

GEORGE WASHINGTON UNIVERSITY

Pregnancy Outcomes for Hispanic Women in Washington, DC

A comparison of the Centering Pregnancy Curriculum and Prenatal Education

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Abstract

Objective To evaluate and compare two prenatal programs serving Hispanic women in Washington, DC. The two programs are a prenatal education program provided by a federally qualified health center (FQHC) Mary's Center for Maternal and Child Care, Inc. (MC), and a group prenatal care program based on the Centering Pregnancy (Providence Hospital, 2011) curriculum provided by the Providence Hospital Center for Life (PH).

Methods Data collected from program administrative records from 2009 prenatal program participants (MC: N = 25; PH: N = 186). Interviews with contributing staff members and former program participants at MC and direct observation of MC program.

Outcome measures included Programs were evaluated based on both birth outcomes and program satisfaction outcomes. Birth outcomes included: birth weight, occurrence of low birth weight (LBW), occurrence of cesarean delivery. Satisfaction outcomes included: attendance rates, participant opinions, staff opinions.

Results MC participants had lower recorded birth weights with 25% qualifying as LBW, as compared to 7% from the PH program. Independent sample t-test and Chi-squared tests were used to confirm the difference in birth weight was statistically significant. PH and MC program participants expressed satisfaction at high rates. Staff from MC identified opportunities for program improvement. Participant satisfaction as indicated by attendance was lower at MC (highly variable attendance) than at PH (94%) attendance. The MC program and PH program differ as MC offers education while PH offers both education and medical care. Both programs are conducted in a group setting in contrast to the traditional approach to individual based prenatal care. The education elements of both programs go beyond traditional childbirth education classes to include newborn care skills, breastfeeding and nutrition.

Conclusions Initial evidence indicates birth outcomes among participants in the Centering Pregnancy program at PH are more favorable than those among participants in the MC program. Birth outcomes from both programs are similar to national averages. The observations indicate advantages to combining prenatal care with prenatal education as is achieved in the Centering Pregnancy curriculum. However, data limitations and lack of experimental design to conclusively report one program as more effective than the other.

Definitions

Several terms specific to maternal and child health are repeated throughout this paper. The short list below provides relevant definitions to ensure clarity of the content presented.

Prenatal Care –Prenatal care incorporates medical care, education and counseling from a clinical obstetric provider. Prenatal care covers various features of pregnancy, such as fitness, nutrition, labor and delivery, and infant care.

Group Prenatal Care- Prenatal care in the group setting includes check-ups, vital measurements, and psychosocial assessments followed by a support group meeting with a group of other women and their partners (when available) who are at similar gestational ages. Group is facilitated by clinical provider with obstetric expertise. Entry to care initiates in first trimester or early on in the second trimester.

Group Prenatal Education- Incorporates healthy lifestyle recommendations with information relevant to the lead up to labor and delivery experiences. These courses typically serve women and partners in the last trimester of the pregnancy. Unlike prenatal care and group prenatal care, prenatal education does not include a medical care component and no medical professional is present.

Low Birth Weight- infant born under 2500 grams (5 pounds, 8 ounces).

Background

Providence Hospital in the Northeast quadrant of Washington, DC has offered the nationally recognized Centering Pregnancy (Centering Healthcare Institute, 2009) prenatal education, health and support curriculum for over three years. This particular site serves both Spanish speaking and English speaking populations, requiring the adaptation of culturally sound health promotion efforts. The Centering Pregnancy model combines health assessment, support and education to create a comprehensive group care setting for expecting families. Each pregnancy cohort assembles for a total of ten sessions throughout pregnancy and early postpartum. During the sessions, the provider conducts standard physical health check-ups in the group environment. Each woman receives a three to five minute individual physical assessment on a mat in the group space from the designated provider. Following these check-ups, the women convene as a group and typically have a facilitated discussion focused on topics of pregnancy, childbirth, and parenting. The group setting offers the chance for these women to express the challenges they have confronted, ask questions about pregnancy as well as labor and delivery, and exchange information.

The Mary's Center for Maternal and Child Care, Inc. site included in the study is a Federally Qualified Health Center (FQHC) serving a high volume Latino immigrant community, and particularly pregnant women throughout the duration of their pregnancy with wide-ranging services including regular checkups, assessments and screenings to examine the fetal growth and development and the mother's progress and general health. Among the variety of innovative service approaches offered at Mary's Center, for two years the group prenatal series has integrated family and peer supports demonstrating encouraging results, particularly in minority, teenage, and other high-risk mothers (Mary's Center for Maternal and Child Health, Inc, 2010). During these sessions, expectant mothers are guided through the stages of pregnancy and are supplied with information regarding nutrition, exercise, lactation, labor and delivery as well as other relevant psychosocial

topics. When available, partners are encouraged to attend group meetings together and to engage in their care as much as possible. This study aims to gather what the benefits of attending a group model are for to Hispanic women in Washington, DC from these two sites. The aim of Mary's Center's prenatal class is to provide a environment where women can come to learn about themes pertinent to perinatal health. Some class participants may be toward the end of their pregnancy while others are in the first or second trimesters. Staff contributes to the curriculum by donating time and expertise due to the lack of financial resources available to fund this series.

Literature Review

Racial inequality in perinatal outcomes within the United States has been recorded since the early 1920s (National Center for Health Statistics., 1966). Although numerous enhancements have improved perinatal care among all races, outcomes are still disparate between Caucasian and non-Caucasian populations. Commonly cited justifications are racial discrepancies in socioeconomic status (SES), incidence of particular risk factors, and admission to prenatal care (Vital and Health Statistics, 1995).

In Washington, DC, the highest Infant Mortality Rate (IMR) is within the population of non-Hispanic blacks in both D.C. and the U.S. The IMR for the United States was 6.86 infant deaths per 1,000 live births. In Washington, D.C., the IMR was nearly twice the national rate, at 11.42 infant deaths per 1,000 live births (Mathews & MacDorman, 2007). On a national scale, Hispanic women have a lower IMR than non-Hispanic Caucasian women, but in Washington, D.C., the rate of infant death in the Hispanic population is approximately twice that among non-Hispanic white women. Infant mortality was also higher for single women, women giving birth to multiple infants, male infants (7.4 per 1,000 among male babies versus 6.1 among female babies), and mothers who were born in the US (Mathews & MacDorman, 2007).

PNC was developed as healthcare model in the United States in the early 1900s. Researchers recognize the institutionalization of regular medical visits for pregnant women as one of the most critical progressions in obstetric care over the past 100 plus years. The effect of this development has been to lower fetal mortality significantly (Ryan, Sweeny, & Solola, 1980) (Foster, Guzick, & Pulliam, 1992) (Vintzileos, Ananth, Smulian, & Scorza, 2003) (Keeping, Chang, Morrison, & Esler, 1980).

Women in different demographic, economic, and racial groups' access and utilize PNC at different rates (Ryan, Sweeny, & Solola, 1980). The Federal Government has attempted to respond to the disparities in prenatal care consumption. Healthy People 2010 are a federal initiative introduced with the objective of bridging racial disparities in health. Included among its goals is to make early (first-trimester) entrance to PNC accessible to 90 percent of all pregnant women. What is the potential for early admission to PNC to curb racial inequalities in perinatal morbidities in our contemporary obstetric practices? The standard influential elements measuring adequacy of medical attention are comprised of the point of initiation, the sum of prenatal visits, and the gestational age of delivery (Alexander & Kotelchuck, Quantifying the Adequacy of Prenatal Care: A Comparison of Indices, 1996).

Benefits of early entry to prenatal care

The benefits of early entry to PNC include better educational opportunities about pregnancy and infant health as well as easing the transition to newborn and infant medical care. PNC can improve a woman's health during pregnancy, provide prevention or preparation for concerns such as pregnancy-induced hypertension, Eclampsia, maternal morbidity, placenta interruption, anemia, and maternal hospitalization. If care starts early, these challenges can be readily dealt with and possibly averted (Conway & Kutinova, 2006) (Jaime-Perez & Gomez-Almaguer, 2002). Women can

benefit from PNC because they incorporated into medical coordination efforts such as cancer screenings, and can receive appropriate referrals once they are recognized as members of at-risk populations. HIV-positive women are a critical at-risk population, and can especially benefit from early entrance to PNC (Wilson, Ickovics, & Royce, 2004) (Clark, Samsom, & Simpson, 2006). Testing for maternal health difficulties including substance use, mental health needs, as well as the presence of domestic violence is further indispensable and embedded within the realm of PNC. These issues are known to impact maternal health and influence fetal development and infant health. Timely screening is additionally essential to identify anomalies and abnormalities in the infant's genetic composition or development (Morris, Egan, & Fang, 2007).

