neonatal health outcomes.

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APPENDIX A: PROVIDER RECRUITMENT EMAIL

NDSU North Dakota State University
1401 Albrecht BLVD, 136 Sudro Hall
Fargo, ND 58102
NDSU Dept. 2670 PO Box 6050
Fargo, ND 58108-6050
701-231-7395

Title of Research Study: Improving Care of Pregnant Women Through the Utilization of Group Prenatal Care

To Whom This May Concern:

My name is Morgan Kautzmann and I am a Doctor of Nursing Practice student in the School of Nursing at North Dakota State University. I am conducting research regarding improving barriers to prenatal care through the utilization of group prenatal care (GPC). The goal of this project is to determine current and changed levels of perceived knowledge regarding barriers to prenatal care and the benefits of GPC services following obstetrics provider education. It is my hope that with this research, there will be an increased level of perceived knowledge of barriers to prenatal care and perceived knowledge of GPC models of care such as CenteringPregnancy®. I also hope to spark an interest in offering GPC services to patients in this clinic.

Because you are a provider at [REDACTED] clinic, you are being invited to participate in this research project. Your participation is completely voluntary, and you may change your mind or quit participating at any time, with no penalty to you.

It is not possible to identify all possible risks in research procedures, but we have considered reasonable safeguards to minimize any known risks. These known risks may include loss of time or productivity.

By taking part in this research, you may benefit by increasing your perceived level of confidence and perceived knowledge in identifying barriers to prenatal care, as well as improving perceived knowledge regarding ways to decrease barriers to care through the utilization of GPC models such as CenteringPregnancy®.

However, you may not benefit from this study.

The pre- and post-surveys will take about 10 minutes to complete. There is one 25-minute educational PowerPoint presentation that has been recorded for your viewing following completion of the pre-education survey. The post-survey link is included at the end of the presentation. After completion of the PowerPoint presentation, please complete the post-survey. You will also be eligible to win a \$50 gift card by attending a Q&A session following completion of this project.

All research records will be kept private. Your information will be combined with information

from other people taking part in the study, and results will be written about the combined information that has been gathered. You will not be identified in these written materials. Results of this study may be published; however, identifying information will remain private.

If you have questions about this project, please contact me at [REDACTED] or morgan.kautzmann@ndsu.edu, or contact my advisor at allison.peltier@ndsu.edu.

You have rights as a research participant. If you have questions about your rights or complaints about this research, you may talk to the researcher or contact the NDSU Human Research Protection Program at 701-231-8995, toll-free at 1-855-800-6717, by email at ndsu.ird@ndsu.edu, or by mail at: NDSU HRPP Office, NDSU Dept. 4000, P.O. Box 6050, Fargo, ND 58108-6050.

Thank you for taking part in this research. If you wish to receive a copy of these results, please send me an email in order to receive a finalized copy of this dissertation.

APPENDIX B: PERMISSION TO USE IOWA MODEL



○ Kimberly Jordan - University of Iowa Hospitals and Clinics <survey-bounc...

Today at 12:10 PM

To: ✕ Kautzmann, Morgan

You have permission, as requested today, to review and/or reproduce *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care*. Click the link below to open.

[Iowa Model - 2015.pdf](#)

Copyright is retained by University of Iowa Hospitals and Clinics. **Permission is not granted for placing on the internet.**

Reference: Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing*, 14(3), 175-182. doi:10.1111/wvn.12223

In written material, please add the following statement:

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Please contact UIHCNursingResearchandEBP@uiowa.edu or 319-384-9098 with questions.

APPENDIX C: FACILITY IRB APPROVAL



Notification of Not Human Research Determination

To: Emily Smith

Link: [STUDY00003285](#)

P.I.: [Emily Smith](#)

Title: Group Prenatal Care

Description: The committee reviewed this submission and assigned a determination of Not Human Research. For additional details, click on the link above to access the project workspace.