The American Academy of Pediatrics advises women to obtain PNC in their first trimester of pregnancy (American Academy of Pediatrics, 1997). The attempts of the Federal Government to encourage utilization of PCN have been somewhat successful among the general population, however, these efforts have not been as successful among economically disadvantaged ethnic minority female populations. Roughly 77.5 percent of Hispanic women in the United States enter PNC in the first trimester, versus 89 percent of Caucasian, non-Hispanic women (Martin, Hamilton, & Sutton, 2005). This twelve percent discrepancy is clinically and statistically significant while evaluating how to increase entry to care within the population.

Numerous analyses have investigated the impediments to entry into PNC for low income as well as ethnic minority populations. Research has concentrated primarily on risk factors including socioeconomic, admission, demographic, and psychosocial indicators. Such research has frequently shown that uninsured women, multi-parous women, and women with elevated stress levels, or women who did not plan the pregnancy tend to initiate care later into their pregnancies (Alexander, Kogan, & Nabukera, 2002) (Beck, Morrow, & Lipscomb, 2002) (Sarnoff & Adams, 2001) (Daniels,

Noe, & Mayberry, 2006) (Sable & Wilkinson, 1998). A small number of studies have inspected protective factors that forecast advanced PNC entry among women confronting socioeconomic hardship.

PNC has been shown to reduce undesirable pregnancy outcomes such as LBW, but could be further improved. The programs offered for PNC fall short of serving families as well as they could (Strong, 2000). A similar study reported PNC as not preventing poor outcomes such as prematurity and LBW babies (Lu, 2003). In Austria, a qualitative study measured the experiences of fifty women receiving PNC. The study revealed that numerous women in the cohort were unsatisfied with the information shared as well as with the approach and attitudes of the providers (Leithner, Assem-Hilger, Fischer-Kern, Loffler-Stastka, Thein, & Ponocny-Seliger, 2006). They expressed anxiety regarding support for psychosocial needs and the limited communication with providers (Leithner, Assem-Hilger, Fischer-Kern, Loffler-Stastka, Thein, & Ponocny-Seliger, 2006).

Raube et al. found a strong link between contentment with care and concern revealed by clinicians, and the amount of information supplied (Raube, Handler, & Rosenberg, 1998). Furthermore, there is substantial evidence reporting that women want a relationship with their physician, participation of their family members in PNC (Biro, Waldenstrom, Brown, & Pannifex, 2003) and sufficient time with their doctors for their concerns to be acknowledged (Handler, Rosenberg, Raube, & Lyons, 2003) (Hildingsson, Waslenstrom, & Radestad, 2002). Dye and Wojtowycz discovered that women's fulfillment with PNC was clearly associated with quantity of time spent with the provider and length of waiting time (Dye & Wojtowycz, 1999). Lastly, a woman receiving PNC is more likely to feel satisfied when she has had to meet with fewer clinicians throughout the pregnancy (Dye & Wojtowycz, 1999). Many health care facilities provide classes focused on prenatal education because of the positive outcomes, and thus prenatal education has

progressed to be an anticipated service contribution of health promotion modules in many healthcare centers.

A brief history of group medical care

Group medical care visits were initially developed in the mid-1970s as an innovation for pediatric well-child visits and have received recognition more recently in the domain of medical practice management (Jaber, Braksmajer, & Trilling, 2006). Because of their successes, group visits have been given consideration from legislators and the Federal Balanced Budget Act of 1997 increased repayment rates by the Centers for Medicaid and Medicare Services that endorsed diabetes education in group care settings (Mensing, 2003). Presently, insurance companies normally cover for health promotion activities and for chronic illness management group visits.

The medical group-visit model has the potential to address problems at the boundaries of existing health programs linked with maintenance of chronic illnesses such as hypertension, diabetes and cardiovascular disease. Patients battling such ailments are faced with the demands to alter their lifestyles and have been seen to benefit from the environment created within group care. When group-visit participants are seen in this setting, they have the chance to learn from peers confronting the same or similar issues while also learning from their clinicians. The group education model may be especially effectual for young, underserved minority and immigrant mothers who have disproportionately high rates of negative perinatal outcomes (Klerman, 2007).

The Hispanic Community

Hispanic/Latinos represented approximately sixteen percent of the United States population as of 2010 with eight percent being foreign-born; the largest ethnic minority group, there are over 50 million Hispanic persons residing in the U.S. today (US Census Bureau, 2010a). Approximately 21 percent of the Hispanic population is under five years old (US Census Bureau, 2010a) (US Census

Bureau, 2010b). Estimates indicate that by 2050, the Hispanic community will represent more than 25 percent (102.6 million) of the US population (US Census Bureau, 2010a). The Mexican population represents the majority of the Hispanic/Latino population in the U.S. making up 65.5 percent (31 million) of the Hispanic/Latino population and approximately 10 percent of the entire population of the nation. The second largest subgroup of Hispanic/Latinos in the U.S. is Puerto Ricans, who comprise approximately nine percent of the U.S. Hispanic population (4.4 million), followed by Salvadorans (3.6 percent, 1.7 million). All Central and South American groups combined represented 11 percent (5.3 million), and Other Hispanics 3.5 percent (3.1 million) (US Census Bureau, 2010a) (US Census Bureau, 2010b)

Approximately 37.5 percent of the Hispanic population in the US is born outside of the country; this represents roughly 18 million people, or 8 percent of the US population (Terrazas, 2010) (US Census Bureau, 2010b). The Mexican population makes up over a quarter (28 percent) of the total United States foreign-born population (Downs, 2003). El Salvadorans are the sixth largest group of foreign born peoples in the US (Terrazas, 2010). Following twenty years of expansion influenced by war, unfortunate natural disasters, as well as widespread poverty the Salvadoran-born population in the United States has reached about 1.1 million (Terrazas, 2010).

Hispanic/Latino women have a higher fertility rate than all other racial groups in the U.S. Among foreign born Hispanic women, the rate is approximately 86.0 babies per thousand women, but for other foreign-born non-Hispanic women the rate is approximately 60.0(per thousand). For US born Hispanic/Latino women, the fertility rate is 78.3 whereas for US-born non-Hispanic/Latino women it lies at around 58.0 (Downs, 2003). In a sample of Hispanic women, insufficient consumption of PNC was correlated with increased chances of delivering preterm and low birth-weight (LBW) infants (Frsibie, Forbes, & Hummer, 1998). One phenomenon related to perinatal

outcomes and the Hispanic community is labeled the “Hispanic Paradox” which hypothesizes that those women of low socioeconomic status, with low educational attainment and ethnic minorities tend to have LBW babies. Among Latinas, however, this is untrue (Robertson, Aycock, & Darnell, 2008).

For the most part, the research has demonstrated inconsistent support regarding how PNC can actually limit the negative birth outcomes (Fischella, 1995). It must be considered, however, that inaccurate approximations regarding the benefits or impacts can be ascribed to selection bias (Frick & Lantz, 1999); this could point to the inclination for higher risk pregnant women to employ services more frequently than their lower-risk counterparts, therefore skewing the observable efficacy of PNC. Birth weight is a significant indicator of the estimated maturity of a newborn infant and the potential of that newborn infant to live. The birth weight of an infant relies on the length of the pregnancy and speed of fetal development. Infants who are delivered earlier than usual are projected to have lower birth weight than average infants. Furthermore, infants who had slower or more rapid fetal growth may additionally have lower or higher than normal birth weights.

Incidence of LBW across the US has been increasing over the past 20 years and Washington, DC rates have always been among the highest. As of 2006, the national average for LBW is 8.3 percent while DC’s overall rate is 11.6 percent. From 2006-2008, average LBW rate in DC was highest for black infants (14.3%), followed by Asians (8.1%), Hispanics (6.9%) and whites (6.8%) (US Department of Health and Human Resources, Health Resources and Services Administration, Maternal and Child Health Bureau, 2009). LBW infants are 20 times more likely to die during infancy and are at elevated risk for prolonged health and developmental complications. Infant mortality is consequently strongly associated with LBW. The infant mortality rate (IMR) of the District of Colombia is 11.3 percent; almost double the national average of 6.5 percent (State Center

for Health Statistics, 2008). Statistically significant increases transpired among every Hispanic subgroup, besides Puerto Ricans, with the greatest increase of 27 percent occurring within the Cubans population (increase in the preterm birth rate from 10.1 percent in 1994 to 12.8 percent in 2004 (US Census Bureau, 2010a). Specifically, rates of preterm birth in 2004 were higher for Hispanic infants whose mothers were born in the states or D.C. (13.1%) compared to those Hispanic infants born to women born elsewhere (11.3%) (March of Dimes, 2004).