APPENDIX D: ALLISON MILLS PRE- AND POST-EDUCATION SURVEY

1. The American College of Obstetrics and Gynecology (ACOG) supports group prenatal care as an acceptable and beneficial alternative to traditional prenatal care. True or False?
 - a. True
 - b. False
2. Literature has shown that group prenatal care has many benefits for patients. Which of the following outcomes have been proven to be a result of group prenatal care? (Select all that apply.)
 - a. Increased breastfeeding rates
 - b. Decreased preterm birth rates
 - c. Decreased postpartum hemorrhage rates
 - d. Increased infant birth weight
 - e. Increased patient satisfaction
3. How long do CenteringPregnancy sessions typically last?
 - a. 30 minutes to 1 hour
 - b. 45 minutes to 1 hours
 - c. 90 minutes to 2 hours
 - d. 2+ hours
4. How many CenteringPregnancy sessions are recommended throughout the course of a pregnancy?
 - a. 5
 - b. 7
 - c. 10
 - d. 12
5. Group prenatal care has been shown to increase patient compliance. True or False?
 - a. True
 - b. False
6. Group prenatal care has been noted to (select all that apply):
 - a. Improve clinical outcomes
 - b. Increase patient satisfaction with care
 - c. Increase patient self-efficacy
 - d. Increase patient health literacy
7. While group prenatal care has many benefits for patients, cost analyses have shown that it is not a cost-effective option. True or False?
 - a. True
 - b. False
8. At this time, I feel confident in my current level or knowledge regarding the process of group prenatal care as well as its benefits.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly Agree

9. Based on my current level of knowledge and familiarity regarding this topic, I am interested in group prenatal care being offered as a service within this practice.
- Strongly Disagree
 - Disagree
 - Neither agree nor disagree
 - Agree
 - Strongly Agree
10. Please share your rationale for your answer to question 9:

Demographics

- What is your title?
 - MD
 - NP
 - CNM
 - RN
 - LPN
 - Other
- How many years have you been employed at [REDACTED]?
 - Less than 1 year
 - 1 to 5 years
 - 5 to 10 years
 - 10 to 15 years
 - 15+ years
- How long have you been a healthcare provider (MD, NP, RN, etc.)?
 - Less than 1 year
 - 1 to 5 years
 - 5 to 10 years
 - 10 to 15 years
 - 15+ years
- What is your gender?
 - Male
 - Female

APPENDIX E: PROVIDER PRE-SURVEY

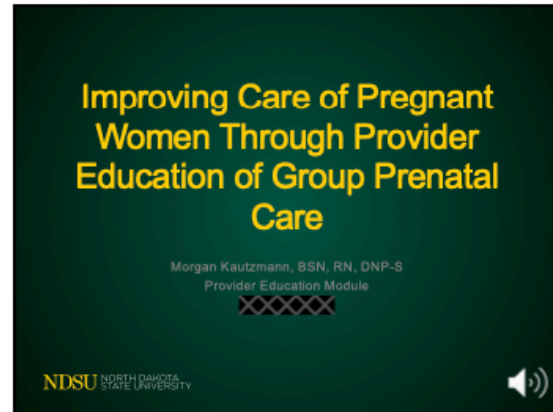
1. What is your title?
 - a. MD
 - b. NP
 - c. Other, specify.
2. What is your gender?
 - a. Male
 - b. Female
 - c. Non-binary/third gender
 - d. Prefer not to say
3. How many years have you been employed at [REDACTED]?
 - a. Less than 1 year
 - b. 1 to 5 years
 - c. 5 to 10 years
 - d. 10 to 15 years
 - e. 15+ years
4. How long have you been a healthcare provider?
 - a. Less than 1 year
 - b. 1 to 5 years
 - c. 5 to 10 years
 - d. 10 to 15 years
 - e. 15+ years
5. The following are barriers to prenatal care that have been reported in literature. **Select all that apply:**
 - a. Long appointment wait times
 - b. Lack of money to pay for services
 - c. Lack of transportation
 - d. Limited access to healthcare
 - e. Scheduling conflicts
 - f. Insurance problems
 - g. Lack of childcare
 - h. Lack of support from family or partner
 - i. Lack of provider support
6. American Indian/Alaskan Native women face barriers to care such as lack of access to care, dissimilar communication styles, and inconsistent continuity of care.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree

7. Based on my current level of knowledge, I have a good understanding of ways to reduce barriers to prenatal care.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree
8. I have a good understanding of the benefits of group prenatal care in clinical practice.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree
9. Group prenatal care has been noted to **(select all that apply)**:
 - a. Improve clinical outcomes
 - b. Increase patient satisfaction with care
 - c. Increase patient self-efficacy
 - d. Increase patient health literacy
10. While group prenatal care has many benefits for patients, cost analyses have shown that it is not a cost-effective option. True or False?
 - a. True
 - b. False
11. I have a good understanding of CenteringPregnancy® and its impact on neonatal and maternal outcomes.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree
12. Based on your current knowledge, how comfortable are you with group prenatal care?
 - a. Very Uncomfortable
 - b. Uncomfortable
 - c. Neither uncomfortable nor comfortable
 - d. Comfortable
 - e. Very Comfortable
13. Based on my current level of knowledge and familiarity regarding group prenatal care (GPC) and CenteringPregnancy®, I intend to implement GPC services into my practice.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree
14. Please use this OneDrive link to view the 25-minute educational PowerPoint presentation:

APPENDIX F: PROVIDER EDUCATION MODULE



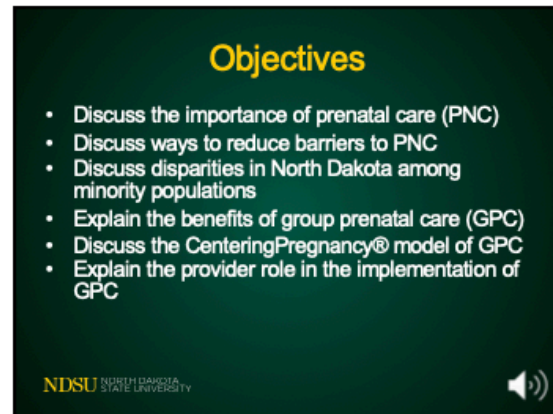
1



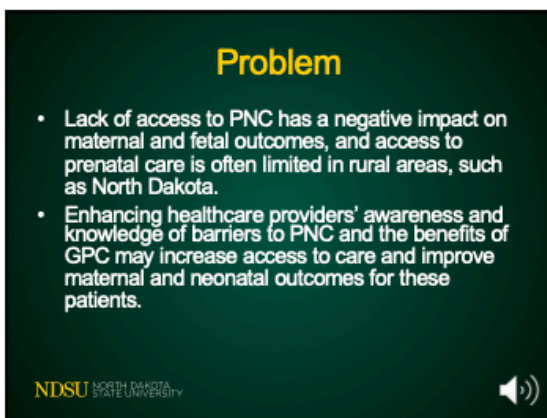
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3



4



5



6

Prenatal Care Importance

- Offers cost-effective interventions that improve maternal and neonatal outcomes
- Reduces complications during pregnancy, childbirth, and postpartum

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7

Impact of Lack of Prenatal Care

- Link between lack of PNC and adverse neonatal outcomes
- Decreased PNC has been linked to poor outcomes
 - Low birth weight, preterm birth, infant mortality
- Small for gestational age infant
 - Neurodevelopmental delays
 - Obesity
 - Chronic diseases
 - Diabetes and hypertension

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8

Barriers to Prenatal Care

- Long appointment wait times
- Lack of money to pay for services
- Lack of transportation
- Limited access to healthcare
- Scheduling conflicts
- Insurance problems or lack of healthcare coverage
- Lack of childcare
- Lack of support from family or partner
- Lack of provider support
- Mental health status
- Cultural beliefs
- Health literacy
- Low socioeconomic status
- Other personal and socioeconomic problems

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9

North Dakota Demographics

- Population of ND is 779,261
- 83.2% White
- 5.7% American Indian/Alaska Native (AI/AN)
- 4.4% Hispanic or Latino
- 3.5% Black or African American
- 2.4% Two or more races
- 1.7% Asian
- 0.1% Native Hawaiian or Pacific Islander

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10

Disparities in North Dakota

- Overall infant mortality rate in ND is 5.4 infants per 1,000 births
- Infant mortality rates are twice as high for the American Indian/Alaska Native (AI/AN) population
- The preterm birth rate in ND is 9.6% as compared to the national average of 10.38%



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11

AI/AN Demographics in North Dakota

- North Dakota is home to five federally recognized tribes and one Indian community
 - These include the Mandan, Hidatsa, & Arikara Nation (Three Affiliated Tribes), the Spirit Lake Nations, the Standing Rock Sioux Tribe, the Turtle Mountain Band of Chippewa Indians, the Sisseton-Wahpeton Oyate Nation, and the Trenton Indian Service Area (ND Indian Affairs, n.d.).
- There are a total of 31,329 AI/AN people living in ND, making up approximately 5% of the population, of which over 40% are under the age of 20.

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12

AI/AN Disparities

- Lower health status
- Lower life expectancy
- Higher disease burden
- Increased incidence of accidental deaths
- Increased complications related to low birthweight
- Decreased first trimester care
- AI/AN women have been found to be almost three times more likely to receive late or no prenatal care as compared to non-Hispanic Caucasian mothers
- AI/AN women face increased barriers to care

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13

How do we decrease barriers to prenatal care for women of childbearing age?