Limited maternal educational attainment is a risk factor for LBW (Braveman, Cubbin, March, Egarter, & Chavez, 2001) and the Hispanic/Latino community has lower average education levels than other ethnic communities (Ramirez & De la Cruz, 2002). Among other risk factors is lower socioeconomic status (SES), high stress levels, and smoking (Lu, 2003).

Although outcomes among Hispanic women tend to be better than their some of their counterparts, the Hispanic/Latino community could still benefit from enhanced educational as well as PNC opportunities during the perinatal period. Among Hispanic people in Washington, DC, 31 percent are uninsured. Approximately two-thirds (67%) of Hispanic women start PNC in the first trimester (US Department of Health and Human Resources, Health Resources and Services Administration, Maternal and Child Health Bureau, 2009), but what about the other third that starts later? Although their outcomes tend to be better than their counterparts, the Hispanic/Latino community could still benefit from enhanced educational as well as PNC opportunities during the perinatal period. Robertson, Aycock and Darnell (2008) conducted a comparative evaluation of Centering Pregnancy with conventional prenatal care among Hispanic/Latino women. They found similar outcomes for both cohorts, and noted a high level of satisfaction among the Centering Pregnancy group participants. They suggested that Centering Pregnancy may have positive results for the Hispanic/Latino community.

Lessening these racial/ethnic disparities in preterm birth is vital to enhancing newborn well-being. In 2004, approximately one in 8 Hispanic births in the U.S. was preterm (110,938 preterm births) (March of Dimes, 2004). No subgroup within the Hispanic/Latino populace has met the Healthy People 2020 goal of 7.8 percent. Over the past ten years, the preterm birth rate within the Hispanic female population has swerved from the Healthy People 2010 goal, going up by nearly 10 percent (March of Dimes, 2004).

Centering Pregnancy as Group Prenatal Care

One example of PNC in a group setting is the curriculum distributed by the Centering Pregnancy and Parenting Association, Inc. The curriculum both medical care and educational materials concerning both prenatal care and health support initiatives, and has been implemented in over 200 locations (Worrell, 2008) including two sites in Washington, DC. This approach emphasizes the normalcy of the prenatal period, highlighting physiologic developments as a common progression and not a malady, highlighting that PNC centers on sustaining wellness and encouraging the utmost positive outcomes for mother and infant. Centering Pregnancy is designed for groups of eight to twelve mothers at roughly matching gestational age (Rising, 1998). Groups are facilitated by a certified nurse-midwife or certified medical professional trained in the group method of instruction. With a number of activities taking place in the group setting, many groups use an extra facilitator to moderate discussions and to assist with referrals, appointments and set-up (Rising, 1998).

The participants in Centering Pregnancy groups take an active position in their own care during each of the ten 90-minute sessions throughout their pregnancies. Women partake in the vital health measurements by checking their own blood pressures, their own urines, and by weighing themselves, verifying their infant's age by employing the gestational wheel, and by taking on the task of entering this information into their own medical records. Women can thus be

encouraged to make inquiries regarding their own care and possible observations (Rising, 1998).

Prenatal Education

Childbirth education historically had the goal of promoting natural childbirth, but has since developed to encompass information including topics such as mental health, daily life and behavioral health, as well as care of the infant postpartum (Enkin, 2000). Over the past eight years, four reports have been recognized for including data regarding utilization (Declercq, Sakala, Corry, Applebaum, & P., 2002); (Lu, 2003); (Slusser, 2002). A 2002 article by Slusser and Lange identified nationally representative sample of women with small children, approximately 70 percent of whom had participated in childbirth classes (Slusser, 2002). This study contained minimal demographic information as well as rate of attendance

The 2002 Listening to Mothers survey (N= 1600) indicated that over two thirds (70 percent) of mothers who had had their first child reported that they had participated in a childbirth education course and approximately 19 percent of mothers who had given birth before had attended such a class (Declercq, Sakala, Corry, Applebaum, & P., 2002). Women who had previously delivered typically reflected on their previous experience as a source of guidance for topics such as enduring labor discomfort, for example. Women who were having their first child typically turned to a combination of resources including their medical providers, classes, as well as the experiences of peers and relatives (Declercq, Sakala, Corry, Applebaum, & P., 2002).

Lu et al. (Lu, 2003) conducted a study reflecting the unequal sociodemographic characteristics within childbirth education workshop that demonstrated approximately two thirds of the participants in the study reported having partaken in a class. The Caucasian women in the study were close to twice as likely as their African American counterparts to have ever been present at a class. Approximately fifty percent or less who identified as Hispanic or as African American, who

were economically disadvantaged, who had never married and had not completed their high school education were notably less expected to have ever attended a class focused on prenatal education (Lu, 2003).

Group care settings are consistently better than for those in conventional one-on-one PNC, according to the research (Worrell, 2008). In a randomized control trial, 1047 women in public clinics were randomized to traditional or group care. There was a 33 percent decrease in preterm delivery for women in prenatal groups (Klerman, 2007). Overall satisfaction of group based care was considerably higher; there were increased breastfeeding rates, and improved comprehension of and preparedness for labor, birth and parenting (Klerman, 2007). Another study showed higher birth weight outcomes for group care participants, particularly for infants born prematurely (Ickovics, et al., 2003). Additionally, group prenatal care presents a structural improvement, allowing increased contact between the provider and patient, presenting the opportunity to attend to medical, psychosocial, and behavioral elements to encourage healthy pregnancy.

At present, prenatal education classes have broadened their scope further than teaching just about labor and delivery (Lamaze International, 2011). The majority of the most recent courses contain critical aims that include encouragement of positive health behaviors as well as stress management, anxiety control, family relationship focus, emphasis on participant strengths, improved confidence and fulfillment, thriving infant nourishment, comfortable transition to postpartum life, and options counseling for contraceptive care (Lamaze International, 2011). PNC offers most if not all of these themes, and they are mentioned with more depth still throughout Centering Pregnancy group prenatal care.

Public Health Significance

There are numerous explanations as to why health care providers maintain a limited role as educators, and why they cannot infer that the questions that pregnant patients have are being answered and resolved during visits alone. Provider-patient time is often limited and concentrates heavily on the physical aspect of the pregnancy. The more complex educational component of prenatal medical care is compromised by the schedules of staff, limited language capability or interpreter services, and restricted time for appointments. These considerations coupled with the anxiety linked with the number of exams required of expecting mothers often provides care that is falling short of her needs, and thus insufficient information exchange transpires during the patient-provider contact opportunity. Although prenatal education has been shown to increase positive outcomes for women, presence in a class of this kind continues to be low. It is therefore necessary to identify barriers to attendance, as well as what the women themselves recognize and perceive as critical to their learning process. Barriers to beginning participation in prenatal health services include pregnancy attitudes, transportation issues, language proficiency, childcare considerations, perceived expense, and geographic region (Beckman, Buford, & Witt, 2000) (Fullerton, Wallace, & Concha-Garcia, 1993) (Conrad, Hollenbach, Fullerton, & Feigelson, 1998). Another study argued that the only important factor is the relevance of the course itself separating those who chose to participate and those who did not (Pyron & Myers, 1996).

Specific Aims

It is critical to learn more about the particular health needs of specific populations to better understand requirements of those who are not tending to participate, and to confirm that these potentially important perinatal interventions are demonstrating cultural competence, and suitability for a variety of races, ethnicities, age ranges and the variety of other requests of each group served. The specific aims of this culminating experience are to evaluate and compare two

prenatal programs serving Hispanic women in Washington, DC. The two programs are a prenatal education program provided by a federally qualified health center (FQHC) called Mary's Center for Maternal and Child Care, Inc., and a group prenatal care program based on the Centering Pregnancy curriculum provided by the Providence Hospital Center for Life. In addition, the present research will include the collection and analysis of qualitative and quantitative data to evaluate perinatal outcomes linked to attendance of these two distinct Hispanic-serving prenatal programs in Washington, DC. The researcher collected data on participation as well as on perinatal outcomes for both mothers who participated and their babies. Through data collection, focus groups, phone interviews and surveys the researcher will work with the Mary's Center staff to evaluate the approach to enhancing the prenatal class setting. Additional aims include the review of literature on similar programs, as well as a discussion of future programmatic recommendations to further enhance the impact of the FQHC prenatal group education curriculum.

Health and Behavioral Objectives

Health Objective: To reduce morbidity and mortality in Latina/Hispanic women of childbearing age in Washington, DC during antenatal and postnatal periods by 10% over a three year period (March of Dimes, 2004).

Behavioral Objective: To increase the seeking out of prenatal education courses among Latina/Hispanic women in Washington, DC by 50% over a two year period (US Department of Health and Human Services (USDHHS), 2010).