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14

Group Prenatal Care (GPC)

- Decreases adverse maternal and neonatal outcomes
- Increases access to prenatal care
- Supported by ACOG and the WHO
- Replaces individualized care

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15

Benefits of GPC

- Improved neonatal outcomes
- Improved maternal outcomes
- Enhanced quality of care
- Improved patient satisfaction with care
- Increased patient self-efficacy
- Increased patient health literacy
- Increased access to prenatal care
- Cost effective

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16

Centering Pregnancy® GPC

- Developed in 1993 by Sharon Rising, CNM
- Standardized elements that guide the structure and content of the group session
- Emphasizes health promoting behaviors
- Empowers patients
- Strengthens patient-provider relationships
- Builds communities through the three main concepts of health assessment, interactive learning, and community building

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17

CP® Group Visit Structure

- 10 prenatal visits of groups of 6 to 12 pregnant women of similar gestational ages
- Group activities led by a Certified Centering Facilitator (CCF)
- Assessments performed by an obstetrics healthcare provider in a private setting
- 90-to-120-minute visits every 2-4 weeks starting at the beginning of the second trimester
- Allows more time for caregiver-patient interaction, skill building, and self-management

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18

Centering Pregnancy® Benefits

- Reduced rates of preterm birth
- Reduced rates of low-birth-weight infants
- Increased breastfeeding rates
- Decreased hospital emergency department visits in the third trimester
- Improved patient satisfaction

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Centering Pregnancy® in North Dakota

- CHI St. Alexius Health Dickinson is the only CP® approved site in ND
- The program was named the 2019 Outstanding Rural Health Program by the UND Center for Rural Health
- Started by Dr. Thomas Arnold, OBGYN
- Positive provider and patient feedback

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Implementation of GPC

The infographic titled 'Centering Implementation Plan' outlines a process for transitioning to a Centering Pregnancy (CP) model. It includes sections for 'Centering Implementation Plan', 'Key Elements', 'Implementation Steps', and 'Benefits'. A central graphic shows a pyramid with 'Centering Implementation Plan' at the top, 'Centering Pregnancy' in the middle, and 'Centering Pregnancy' at the base. The text describes the importance of provider support, patient education, and a supportive environment for successful implementation.

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Financial Perspective

- CP® visits are billed as prenatal care visits for each participant
- GPC is sustainable and cost-effective
- CP® has been credited with substantial healthcare savings

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Providers Role in GPC

- Providers role in GPC
 - Provider support is essential
 - Providers report higher satisfaction and understanding
 - More personalized care
 - Peer support component
 - Reduced repetition

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Conclusion

- Prenatal care is essential in the care of a pregnant women
 - Improves outcomes for both mother and baby
- GPC can improve outcomes for many populations of women
- Healthcare providers must be willing to transform their practice in order to improve outcomes

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APPENDIX G: PROVIDER POST-SURVEY

1. What is your title?
 - a. MD
 - b. NP
 - c. Other, specify.
2. What is your gender?
 - a. Male
 - b. Female
 - c. Non-binary/third gender
 - d. Prefer not to say
3. How many years have you been employed at [REDACTED]?
 - a. Less than 1 year
 - b. 1 to 5 years
 - c. 5 to 10 years
 - d. 10 to 15 years
 - e. 15+ years
4. How long have you been a healthcare provider?
 - a. Less than 1 year
 - b. 1 to 5 years
 - c. 5 to 10 years
 - d. 10 to 15 years
 - e. 15+ years
5. The following are barriers to prenatal care that have been reported in literature. **Select all that apply:**
 - a. Long appointment wait times
 - b. Lack of money to pay for services
 - c. Lack of transportation
 - d. Limited access to healthcare
 - e. Scheduling conflicts
 - f. Insurance problems
 - g. Lack of childcare
 - h. Lack of support from family or partner
 - i. Lack of provider support
6. American Indian/Alaskan Native women face barriers to care such as lack of access to care, dissimilar communication styles, and inconsistent continuity of care.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree

7. After review of the educational module, I have a good understanding of ways to reduce barriers to prenatal care.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree
8. After review of the educational module, I have a good understanding of the benefits of group prenatal care in clinical practice.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree
9. Group prenatal care has been noted to **(select all that apply)**:
 - a. Improve clinical outcomes
 - b. Increase patient satisfaction with care
 - c. Increase patient self-efficacy
 - d. Increase patient health literacy
10. While group prenatal care has many benefits for patients, cost analyses have shown that it is not a cost-effective option. True or False?
 - a. True
 - b. False
11. After review of the educational module, I have a good understanding of CenteringPregnancy® and its impact on neonatal and maternal outcomes.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree
12. Based on your current knowledge, how comfortable are you with group prenatal care?
 - a. Very Uncomfortable
 - b. Uncomfortable
 - c. Neither uncomfortable nor comfortable
 - d. Comfortable
 - e. Very Comfortable
13. After reviewing the group prenatal care (GPC) educational module, I have a good understanding of GPC and intend to utilize information learned to change my practice.
 - a. Strongly Disagree
 - b. Disagree
 - c. Neither Agree nor Disagree
 - d. Agree
 - e. Strongly Agree
14. Please share your rationale for your answer to question #13.