The objective of this research study is to evaluate and compare two prenatal programs serving Hispanic women in Washington, DC. The two programs are a prenatal education program provided by a federally qualified health center (FQHC) Mary's Center for Maternal and Child Care,

Inc., and a group prenatal care program based on the Centering Pregnancy curriculum provided by the Providence Hospital Center for Life.

Theoretical Framework

The Socio-Ecological Model identifies various tiers of influence on perinatal health behaviors and outcomes. Urie Bronfenbrenner (1979) categorized micro-, meso-, exo-, and macro- structures of impact. Stokols separated these layers of influence into *intrapersonal features, interpersonal processes, institutional or organizational aspects, community factors, and public policy* (Stokols, 1996). When health hurdles are tackled within not only the context of the individual, but her whole neighborhood and community, behavioral modifications develop more holistically to become more readily feasible. Bronfenbrenner highlights that the most efficient methods to modify behavior is the incorporation of these changes at all echelons as described by the socio ecological model— individual, interpersonal, organizational, community, and policy (Bronfenbrenner, *The Ecology of Human Development*, 1979) (See Appendix 3).

This model acknowledges that a person's health is impacted not only by physiological events and genetic disposition but additionally by a multifaceted relationship of these biological determinants with societal and household interactions, environmental influences, and expansive social and economic frameworks throughout the life course. The intervention initiatives proposed to improve perinatal outcomes, such as the programs at Mary's Center and at Providence Hospital, should speak to not only future individual level occurrences such as the physiological routes to illness, individual and daily life influences, or the current aspects of population-based programs, but also societal-level phenomena (Bronfenbrenner, *Toward and Experimental Ecology of Human Development*, 1977) (Bronfenbrenner, *The Ecology of Human Development*, 1979). A graphic of the ecological model can be found in the appendix.

Methods

The researcher employed quasi-experimental designs using both evaluation and needs assessment study design components. The researcher worked with program directors at Mary's Center for Maternal and Child Care and at Providence Hospital in the Center for Life. Both sites have established prenatal educational programs that serve Hispanic/Latina women in Washington, DC. The researcher gathered descriptive materials including literature about each program, as well as reports and additionally relevant information to guide the study. The researcher corresponded with personnel involved with each of the programs. To gain a more thorough perspective of the prenatal class program environment, the researcher attended classes and performed observational methodology as a participant in the class over the course of ten sessions from January through March of 2011.

Both of the program sites provided the researcher with data collected from cohorts served in 2009. Program personnel provided administrative data concerning variables such as birth weights (converted to just ounces from pounds and ounces for ease of analysis), age of mother at birth, years of school completed, gestational age, and delivery type (vaginal delivery or cesarean section delivery). Data collection initiated following the submission of the preliminary concept paper and proposal to the necessary academic advisor/principal investigator, and following initial agreements with two research sites in the Washington, DC area.

Group participants were selected from the 2009 cohorts at both Providence Hospital and Mary's Center. A combination of qualitative and quantitative research added to the richness of data collected from the two sites. Demographic data were collected on mother's age, number of years in the United States, native language, education, number of previous pregnancies, number of living children, weeks of gestation, and birth weights of the babies born to participating women.

The researcher conducted interviews at Mary's Center with former class participants to investigate knowledge, attitudes and beliefs as well as individual structural barriers such as transportation, childcare, and the timing and cost of class participation. The researcher recruited subjects who had previously attended (2009) the prenatal course at the Mary's Center for in-person, as well as telephone interviews. Once all queries were answered, verbal informed consent was obtained from all participants. Selection into interviews depended on attendance in education classes. Content of class was included within several questions in the collected data; the researcher also recorded anecdotally that the study participants had previously attended formal prenatal classes on the site being evaluated.

The researcher conducted in depth semi-structured individual interviews with participating prenatal class staff at Mary's Center. Staff answered questions regarding length of involvement in prenatal education program, recommendations for series enhancements, as well as queries directed towards the needs of the staff members such as trainings, meetings, and topic area review. The researcher was unable to obtain interviews with staff or clients at Providence Hospital due to Internal Review Board (IRB) limitations.

Data analysis instruments

The researcher used SPSS 19 data analysis software to investigate findings of the research in both sites including differences in background characteristics, class retention and pregnancy outcomes compared between the two prenatal program groups using independent sample t-tests for continuous characteristics. The researcher used the Chi-squared test to ascertain significance among the nominal dichotomous data. Independent sample t-tests tests were used to evaluate continuous data from the hospital and FQHC environments. All of the statistical methods were employed to determine the existence of statistical significance between the two programs.

Results- Mary’s Center and Providence Hospital Birth Outcomes

The Health Promotion department at Mary’s Center designed the prenatal class at to provide another learning opportunity for prenatal patients in the community. The prenatal education groups are available throughout the year, and typically run for eight sessions on a quarterly basis. Each session has a different instructor who conducts an interactive presentation on one of a number of selected topics including family supports and depression, relaxation during labor and delivery, nutrition, family planning options, among other relevant topics. **Table one** (below) indicates the birth outcomes from the Mary’s Center cohort from 2009.

Table 1: Birth Outcomes Among Participants in Mary’s Center Prenatal Education Program

Clinic	Mean Birthweight (oz.)	Patients in Sample (N)	Standard Deviation of Birthweight (oz.)	Percent Low Birth Weight	Percent Vaginal Delivery*	Percent Cesarean Delivery*	Independent Samples T-test (Delivery)
MC	90.05	20	41.1	25%	64%	36%	t= 2.178; p=0.05

*= Six participants from the sample had unrecorded delivery types

The mean birth weight for Mary’s Center prenatal education group was 90.05 ounces. The range of newborn weights was from 5 pounds 7 ounces to 8 pounds 1 ounce. Five of the babies born to the twenty Mary’s Center prenatal class participants qualified as LBW. Although there were twenty women in the group, six of them had unrecorded delivery types and were unreachable during the data collection phase (marked with asterisk in the table). The remaining fourteen women (64%) had vaginal deliveries. The additional 36 percent (N=5) of the group delivered through cesarean section.

Providence Hospital Birth Outcomes

Providence Hospital’s Centering Pregnancy has been running for three years. Midwives and medical assistants facilitate the program medical visits and discussion sessions. **Table 2** shows the birth outcomes for the Providence Hospital Centering Pregnancy group in 2009.

Table 2: Birth Outcomes Among Participants in Providence Hospital Prenatal Care Program

Clinic	Mean Birthweight (oz.)	Patients in Sample (N)	Standard Deviation of Birthweight (oz.)	Percent Low Birth Weight	Percent Vaginal Delivery	Percent Cesarean Delivery	Independent Samples T-test (Delivery)
PH	116.2	186	17.47	7%	74%	26%	t= 2.178, p=.05

The mean birth weight for Providence Hospital Centering Pregnancy group was 116.24 ounces. Among 186 participants in the 2009 cohort, seven percent of the babies born qualified as LBW. Nearly three quarters (74%) of the participants had vaginal deliveries; just over one quarter had cesarean section deliveries.

Mary’s Center Satisfaction Outcomes

Prenatal education participant satisfaction

Relaxation and Breathing

The researcher collected staff (N=9) and participant (N=9) satisfaction data through in-person and telephone interviews. Class participant interviewees reported high rates (100%) of satisfaction with the prenatal series. The most memorable class for the majority of the interviewed participants focused on relaxation and meditation during labor and delivery. Those who reflected on this topic reported having used the knowledge from the class during the labor and delivery of their babies.

Nutrition

The nutrition session was referred to through the majority (N=9) of participant interviews. Many class participant interviewees reflected on the nutrition class and the positive impacts beyond the perinatal period. Several reported having changed their eating behaviors as a result of the hands-on nutrition session. Although there was overall enthusiasm expressed about this session, the participants requested additional guidance pertaining to healthy eating habits, weight gain, and perinatal fitness.

Staff Satisfaction

Staff members (N=9) who contributed to the prenatal class curriculum participated in interviews to better understand the process of program implementation, experiences with instruction and general participation and satisfaction within the prenatal class context. Staff members answered inquires about strengths of the prenatal education program, and offered elaboration on what would enhance the program effectiveness.

Exchange of Information Among Participants

All of the staff highlighted strengths of the program and reported the exchanges of experiences among participants, the opportunities to ask questions, and the chance to interact with other women in comparable situations as the major advantages of their curriculum and environment. Staff acknowledged that the exchange among women in the groups may be the most critical component to the program.

Participant Attendance, Retention and Perceived Barriers to Attendance

All of the interviewed staff provided feedback regarding concerns and potential enhancements to their program. The rate of participant retention was the most common concern from the staff members. Women who were further along in their pregnancies concluded the class before others who were in the first or second trimesters of pregnancy. In addition to varied gestational ages, staff suggested common scheduling conflicts for many people during the mid-morning. Class sessions run from 10:00am until 12:00pm. Staff hypothesized the schedule is inconvenient for women who have jobs, as well as for those who had other children and required childcare. Several staff made recommendations to either shift the schedule or provide additional course times that would accommodate the needs of women who were unable to attend for a variety of reasons. Staff further suggested providing childcare on-site for those who are not in first-time pregnancy category.

Retention, Attendance and Perceived Barriers to Attendance

In addition to the barriers to attendance, the staff interviews revealed repeated concerns regarding class retention. Staff reported inconsistent attendance among those who did choose to enroll and hypothesized that the continually changing staff leaders may be related. Staff reported interest in attending more than the one class they were leading, but conflicts with other responsibilities posed challenges for their own attendance. As far as the group participants' attendance, staff recommended offering incentives (in addition to the light refreshments) such as gift cards to local businesses. Interviewees reported that the changes with systematic contacting mechanisms such as reminder calls (now replaced by email reminders) need revisiting. Staff members recommended trying to work with the clinic to coordinate prenatal appointments to correspond to the class session so the women would not have to come more than once per week to

the clinic. Other recommendations to create a more cohesive classroom environment included serving refreshments in the beginning versus at the close of the session, and developing a type of ritual that would create more camaraderie among group members and make the timely arrivals more important to participants.

Training Opportunities

Staff expressed unanimous interest in obtaining more training on actual delivery of material through teaching methods. Staff described the wanting to learn about curriculum development, childbirth education, as well as public speaking, lesson plan development, and working with a variety of literacy levels in medical settings. Staff interviews revealed that many would like to strengthen group facilitation skills, and more interactive techniques for teaching. With regards to the technical and resource-based knowledge inquiries, staff reported interest in learning more about community lead detection services as well as laws in not only Washington, DC but also in Maryland and Virginia where many of the participants reside. Lastly, staff members recommended assessment of the topics in each session and the order of presentation each week.

Providence Hospital Participant Satisfaction

The Providence Hospital Centering Pregnancy program collects detailed information from each person who participates in the group prenatal care program. This program contains a standardized evaluation tool to assess perceptions, experiences, and comfort levels. **Table 3** illustrates a variety of these participant satisfaction data from 2009. The rate of attendance for the Providence Hospital program (N=186) was approximately 94 percent in 2009. According to their evaluation, 98 percent of the 2009 participants “felt prepared for labor, delivery and infant care”. Approximately 91 percent of the program participants felt satisfied with the presentation of program themes (“program areas were well covered”). Approximately 99 percent were

comfortable doing risk assessments in a group environment, and 99 percent expressed preference for the group mode of care delivery.

Table 3: Satisfaction Outcomes among Providence Hospital Prenatal Care Participants, from evaluation surveys (N=186)

Rate of Attendance	94%
Percent who "Felt prepared for Labor and Delivery, Infant care"	98%
Percent who thought "Program areas were well covered"	91%
Percent who felt "Comfortable doing risk assessments in a group"	99%
Percent expressing preference for group over individual care	99%

Statistical Tests

The researcher used the Independent Sample T-test to compare the mean scores from the Mary's Center on the birth weight and delivery type variables with the Providence Hospital Centering Pregnancy program birth weight (ounces) and delivery type (vaginal delivery or cesarean delivery) variables to investigate statistical significance. The Chi-squared statistical test compared the Providence Hospital Centering Pregnancy participant characteristics and outcomes with participants in the Mary's Center prenatal group, and tested the strength of correlations of the different characteristics. These tests had the role of verifying whether there were truly random or significant differences among the cohorts in the study.

Within the variable showing age of participants, the Mary's Center program were younger by about two years on average than the Providence Hospital program. The standard deviation of age was 5.5 with an average age of 26 years old at time of program. The Providence Hospital

outcome was a mean of 28 years old, with a standard deviation of 5.4. Chi-square outcomes for delivery type showed no statistical significance, but did show clinical significance as ten percent more of the Mary’s Center group participants had cesarean deliveries than those at the Providence Hospital program. Chi-square test for LBW was significant ($p=.019$, $\chi^2 = 7.3$) showing a higher rate for Mary’s Center (25% of participants babies were LBW) than for Providence Hospital (7% LBW).

Birth Outcomes

One of the major indicators of infant health is birth weight. **Table 4** shows the comparison of birth outcomes from Mary’s Center prenatal education program and Providence Hospital Centering Pregnancy program. Within the study’s findings, birth weight shows a significant difference between the Mary’s Center and Providence Hospital outcomes, with a 26 ounce difference between the two programs($T=2.178$, $p=.05$). The data from Providence Hospital’s Centering Pregnancy program had more favorable outcomes for the birth weight variable than the Mary’s Center prenatal class given the results from the significance tests. Because Mary’s Center had a much smaller cohort, the Standard Deviation was thus much larger (41.1) compared to that at Providence Hospital (17.7) with a significantly larger group.

Table 4: Percent of Birth Outcomes with specific characteristics

	Age Mean (SD)	Birthweight Mean (SD)	LBW: Yes N(%)	C-Section N(%)
MC N=20	25.6(5.5)	90.05 (41.1)	5(25%)	5(36%)
PH N=186	28.1(5.45)	116.24 (17.1)	13(7%)	45(26%)
Total	27.9(5.49)	113.70 (22.19)	18(8.7%)	50(26.3%)
Significance test	T-test= 2.036	T-test= 2.178	Chi Sq= 7.3	Chi Sq = 14.7

Table 5 (Mathews & MacDorman, 2007) illustrates the patterns for similar outcomes within the United States for non-Hispanic white populations, non-Hispanic black populations, and Hispanic populations. Interestingly, Providence Hospital’s program has outcomes that are exactly the same as the Hispanic averages of LBW.

Table 5: Comparisons of Mary’s Center and Providence Hospital with United States

(T=2.178; p= .05 for delivery types; LBW at MC = 41.1 STD; LBW at PH = 17.4 STD)

	Mary's Center	Providence Hospital	United States Hispanic Women
Birth weight(oz)	90.05	116.2	N/A
N	20	186	N/A
Percent Low Birth Weight	25%	7%	7%
Percent Vaginal Delivery	64%	74%	59%
Percent Cesarean Delivery	36%	26%	31%

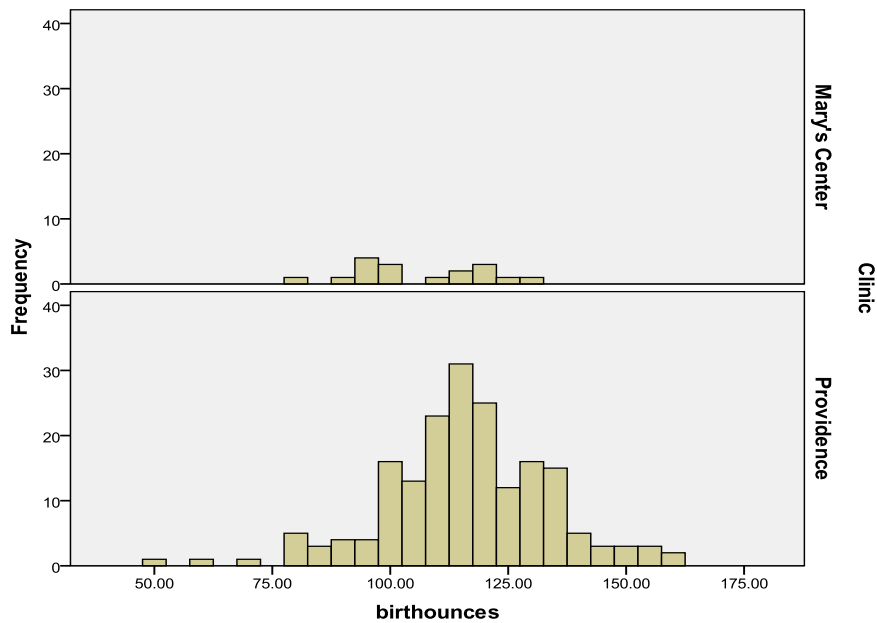
Low Birth Weight

Low birth weight is a critical newborn condition that is influential in child development, or in extreme cases, infant mortality. The side-by-side comparison places Mary’s Center and Providence Hospital in distinct positions. The outcomes from this study shows Mary’s Center prenatal program participants have a 25 percent LBW rate from the 2009 cohort, while Providence Hospital’s Centering Pregnancy program has a rate of 7 percent (see **Table 4**).