15. What barriers may make the implementation of group prenatal care difficult in your practice? **(Please select the top three)**

- a. Difficulty with space
- b. Scheduling
- c. Recruitment
- d. Staffing
- e. Financial challenges
- f. High patient volume
- g. Low group attendance
- h. Lack of provider support
- i. Lack of facility support
- j. Other; please explain.

APPENDIX H: NDSU IRB APPROVAL



06/12/2023

Dr. Allison Evelyn Peltier
Nursing, Sanford Bismarck

Re: IRB Determination of Exempt Human Subjects Research:
Protocol #IRB0004801, "IMPROVING CARE OF UNDERSERVED PREGNANT WOMEN THROUGH THE UTILIZATION OF GROUP PRENATAL CARE"

NDSU Co-investigator(s) and research team:

- Allison Evelyn Peltier
- Morgan Leigh Kautzmann

Approval Date: 06/12/2023

Expiration Date: 06/11/2026

Study site(s): The research project will be conducted at the [REDACTED]

Funding Source:

The above referenced human subjects research project has been determined exempt (category 1,2) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*).

Please also note the following:

- The study must be conducted as described in the approved protocol.
- Changes to this protocol must be approved prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
- Promptly report adverse events, unanticipated problems involving risks to subjects or others, or protocol deviations related to this project.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.

NDSU has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

RESEARCH INTEGRITY AND COMPLIANCE

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NDSU is an EO/AA university.

APPENDIX I: EXECUTIVE SUMMARY

Improving Prenatal Care Through Provider Education of Group Prenatal Care

Project Summary

Prenatal care has been associated with improved pregnancy outcomes for both a mother and her unborn child. However, there are still many disparities that exist in healthcare today, resulting in inadequate access to prenatal care for many groups of women. Lack of access to prenatal care has a negative impact on maternal and fetal outcomes, and access to prenatal care is often limited in rural areas, such as North Dakota. Enhancing healthcare providers' awareness and knowledge of barriers to prenatal care and the benefits of group prenatal care (GPC) may increase access to care and improve maternal and neonatal outcomes for these patients. This project focused on increasing local healthcare providers' knowledge of barriers to care experienced by women of childbearing age and the benefits of GPC.

Background

Women face many barriers to prenatal care that can lead to poor maternal and neonatal outcomes such as lack of transportation, scheduling difficulties, inability to pay for services, and other social factors (Abshire et al. 2019; Akamune, 2018; Crocket et al., 2019). Since the early 1900's, the focus has been on individualized care models, but the benefits of GPC have recently become a pertinent topic of discussion. Both the American College of Obstetrics and Gynecology (ACOG) and the World Health Organization (WHO) have discussed the potential benefits of GPC including improvements in the quality of care, as well as enhanced maternal and neonatal outcomes among diverse populations of women.

Process

To better improve the prenatal care of women in a central North Dakota OBGYN clinic, obstetrics providers were invited to watch a 25-minute evidence-based PowerPoint presentation regarding topics such as barriers to prenatal care, benefits of GPC, and CP®. Prior to the start of the presentation, providers completed a pre-survey to assess their knowledge of barriers to care, understanding of ways to reduce barriers, and the benefits of GPC in clinical practice. Pre-survey questions also assessed providers' understanding of CP® and intent to implement GPC services into their practice with their baseline knowledge. Similar questions were asked on the post-education survey and data from both surveys was analyzed after the implementation period ended.

Findings and Conclusions

Although only 4 providers responded to the pre-survey and 2 responded to the post-survey, results of the project indicated an overall increase in providers' perceived knowledge regarding barriers to prenatal care, ways to reduce barriers to prenatal care, and benefits of GPC and CP®. In addition, provider intent to implement GPC services increased following review of the educational module. The top barriers to implementation of GPC were identified as lack facility support, staffing, space, and scheduling. The educational module was beneficial in promoting the use of evidence-based research to increase providers' knowledge of ways to reduce barriers to care through the utilization of GPC.

Recommendations for Further Action

- Attempt to gain facility support regarding the implementation of GPC at implementation site
- Identify providers who are in support of GPC implementation at this facility
- Discuss steps to GPC implementation with supportive providers and administration