Figure one (below) exemplifies the distribution of birth weights among Mary’s Center and Providence Hospital group programs. As noted above, there was a significant difference of approximately 26 ounces difference between babies born to the Providence group and babies born to the group sampled from Mary’s Center. While Providence has more of a bell-shape curve, the

Mary's Center prenatal group maintains a flatter formation. This also highlights the discrepancy in data provided for the present analysis.

Figure 1: Distribution of Birth weight Among Participants in Mary's Center and Providence Hospital Prenatal Programs



Participant Retention

One of the outstanding differences that surfaced in this study is that the participants in the Providence Hospital program maintain a longer, and more involved commitment to the program they are a part of. Participants begin their PNC with the group, typically early on in the pregnancy. Providers are more familiar with the participant needs, and any other potential influence in their physical health such as interpersonal confounders. While Mary's Center prenatal education program has the consistency of running each week during set periods of time, the series has the feel of a drop-in environment with the continuously dynamic changes of the group and staff member changes.

Providence Hospital and Mary's Center Satisfaction

The satisfaction survey component of this study revealed numerous intriguing insights. Although both Mary's Center prenatal program had high satisfaction rates, the attendance and retention rates from Providence Hospital speak to the participant satisfaction at that site more clearly. Whereas Mary's Center had a program that was open to any interested and expecting participant, Providence Hospital held groups of eight to twelve individuals for longer periods of time. This may be because a common underlying interest in becoming better acquainted with hospital staff and/or the hospital setting with anticipation of delivery there. It may be the obligation of attending critical prenatal appointments solidified participant adherence to the group. Interestingly, participants from the Providence Hospital group often change medical homes once they deliver because of limited pediatric care in the hospital. The participants from Mary's Center tended to return (90%) to Mary's Center for pediatric care following delivery.

Delivery Types

While not statistically significant, it is critical to note in the present study the clinical significance of the ten percent difference in delivery types from Providence Hospital's Centering Pregnancy program and Mary's Center prenatal group. Providence Hospital's Centering Pregnancy program cohort received Cesarean sections 36 percent of the time. This finding indicates the need for more investigation into more complicated influences such as psychosocial needs, previous work conditions, home life, among other stressors that could influence this outcome (Durik, Hyde, & Clark, 2000). This may correspond with the outcomes of LBW shown in tables two and five. Out of 186 participants at Providence, there were 7 percent infants born LBW; at Mary's Center the proportion resulted at approximately 25 percent for the total of 20 births recorded.

Discussion

When matching these two outcomes with the 2005 United States LBW rates for Hispanic women, it is notable that Providence has an exact match. What impact does each of the programs have on birth weight then? It is difficult to say exactly what influence attendance had since there are many confounders, and it would require studies with more substantial sample sizes, over numerous years before beginning to declare causation or correlation. What is known is that the state of mind that a pregnant mother is experiencing can impact her baby's health. If a mother is experiencing elevated stress or is depressed, she is at risk for delivering a baby with LBW (American College of Obstetricians and Gynecologists (ACOG), 2000).

A group setting can begin to lessen the intensity of stressors, and therefore reduce the risks associated with LBW. Birth weight is not the only characteristic that merits attention in group settings, but it is a critical factor requiring attention. The vaginal delivery rates at Mary's Center and Providence Hospital are significantly higher than those shown from the U.S. data. Interestingly, the percent of cesarean deliveries is higher at Mary's Center sample and in the U.S. figures. Determining causation is extremely challenging from the present study, and more rigorous investigations into whether group PNC influences the cesarean or vaginal birth rates among Latina/Hispanic women is necessary before declaring any specific link.

The sample sizes had major discrepancies which may have impacted the findings from both sites, and particularly Mary's Center. Because the sample at Mary's Center was notably smaller compared to the Providence Hospital sample, the findings merit further investigation with a broader participant base. If these findings were indeed among a larger sample, they would still require further research to identify the additional confounders influencing these outcomes. Furthermore, the majority of prenatal education series initiates in the third trimester and continue through the postpartum period. Providence Hospital's program, however, begins with the first

prenatal visit and carries on throughout the postpartum stages. Mary's Center has the tools prepared within its staff, space, and openness of clientele to move closer to a model with outcomes resembling those of the Providence Hospital Centering Pregnancy program.

A number of variables may influence whether a woman decides to participate in a prenatal education course series. As the staff interviews and literature pointed out, there are numerous barriers to joining a group that require assessment. It is challenging to partake in a class during the work day if a woman is employed. Finding a job in the current economy poses challenges for experienced and well-educated individuals, and is that much more challenging for those who have lower educational attainment, fewer technical skills, and who potentially learning a new language. Sacrificing a job to attend a class that lasts a short time is an unlikely option for many women who may be interested. Separately, it can be daunting for some women and their partners to share personal experiences with people they do not know well, such is the case in some group sessions in both of the research study environments. Lastly, the prohibitive public transportation cost can pose an additional barrier for those who live outside of the immediate neighborhood and need to commute in for the class. The next steps for this research project should investigate these barriers with those who were unable to attend.

Although Mary's Center provides the educational series, given the numerous barriers mentioned one possible conclusion for the lower attendance rates at that site may be the need for participants must prioritize their PNC appointments over the class program. If the class was coordinated with the appointment times, there may be better turn out for attendance since it would mean one day out of the week to take care of many needs, education and medical care included. Childbirth education is considered a valuable resource for many people, but when time is limited and there are other concerns surrounding an expectant woman, simply getting to the doctor's office can pose a major challenge.

One of the most striking differences in this study and in the literature is the fact that Providence Hospital's Centering Pregnancy program is indeed prenatal care coupled with the developed group education elements, and it integrates the aspects of physical health with educational content. Even with the incorporation of a wide-ranging spectrum of materials, the main focus of prenatal education classes continues to emphasize the experience of the labor and birth, though Mary's Center strives to go beyond those themes to support participants in a broader learning experience. Further research may determine perceived need for educational settings including prenatal class series such as the program at Mary's Center.

Birth Outcomes

This proportion within the researcher's findings at Mary's Center goes against the Hispanic Paradox phenomenon described, though outcomes do correspond with the findings of elevated LBW among Latinas in the Washington, DC region. In the present study, they are still 50 percent higher than the total Washington, DC area LBW rates for Latinas, and this requires consideration. The limited sample data may contribute to this outcome; reevaluating may provide a clearer picture.

The clinical significance of the ten percent cesarean section outcome between the Mary's Center group and the Providence Hospital group is worth noting. There are a number of contributing elements that could lead to cesarean section, but as far as the present study goes, more investigation into the causes merits attention before making these linkages. The present study does not imply any causation in terms of group participation and delivery type, however it is an outcome that requires further research to ascertain possible reasons why these two populations are facing significantly different delivery type outcomes.

Staff Satisfaction

The researcher was unable to gather the staff satisfaction from the Providence Hospital to ascertain staff perspectives on care delivery, prospective modifications, and barriers to participation. The data found in the study from Mary's Center staff interviews pointed to the need to address structural changes within the group and within the team itself. Reports indicating the need for team meetings, and for more in depth understanding of each instructor's area of expertise implies the need for more structured team adaptations. Ultimately, the cohesion of the participant cohort may be linked to the cohesion of the team delivering the program. The participating staff at Mary's Center reported an interest in regularly scheduled team meetings to discuss the prenatal education program, to learn more about what other instructors do, and to make enhancements to the general prenatal group setting on an ongoing basis. These structural adaptations are components that the Providence Hospital's Centering Pregnancy staff has in place at present, which may contribute to staff satisfaction on that site though further investigation is required to make any conclusions on this variable.

The researcher was able to observe the Mary's Center group, though because of limitations she was not able to attend the Providence Hospital program. Because the program data at Providence Hospital is more structured on many levels, it appeared inherently more organized with regard to data aggregation systems. For example, the Providence Hospital program is grant funded, and therefore requires more rigorous record keeping than the non-funded prenatal class at Mary's center. To date, Mary's Center keeps records of participation for each cohort. Although there are valuable data, more intensive analysis and further evaluation would offer more solid conclusions regarding impact of the prenatal class.

Program Enrollment and Class Referral

The method of enrollment had interesting differences. At Providence Hospital, patients are not permitted to join the Centering Pregnancy program after a particular period of time (typically 14-18 weeks gestation) because they will be further away in gestational age than the rest of the group. Although this limits those who find out later about the program, this rule maintains the similar gestational age of each cohort, and hence the diverse experiences of the expectant mothers at that same relative points in their pregnancies. At Providence Hospital, participants are referred directly to the Centering Pregnancy coordinator, and depending on where she is in her pregnancy, she can join the group or is referred to other services. These differences perpetuate varied dynamics within each of the separate group settings.

At Mary's Center, anyone who is expecting and interested in joining the prenatal class is welcome to do so. And, although this is positive for those who learn about the group at varied times in their pregnancies, this could be contributing to the changing retention and attendance rates. This study also found that paths of referral also have discrepancies. The staff interviews at Mary's Center revealed that among some of the staff who contributes to the class, there is confusion about how participants find out about the class. There are numerous ways in which people at Mary's Center find out about the prenatal group. Individuals who enroll in prenatal care through the clinic hear about the group from the prenatal coordinator. Others learn about the class from a doctor, a midwife, a community health worker, or a flyer on the community bulletin board in the waiting room. It may be worth investigating alternate systems to enroll prospective participants in the prenatal class. Clients could be automatically signed up for classes during their intake processes. One potential option would be for Mary's Center staff to develop an information welcome session to

precede the actual series to gauge interest, answer questions, and learn about what the prospective learners would like to get out of participating.

Methodological Limitations

The variation in the sample size is important to review since it was significantly unequal. Significance tests could be implemented again in future studies with more balanced sample sizes. However, the overarching methodological limitation in this study was the lack of a control group. The researcher was unclear whether the participants in each group site possessed disparate characteristics or notable risk factors. The lack of an experimental design limits the study validity, and future research should include this if feasible. Furthermore, while the women in each of the programs were all Hispanic/Latinas residing in Washington, DC the programs serve different neighborhoods and this could draw varied conclusions among the participants. The enrollment protocols were also notably different and likely impacted items such as attendance and retention. An additional challenge to the participant assessment data was that it was collected by participating staff members. Although confidential in nature, the groups are small and there was potential for a bias toward positive responses among participants from the two cohorts.

It is critical to address the confounding factors even though there were significant outcomes within the statistical tests measuring birth weights among the two sites. Neither of the programs involved randomization; all of the participants in each of the programs self-selected into the groups because of individual interest in a group model. Secondly, the researcher did not have access to additional medical history data regarding either of the groups' participants. In either of the two prenatal group settings, participants could have medical conditions placing her at risk such and impacting the outcomes for delivery types, for example. Furthermore, although the participants are relatively matched for race/ethnicity, and the sites serve comparable populations, residence in

different neighborhoods could skew outcomes in unexpected ways. Lastly, sample sizes varied significantly; this discrepancy could provide power or remove power strength from outcomes.

Conclusions/Recommendations

The Providence Hospital Centering Pregnancy program and the prenatal education program at Mary's Center embrace parallel intentions aimed at promoting health and encouraging expectant women's confidence in their own capabilities. The efficacy of prenatal education on the whole is merits examination as well as an assessment of prenatal education between methods. Additional studies could look deeper into the correspondence of prenatal education models and maternal traditions, cultures and beliefs about birth and the impact of prenatal and childbirth education on the perception of the birth experience. Investigations that systematically identify measures of health-focused outcomes and institutes standardization of the intervention of prenatal education are needed (Koehn, 2002). Furthermore, studies that measure the declared aims of each type of prenatal education program would contribute to the comprehension regarding the field.

Prenatal education is undeniably at a junction in research (Lothian, 2008). Currently, the availability of information about pregnancy and childbirth readily accessible to women is far beyond what it has ever been in the past. What supplementary education could further prenatal education classes? Prenatal educators in Washington, DC should offer a viewpoint that is culturally relevant and applicable to the diversity of women they serve. Prenatal education advocates are confronting the challenges by modifying the curricula to keep up with societal shifts and to speak to consumer demands and nascent maternity care practices. New methods of collaborating, including prenatal educators working in partnership with Centering Pregnancy group prenatal care (Worrell, 2008), have been projected. Mary's Center in particular could choose to adopt some of the attributes of the Centering model to both serve more clients, and to develop more measureable data

on which to develop programs more thoroughly. That said, neither Mary's Center nor Providence Hospital should abandon the traditional prenatal education/childbirth education approaches because although they may not be as structured as the Centering Pregnancy Model, they provide a critical space for learning and sharing a life transition with others in similar circumstances.

While Centering Pregnancy has several parallels to prenatal education, it is not a replacement. The group approach employed by Centering Pregnancy and prenatal education focuses on similar instructive areas, but prenatal education courses continue to be an important component of pregnancy care and are particularly important for first-time parents as they learn from one another in an organic, family-centered way. Prenatal care, as well as prenatal education, is developing in ways that come closer to meeting the wants and desires of contemporary families in a variety of settings and circumstances. Interventions that have evolved to engage our communities' most at-risk members require ingenuity and adaptability, as well as profound care, and compassion.

Whether one chooses Centering Pregnancy or childbirth classes, these opportunities for learning must embrace a dialogue of individual belief systems and viewpoints of childbirth; methods of maintaining one's health through suitable diet and fitness; framework of pregnancy from anatomical and physiological perspectives; labor and delivery; varied methods of managing the pain of labor as well as interventions and preferences during childbirth such as employment of anesthesia and other medications; unanticipated results; preferences for the infant; and breastfeeding and postpartum concerns.

In addition to this evaluation, which concentrates on the birth weight outcomes as well as delivery types, future evaluations should observe the long-term impacts of both Mary's Center and Providence Hospital's prenatal group programs. More rigorous and systematic evaluations with each cohort would offer valuable records and would help to demonstrate the long-term outcomes

of the families involved Mary's Center prenatal education program; these would play to the distinctive prospect this program has given its role in the Hispanic community. Further research should ascertain the barriers of attendance to each of the programs by including those who were eligible for enrollment that could not (or chose not) participate for any number of reasons. Mary's Center is a clinic environment that strives to provide the continuum of care to their patients. This recommended research would begin to explain why a program within a maternal and child health setting is not reaching the number of participants in the prenatal education module. Prospective research endeavors should investigate the barriers that actually prevented potential enrollees from entering either or both of the series to better understand not only what works about the established series, but what could be further enhanced to reach more people and improve maternal and child health outcomes.

Providence Hospital's Centering Pregnancy program and Mary's Center for Maternal and Child Care's prenatal education classes have significant overlap. The complementary roles of childbirth education and Centering Pregnancy not only can improve a woman's comprehension but also may possess the possibility of facilitating a reduction in infant mortality and morbidity. This study found that the Providence Hospital Centering Pregnancy model provides an innovative and suitable method by which to deliver prenatal care and education that promotes contribution and exchange of experiences. Although the limited data from Mary's Center presented challenges to drawing concrete conclusions, it is undeniable that the social and interpersonal benefits of attending the prenatal education sessions were what made the deepest impression on both the participating staff and on the clients served.

The present study provides data that lays the groundwork indicating that participants at Providence Hospital's Centering Pregnancy program and Mary's Center prenatal education were content with the care, the social interaction, and ultimately the sense of readiness for labor and

delivery preparation they received. These two programs offer satisfactory approaches for Hispanic women in the Washington, DC region. However, more extensive randomized clinical trials with Hispanic women are required to conclude whether Centering Pregnancy or the Mary's Center model is better than traditional prenatal education with regard to both maternal and infant outcomes. Additionally, financial as well as clinician satisfaction requires measurement before adopting either these models of education delivery.

Development and employment of evidence based models of group prenatal care could reduce maternal and infant mortality rates that have otherwise remained challenging to decrease when implementing other models of prenatal care. Medical providers have continuously recommended childbirth education courses. Strategies for encompassing a broader and more diverse population of expectant women and their families, as well as further exploration on the impacts of childbirth education on perinatal outcomes, are needed. Preventing LBW and other negative perinatal outcomes demands a life course approach to the health of women and men, one that takes complete account of SES, environmental, and as medical issues and integrates influential public education campaigns. High proportions of women confront chronic medical conditions during their childbearing years. Many curable or at least treatable health conditions that surface during pregnancy impact a smaller fraction of women.

Ultimately, it is critical to call attention to women's health over the life course, in addition to the span of time in prenatal care or in a prenatal group setting; this requires a stronger effort on the part of medical professionals and legislators. The CDC reports that preconception counseling and medical attention for both women and men is a key component to any strategy whose effort is to lower the rate of LBW (among other poor outcomes) in the US among all populations (Johnson, Posner, & Biermann, 2006). The National Institutes of Health have continually deemed "unraveling the underlying reasons for ethnic variations in LBW and preterm delivery" to be one of the leading

public health challenges (National Institutes of Health (NIH), 2003). Despite the fact that prenatal care and group participation cannot replace the existence of long term medical conditions, it is essential that women receive prenatal care and can participate in these evidence-based interventions to help prevent poor birth outcomes. It is these interventions that have the potential to impact the birth outcomes of many women and their families.

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Appendix 1- Interview questions Mary's Center Participants

- What is your country of origin? / De donde son?
- How long have you been in the US? Por cuánto tiempo han estado en los EEUU?
- Do you live with or close to other family members? Viven ustedes con otros familiares o cerca a otros familiares?
- Do you have a job? Where? Estan trabajando? En que tipo de trabajo?
- Where do you receive medical care? Donde reciben cuidado medico?
- At what point in your pregnancy did you initiate prenatal care? Cuando comenzaron recibir cuidado prenatal?
- How did you find out about the prenatal class? Como aprendieron sobre la clase prenatal?
- Why did you decide to attend? Porque decidieron asistir?
- What did you think you would learn when you enrolled? Que es lo que pensaban que irian a aprender cuando matricularon?
- What did you think about the time of day that the class was held? Que pensaban sobre el tiempo de las clases?
- How did you get to the class? Como llegaban a las clases?
- Was it ever difficult to get to the class? Fue dificil? Facil?
- What do you think was the overall impact of attending the series? En su opinion, que fue el impacto total de asistir la serie de clases?
- Was there one thing you learned that has made a difference? Hubo una cosa que aprendieron que hizo una gran diferencia?
- What did your group do for the nutrition session? Pueden acordarse de lo que hicieron para la sesión enfocada en la nutrición?
- When you were delivering your baby, did you remember what you learned from the class about breathing and relaxation? What else did you remember? Cuando estaban en el parto mismo, recordaron temas de la clase?
- Have any of you had another child since the group ended? Han tenido mas niños desde que acabara la clase?

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- What did you learn regarding family planning? Is there a method that you prefer? Que aprendieron acerca a la planificación familiar? Existe un método que prefieren?
- Was there one particular session that stands out in your memory? Hubo una sesión que les impresionaron mucho?
- After you had the baby, was there class information that helped you? Después de que tuvieron sus hijos, había información desde las clases que les ayudaban?
- Did you know how to make appointments for vaccines and any other care? Sabían hacer citas para las vacunas y otros tipos de cuidado?
- Did you know what was available to you and your family in terms of health care and other benefits before the class? Did the class help with that information? Sabían ustedes cuáles tipos de cuidado de salud y otros beneficios antes de tomar la clase?
- Is there anything you'd like to add about your prenatal education experience here in the US? Hay algo más que ustedes les gustaría contribuir sobre su experiencia de las clases prenatales en los EEUU?

Mary's Center Staff Interviews:

- How long have you been at Mary's Center?
- What were you doing before you came to Mary's Center?
- Have you had positions similar to the one you have at Mary's Center?
- What is your role in the prenatal education group?
- Was the prenatal group facilitation on your job description?
- Is the role what you expected?
- Has this role changed?
- What types of training do you think staff need?
- How do participants find out about the prenatal group?
- Do you have ideas about how to reach more participants?
- In your opinion, what is it that makes the group work?
- What would you like to see changed in the group setting?
- Are there barriers? If so, what are they? Are they solvable?
- What is the protocol around participant referrals?
- What is your impression of participant retention? Is there anything you'd like to see changed?
- What are the strengths and weaknesses of the program overall?

Appendix 2 Common themes -Staff Interviews

- How long have you been at Mary's Center?
- 2.5 yrs
- 8 years
- 10 years
- 2 years
- 2.5 years
- 3 years
- What were you doing before you came to Mary's Center?
- In school (premed)
- School (nursing)
- Doctor in South America/Director of a clinic
- Public Health Nurse
- Nutritional counseling in S.America
- Medical Assistant; Dr in C.America
- Have you had positions similar to the one you have at Mary's Center?
- Shadowed at a hospital; burn unit in C.America
- STD coordinator
- Nurse in school health setting
- Summer midwifery program; public health home visits in C.America
- Nutritional counseling
- Red Cross; home visits in rural C.America with pregnant women
- What is your role in the prenatal education group?
- Teach the first class including development, phys/emo, changes in pregnancy, hormones
- I give one class, coordinate group.
- Newborn care
- Relaxation, meditation during labor
- Nutrition
- Health educator; importance of vaccines; well visits; first 2 years; allergens, asthma, lead, support.
- Was the prenatal group facilitation on your job description?
- No
- No
- Yes
- No
- I don't remember
- Yes
- Is the role what you expected?
- I thought it would be more formal
- Role is what I expected
- There are fewer women than I expected

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- It has become more hands on
- I wasn't sure who was going to be in front of me
- Has this role changed?
- I've become less involved because of my other responsibilities
- Not really
- Much more time on the computer
- Become more hands on
- It hasn't changed much
- What types of training do you think staff need?
- Better understanding of what each person teaches
- We need to meet and share the experience
- We need a pre-test and post-test
- We need to learn how to connect the themes such as dynamics, groups and teaching
- No areas that I can think of
- Limited perspective of other classes
- Childbirth education training
- We need to meet
- Public speaking
- Teaching skills, lesson plan development, curriculum
- Interactive techniques for teaching
- Laws- different in DC, MD, VA
- Lead resources
- Working with varied literacy levels
- How do participants find out about the prenatal group?
- Evelyn or Alis; FSWs
- We give flyers
- Advertising; HV; FSWs
- Evelyn and assessment team
- Flyers, Alis, Evelyn
- I don't know; a couple were referred by midwives
- Do you have ideas about how to reach more participants?
- The time of year is challenging; outreach no longer exists
- Incentives
- Go to the Centering model with medical visits; though we'd only see MC pts then
- Consistency is lacking
- Teachers are always changing
- Create more structure
- Provide a book, activities, more structure
- Make the participants commit somehow
- Find out what the barriers are from those who enrolled but couldn't attend

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- Offer childcare
- Change the time, offer other times
- In your opinion, what is it that makes the group work?
- The way we set it up is very homey
- We're in a circle
- We use a lot of pictures, so lower literacy people feel comfortable
- People who come want to learn
- People are in the same situation
- For many people it's their first baby
- Pregnant women are in a great situation for learning, especially if it's their first baby they want to hear other opinions
- Variety of topics
- It's good to offer a prenatal class
- What would you like to see changed in the group setting?
- Have an English group
- Nothing
- Get people here on time
- Serve food in the beginning instead of the end
- More consistency would help camaraderie of the women
- Have a ritual at the beginning of class
- Lack of professionalism among staff is reflected in the participants' attitudes
- Improve attendance
- Keep people in the group
- Are there barriers? If so, what are they? Are they solvable?
- Transportation
- Child care
- Work
- Communication
- People feel intimidated by instructors because they're standing
- Classes are all in Spanish
- Work
- Consistency
- Schedule of class
- Have staff meeting before class sessions start
- Transportation
- Time of day
- Awareness of importance of topics- clients don't believe they have anything else to learn
- Economic issues- can't afford the bus/metro
- Schedule
- Flexibility

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- What is your impression of participant retention? Is there anything you'd like to see changed?
- We used to call them and let them know about each time. We don't call any more and email is less effective
- It's consistent; I would like to do pre and post tests
- Personal invitations get people there
- Most people say they've been to a couple of classes, but not all. First impression is really important: if you feel like you're getting something valuable, you stay. Ordering of the classes should be evaluated
- Attendance is inconsistent
- The first points of contact should ask what the participants would like to learn
- Give incentives
- Patients want to see the doctor
- What are the strengths and weaknesses of the program overall?
- Strengths
 - We know the program works because of the turnout in the end, how receptive the participants are, how many questions they end up asking, how knowledgeable they feel.
 - Open minds, what happens to one person happens to another; sharing; exposure to friendship, knowledge
 - Thorough
 - Well-Organized
 - Leaders are good
 - Food is good
 - Setting is comfortable
 - Good sharing opportunities for participants
 - People in clinic (staff) participate in class
- Weaknesses
 - Each person who teaches disconnects from the group. We should come to more classes
 -
 - Recruitment is weak- partially because of us, the doctors, the inertia of the participants. We miss a lot of people
 - No team meetings
 - No manuals or folders
 - The goal is not to have a drop in class, but that's what it is
 - Consistency
 - Professionalism
 - We are informed about the class last minute
 - We need better evaluation
 - We need to give consistency to messages

Common themes Participant Interviews -Mary's Center

Why did you decide to attend?

- To learn more about pregnancy
- It seemed important
- It was my first child
- I wanted to learn more about childbirth

What did you learn regarding family planning? Is there a method that you prefer?

- We learned the different methods
- I learned all about the different methods, and then me and my husband decided on the IUD
- We learned about different ways, with hormones and without hormones

Was there one particular session that stands out in your memory?

- Relaxation and meditation
- Nutrition
- Massage
- Household toxins

After you had the baby, was there class information that helped you?

- Nutrition; I'm eating better now because we learned more about nutrition
- Nutrition

What was the overall impact of the class?

- I learned a lot
- I learned about relaxing during the labor and delivery
- I met other people and could ask questions

Appendix 3- Socio-Ecological Model

